



**United States Department of Agriculture
Forest Service**

Rio Grande National Forest

Draft Revised Land Management Plan

**Alamosa, Archuleta, Conejos, Hinsdale, Mineral,
Rio Grande, Saguache, and San Juan Counties, Colorado**

September 2017



Rio Grande Pyramid in the Weminuche Wilderness

Acronyms and Abbreviations

AIR – Air quality
ATI – Area of Tribal importance
CCF – One hundred cubic feet
CDT – Congressionally designated trail
CFR – Code of Federal Regulations
CRT – Cultural resources
CWD – Coarse woody debris
DBH – diameter at breast height
DC – Desired condition
FISH – Fisheries
FIRE – Fire management
FP – Forest products
FSH – Forest Service Handbook
G – Guideline
GDE – Groundwater-dependent ecosystem
HUC – Hydrologic Unit Code
INFR – Infrastructure
INDS – Insects and disease
LAND – Lands
LYNX – Canada lynx
MA – Management area
MIN – Minerals
NNIS – Aquatic and terrestrial nonnative invasive species and noxious weeds
OBJ – Objective
PAOT – Persons at one time
PLTR – Pollinators
REC – Recreation management
RNG – Range management
ROS – Recreation opportunity spectrum
RMZ – Riparian management zones
S – Standard
SCC – Species of conservation concern
SOIL – Soils
TEPC – Threatened, endangered, proposed, and candidate species
USDA – U.S. Department of Agriculture
VEG – Vegetation management
WA – Watershed
WCF – Watershed Condition Framework
WLDF – Wildlife and plants

Rio Grande National Forest Draft Revised Land Management Plan

**Alamosa, Archuleta, Conejos, Hinsdale, Mineral,
Rio Grande, Saguache, and San Juan Counties, Colorado**

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Planning documents are posted at: [Forest Plan Revision Webpage](#)

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Proposed Forest Plan

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Chapter 1. Introduction

In this document, “forest” with a lower case “f” refers to areas with trees, while “Forest” or “Forestwide” with an upper case “F” refers to the Rio Grande National Forest. Forest Service land management plans are commonly referred to as forest plans.

Purpose of this Land Management Plan

This forest plan guides project implementation, practices, uses, and protection measures to assure sustainable multiple use management of the Rio Grande National Forest, hereafter referred to as the Forest. The forest plan describes activities that would be implemented to achieve or maintain desired conditions and any resulting public benefits. Forest plan direction applies only to National Forest System lands administered by the Forest and does not imply or form direction for other ownerships (36 CFR 219.2).

Forest plans are strategic in nature and do not compel any action, authorize projects or activities, or guarantee specific results. Instead, they provide the vision and strategic direction needed to move a national forest toward ecological, social, and economic sustainability. Project-level environmental analysis will be completed for specific proposals that implement the direction in the forest plan. A forest plan may restrict the agency authorizing or implementing projects and activities. Projects and activities must be consistent with the forest plan (36 CFR 219.15)

Forest plans do not regulate uses by the public. A project or activity decision that regulates public use under 36 CFR Part 261, Subpart B, may be made concurrent with plan approval, plan amendment, or plan revision. The forest supervisor or district ranger is the responsible official for project and activity decision, unless delegated to a higher level official.

A forest plan establishes desired conditions, objectives, standards, guidelines, and land suitability. These are required plan components under the 2012 Planning Rule and Forest Service Handbook 1909.12. The components guide future projects and decision-making and should be in compliance with, but not repeat, Agency direction. Some of the plan components are described in the following pages of this plan.

Desired Conditions

Desired conditions present a vision of what the Forest should look like in the future. They describe specific social, economic, and ecological characteristics of the Forest, or a specific area. Forestwide desired conditions reflect anticipated resource- and species-specific conditions. Management areas have been designated to reflect integrated desired conditions that describe the overall condition of all resources for a specific area.

Objectives

Objectives are selected to guide progress toward the desired conditions. Each objective is a concise, measurable, and time-specific action intended to show progress toward desired conditions. Objectives must be achievable within the fiscal capabilities of the Forest.

Standards

Standards are strict, mandatory constraints on projects and activities and do not allow for variation. Standards are written in a precise manner using mandatory or prohibitive wording. They are designed to help achieve or maintain desired conditions, mitigate undesirable effects, or meet other applicable requirements.

Guidelines

Guidelines also constrain projects and activities but provide more flexibility than standards. Guidelines allow for departure from the terms as long as the underlying purposes are met (FSH 1909.12 § 22.14). Rationale and effects resulting from departure from guidelines are described in project-level analysis and decision documentation.

Suitability of Lands

National Forest System lands are identified as suitable for various multiple uses or activities in accordance with applicable desired conditions. Because lands are generally suitable for a variety of uses, identifying suitability helps determine if future projects and activities are consistent with desired conditions. A forest plan identifies lands as not suitable for uses that are not compatible with the desired conditions for those lands. Suitability determinations are not made for all uses, but suitability for timber production is required by law. Although a determination of an area as suitable for a given use does not commit a national forest to authorize the activity, lands identified as not suitable for a particular use preclude the ability to authorize that use.

Consistency of Projects with the Forest Plan

All projects and activities authorized on a national forest must be compliant with the forest plan (16 USC 1604(i) and 36 CFR 219.15(b–c)). The responsible official may bring projects into compliance with the forest plan by modifying the project or activity, rejecting it, amending the plan so that the project is in compliance, or amending the plan just for the duration of the project or activity.

Strategic Planning Framework

The framework for the forest plan (Figure 1) is divided into five domains: vision, strategic, tactical, monitoring, and adaptive management. Each domain feeds information back to help land managers determine how best to maintain or adapt forest plan direction to continue to improve the condition of resources toward desired conditions.

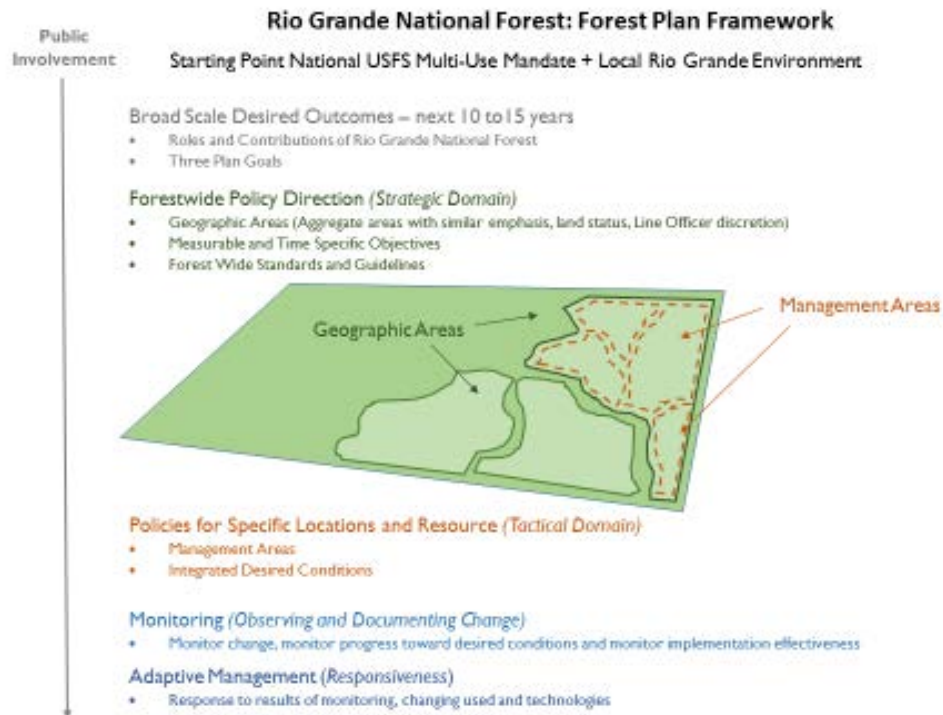


Figure 1. Forest plan framework

Vision Domain

Forestwide goals provide umbrella or vision statements that all other direction tiers to. To incorporate the many uses on the Forest and manage the resources in a sustainable manner, three goals have been established to convey the intent of plan direction. The goals address watersheds and watershed health, sustainable ecosystems, and social and economic contributions of the Forest to the surrounding communities, and they connect citizens to the land. The goal statements are numbered to allow for reference, not to indicate priority.

Goal 1

Protect and restore watershed health, water resources, aquatic ecosystems, and the systems that rely on them

National forests that exist today were initially created under the guidance of the National Forest Reserve Act of 1891, which allowed the President of the United States to set aside forest reserves from land in the public domain. This Act provided for wise use of the lands that provide protection of timber at the headwaters of streams, reduce downstream flooding, and provide a summer-long water supply for irrigation in the arid West (Muhn 1992). Protecting and restoring watershed health reaffirms the Act that created today's national forests.

Water from National Forest System lands supports outdoor recreation, biological diversity, wildlife species and habitats, agricultural irrigation, and flood control. National forests provide clean, abundant water for municipal water supplies, and for local and regional aquifer systems.

Opportunities for collaborative stewardship of watersheds emphasize the interrelated biological, economic, and social factors that affect these areas. Healthy and functioning watersheds contribute to overall resource health.

Goal 2

Maintain and restore sustainable, resilient terrestrial ecosystems

Ecosystems are a barometer of the quality of land management practices. A natural variety of species, genetic composition, and ecological processes are key to providing the diversity needed for resiliency in the face of environmental disturbances and changes.

Where appropriate in the next planning horizon, diversifying age classes and structure, seral stage, and habitat classes while providing for and maintaining habitat connectivity would provide multiple ecosystem benefits. Increased resilience to insect and disease outbreaks, responsiveness to warmer, drier weather patterns, and increased ecosystem services are just a few of the many benefits that would be provided.

Ecosystems are managed for connectivity across jurisdictional boundaries. The Forest strives to collaborate and cooperate with other agencies, units, partners, groups, state and local agencies, and individuals.

Goal 3

Actively contribute to social and economic sustainability in the broader landscape and connect citizens to the land

The Forest contributes forest products and tourism opportunities that are important to local economies, and provides ecosystem services for current and future generations. The Forest maintains locations with human influence while protecting areas of tribal importance and traditional uses in addition to other areas of religious or cultural importance. Opportunities are available for individuals, partners, and organizations to be active participants in managing, monitoring, and implementing projects that achieve integrated resource management.

The Forest provides natural-appearing landscapes with diverse scenery. The Forest maintains and provides access to a multitude of recreational opportunities within the expected capacity of the budget. Designated areas, such as wilderness and wild, scenic, and recreational rivers, are maintained to protect integrity and avoid damage incurred by overuse. The Forest provides a wide range of outdoor experiences ranging from primitive to highly developed that are within the overall capacity of the Forest. Where possible, interpretive opportunities increase public knowledge, provide historical background, and promote a connection of the current people to the past and their land.

Heritage resource sites are managed and integrated with recreation and environmental education in compliance with all applicable laws and regulations. When appropriate, sites are nominated to the National Register of Historic Places and managed to those standards.

Colorado tourism thrives on outdoor recreation and beautiful scenery, and the Forest maintains these values to continue to attract visitors to the area. Market-oriented programs such as minerals, range management, special use permitting, and timber management are managed to continue. Nonmarketable programs, including fisheries, heritage resources, recreation, water,

wilderness, and wildlife, are managed to continue to supply goods and services as requested by the public.

Ecosystem services, as defined in the 2012 Planning Rule (36 CFR 291), include provisioning services such as air, water, energy, fiber, and minerals; regulating services such as soil stabilization; and cultural services that include cultural heritage values and recreational experiences. The Forest strives to meet the demand for these services.

Strategic Domain

The strategic domain encompasses Forestwide policy direction that includes an overall emphasis for the geographic areas. Geographic areas represent areas based on line-officer discretion for management. The Forestwide desired conditions describe the conditions that forest managers are working to achieve. Measurable and time-specific objectives are developed to help managers determine if forest resources are trending toward or away from desired conditions. Forestwide standards and guidelines associated with these areas further direct activities in these areas.

Tactical Domain

The tactical domain divides the geographic areas into smaller management areas, which emphasize management at the landscape scale. Specific integrated desired conditions have been defined for most resources. Management areas are designated by number, with the first integer representing the overall emphasis of the area (Table 1). Each designated management area is characterized by an integrated desired condition that addresses desired conditions for that specific unit of land. The management areas are shown on the *Proposed Forest Plan* map, and each management area is individually mapped. These maps are listed in the table of contents and contained on the DVD located at the back of this document.

Table 1. Management area designations

Management Area Integer	Emphasis
1	Wilderness and wild, scenic, and recreational river designation
2	Areas set aside for research
3	Preservation of roadless characteristics
4	Areas designated for scenic values or high recreation emphasis
5	General forest management and wildlife designations
6	Grassland management
7	Wildland-urban interface ¹
8	Ski-based recreation

¹ The forest plan does not propose any wildland-urban interface management areas.

Monitoring Domain

The monitoring domain has at least eight topic areas required by the 2012 Planning Rule (36 CFR 219.12) and reflects an ongoing partnership with the Forest Inventory and Analysis program that is managed by the Forest Service Research and Development branch to share information collected on the Forest.

Adaptive Management Domain

The adaptive management domain created a process to increase the responsiveness of forest managers to changing conditions on the landscape, changes in higher level direction, and developing technologies. The process was developed in response to comments from the public that forest plans should be able to adapt to changing conditions in a timelier manner.

Management Approaches

Management approaches are optional plan content (FSH 1909.12 § 224) that offers more flexibility in adapting plan direction while still providing site-specific operational guidance. Management approach provide additional direction for projects and activities that implement the forest plan or explain how management will be undertaken and prioritized. They relate to desired conditions and may indicate the future course or direction of change while recognizing budget trends, program demands, and accomplishments. Deviation from management approaches would require documentation and public involvement, however, as optional plan content management approaches do not require a forest plan amendment if there is a need for adjustment.

Background, Roles, and Contributions of the Forest

The Forest consists of about 1.83 million acres in south-central Colorado (Figure 2) and forms the backdrop for the San Luis Valley, one of the largest mountain basins in the world. The headwaters of the Rio Grande river originate within the boundaries of the Forest, and most watersheds on the Forest feed into the Rio Grande river system. Water for municipal, industrial, and agricultural purposes comes from Forest lands in the Sangre de Cristo mountain range on the east side of the valley, and the San Juan mountain range to the west. The Forest was established in large part for the protection of these watersheds, and this foundational language is every bit as relevant today as it was at the inception of the forest reserve.

The Forest is administered by the U.S. Forest Service, one of several land management agencies in the San Luis Valley. Department of Interior agencies that manage land in the valley include the Bureau of Land Management, National Park Service, and U.S. Fish and Wildlife Service. All of the agencies have similar missions and directives and work collaboratively across area boundaries. Differences among the agencies are not always understood by the general public.

State agencies also provide input to management on Federal lands. For example, Forest staff collaborate closely with Colorado Parks and Wildlife staff in the management of habitat for wildlife species, including big game species such as elk and bighorn sheep. The Colorado Parks and Wildlife directs herd location and management that relates to the habitat management responsibilities of the Forest.

Elevation ranges from about 7,800 feet in the foothills to more than 13,000 feet in the San Juan Mountains along the Continental Divide. A few Sangre de Cristo elevations, to the east, exceed 14,000 feet.

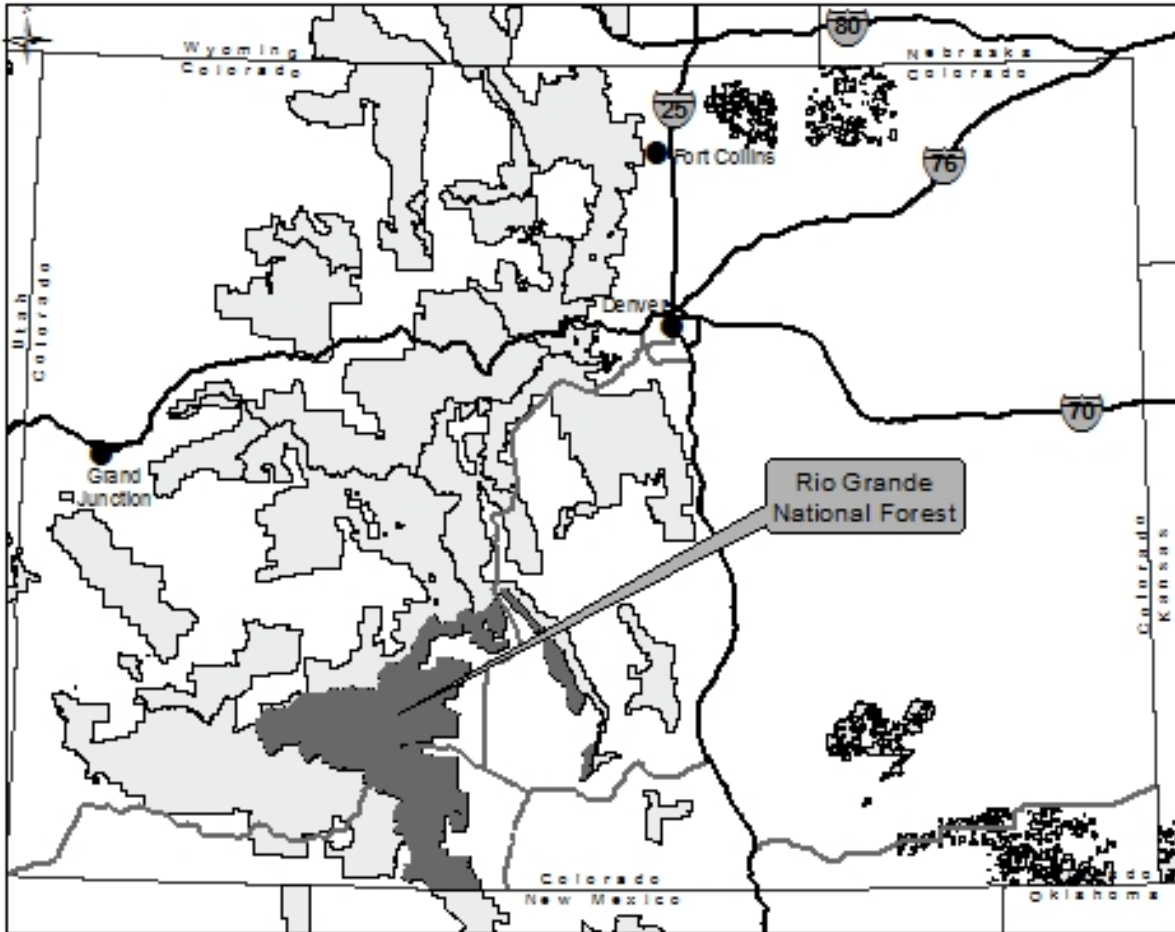


Figure 2. Location of Rio Grande National Forest in Colorado

The expansive and flat San Luis Valley, which contains very little National Forest System land, is composed of unconsolidated sediments laid down during the late Tertiary period. The Sangre de Cristo and San Juan mountain ranges on either side of the San Luis Valley, where most of the Forest is located, are of different origin and geologic age. The San Juan Mountains are composed of volcanic rocks and related shallow, intrusive rocks of the mid- to late-Tertiary period. Although the Sangre de Cristo Mountains are of more recent origin, the bedrock is older. The steep, narrow Sangre de Cristo Mountains were formed by faulting and thrusting along the Rio Grande Rift, a north-trending continental rift zone that separates the Colorado Plateau to the west from the Southern Rocky Mountains to the east.

Forest ecosystems generally vary by elevation, with the highest elevation containing the alpine tundra that occurs at or above 11,500 feet. Decreasing in elevation is the spruce-fir forest, which is generally inhabited by Engelmann spruce and subalpine fir mixed with quaking aspen. Vegetation in these ecosystems has been substantially altered by the recent spruce bark beetle infestation.

The Rocky Mountain alpine turf ecosystem is widespread above the upper timberline (11,000 feet and higher). Dominant species include boreal sagebrush, several sedge species,

tufted hair grass, fescue grasses, Ross' avens, Bellardi bog sedge, cushion phlox, and alpine clover.

The mixed-conifer wet ecosystem occurs in the transition zone between the higher elevation spruce-fir and the drier mixed-conifer type. It is generally dominated by Douglas fir and various combinations of white fir, Colorado blue spruce, Engelmann spruce, or subalpine fir with incidental occurrences of ponderosa pine.

The drier mixed-conifer ecosystem sites include a mix of conifer species, including ponderosa pine, Douglas fir, white fir, Colorado blue spruce, and smaller amounts of aspen. Depending on site conditions, limber pine, bristlecone pine, and some pinyon pine or juniper can be present.

Closer to the valley the pinyon-juniper woodland ecosystem includes pinyon pine, Rocky Mountain juniper, and Utah juniper. These woodlands generally occur on warm, dry sites on mountain slopes, mesas, plateaus, and ridges. Understory species include sparse perennial grasses, annual and perennial forbs, and sparse shrubs.

Rocky Mountain Gambel oak shrubland ecosystems are present at the north end of the San Luis Valley near Poncha Pass. Dominant species include Gambel oak, serviceberry, sagebrush, and various other shrubs, grasses, and forbs.

The Southern Rocky Mountain montane-subalpine grassland ecosystem includes Thurber fescue, Arizona fescue, and several other grasses, forbs, and sedges.

The Rocky Mountain riparian ecosystem includes numerous riparian types in the upper montane/subalpine zones. These systems are highly variable and generally consist of cottonwoods, willows, sedges, and other herbaceous vegetation, aspen, and conifers such as blue spruce, Engelmann spruce, and subalpine fir.

The various ecosystems provide wood products, clean air and water, and recreation opportunities for Forest visitors.

The Forest provides habitat for an estimated 300 species of mammals, birds, reptiles, amphibians, and fish. Eight of the 300 species are federally recognized as threatened or endangered animal species and include:

- Black-footed ferret
- Canada lynx
- Gunnison sage grouse
- Mexican spotted owl
- New Mexico meadow jumping mouse
- Southwest willow flycatcher
- Uncompahgre fritillary butterfly
- Yellow-billed cuckoo.

The Forest represents a large part of the core area for Canada lynx, which were reintroduced to Colorado from 1999 to 2006. The vast majority of Canada lynx in Colorado remain and reproduce in the high-elevation spruce-fir zone in the southwestern part of the state, including the Forest.

Counties containing National Forest System lands include Alamosa, Archuleta, Conejos, Hinsdale, Mineral, Rio Grande, Saguache, and San Juan. Many counties are characterized by low population densities, high unemployment, and low per capita income.

The area of influence for the Forest extends beyond the eight counties that contain lands within its boundaries. Colorado communities within Alamosa, Archuleta, Chafee, Conejos, Costilla, Fremont, Gunnison, Hinsdale, Huerfano, La Plata, Mineral, Montrose, Park, Rio Grande, Saguache, and San Juan Counties, and New Mexico communities in Rio Arriba and Taos Counties, are recognized as having strong socio-economic ties to the Forest. Residents from these local and surrounding communities rely on the Forest for gathering forest products such as firewood, and for hiking, camping, and other recreational activities.

Communities surrounding the Forest have become increasingly attractive to new residents because of their proximity to open spaces, natural settings, and easy access to year-round recreational opportunities. Population projections indicate that the San Luis Valley and the region surrounding the Forest will continue to grow, increasing demands on Forest resources.

The Forest offers diverse recreation opportunities that include backpacking, boating, camping (both developed and dispersed), cross-country skiing, fishing, hiking, hunting, off-road vehicle riding, picnicking, rock climbing, snowshoeing, and snowmobiling.

More than 1,350 miles of trails traverse the Forest including the Continental Divide National Scenic Trail, the Colorado Trail, and the Old Spanish National Historic Trail. About 170 miles of the Continental Divide National Scenic Trail traverse the Rio Grande National Forest, starting at the boundary with the Gunnison National Forest and stretching to the New Mexico state line. Sections of the Old Spanish National Historic Trail, designated in 2002, pass through the Rio Grande National Forest, offering a glimpse into past trade routes along which supplies and slaves were moved from Santa Fe to the California territory in the 1820s.

Colorado has the sixth-highest amount of National Forest System lands nationwide, with about 14,471,800 acres of national forest and grasslands that provide places for recreation activities for residents and tourists. For Colorado and most of the Rocky Mountains, tourism is a main source of income. There is a direct tie between the beautiful scenery provided by the Forest and local economic benefits.

The Forest makes up 13 percent of the National Forest System land in the State of Colorado. Traversing the Forest are two designated scenic byways—the Silver Thread and Los Caminos Antiguos—and a well-developed system of roads and trails. Many outfitter and guide services provide visitor opportunities to experience the Forest.

Located in the south-central part of the Rocky Mountains, the Forest offers unique scenic experiences. Southwestern flora combine with the spectacular scenery of the central Rocky Mountains. To the east, the open floor of the San Luis Valley is surrounded by the rugged mountain peaks of the Sangre de Cristo range. To the north, high mountain peaks give way to gentler rolling hills covered in lodgepole pine that extend to the valley bottom. Looking west, the scattered mountain peaks are mixed with rolling hills, rock canyons, and open meadows. To the south, the valley is fairly flat, with several dominant, rounded mountains that rise above the horizon.

These characteristics offer visitors some of Colorado’s most beautiful scenery. The Sangre de Cristo range is home to several of Colorado’s 14,000-foot peaks, including Crestone Peak, Crestone Needles, Kit Carson, and Blanca Peak. Great Sand Dunes National Park and Preserve borders the Forest in the Sangre de Cristo range. Some of the tallest dunes in North America occur in the park, which is managed by the National Park Service and is adjacent to the Forest.

The western part of the Forest has a view of the Rio Grande Pyramid, the 100-foot-high North Clear Creek Falls, Bristol Head Mountain, the headwaters of the Rio Grande (river), and the La Garita, South San Juan, and Weminuche Wilderness areas. Parks and open meadows, such as Saguache Park, contain a variety of plant and animal life and are home to a wide range of wildflowers.

Historic scenic areas include the Bachelor Loop, near Creede; the Bonanza Loop, near Villa Grove; and the Cumbres and Toltec Scenic Railroad, near Antonito. Tucked in the foothills are many unique rock formations, including the Natural Arch and Summer Coon Volcano areas. Adjacent Bureau of Land Management lands have well-known rock climbing areas such as Penitente, Witches, and Sidewinder Canyons, and the Rock Garden, that draw avid rock climbers to the area.

Relationship to Other Strategic Guidance

Direction for managing National Forest System land comes from a variety of levels. National and regional direction includes laws, Executive orders, regulations, and Forest Service policies. Forest plans provide Forest-level direction for managing resources at a project or site-specific level. The forest plan tiers to direction prepared at higher levels in the agency that can include laws, agency policies, and regulations.

The Forest contributes to national strategic guidance in the context of its unique combination of social, economic, and ecological conditions. This plan helps define the role of the Forest in advancing the Agency’s national strategy and reflects the national goals. The plan is reflective of the mission of the Forest Service, which is “to sustain the health, diversity, and productivity of the Nation’s forests and grasslands to meet the needs of present and future generations.” The proposed plan also considers direction from other applicable tribal, federal, state, and county plans and strives to incorporate these organizational goals through an “all lands” integrated approach that considers the broader landscape in which the plan operates.

Forest staff took the goals and objectives outlined in the Forest Service’s [2015–2020 Strategic Plan](#) into account during revision of the forest plan. The additional laws, policies, regulations, and agency direction tiered to by this plan are listed in Appendix I.

The Forest is adjacent to lands managed by other Federal agencies in addition to state, county, and private lands. The Federal agencies that manage adjacent lands—U.S. Department of Interior National Park Service and Bureau of Land Management—were consulted during preparation of the plan, and every effort was made to provide compatible direction across agency boundaries.

The forest plan provides a strategic framework that guides future management decisions and actions (see Appendix J). As such, the plan will not create, authorize, or execute any ground-disturbing activity. The plan will not subject anyone to civil or criminal liability and will create no legal rights. The plan will not change existing permits and authorized uses.

Chapter 2. Forestwide Direction

This chapter contains resource-specific direction for desired conditions, objectives, standards, guidelines, and management approaches. The resources are categorized into four groups: aquatic ecosystems, native animals and plants, terrestrial ecosystems and vegetation, and socioeconomics and ecosystem services. Because the need for plan components and direction varies by resource, not every resource includes all plan components. Some areas may have only guidelines, while others may need the full complement of desired conditions, objectives, standards, guidelines, and management approaches.

Aquatic Ecosystems

The following resources are grouped under this heading:

- Fisheries
- Groundwater-Dependent Ecosystems
- Riparian Management Zones
- Watersheds.

All three of the overarching goals stated in the *Vision Domain* section are met in this section, which considers the aquatic aspects of management of the Forest. Water is one of the most important natural resources provided by national forests. An estimated 80 percent of the freshwater resources in the United States originates on national forests (USDA Forest Service 2000). Water from national forests provides, maintains, and supports other related ecological and societal services such as biological diversity, threatened and endangered species and habitats, spawning and rearing habitat for sport and commercial fish species, agricultural irrigation, navigation, and flood control. In addition, recreational opportunities such as boating, fishing, and swimming bring revenue to surrounding areas, enrich lives, and provide jobs. Runoff from the Forest supplies water to rivers and aquifers in the southwestern United States and northern Mexico.

Fisheries (FISH)

Management direction is provided for individual resource areas. This direction has been integrated across resource areas. Plan components contained in the *Fisheries* section cover the broad area of aquatic habitats that are present throughout the Forest and support all fisheries. Species of conservation concern (Rio Grande cutthroat trout, Rio Grande chub, and Rio Grande sucker), all other native species, and desired nonnative recreational species are included. Many of the plan components that affect fisheries are also addressed in other sections including, but not limited to, *Minerals, Aquatic and Terrestrial Nonnative Invasive Species and Noxious Weeds, Recreation, Riparian Management Zones, Soils, Watersheds, Wildlife, and Species of Conservation Concern*. Specific direction for designated wilderness and designated and eligible wild, scenic, and recreational rivers is also provided.

Desired Conditions

DC-FISH-1: Populations of native and desired nonnative fish and other aquatic species are distributed, or are expanding into previously occupied habitat, with interconnectivity among and

within metapopulations. The amount, distribution, and characteristics of life-stage habitats are suitable to maintain or reach viable populations of native and desired nonnative species. Habitat conditions are not a primary factor in listing of species under the Endangered Species Act or adding species to the species of conservation concern list. (Forestwide)

DC-FISH-2: Aquatic populations during critical life stages are distributed and abundant. (Forestwide)

DC-FISH-3: Healthy aquatic habitat provides for sustainable fish populations for recreational and cultural significance. (Forestwide)

DC-FISH-4: Fish populations have adequate habitat and water quality to thrive in lakes and streams on the Forest. Natural fish habitat is preferred and promoted over human-made habitat. (Forestwide)

DC-FISH-5: Habitat for native and desired nonnative fish species is not fragmented by the design and implementation of management actions. (Forestwide)

Objectives

OBJ-FISH-1: Restore connectivity in currently fragmented habitat where the risk of genetic contamination, predation, or competition from undesired nonnative fish species is not a concern by completing 10 fish connectivity projects (combination of removing 10 barriers and/or replacing 10 aquatic organism passage structures) over the life of this plan. Prioritize improvements to existing culverts, bridges, and stream crossings identified for fish passage based on the Rio Grande cutthroat trout conservation strategy and Rio Grande chub and Rio Grande sucker conservation strategy as applicable. (Forestwide)

OBJ-FISH-2: Take action to maintain or restore structure, composition, or function of habitat for fisheries and other aquatic species along 30 to 50 miles of stream total over a 10-year period, with a focus on larger individual stream segments when possible (i.e., 3 to 5 miles annually). (Forestwide)

Standards

S-FISH-1: When authorizing new surface diversions in fish-bearing waters, provide upstream and downstream passage designed for all fish species that are threatened, endangered, or sensitive, and for species of conservation concern, and if needed, include either fish screens or other means to prevent fish entrapment/entrainment. (Forestwide)

Guidelines

G-FISH-1: New surface diversions in intermittent and perennial streams should provide passage and habitat for native and desired nonnative aquatic species. Flows in intermittent and perennial non-fish-bearing waters that are adequate for fish to pass would also be sufficient for other aquatic species to pass. (Forestwide)

G-FISH-2: Habitat should be determined for aquatic threatened, endangered, and sensitive species, and for species of conservation concern, within or near the planning area. Surveys to determine presence should be conducted for those species with suitable habitat. (Forestwide)

G-FISH-3: Construct perennial stream crossings and aquatic organism passages to allow natural streamflow, and bidirectional movement of adult and juvenile fish and other aquatic species. (Forestwide)

Management Approaches

MA-FISH-1: The Forest intends to continue to cooperate, coordinate, meet objectives, and share data among the signatories with management responsibility for Rio Grande cutthroat trout, Rio Grande chub, and Rio Grande sucker and their habitat and related community assemblages. Fisheries activity period maps (contained on the DVD located at the back of this document) facilitate a consistent and effective implementation of conservation strategies and agreements. (Forestwide)

MA-FISH-2: Coordinate with staff from the Colorado Parks and Wildlife on fish stocking programs to ensure benefits and reduce degrading effects on native and desired nonnative fish and aquatic species. Provide Colorado Parks and Wildlife recreational fish stocking reports annually by June 15 or as they become available to Forest media outlets, including all district offices. (Forestwide)

Groundwater-Dependent Ecosystems (GDE)

Groundwater-dependent ecosystems are a vital component of the natural environment and can include fens, wetlands, seeps, springs, riparian areas, groundwater-fed streams and lakes, and aquifers. These are present throughout the Forest and vary in size and timing. These areas provide an important ecosystem component and provide late-season flows with cold water temperatures, help sustain the function of surface and subsurface aquatic ecosystems, and provide habitat to plant species that are on the species of conservation concern list.

Desired Conditions

DC-GDE-1: Fens are identified and continue to accumulate peat and provide habitat for species of conservation concern, including:

- Little grapefern,
- Mud sedge,
- Colorado woodrush, and
- Spiny-spore quillwort. (Forestwide)

Guidelines

G-GDE-1: Protect the functions and services of groundwater-dependent ecosystems, including fens. Provide special emphasis to large-size fens, unusual kinds of fens (such as iron fens and calcareous fens), and fens in especially pristine condition—along with the hydrologic features influencing them. (Forestwide)

G-GDE-2: Design projects to avoid impacting the function or ecological services of fens. Rehabilitate and restore damaged fen resources and the ecological conditions that sustain them. (Forestwide)

Management Approaches

MA-GDE-1: The conservation of fens is promoted through cooperative work with other state and Federal agencies and adjoining private landowners. The effects of use and management on fens is researched to improve approaches to conservation. (Forestwide)

MA-GDE-2: Fens and watershed conditions that support healthy fens present an irreplaceable ecological feature on the landscape. These areas are inventoried and evaluated as a management objective for maintaining healthy watersheds and aquatic resources. (Forestwide)

Riparian Management Zones (RMZ)

Forest plans must establish width(s) for riparian management zones (Appendix F) around all lakes, perennial and intermittent streams, and open-water wetlands. The following guidance has been developed to help interdisciplinary teams become familiar, with and consistently apply, criteria to: 1) appropriately delineate riparian management zones, and 2) analyze important considerations in developing appropriate management actions within or affecting riparian management zones. The intent is to ensure that interdisciplinary teams adequately consider riparian functions and ecological processes in both the delineation of riparian management zones and determination of appropriate management actions within or affecting riparian management zones.

Delineation and further definition of riparian management zones are contained in Appendix M.

Desired Conditions

DC-RMZ-1: Riparian areas and wetlands are healthy, fully functioning ecosystems. Vegetation consists of desirable native species and age classes. Populations of riparian vegetation are diverse, vigorous, and self-perpetuating. Invasive species, including plants and animals, in riparian and wetland ecosystems are rare. There is sufficient vegetative cover to provide bank stability, trap and retain sediment, regulate temperature, and contribute to floodplain function. Riparian ecosystem composition, structure, and function can generally be restored and enhanced by beaver habitat. (Forestwide)

DC-RMZ-2: Aquatic ecosystems, riparian ecosystems, and watersheds exhibit high ecological integrity. (Forestwide)

DC-RMZ-3: Hydrologic regimes of riparian and wetland ecosystems contribute to appropriate channel and floodplain development, maintenance, and function. (Forestwide)

DC-RMZ-4: Riparian and wetland ecosystems are resilient and withstand disturbance from natural and management activities, including flood, fire, drought, changes in timing and frequency of weather events, recreation, and herbivory. (Forestwide)

DC-RMZ-5: Habitats sensitive to management activities, such as riparian management zone vegetation, meet the needs of resident amphibians, fish, and migratory birds. (Forestwide)

Objectives

OBJ-RMZ-1: Over the planning period, work with cooperators to prioritize and restore at least 300 acres of riparian and/or wetland areas. (Forestwide)

Standards

S-RMZ-1: Management activities within the riparian management zones must maintain or restore the connectivity, composition, function, and structure of riparian and wetland areas over the long term. (Forestwide)

Guidelines

G-RMZ-1: To maintain ecological integrity and connectivity, limit the construction of roads and infrastructure in the riparian management zone. (Forestwide)

G-RMZ-2: Grazing and other management activities in the riparian management zone should provide healthy willow carrs, which can provide the structural nesting habitat requirements for riparian-associated birds. (Forestwide)

G-RMZ-3: Grazing, grazing infrastructure, and other activities in the riparian management zone should prevent or minimize the introduction and spread of cowbirds in riparian willow systems. (Forestwide)

Watershed (WA)

Healthy, properly functioning watersheds are essential to forest health, water quality, water quantity, and a host of other functions and services provided by the Forest. Plan and management direction is integrated throughout many of the different resource areas, but to make finding it easier it is grouped by resource area. National and regional guidance is provided, which informs and defines limits for management activities on the Forest. Higher level guidance allows for more streamlined forest plan components while still protecting watersheds and their associated functions and services. Information on priority watersheds is contained in Appendix H.

Desired Conditions

DC-WA-1: Physical channel characteristics are in dynamic equilibrium and are commensurate with the natural ranges of discharge and sediment load provided to a stream. Streams have the most probable form and the expected native riparian vegetation composition within the valley landforms that they occupy; they function correctly without management intervention. Historically disturbed and degraded stream channels recover through floodplain development and establishment of riparian vegetation, and demonstrate stable channel geomorphic characteristics. Beaver reintroduction, and the persistence of beaver habitat, can contribute to channel recovery and floodplain function. Roads, trails, and impervious surfaces minimally affect hydrologic processes within watersheds. (Forestwide)

DC-WA-2: Aquatic systems and riparian habitats express physical integrity, including physical integrity of shorelines, banks, and bottom configurations, within their natural range of variation. Upland areas function properly and do not contribute to stream-channel degradation. (Forestwide)

DC-WA-3: The sediment regime within water bodies is within the natural range of variation. Elements of the sediment regime include the timing, volume, rate, and character of sediment input, storage, and transport. (Forestwide)

DC-WA-4: Within the constraints of existing water rights decrees, the timing and magnitude of flood events is within the natural range of variation. Floodplains are accessible to water flow and sediment deposits. Overbank floods allow floodplain development and support healthy riparian and aquatic habitats. Floods also allow the propagation of flood-associated riparian plant and animal species. (Forestwide)

DC-WA-5: State water quality standards are met and State-classified water uses are supported for all water bodies. Water quality for those water bodies listed as impaired on the State of Colorado 303(d) list move toward fully supporting State-classified uses. (Forestwide)

DC-WA-6: Aquifers maintain natural conditions of recharge, discharge, and groundwater quality, especially where they are important to surface features dependent on groundwater for their existence (including but not limited to caves, springs, seeps, lakes, riparian areas, wetland ecosystems, fens, and intermittent and perennial streams). (Forestwide)

DC-WA-7: Watersheds provide clean, safe water suitable for public consumption after adequate and appropriate water treatment. (Forestwide)

Objectives

OBJ-WA-1: Improve condition class on at least one identified priority watershed, as defined by the national Watershed Condition Framework, within 10 years of plan approval. (Forestwide)

OBJ-WA-2: Over the planning period, conduct the necessary data collection to evaluate the need to move instream flow quantification points to the current Forest boundary. (Forestwide)

OBJ-WA-3: Over the next 5 years, quantify minimum instream flows at new quantification points for stream reaches impacted by federal land acquisitions such as the Baca Tract. (Forestwide)

Standards

S-WA-1: Incorporate project-specific best management practices described in FS 990A or as updated in land-use and project plans as a principle mechanism to maintain or restore water quality and meet desired watershed conditions. (Forestwide)

Guidelines

G-WA-1: Management activities should maintain or restore water quality to meet State of Colorado water quality standards. In watersheds where State of Colorado 303(d) listed impaired water bodies exist, management activities should assist in achieving State water quality standards. (Forestwide)

G-WA-2: Management actions should not cause long-term degradation to water resources, including lakes, streams, wetlands, and groundwater. Particular attention should be paid to public water supplies, sole source aquifers, and source water protection areas. (Forestwide)

Native Animals and Plants

The following sections are grouped under this heading:

- Pollinators
- Species of Conservation Concern
- Threatened, Endangered, and Proposed Species – including Canada lynx and other species
- Wildlife and Plants –direction related to species that are not a species of conservation concern or a threatened, endangered, or proposed species
- Plan components contained in the *Native Animals and Plants* section cover a broad area of habitats that support native animal and plant species throughout the Forest. Many plan components that affect native animal and plant species as well as pollinators; species of conservation concern; threatened, endangered, proposed, and candidate species; and other wildlife are contained in other sections, such as *Aquatic Ecosystems*, *Terrestrial Ecosystems and Vegetation*, *Geographic Areas*, *Fire Management Zones*, and *Management Areas*.

Pollinators (PLTR)

Pollinators include insect, bat, and bird species that pollinate flowers during feeding activities. These pollinators are important to common plant species and many rare species, and often have symbiotic relationships where only one animal species can pollinate a specific plant species. In addition to being important for the survival of many plant species, many of the pollinators themselves are rare and may be on the list of species of conservation concern. Plan components that affect pollinators include riparian, biodiversity, range, wildlife, and disturbance processes (undesirable species, fire, insects, and disease).

Objectives

OBJ-PLTR-1: Restore or enhance 65,000 acres of pollinator habitat over the planning period. (Forestwide)

Standards

S-PLTR1-1: Mitigate impacts to insect species that are listed as species of conservation concern, or that are necessary to those species as pollinators or as food, from applications of insecticide or other pesticides. (Forestwide)

Management Approaches

MA-PLTR-1: Impacts (positive, negative, or neutral) to pollinators are addressed when undertaking project design, analysis, and implementation. (Forestwide)

MA-PLTR-2: Implement pollinator-friendly best management practices for Federal lands to improve pollinator habitat and protect pollinators when taking management actions. Actions can include the following:

- Design projects to maintain or improve pollinator habitat while still meeting resource objectives
- Include local pollinator species in project seed mixtures

- When using insecticide, consider and mitigate impacts to pollinating insects to the greatest extent possible
- Include creation or maintenance of pollinator habitat in project rationale
- Implement best management practices when managing roads. (Forestwide)

Species of Conservation Concern – Animal and Plant (SCC)

Species of conservation concern (Appendix D) are animals or plants that the regional forester has substantial concerns about regarding the ability of the species to persist over the long term. This determination is made on the basis of criteria contained in the 2012 Planning Rule, specifically at 36 CFR 219.6(b) as described in Chapter 12 of FSH 1909.12. Plan components that contribute to the conservation and maintenance of viable populations of species of conservation concern include riparian, biodiversity, range, wildlife, and disturbance processes (undesirable species, fire, insects, and disease).

Desired Conditions

DC-SCC-1: A healthy sagebrush steppe ecosystem meets the needs of sagebrush obligate species including, but not limited to, Brewer’s sparrow. (Forestwide)

DC-SCC-2: Habitat diversity along reaches or sections of perennial stream includes tall, undisturbed grass cover and large, woody riparian complexes. Livestock access is limited in these areas to protect habitat for small, at-risk mammal species, such as the New Mexico meadow jumping mouse. Habitat refugia is available for small mammals that are sensitive to management activities. (Forestwide)

DC-SCC-3: Talus slopes provide habitat for many plants listed as species of conservation concern, including:

- Gray’s draba
- Rocky mountain draba
- Rothrock’s Townsend daisy
- Colorado tansy aster
- Colorado larkspur
- Stonecrop gilia
- Smith’s draba (Forestwide)

DC-SCC-4: Plant species that are necessary for species of conservation concern as food (including grazing, forage, and nectar for pollinators) or structure are identified and occur in numbers viable enough to fulfill that function. This includes snow willow (necessary for the Uncompahgre fritillary butterfly), flowering plants (nectar producing species for the Western bumblebee) and many other species. (Forestwide)

DC-SCC-5: Large log (generally greater than 18” diameter) components contribute to the downed woody material remaining in the post-treatment environment. Log decks and slash piles provide supplementary habitat features for marten and other forest species. (General Forest Geographic Area)

DC-SCC-6: Gunnison’s prairie dog colonies continue to expand and occupy historic habitat areas as an integral component of montane grasslands. (Forestwide)

DC-SCC-7: Natural openings and grasslands provide habitat beneficial to small mammal species that depend on grassland cover and diversity. (Forestwide)

DC-SCC-8: Manage soils to maintain soil health and productivity, while taking into consideration plant species of conservation concern that grow in association with specific soil and geologic characteristics or edaphic plant communities (Table 2). (Forestwide)

Table 2. Select set of ecological conditions for at-risk species on the Forest

Ecological Condition or Feature	Description	Associated Species
Volcanic Substrates: Ash-tuffs Latitic lava flows Rhyolite Andesitic substrates	These are specific soil types that many plant species are dependent upon.	Black Canyon gilia Stonecrop gilia Ripley’s milkvetch Rocky Mountain draba Colorado tansy aster Arizona willow Kings campion Rothrock’s Townsend daisy Weber’s catseye Arizona willow
Sedimentary calcareous substrates	These are specific soil types that many plant species are dependent upon. Mostly shale or limestone.	Slender cliffbreak Colorado tansy aster King’s campion

DC-SCC-9: Ensure continued viability of plant habitats for species of conservation concern during forest management activities in fens, patches of snow willow, alpine cushion plant communities, talus slopes, alpine fellfields, and floating vegetation mats. (Forestwide)

Objectives

OBJ-SCC-1: Mitigate impacts to insect species that are listed as species of conservation concern, or that are necessary to those species as pollinators or as food, from applications of insecticide or other pesticides. (Forestwide)

OBJ-SCC-2: Mitigate impacts to plant species that are listed as species of conservation concern, or that are necessary for those species as food (including grazing, forage, and nectar for pollinators) or cover, from herbicide or other pesticides. (Forestwide)

Standards

S-SCC-1: Avoid disturbance to species of conservation concern that might result in a loss of population viability. The protection may vary depending on the species, disturbance type and potential, topography, and other pertinent factors. Special attention will be given during breeding, young rearing, and other times that are important to survival. (Forestwide)

S-WLDF-3: Avoid or mitigate impacts to boreal toad breeding sites and winter hibernacula within 100 feet from May 15 to September 30.

- Consider management actions related to the protection and maintenance of potential summer movements of adult boreal toads away from the sites.
- Ensure that sites are identified in the wildland fire decision support system to avoid exposure from retardant. (Forestwide)

Guidelines

G-SCC-1: Avoid road construction and other permanent ground-disturbing activities in and around the perimeter of alpine fell fields and talus rock fields, or activities that would degrade the vegetation within 100 feet of these features. (Forestwide)

G-SCC-2: Avoid impacts to soil characteristics of shale and gypsum soils occupied by species of conservation concern as necessary to maintain the viability of those species. (Forestwide)

G-SCC-3: Reduce project-related impacts to known or potential flammulated owl nesting territories by:

- Retaining large-diameter snags at or near reference conditions for the primary forest cover type
- Retaining large-diameter snags within 300 feet of nesting locations
- Maintaining adjacent upland areas in open stand conditions within the context of the natural range of variation. (Forestwide)

G-SCC-4: Avoid impacts to Brewer's sparrow habitat by:

- Mitigating fragmentation of sagebrush by motorized and mechanized activities
- Use grazing systems that discourage fragmentation and promote and maintain late seral understory plant composition
- Maintaining large patches of sagebrush that provide suitable habitat and display a variety of structural conditions. (Forestwide)

G-SCC-5: Maintain and restore Gunnison's prairie dog habitat in montane grasslands by:

- Discouraging recreational shooting
- Livestock grazing
- Improving public understanding of prairie dog roles
- Avoiding the use of poison to control or eliminate prairie dogs
- Working with partners to translocate prairie dogs. (Forestwide)

Management Approaches

MA-SCC-1: The Forest intends to map populations of insect species that are species of conservation concern, threatened, endangered, proposed, or candidate species so that interdisciplinary teams can use the information to design projects to avoid impacts to these species. (Forestwide)

MA-SCC-2: Continue to support the Interagency Recovery Team efforts for the Uncompahgre fritillary butterfly, as necessary, to provide for the recovery of the species and the protection of the alpine habitat components that support it and other high-elevation alpine pollinators. (Forestwide)

MA-SCC-3: Resource advisors should assist wildland fire and other emergency incident commanders, allowing them to accomplish their tasks with minimal harm to species of conservation concern or threatened, endangered, proposed, and candidate species. (Forestwide)

Threatened, Endangered, Sensitive, Proposed, and Candidate Species

Eight of the more than 300 species of amphibians, fish, mammals, birds, and reptiles that inhabit the Forest are federally recognized as threatened or endangered species. These include:

- Black-footed ferret
- Canada lynx
- Gunnison sage grouse
- Mexican spotted owl
- New Mexico meadow jumping mouse
- Southwest willow flycatcher
- Uncompahgre fritillary butterfly, and
- Yellow-billed cuckoo.

These species warrant extra focus and protection afforded by the Endangered Species Act (U.S. Fish and Wildlife Service 2017)

Canada Lynx (LYNX)

Direction prescribed in the Southern Rockies Lynx Amendment (Appendix E) still applies across the Forest. Additions to the Southern Rockies Lynx Amendment plan components are needed to sufficiently address the recovery, conservation, and viability of Canada lynx due to the habitat conditions associated with the spruce beetle outbreak in the subalpine forest ecosystem. This direction supplements but does not replace the management direction incorporated from the Southern Rockies Lynx Amendment. It is important to recognize that high-quality habitat exists on the landscape in the current condition and may be of increased value to identify during management activities.

For consistency with existing direction, the standard below is in the same format as the Southern Rockies Lynx Amendment.

Standard VEG S7 (S-LYNX-7):

Where and to what this standard applies: Standard VEG S7 applies to all vegetation management practices within lynx habitat in conifer forests that no longer meet the definition for Standard VEG S6 (multi-story mature or late successional conifer forests) due to the extensive bark beetle outbreaks. These stands may no longer contain at least two layers of live vegetative structure and do not have a live mature overstory that provides at least 40 percent canopy closure. However, these stands may still represent quality habitat important to the persistence of Canada lynx in these vastly changed landscapes and are characterized by understory vegetation

that provides dense horizontal cover for snowshoe hares. Conifer stands that meet the Standard VEG S7 definition may also continue to support secondary prey species, particularly when live green vegetative structure is present.

Standard VEG S7 stands are identified by:

1. Total live canopy cover of less than 40 percent.
2. Understory densities that contain at least 35 percent dense horizontal cover in winter foraging habitat condition for snowshoe hares (i.e., about 1 to 3 meters above average snow depth).

The standard does not apply to fuel treatment projects within the wildland-urban interface as defined by the Healthy Forest Restoration Act, subject to the following limitation:

(Wildland-urban interface fuels exemption): Fuel treatment projects within the wildland-urban interface that do not meet Standards VEG S1, VEG S2, VEG S5, VEG S6, or VEG S7 shall occur on no more than 3 percent (cumulatively) of lynx habitat on each administrative unit (a national forest, or administratively combined national forests).

For fuel treatment projects within the wildland-urban interface see Guideline VEG G10.

The Standard:

Vegetation management activities that occur in conifer stands that qualify as VEG S7 with potential to reduce high-quality winter snowshoe hare habitat shall occur only:

1. Within 200 feet of administrative sites, dwellings, outbuildings, recreation sites, and special use permit improvements, including infrastructure within permitted ski area boundaries; or
2. For salvage harvest activities when incidental damage to understory and standing green trees is minimized. Pre-project projections of incidental damage will be validated by implementation monitoring and will be documented in administrative records.
(Forestwide)

Objective

OBJ-LYNX-1: Over the planning period, reduce adverse highway effects on Canada lynx by working with other agencies to provide for movement and habitat connectivity, and to reduce the potential for mortality. (Forestwide)

Management Approaches

MA-LYNX-1: The Forest intends to use existing lynx habitat baseline conditions or other existing information, new science, data, and/or analysis tools to assess whether a lynx analysis unit meets Southern Rockies Lynx Amendment standards S1 (30 percent total unsuitable limit) and S2 (15 percent management induced unsuitable limit over 10-year period). If the limit for either standard is attained, further conversion to unsuitable (stand initiation) cannot occur unless a site-specific plan amendment is developed. (Forestwide)

MA-LYNX-2: Definitions used to determine suitable versus unsuitable lynx habitat due to the conditions associated with the spruce beetle outbreak are:

- Unsuitable habitat: stands with less than 25 percent live (green) canopy without understory that provides at least 20 percent horizontal density (e.g., 1 to 3 meters above average snow depth or snowshoe hare winter foraging habitat condition).
- Suitable habitat: stands that have greater than 25 percent live canopy with or without understory, or stands that contain 0 to 25 percent live canopy and understory trees that provide at least 20 percent horizontal density in winter snowshoe hare foraging habitat condition. (Forestwide)

MA-LYNX-3: Prioritize the placement of snag clumps and/or other leave areas around good or high-quality winter foraging habitat to meet multiple wildlife habitat objectives. (Forestwide)

MA-LYNX-4: Under the landscape conditions associated with the spruce beetle outbreak, additional considerations may be needed to provide for habitat connectivity within and between lynx analysis units. These considerations include:

- Assessing habitat connectivity at multiple scales at the project level. Recommended foundation for assessment is an established sub-basin (e.g. 8th-level hydrologic unit code).
- Use remaining and recently changed late successional stands as foundations for connectivity patches. Recognize that both stand and landscape-level patches may be influential.
- Consider using some stream corridors for movement within and between the planning area and lynx analysis units. Stream corridors that are intended to provide functional habitat connectivity for lynx and other meso-carnivores should be at least 400 to 600 feet wide in total, and designed to promote movement within and between suitable habitat patches, sub-watersheds, and lynx analysis units, where desired based on existing landscape conditions.
- Recognize contiguous understory patches of 0.5 acre or larger as particularly valuable to snowshoe hare densities. (Forestwide)

MA-LYNX-5: Evaluate and update current lynx linkage areas with agency partners to provide the desired habitat connectivity functions, as practical and needed based on available resources. (Forestwide)

MA-LYNX-6: Where desired, based on use information or other local conservation criteria, provide additional considerations for lynx denning habitat and/or known current or past denning areas. These considerations include:

- Use existing den site layer to inform historic and potential denning activity during management activities, as needed.
- Use local denning model to inform presence and extent of potential denning habitat. Combine with local knowledge and field review to define potential high-quality denning habitat.
- Protect known or potential high quality denning habitat through considerations for habitat connectivity, snag patch leave areas, or through suitable lynx habitat retention needs.
- Recognize that lynx may use several maternal den sites in the vicinity of a natal den until the post-denning period (August).
- Provide for continuing availability of lynx foraging habitat in proximity to denning habitat where applicable.

Addition of Supplement to Standard S1:

1. To maintain the amount and distribution of lynx foraging habitat over time, manage so that no more than 30 percent of the lynx habitat in a lynx analysis unit is in an early stand initiation structural stage or has been silviculturally treated to remove horizontal cover (i.e., does not provide winter snowshoe hare habitat). Emphasize sustaining snowshoe hare habitat in a lynx analysis unit. If more than 30 percent of the lynx habitat in a lynx analysis unit is in early stand initiation structural stage or has been silviculturally treated to remove horizontal cover (e.g., clearcuts, seed tree harvest, pre-commercial thinning, or understory removal), no further increase as a result of vegetation management projects should occur on Federal lands. (Forestwide)

Other Threatened, Endangered, Proposed, and Candidate Species (TEPC)

Plan components in this section cover management activities designed to protect and recover animal and plant species that are listed as threatened or endangered under the Endangered Species Act, or those species that have been proposed or are candidates for listing. Threatened, endangered, proposed, and candidate species can occur on nearly any terrestrial habitat on the Forest. These species can be influenced by plan components for native animal and plant species as well as pollinators, species of conservation concern, aquatic ecosystems, terrestrial ecosystems and vegetation, geographic areas, wildfire management zones, and management areas.

Desired Conditions

DC-TEPC-1: Occupied or potential Gunnison sage-grouse habitat is maintained for habitat integrity and diversity using information provided by the local interagency working group and/or Range-wide Conservation Plan. (Forestwide)

DC-TEPC-2: Occupied or potential Gunnison sage-grouse habitat provides for habitat integrity and diversity using information provided by the local interagency working group and/or Range-wide Conservation Plan. (Forestwide)

Standards

S-TEPC-1: Management actions shall maintain or improve habitat conditions for all at-risk species, contributing to the stability and/or recovery of these species. (Forestwide)

Guidelines

G-TEPC-1: Reduce impacts to the abundance and distribution of willows to maintain or improve the ecological integrity of riparian area and wetland ecosystems for southwestern willow flycatchers and other sensitive woody-riparian associated birds. (Forestwide)

G-TEPC-2: Maintain habitat availability and quality for threatened, endangered, proposed, and candidate species by incorporating conservation strategies and species habitat needs. Follow higher level direction when species are listed, delisted, or proposed in compliance with U.S. Department of Interior Fish and Wildlife Service direction. (Forestwide)

G-TEPC-3: To limit impacts to Gunnison sage-grouse habitat:

- Design projects or activities to mitigate or avoid the direct or indirect loss of habitat necessary for maintenance of the local population.

- Manage riparian areas and wet meadows to meet proper functioning condition while striving to attain reference state vegetation relative to the ecological site description.
- Ensure livestock grazing is compatible with nesting and brood-rearing objectives in sage habitats and riparian areas.
- Design fuels treatment objectives to protect existing sagebrush ecosystems, modify fire behavior, restore native plants, and create landscape patterns that benefit habitat. (Forestwide)

G-TEPC-4: Management approaches to recreation and ground-disturbing activities in snow willow habitats occupied by the Uncompahgre fritillary butterfly:

- Be consistent with recovery plan objectives, as necessary and in accordance with site-specific needs
- Avoid new trail development within occupied colony sites, and manage existing trails and access as necessary to discourage off-trail use. (Forestwide)

G-TEPC-5: Avoid impacts to the southwestern willow flycatcher in riparian willow stream reaches and reference sites where browse-related issues suggest a management concern. (Forestwide)

Wildlife and Plants (WLDF)

Plan components contained in this section cover a broad range of terrestrial habitats throughout the Forest, including all vegetation types. This includes all native species as well as any desirable nonnative species. Nearly all plan components have the potential to affect wildlife in some way.

Desired Conditions

DC-WLDF-1: Habitat conditions are suitable for all resident and migratory birds and accommodate key life history requirements, such as resting in stop-over habitats, and nesting. (Forestwide)

DC-WLDF-2: Habitat conditions for bats, including species of conservation concern, are suitable for reproduction and roosting. (Forestwide)

DC-WLDF-3: Sufficient habitat connectivity is present in each vegetation type to facilitate species movement within and between daily home ranges, for seasonal movements, for genetic interchange among species (including Canada lynx and others), and for long-distance movements across boundaries. (Forestwide)

DC-WLDF-4: Habitat conditions provide the quantity, quality, and spatial arrangement of forage, cover, and security needed to support mutually desired population objectives for mule deer, Rocky Mountain elk, pronghorn, and Rocky Mountain bighorn sheep on mapped winter range. (Forestwide)

DC-WLDF-5: Security habitat for big game species in winter range is provided. Motorized and nonmotorized route travel, on and off existing roads, does not negatively affect population viability. (Forestwide)

DC-WLDF-6: Habitat conditions promote the prevention and control of wildlife-related pathogens and diseases, such as chronic wasting disease. (Forestwide)

DC-WLDF-7: Wood legacies, including snag components, occur in adequate numbers, distribution, and patterns to contribute to landscape connectivity, particularly in spruce-fir forests highly influenced by spruce beetle outside of developed recreation sites. (Forestwide)

DC-WLDF-8: Manage northern goshawk nesting territories on the basis of nest site, post-fledging, and foraging area needs. Nest site buffers should encompass 25–30 acres and post-fledging areas 420 acres, with considerations for surrounding foraging habitat. Refer to Table 24 in Appendix G. (Forestwide)

DC-WLDF-9: Maintain road density of 1.5 miles/per square mile or less in winter concentration areas, winter range, calving areas, and transition habitat. (Forestwide)

DC-WLDF-10: Where possible, retain public ownership of wildlife travelways adjacent to public highways, or where public lands are identified as a key component in maintaining the integrity of seasonal movements by wildlife. (Forestwide)

DC-WLDF-11: Maintain habitat components of size, quality, and spatial extent necessary on the landscape to provide for connectivity of movement between seasonal habitats (i.e., wildlife travelways) as identified and mapped by Colorado Parks and Wildlife or other science-based partners (e.g., Colorado Natural Heritage Program). (Forestwide)

DC-WLDF-12: Maintain dense, interior riparian willow habitat where needed for maintenance of suitable nesting habitat conditions for veery and other ground or low-level shrub-nesting riparian species. Avoid or limit activities that increase edge habitat and contribute to impacts from cowbird nest parasitism. (Forestwide)

DC-WLDF-13: Implement management to restore and improve habitat quality on important bighorn sheep lambing areas, winter concentration areas, migratory routes, and movement areas to reduce the potential for disease transmission from domestic sheep. (Forestwide)

Objectives

OBJ-WLDF-1: Over the planning period, develop and interpret at least one location identified in the Colorado Birding Trail. (Forestwide)

OBJ-WLDF-2: Evaluate the abandoned mine lands program annually to consider at least one project. Maintain existing partnerships and seek additional partners for adequate underground assessments, as possible, prior to closure. (Forestwide)

OBJ-WLDF-3: Use vegetation management and habitat improvements, including prescribed fire, to help achieve and maintain big game winter habitat objectives on about 500 acres per year. (Forestwide)

Standards

S-WLDF-1: Avoid or minimize disturbances as much as possible during the local nesting season (April 15 – July 1 for most passerine birds). Evaluate the effects of projects and activities on migratory and resident birds, with a focus on species of management concern (species of conservation concern, and birds of conservation concern identified by the U.S. Department of Interior Fish and Wildlife Service). Consider important life history needs such as nesting requirements, post-fledging areas, and stop-over habitats. Incorporate conservation measures and principles, as applicable and needed, from local bird conservation plans (e.g., Colorado Bird Conservation Plan, Rio Grande National Forest Avian Monitoring Analysis documents) and/or

other references into project design to eliminate or minimize potential adverse effects.
(Forestwide)

S-WLDF-2: Mitigate disturbance to bat habitat and reduce the potential for the introduction of pathogens, such as the fungus that causes white-nose syndrome, by adhering to current regional guidance regarding disease prevention, pathogen management, human access management, and protocols for decontamination requirements, monitoring, etc. (Forestwide)

S-WLDF-3: Provide security habitat in winter range, winter concentration areas, severe winter range, and lambing areas during big game primary use seasons from December 1 to March 31. Employ access restrictions and seasonal closures as necessary. Dates may vary depending upon variations in winter use. (Forestwide)

S-WLDF-4: Activities, including alteration of vegetation, that may alter the suitability of the cave or mine should not occur within 500 feet of the entrance of bat swarming sites, hibernacula, and maternity sites, unless to rehabilitate or maintain the suitability of the site or install mine safety closures. (Forestwide)

S-WLDF-5: Do not allow management activities to impact selected sites occupied by bats during the following periods:

- Maternity sites (April 1 to October 1)
- Swarming sites (August 15 through October 15, 30 minutes before sunset to 30 minutes after sunrise)
- Winter hibernaculum (November 1 to April 1). (Forestwide)

S-WLDF-6: Retain residual grass cover from the previous growing season where tall, dense cover is desired for ground-nesting birds. (Forestwide)

S-WLDF-7: Manage livestock grazing from April 15 to July 1 provide cover for ground-nesting bird species that prefer undisturbed cover. (Forestwide)

S-WLDF-8: Limit disturbance, including but not limited to rock climbing and use of unmanned aerial systems, within one-half mile of:

- Active peregrine and prairie falcon nest sites from April 15 to July 31, to maintain nest site integrity.
- Active golden eagle nest sites from December 15 to July 31. (Forestwide)

S-WLDF-9: Maintain screening cover to minimize disturbance and harassment of deer and elk along open roads and around openings on the basis of site conditions. Design screening cover design consistent with the disturbance regime characteristics of the forest cover type it is occurring in. (Forestwide)

S-WLDF-10: Maintain effective separation to minimize the risk of disease transmission between domestic sheep and bighorn sheep on active grazing allotments. Effective separation is defined as spatial or temporal separation between bighorn sheep and domestic sheep, resulting in minimal risk of contact and subsequent transmission of respiratory pathogens between animal groups. (Forestwide)

S-WLDF-11: Mitigate adverse impacts from projects, activities, and uses to bighorn sheep production areas that may result in disturbance or displacement of bighorn sheep during the critical reproductive period (generally April 15 to July 1). (Forestwide)

S-WLDF-12: Do not authorize actions that reduce the effective use of habitat on severe winter range and winter concentration areas between approximately November 1 and April 15. (Forestwide)

S-WLDF-13: Prohibit the use of recreational pack goats in the Sangre de Cristo Mountains to eliminate potential interactions between pack goats and bighorn sheep. (Forestwide)

S-WLDF-14: Maintain effective separation between domestic goats used for vegetation management and bighorn sheep to minimize risk of contact between animal groups. (Forestwide)

Guidelines

G-WLDF-1: Inventory and protect known active raptor nests and nest areas from disturbance, including owl species. Protect inactive nests as needed depending upon nest condition, time since last use, and species potential for nest reuse. Refer to Appendix G for timing considerations and other factors for local raptor species. (Forestwide)

G-WLDF-2: In alpine and subalpine willow-dominated riparian areas that provide winter habitat for white-tailed ptarmigan and snowshoe hare:

- Ensure that heavy metals that enter the food chain do not bioaccumulate above historically occurring background levels.
- Ensure that areas of contamination do not become limiting factors for wildlife population.
- Discourage winter recreation and summer vegetation management activities near timberline that would impact winter habitat. (Forestwide)

Management Approaches

MA-WLDF-1: Human safety and bat habitat needs are addressed through implementation of the abandoned mine lands program. (Forestwide)

MA-WLDF-2: Pathogens that could cause mortality to bats are detected early and management is coordinated with Colorado Parks and Wildlife and other partners. (Forestwide)

MA-WLDF-3: Habitat management for bats is consistent with recommendations from the Colorado Bat Working Group and the Colorado Bat Conservation Plan. (Forestwide)

MA-WLDF-4: Annual collaboration with staff from Colorado Parks and Wildlife and other partners ensures that all desired prairie dog colonies receive dusting and/or vaccinations for plague as needed for maintenance of the colonies. (Forestwide)

MA-WLDF-5: Priority habitats and priority species, as described in the Colorado Bird Conservation Plan, are integrated into management activities on the Forest, as applicable to site-specific conservation needs. (Forestwide)

MA-WLDF-6: Continue to provide support for existing avian monitoring activities through the Integrated Monitoring in Bird Conservation Regions Program with the Bird Conservancy of the Rockies with a goal of providing valid trend data for applicable threatened, endangered, proposed, candidate, and species of conservation concern and priority bird species. (Forestwide)

M-WLDF-7: Increase the number of Naturewatch viewing sites that focus on bird conservation; participate in events for International Migratory Bird Day. (Forestwide)

MA-WLDF-8: Establish a maintenance program for existing bat gates. (Forestwide)

MA-WLDF-9: Use vegetation management and habitat improvement strategies, including but not limited to prescribed fire, thinning, building stock ponds, and guzzler placement, to help achieve and maintain desired conditions for big game winter habitat (Management Area 5.41). (Forestwide)

MA-WLDF-10: The Forest intends to increase education and awareness of potential disease transmission between recreation pack goats and bighorn sheep at entry points into areas known or suspected to be used by bighorn sheep. (Forestwide)

MA-WLDF-11: In coordination with Colorado Parks and Wildlife and other partners, continue to assess Forest bighorn sheep populations to understand overall population status and inform effectiveness of management actions to support the persistence of bighorn sheep on the Forest. (Forestwide)

MA-WLDF-12: Discourage recreational activities that disturb bighorn sheep, particularly around primary use or reproduction areas. (Forestwide)

MA-WLDF-13: Separation response plans should be developed for grazing allotments determined to have high or moderate risk of contact between domestic sheep and bighorn sheep. Plans should include a process, protocols, and timelines for communication and subsequent management action when intervention is needed to respond to observed or reported interaction between bighorn sheep and domestic sheep. Plans should be developed cooperatively with the permittees/lessees, Colorado Parks and Wildlife, tribes, and other affected Federal agencies or units. Plans should be developed as part of an adaptive management framework that integrates monitoring information, management activities, and the best available scientific information. (Forestwide)

MA-WLDF-14: The Forest intends to observe and report recreational pack goat use where it might overlap known bighorn sheep range. (Forestwide)

MA-WLDF-15: Continued cooperation with partners, support for investigative research of alpine habitats on the Forest, including snow willow communities, in regards to potential influences of fluctuations of temperature, frequency, and timing of weather events. (Forestwide)

MA-WLDF-16: Provide educational materials and outreach regarding chytrid fungus to the public and internally. Explore the need to implement decontamination procedures for all activities within or near sites known to be positive for chytrid fungus to protect boreal toads and other amphibians. (Forestwide)

MA-WLDF-17: Agency actions should avoid or otherwise mitigate adverse impacts in unique or rare plant community types that have a biodiversity significance ranking of B1 (outstanding) or B2 (very high) (Colorado Natural Heritage Program), or in riparian area and wetland ecosystems that have plant communities with G1, G2, S1, or S2 NatureServe plant community conservation status ranks, to maintain the ecological integrity of those rare plant communities. (Forestwide)

MA-WLDF-18: Ensure access for bats and reduce disturbance to resident populations when considering mine or cave closures. Exclude bats from the site prior to closure when closing mines. (Forestwide)

MA-WLDF-19: When feasible, pursue formal mineral withdrawal of abandoned mine sites necessary for conservation of bat species on the species of conservation concern list. (Forestwide)

MA-WLDF-20: Assess for potential bat roost activity when maintaining or removing facilities or bridges. Schedule work to reduce impacts to roosting bats and incorporate features specific to this use as necessary or as separate wildlife habitat improvement projects. (Forestwide)

MA-WLDF-21: Locate and design wind energy structures to minimize or prevent wildlife mortality. (Forestwide)

MA-WLDF-22: Manage off-road travel on big game winter range areas, including over-the-snow track machines, during the primary use seasons for big game. Exceptions may be authorized under special use permit. (Forestwide)

MA-WLDF-23: Design management activities to provide forage and cover across the landscape to sustain ungulate populations and to support state population objectives. (Forestwide)

MA-WLDF-24: Maintain habitat components necessary to provide for connectivity of seasonal habitats as mapped by Colorado Parks and Wildlife. (Forestwide)

MA-WLDF-25: Retain large, unique, legacy trees where feasible. (Forestwide)

MA-WLDF-26: Review direction for consistency when new recovery plans, conservation agreements, conservation strategies, critical habitat designations, or regional management directions for threatened, endangered, or sensitive species are prepared. Use the appropriate authorities to incorporate new direction. (Forestwide)

MA-WLDF-27: Identify and assess habitat connectivity needs at various spatial scales when conducting forest management activities at the project level, as necessary, on the basis of existing landscape patterns and local species concerns. Use a nesting of hydrologic unit codes at the scale(s) necessary to assess connectivity patterns (e.g., 8th-level hydrologic unit codes or smaller). Identify and use key stream zones and topographic features to help facilitate movement across broader landscapes. Movement zones of 400 to 600 feet in width may be sufficient to facilitate movement for most local species of conservation concern, including large predators, in most landscape conditions. (Forestwide)

Aquatic and Terrestrial Nonnative Invasive Species and Noxious Weeds (NNIS)

Nonnative invasive species and noxious weeds include plant and animal species that disrupt ecosystem integrity and displace habitat for native plants and animals. Integrated pest management approaches are applied when treating invasive plant species. These include effective prevention and education programs that combine mechanical, biological, cultural, and chemical methods of control. Technological advances are capitalized on if they are shown to be equivalent to or more effective than existing treatments. The Forest maintains an invasive species action plan that presents a strategy and direction for control, prevention, and management of invasive species of terrestrial and aquatic plants and aquatic invertebrates.

Desired Conditions

DC-NNIS-1: Populations of aquatic and terrestrial nonnative invasive species do not occur or are low in abundance. Those that do occur do not disrupt ecosystem function. (Forestwide)

DC-NNIS-2: Native ecosystems are self-sustaining and resistant to invasion by nonnative invasive species and/or provide habitat for a broad range of species. (Forestwide)

Objectives

OBJ-NNIS-1: Within 10 years of plan approval, reduce terrestrial or aquatic nonnative invasive species on 300 acres. (Forestwide)

Guidelines

G-NNIS-1: To reduce and control aquatic nuisance species during wildland fire operations, as practicable, follow guidelines and best management practices put forward in *Guide to Preventing Aquatic Invasive Species Transport by Wildland Fire Operations* (National Wildfire Coordinating Group 2017). (Forestwide)

Management Approaches

MA-NNIS-1: Reduce and control nonnative and noxious plants Forestwide, with priority given to research natural areas and designated wilderness. Determine the risk of nonnative/noxious weed introduction and spread to all proposed projects and activities and implement appropriate mitigation measures. (Forestwide)

MA-NNIS-2: Coordinate with Colorado Parks and Wildlife staff to reduce the potential for introduction and/or control the spread of aquatic invasive species by recreational users of Forest waters by promoting effective prevention and control measures for aquatic nuisance species. (Forestwide)

MA-NNIS-3: Prioritize treatment of cheatgrass among, in, or near sage-grouse habitat. (Forestwide)

MA-NNIS-4: Mitigate conduits for introductions of nonnative invasive species. (Forestwide)

MA-NNIS-5: Areas affected by existing populations, and new introductions, of nonnative invasive species are minimized through project implementation. (Forestwide)

MA-NNIS-6: Timely and effective revegetation of disturbed sites provides protection to soil and water resources that cannot be restored naturally. (Forestwide)

MA-NNIS-7: All available biological, cultural, and chemical tools are available to reduce and control nonnative invasive species.

Terrestrial Ecosystems and Vegetation

The following sections are grouped under this heading:

- Aquatic and Terrestrial Nonnative Invasive Species and Noxious Weeds
- Insects and Disease
- Range Management
- Soils
- Vegetation Management

Insects and Disease (INDS)

Insects and disease cause major disturbances to the ecological processes that shape the conditions of forests. Insects and diseases play an important role in the cycles of forest growth and decline. Without the influence of change agents such as fire, insects, and disease, the forest would stagnate and eventually become homogeneous, with a resultant negative impact on biodiversity and resilience to disturbance. These change agents are an integral part of forest ecosystem processes, but still pose a challenge to forest management.

Many of the plan components that affect insects and diseases are contained in others sections of this forest plan, including but not limited to *Vegetation*, *Pollinators*, and *Wildlife*, along with specific direction for management areas: *Wilderness*, *Research Natural Areas*, *Colorado Roadless Areas*, *Dispersed and Developed Recreation*, and *Ski-based Resorts*.

Management Approaches

MA-INDS-1: Consider potential insect and disease outbreaks so that management activities can be designed to meet or enhance resource objectives. (Forestwide)

MA-INDS-2: Manage vegetation in high-use recreation areas to ensure public safety and to improve forest health, as needed to maintain or improve the desired recreational setting(s). (General Forest Geographic Area, Roadless Geographic Area, Specially Designated Geographic Area)

MA-INDS-3: Use integrated pest management techniques, including silvicultural treatments, to meet resource objectives. Treatment activities will be based on values of, and risks to, adjacent private lands, as well as public land. Priority should be given to areas in which values to be protected exceed the cost of protection. (For example, adjacent to subdivisions, recreation sites, or areas of concentrated public use.) (General Forest Geographic Area, Specially Designated Geographic Area)

MA-INDS-4: Design project activities to minimize the risks of spreading existing infestation, while still providing habitat for those wildlife species dependent on the presence of insects and disease. (General Forest Geographic Area, Specially Designated Geographic Area)

Range Management (RNG)

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. Rangelands on the Forest are naturally fragmented because of highly dissected mountain slopes and changes in vegetation as elevation increases. They can be characterized as narrow canyons with riparian ecosystems and adjacent grassland communities. A forest plan identifies areas suitable and capable for livestock, and assigns standards and guidelines specific to range management for those areas. The 1996 forest plan projects a capacity for livestock grazing at 143,000 head months, including cattle and sheep. About 581,000 acres of land are considered capable and suitable for domestic livestock grazing on the Forest.

Livestock-based agriculture is historically and culturally important in the San Luis Valley and southwestern Colorado. Agriculture, particularly farming and ranching, continues to be an important industry. Domestic livestock grazing contributes to the stability of the surrounding ranching community and its values are recognized as a part of the heritage, for contributions to food and fiber, and for maintenance of open space. While the range allotments on the Forest are not the exclusive source of feed for the permitted stock, they provide important high-elevation forage during the summer months. This forage supplements private and leased pasture, and allows the permittees to maintain current livestock numbers.

Desired Conditions

DC-RNG-1: Management of domestic livestock grazing allows for the perpetuation of natural landscape diversity (composition, structure, and function). This includes consideration in a spatial context (what species, what kind of structure, and what landscape patterns are natural by ecosystem) and a temporal context (which seral stages and how many are natural by ecosystem). (Forestwide)

DC-RNG-2: Forage, browse, and cover needs for wildlife and authorized livestock are in balance with the available forage. (Forestwide)

DC-RNG-3: Rangelands sustain biological diversity and ecological processes. (Forestwide)

DC-RNG-4: Grazed areas trend toward slight to no departure for soil and site stability, hydrologic function, and biotic integrity. (Forestwide)

DC-RNG-5: Transitory forage on Forest lands is available for grazing within existing, permitted allotments in coordination with other resource needs, e.g., reforestation. (Forestwide)

DC-RNG-6: Range improvements on grazing allotments should support ecologically sustainable grazing and benefits for wildlife when opportunities exist. New and replacement improvements are designed to benefit and allow for passage of aquatic and terrestrial species. (Forestwide)

Objectives

OBJ-RNG-1: Over the planning period, prioritize and restore at least 150 acres of upland ecosystems. (Forestwide)

Guidelines

G-RNG-1: Develop site- and species-specific vegetation use and residue guidelines during rangeland planning, and document them in allotment management plans. In the absence of updated planning or an approved allotment management plan, the utilization and residue guidelines in Table 3 and Table 4 will apply. (Forestwide)

Table 3. Utilization guidelines for rangeland condition

Type of Management	Satisfactory (%)	Unsatisfactory (%)
Season-long	35	20
Fall and winter	55	35
Deferred rotation	45	25
Rest rotation	50	35

Table 4. Clary and Webster residue allowances for rangeland

Season of Pasture Use	Satisfactory (inches)	Unsatisfactory (inches)
Spring	3	4
Summer and fall	4	6

G-RNG-2: Phase out grazing systems that allow for livestock use in an individual unit during the entire vegetative-growth period, except where determined to achieve or maintain the desired plant community. (Forestwide)

G-RNG-3: Allow livestock use of riparian management zones as long as use is in compliance with residual stubble heights identified in Forest Service Technical Report INT-263 *Managing Grazing of Riparian Areas in the Intermountain Region* (Clary and Webster 1996), or more recent research. (Forestwide)

G-RNG-4: Grazing in aspen stands should ensure sprouting and sprout survival sufficient to perpetuate the long-term viability of the clones. (Forestwide)

G-RNG-5: Minimize controlled driving of permitted livestock in designated wilderness. (Primitive Wilderness Geographic Area)

Management Approaches

MA-RNG-1: After all other solutions have been extensively considered, remove livestock from the grazing unit or allotment when further utilization on key areas will exceed allowable-use criteria, allotment management plan guidance, or annual operating instructions. Damage from use can result from many things including but not limited to wildlife, recreation, flooding, and livestock grazing, none of which should push the use beyond what is allowed. (Forestwide)

MA-RNG-3: Rangelands are managed to provide a wide variety of benefits, including forage for livestock and wildlife, a diversity of plant and animal communities, and high yield of high-quality water. (Forestwide)

MA-RNG-4: Discourage livestock use in openings created by fire or timber harvest that would delay successful regeneration of the shrub and tree components. (Forestwide)

MA-RNG-6: Rangelands are managed to provide a variety of benefits, including forage for livestock and wildlife, a diversity of plant and animal communities, and high yields of high quality water. (Forestwide)

MA-RNG-7: Work with cooperators, partners, and permittees to prioritize and restore upland ecosystems and rebuild important structural improvements. (Forestwide)

Soils (SOIL)

Soils are a foundational and integral part of ecosystems and the services they provide. Soils provide ecosystem services such as clean drinking water and forest products such as timber and firewood, and provide areas for cattle grazing and recreational opportunities. Healthy, sustainable soils will continue to provide these important ecosystem services into the future. Effects of changes in temperature, and frequency and timing of weather events, can also be mitigated in the short term if healthy soils are present. The 1996 forest plan used the watershed conservation practices handbook as standards and guidelines, which largely protected soils and soil productivity over the years of plan implementation. These practices will continue to be used to protect soils as regional direction. Additionally the national best management practices program allows for systematic monitoring of practices that have the potential to impact soils and overall watershed health. Soils have generally improved due overtime. There are still areas with needs for improvement, but soils are largely in acceptable or good condition in areas of high use and excellent in designated roadless and wilderness areas.

Desired Conditions

DC-SOIL-1: Soil condition is satisfactory, soil functions are sustained, and soil is functioning properly. The ability of soil to maintain resource values and sustain outputs is high. (Forestwide)

DC-SOIL-2: Vegetation contributes to soil conditions, nutrient cycling, and hydrologic regimes at natural levels. (Forestwide)

DC-SOIL-3: Downed woody debris occurs at levels (amount, decay, and size) sufficient to support soil productivity. (Forestwide)

DC-SOIL-4: Biological soil crusts are present at sustainable levels where expected (desert, desert grasslands, piñon-juniper, and sagebrush). (Forestwide)

DC-SOIL-5: Soils are free of pollutants that could alter ecosystem integrity or affect public health. (Forestwide)

DC-SOIL-6: Occasional, intermittent, small-scale soil disturbance occurs, allowing propagation of plant species of conservation concern, including but not limited to Ripley's milkvetch, silky-leaf cinquefoil, Rothrock's Townsend daisy (Forestwide)

Standards

S-SOIL-1: Management activities do not create detrimental soil conditions on more than 15 percent of an activity area. In activity areas where less than 15 percent detrimental soil conditions exist from prior activities, the cumulative detrimental effects of the current activity following project implementation and restoration must not exceed 15 percent. In areas where more than 15 percent detrimental soil conditions exist from prior activities, the cumulative detrimental effects from project implementation and restoration should not exceed the conditions

prior to the planned activity and should move toward a net improvement in soil quality.
(Forestwide)

Guidelines

G-SOIL-1: On sensitive soils (high erosion or mass movement potential), ground-disturbing activities should be planned to maintain soil and slope stability and, where practicable, should be avoided on soils with high mass movement potential. (Forestwide)

Management Approaches

MA-SOIL-1: Use genetically appropriate, weed-free seed populations of native plant species for revegetation efforts where technically and economically feasible. Nonnative annuals or sterile perennial species may be used while native perennials are becoming established. (Forestwide)

MA-SOIL-2: All soil types supportive of edaphic plant species of conservation concern should be mapped. This includes volcanic substrates such as ash-tuffs, latitic lava flows, rhyolite, and andesitic substrates; sedimentary substrates supportive of edaphic species include calcareous substrates such as limestone and shale. (Forestwide)

MA-SOIL-3: Project-specific best management practices and project design features should be incorporated into land management activities as a principle mechanism for protecting soil resources. (Forestwide)

MA-SOIL-4: Following ground-disturbing activities, soil function should be restored to the extent practicable. (Forestwide)

Vegetation Management (VEG)

The Forest provides a diverse landscape with a wide variety of vegetation communities. The majority of the Forest is in the spruce-fir ecosystem. Other vegetation types that dominate include the Southern Rocky Mountain montane-subalpine grassland and Rocky Mountain alpine turf, followed by mixed-conifer, dry, and pinyon-juniper woodland.

Plan components contained in the section below cover the broad area of forest vegetation and management of forest vegetation. The direction includes plan components related to terrestrial ecosystem integrity, as well as the required timber harvest-related plan components, as described within Chapter 60 of Forest Service Handbook 1909.12.

Plan components that affect vegetation are also contained in other sections of this forest plan including, but not limited to, *Fire, Insects and Disease, Minerals, Nonnative Invasive Species and Noxious Weeds, Range Management, Riparian Management Zones, Soils, Special Forest Products, Species of Conservation Concern, Visual Quality, Watersheds, and Wildlife*. Specific direction is also contained for management areas: *Wilderness, Dispersed and Developed Recreation, General Forest and Intermingled Rangelands, Roadless Areas, Scenic Byways and Scenic Railroads, and Special Interest Areas*.

Desired Conditions

DC-VEG-1: Timber harvest prescriptions should identify distribution of coarse woody debris and snags, as well as live green replacement trees for future snags. The minimum requirements for adequate wildlife habitat and ecosystem function are shown in Table 5.

In each forest type, maintain late-successional and old forest conditions (see Appendix A) that provide key ecological components for wildlife. Snags are important for cavity-nesting birds and other wildlife, including species of conservation concern. These legacy components are an important key ecosystem characteristic for many species.

Snags are also an important component in the maintenance of habitat connectivity. Particularly in spruce-fir forest types, a focus on habitat components including snags, down wood, and understory patches of regeneration would maintain and restore habitat connectivity. Snag retention strategies provide a variety of snag heights for species such as bats and the olive-sided flycatcher. Snag height ranges from less than 25 feet to taller than the surrounding habitat.

Available hollow trees, snags, and longs are retained to provide unique habitat components that supplement the snag and downed wood recommendations. Downed wood retention provides whole logs in the largest size class. Unless they pose a safety risk, soft snags are retained during management.

Downed wood, i.e., woody materials greater than 3 inches in diameter, is important for retaining moisture, trapping soil movement, providing microsites for plant establishment, and cycling soil nutrients in ecosystems. A wide variety of downed wood size classes is preferred.

Recommended snag and downed wood criteria for wildlife habitat and ecosystem processes are shown in Table 5. At least the minimum number of snags and amount of downed wood in the planning unit should be maintained. At least 50 percent of the snags retained should represent the largest size classes available. If larger snags are not present, a greater number in the smaller size classes should be retained. Snags do not need to be retained on every acre. (General Forest Geographic Area)

Table 5. Recommended snags and downed wood for wildlife habitat and ecosystem processes

[Quantities are based on an average per acre basis across the planning unit.]

Forest Type	Snags			Downed Wood ¹
	Minimum diameter at breast height	Minimum/Acre in Planning Unit	Minimum height (feet)	Tons/Acre
Spruce-fir	² 12	6	25	10–15
Cool-moist mixed-conifer	² 12	4	25	5–10
Aspen	10	5	25	3–5
Cool-dry mixed-conifer	12	4	25	5–10
Warm-dry mixed-conifer	² 12	3	25	4–9
Ponderosa pine	² 12	3	25	2–3
Lodgepole pine	10	3	15	5–10

¹ Project implementation should focus on leaving larger and longer logs onsite in accordance with site capacity.

² At least 50 percent of the required snag numbers should represent the largest size classes available.

DC-VEG-2: Vegetation management strategies are consistent with historical succession and disturbance regimes where possible and consistent with other land management objectives. (General Forest Geographic Area, Specially Designated Geographic Area)

DC-VEG-3: Vegetation management occurs on lands identified as not suitable for timber production, for other multiple-use purposes, and these areas have an irregular, unscheduled timber harvest program. These harvests meet management direction and desired conditions for these areas and may provide services and benefits to people. (General Forest Geographic Area, Roadless Geographic Area, Specially Designated Geographic Area)

DC-VEG-4: In spruce-fir forests where the mature forest canopy has reached 60 percent or more mortality from bark beetles, remaining mature and late-successional forest patches that are expected to remain green or mostly green during the life of the plan are retained where they are considered integral to ecosystem or species habitat-related goals. (General Forest Geographic Area, Specially Designated Geographic Area)

DC-VEG-5: Late-successional/old-forest conditions (see Appendix A) are maintained or enhanced to provide key ecological conditions when needed to provide for the viability of at-risk species. (General Forest Geographic Area, Specially Designated Geographic Area)

DC-VEG-6: Cottonwood riparian areas and wetland ecosystem communities display moderate to high canopy cover (greater than 20 percent) of young, middle-aged, and old cottonwood trees. (General Forest Geographic Area, Specially Designated Geographic Area)

DC-VEG-7: Habitat structure in Gambel oak communities provides for species assemblage associated with this habitat. (General Forest Geographic Area, Specially Designated Geographic Area)

DC-VEG-8: All development stages of the forested terrestrial ecosystems are well represented at the landscape scale and occur Forestwide within the ranges identified in Table 6. (Forestwide)

DC-VEG-9: When salvaging timber following wildfire, retain tall snags for snag-associated species and snag location in the riparian management zone. (Forestwide)

Table 6. Current status and desired conditions of development and structural stages of the forested terrestrial ecosystems

Terrestrial Ecosystem	Development Stage	Structural Stage	Current Condition (%)	Desired Condition (%)	Desired Condition in Old Forest (%)
Ponderosa Pine	Young	1T/2T	8	5–10	10–15
	Mid-open	3A	19	5–10	
	Mid-closed	3B,C	5	5–10	
	Mature-open	4A	49	40–50	
	Mature-closed	4B,C	19	15–25	
Warm-dry mixed-conifer	Young	1T/2T	<1	5–10	15–20
	Mid-open	3A	6	10–15	
	Mid-closed	3B,C	8	10–15	
	Mature-open	4A	34	25–30	
	Mature-closed	4B,C	52	25–35	
Cool-moist mixed-conifer	Young	1T/2T	8	5–10	20–30
	Mid-open	3A	10	5–10	
	Mid-closed	3B,C	22	15–20	
	Mature-open	4A	17	15–20	
	Mature-closed	4B,C	43	30–40	
Cool-dry mixed-conifer	Young	1T/2T	0	5–10	15–20
	Mid-open	3A	12	5–10	
	Mid-closed	3B,C	24	15–20	
	Mature-open	4A	25	30–40	
	Mature-closed	4B,C	39	15–20	
Spruce-fir	Young	1T/2T	30	5–10	25–35
	Mid-open	3A	13	5–10	
	Mid-closed	3B,C	7	10–15	
	Mature-open	4A	27	20–25	
	Mature-closed	4B,C	22	30–40	
Aspen	Young	1T/2T	6	See MA-VEG-3	
	Mid-open	3A	16		
	Mid-closed	3B,C	58		
	Mature-open	4A	2		
	Mature-closed	4B,C	19		
Pinyon-juniper woodland	Young	1T/2T	1	5–10	20–30
	Mid-open	3A	47	10–15	
	Mid-closed	3B,C	38	10–15	
	Mature-open	4A	5	20–30	
	Mature-closed	4B,C	9	30–40	

Objectives

Annual objectives should be interpreted as annual averages for each decade over the life of the plan.

OBJ-VEG-1: Diversify the structure class distribution for various forest types via management on 100 acres annually in the first decade and 1,200 acres in the second decade, to work toward or maintain the desired conditions in Table 6, above. (General Forest Geographic Area, Specially Designated Geographic Area)

OBJ-VEG-2: Annually restore 150–300 acres of dry mixed-conifer and ponderosa pine areas to move these forest types toward a species composition and landscape pattern where fire can function in its natural role. (General Forest Geographic Area)

OBJ-VEG-3: Annually, for the first decade, salvage harvest about 3,000 acres per year of spruce-fir to provide for economic sustainability within the region. (General Forest Geographic Area)

OBJ-VEG-4: Annually, for the second decade, offer timber for sale at an average potential timber sale quantity of 8,400 CCF (hundred cubic feet). (General Forest Geographic Area)

OBJ-VEG-5: Annually, for the second decade of the plan, offer commercial timber and other products for sale at an average annual potential wood sale quantity of 15,600 CCF. (General Forest Geographic Area)

Standards

S-VEG-1: Timber may not be harvested for the purpose of timber production on lands not suited for timber production. Timber harvest may occur on these lands for the following purposes: protecting other multiple-use values, protecting or enhancing biodiversity or wildlife habitat, scenic-resource management, research or administrative studies consistent with geographic or management area direction, and salvage, sanitation, public health, or safety. (General Forest Geographic Area)

S-VEG-2: Timber shall not be harvested on lands where soil, slope, or other watershed conditions may be irreversibly damaged, as identified in project-specific findings. (General Forest Geographic Area, Roadless Geographic Area, Specially Designated Geographic Area)

S-VEG-3: Conduct harvest to assure that the technology and knowledge exist to restock these areas adequately with trees within 5 years after final harvest.

Minimum restocking levels for suitable timber lands are defined in Table 7. Exceptions to these levels are allowed if supported by a project-specific determination of adequate restocking.

Restocking levels for nonsuitable timber lands must be specified with the silvicultural prescription. Project-specific determination of adequate stocking must be based on the plan's desired conditions and objectives applicable to the area and project and be consistent with all other applicable plan components. (General Forest Geographic Area, Roadless Geographic Area, Specially Designated Geographic Area)

Table 7. Minimum restocking level for suitable timber lands, by species

Species	Spruce-Fir	Aspen	Douglas Fir	Lodgepole Pine	Ponderosa Pine	Other Softwoods	Other Hardwoods
Trees per Acre	150	300	100	150	75	150	150

Minimum seedling height requirements are not specified. Seedlings must have survived a minimum of one growing season and be expected (on the basis of research and experience) to be able to produce the desired stand condition specified for this area in the forest plan. The numbers of seedlings in Table 7 represent the minimum number of seedlings needed to meet resource objectives. To assure that adequate restocking of openings created as a result of final harvest is accomplished, as a minimum, stocking surveys are conducted at the end of the first and third growing seasons following regeneration treatment. Adequate stocking cannot be certified until after the third-year growing-season survey.

S-VEG-4: Select harvest systems to achieve desired conditions and objectives or to meet site-specific project needs, not primarily for the greatest dollar return or timber output. (General Forest Geographic Area)

S-VEG-5: Clearcutting may be used where it has been determined to be the optimum method, and other types of even-aged harvest shall be used only where determined to be appropriate. Determinations shall be based on site-specific conditions and the desired conditions for vegetation, wildlife habitat, scenery, and other resources. (General Forest Geographic Area)

S-VEG-6: Openings will not be created larger than 40 acres, regardless of forest type. Openings larger than 40 acres may be created when one of the following is true:

- Proposals for larger openings have been approved by the regional forester, following a 60-day public review,
- Larger openings are the result of natural catastrophic conditions (including those resulting from fire, insect or disease attack, or windstorm), or
- When the area that is cut does not meet the definition of created openings. (General Forest Geographic Area)

S-VEG-7: The quantity of timber that may be sold per decade will be less than or equal to the sustained yield limit of 73,749 CCF per year or 737,490 CCF per decade with the following exceptions: salvage or sanitation harvesting of timber stands that are substantially damaged by fire, windthrow, or other catastrophe or that are in imminent danger from insect or disease attack. Salvage harvest of trees substantially damaged by fire, windthrow, or other catastrophe or in imminent danger from insect or disease attack may be harvested over and above the sustained yield limit, consistent with desired conditions for terrestrial and aquatic ecosystems. (General Forest)

Guidelines

G-VEG-1: Even-aged stands shall generally have reached or surpassed culmination of mean annual increment (achieving 95 percent of culmination of mean annual increment, as measured by cubic volume) prior to regeneration harvest, unless the following conditions have been identified during project development:

- a) When such harvesting would modify fire behavior to protect identified resource, social or economic values
- b) When harvesting of stands will trend landscapes toward desired conditions
- c) When harvest uses uneven-aged silvicultural systems, thinning, or other intermediate stand treatments that do not regenerate even-aged or two-aged stands
- d) When harvest is for sanitation or salvage of timber stands that have been substantially damaged by fire, wind-throw, or other catastrophe or that are in imminent danger from insect or disease attack
- e) When harvest is on lands not suited for timber production and the type and frequency of harvest is due to the need to protect or restore multiple use values other than timber production. (General Forest Geographic Area)

G-VEG-2: Even-aged harvest openings should be irregularly shaped and blend with the natural terrain. (General Forest Geographic Area)

Management Approaches

MA-VEG-1: The scientifically defined silvicultural systems shown by forest cover type in Table 8, which meet the management objectives for the landscape or individual stands of trees within a landscape setting, are acceptable. Both even-aged and uneven-aged management systems can be used and applied at scales ranging from a few acres to many hundreds of acres. These silvicultural systems are to be applied in a manner that will create conditions favorable for natural regeneration. Artificial regeneration will be considered when necessary to meet minimum stocking standards. The silvicultural systems identified in Table 8 can be used to convert uneven-aged stands to even-aged management and even-aged stands to uneven-aged management. (General Forest Geographic Area, Specially Designated Geographic Area)

Table 8. Appropriate silvicultural system by cover type

Forest Cover Type	Even-Aged	Two-Aged	Uneven-Aged
Ponderosa pine	Shelterwood, Clearcut, Overstory removal, Seed tree	Irregular shelterwood, shelterwood with reserves	Group selection, single-tree selection
Mixed-conifer	Shelterwood, Clearcut, Overstory removal, Seed tree	Irregular shelterwood, shelterwood with reserves	Group selection, single-tree selection
Aspen	Coppice ¹	Coppice with standards ²	Group selection ³
Lodgepole pine	Shelterwood, Clearcut, Overstory removal, Seed tree	Irregular shelterwood	Group selection
Engelmann spruce & subalpine fir	Shelterwood, Clearcut, Overstory removal	Irregular shelterwood	Group selection, single-tree selection

¹ Coppice is a vegetation reproduction method with clearfelling or clearcutting. Clearfelling (clearcutting) stimulates sprouting from the residual roots.

² "Standards" are selected overstory trees reserved for a longer rotation at the time each crop of coppice material is cut.

³ Use of group selection as an appropriate silvicultural system in aspen is currently under study to determine regeneration success, but is authorized on a test basis.

MA-VEG-2: Maintain aspen on the landscape. When regenerating aspen, prioritize treatment within seral aspen clones using the following criteria:

- Identify stands with large standing and down dead basal area (about 20 percent dead) that are single-storied and showing signs of animal barking (gnawing and bark stripping) or disease. Multistoried stands that have several hundred sapling-size suckers per acre under them, or that show little sign of canker disease or animal barking, are lower priority for any management intervention.
- Identify conifer stands with a small minority of live aspen basal area (less than 20 percent live basal area). (Aspen is likely to disappear from these stands within several decades without intervention).
- Identify isolated clones and stands in heavy animal-use area and riparian area, and those at low elevations. Any stands in these situations that meet the criteria above should be given the highest priority for regeneration. (These stands will be at greatest risk of disappearing and will be the toughest to regenerate successfully. Protection of treatment areas from browsing animals may be needed to achieve successful regeneration.)
- Identify stands that are more cost efficient and not impacted by heavy animal use to treat and contribute positively to the distribution of aspen. (General Forest Geographic Area)

MA-VEG-3: Base the size of the uncut forest areas between openings on project-level objectives for the landscape unit being analyzed. If objectives include creating a mix of vegetation types to benefit wildlife associated with early successional stages and edges, the uncut units can be small. If project-level objectives include provisions for late-successional dependent wildlife species, the uncut units could be large enough to function as an ecological system not overly influenced by edge. (General Forest Geographic Area, Specially Designated Geographic Area)

MA-VEG-4: Except for treatments designed to enhance, maintain, and restore meadows, avoid alteration of the edge of a natural opening, dependent on the surrounding forest type and assessed on site-specific conditions and habitat needs. (Forestwide)

MA-VEG-5: To restore or maintain genetic diversity when thinning, use practices that consider genetic diversity and competition for water, nutrients, and light among the trees. The frequency of thinning should depend upon species, financial efficiency, and growing conditions of the site (as commonly measured by site index). (General Forest Geographic Area)

MA-VEG-6: Determine if old forest is present (see Appendix A for criteria) during planning, and make assessments of quality and distribution. (Forestwide)

MA-VEG-7: Preserve or defer from harvest some old-forest/late-successional stands to maintain biotic diversity within the landscape/watershed. Assess size, distribution, abundance and the degree of habitat variation among old-forest stands. Consider the following in selecting old-forest stands that to be retained:

- Older stands that have not been manipulated are more desirable than younger ones.
- Stands with limited use and access are better to maintain old-growth characteristics.
- Stands that are habitat for threatened, endangered, or proposed species, species of conservation concern, or Colorado Natural Heritage Program Species of Special Concern.
- Stands exhibiting a great variety of attributes, such as diverse canopy layers, decadence in live trees, standing and/or downed dead, patchiness, etc. (Forestwide)

MA-VEG-8: Openings created by management are no longer considered openings when the trees reach a height and density that meet management objectives. The default criteria are when the minimum stocking standards for the forest vegetation type are met and average height is 6 feet or greater with at least a 70-percent distribution for conifer species and 10 feet or greater with at least a 70-percent distribution for aspen. The criteria will be validated and may be modified in accordance with local conditions encountered during implementation. Criteria to consider in determining when an opening is no longer an opening include:

- Visual sensitivity of the area
- The character of the landscape
- The abundance, quality, and need for cover for big game; other vegetation that may be present (i.e., tall shrubs)
- Forest health
- The need for seed sources
- The need for interior forest area
- The production of wood fiber
- Watershed and riparian area protections. (General Forest Geographic Area)

MA-VEG-9: Forest vegetation management that results in, among other objectives, meeting needs or demands for forest product offerings (commercial, personal, or other use) is done in a manner that supports one or more of the following:

- Maintains or improves ecosystem function, resilience, and sustainability,
- Supports a sustainable level of economic activity in the local timber industry,
- Provides economic or social support to local communities,
- Ensures current and future needs for American Indian tribal use, including that associated with special forest products (e.g., teepee poles),
- Uses, to the fullest extent practicable, potential products including sawtimber, poles, topwood, or slash (e.g., limbs, foliage),
- Supports innovation in utilization, including conversion of cut-tree mass into biofuels, pellets, biochar, or other useful products,
- Efficiently balances or reduces costs of implementation of treatment activities, and
- Anticipates climate-related plant succession changes (such as favoring heat- or drought-resistant tree species as leave trees). (General Forest Geographic Area)

MA-VEG-10: In areas suitable for timber production, dead or dying trees (due to fire, insects, disease) are salvaged to recover the economic value of the wood while providing for ecosystem function, including but not limited to retention of downed woody material, habitat, and snags as well as public safety. (General Forest Geographic Area)

Socioeconomics and Ecosystem Services

The following sections are grouped under this heading:

- Air Quality
- Areas of Tribal Importance
- Congressionally Designated Trails
- Cultural Resources
- Fire Management
- Forest Products
- Infrastructure
- Minerals
- Recreation Management
- Visual Quality

Air Quality (AIR)

The Clean Air Act and subsequent amendments give Federal land managers the responsibility to protect air-quality-related values in Class 1 areas and to protect human health and basic resource values in all areas. The La Garita, Weminuche, and nearby Great Sand Dunes Wilderness areas are classified as Class 1 areas where very little deterioration of air quality is allowed. Virtually all

land management activities on the Forest occur outside the non-attainment boundaries. The greatest potential to affect air quality would be from smoke (wildfires, prescribed fires) and road dust.

Desired Conditions

DC-AIR-1: Air quality related values over Class I wilderness areas (La Garita and Weminuche) include but are not limited to visibility, water and snow chemistry, precipitation and atmospheric chemistry, soil chemistry, and aquatic and terrestrial biota. Air quality values meet or exceed state standards. (Primitive Wilderness Geographic Area)

DC-AIR-2: Air quality over Class II wilderness areas (Sangre de Cristo and South San Juan) meets or exceeds state standards with respect to pollutant concentrations to protect human health and the integrity of associated aquatic and terrestrial ecosystem components. (Primitive Wilderness Geographic Area)

DC-AIR-3: Natural air quality conditions in nearby Class I areas, including the Great Sand Dunes Wilderness, will be based on information provided by the Federal land managers about the potentially impacted Class I areas. (Primitive Wilderness Geographic Area)

DC-AIR-4: Dust from projects is limited to reduce impacts of dust-on-snow events. (Forestwide)

DC-AIR-5: The ecological footprint is minimized to promote sustainable natural resource management and emit the lowest practicable greenhouse gas emissions. (Forestwide)

DC-AIR-6: Within agency control, atmospheric deposition of nitrogen and sulfur for lakes with an acid neutralizing capacity of at least 25 $\mu\text{eq/L}$ allows for no more than a 10-percent change from established baseline, and for lakes with an acid neutralizing capacity of less than 25 $\mu\text{eq/L}$ allows for no more than 1 $\mu\text{eq/L}$ decrease in acid neutralizing capacity. (Forestwide)

Guidelines

G-AIR-1: Use approved dust abatement measures (oils and solvents are not acceptable). (Forestwide)

G-AIR-2: Prevent or reduce airborne nutrient and mercury deposition impacts to sensitive high-elevation lakes in Class I wilderness areas over the life of the forest plan; allow no detectable mercury, no more than 2 $\mu\text{eq/L}$ of ammonium, and no late summer nitrate. (Primitive Wilderness Geographic Area)

Areas of Tribal Importance (ATI)

*“Stay in touch with this place, talk to these places in your language.”
~ Bryan Vigil, Jicarilla Apache elder*

The San Luis Valley and the surrounding San Juan and Sangre de Cristo Mountains are the ancestral homelands of several American Indian clans, bands, and tribes. Despite their removal by the U.S. Government in the late 1800s, several tribes maintain strong cultural and spiritual connections to the area. These include the Jicarilla Apache, Navajo, Southern Ute, and Ute Mountain Ute Tribes, as well as several Upper Rio Grande and Western Pueblos. Ceremonial and culturally important sites and traditional gathering areas exist on the Forest. Tribes affiliated with the area exhibit a continuing interest in the homeland-related traditions of their people and look

to the Forest to aid in the maintenance and re-establishment of cultural connections to ancestral landscapes.

Policy development and methods of consulting with tribes has evolved since the last forest plan was completed 20 years ago. Changes include how the Forest programmatically integrates consultative elements into planning documents, including recognizing and managing traditional and cultural landscapes. The legal framework of Federal policy, case law, and Executive orders provides guidance and establishes a higher standard for tribal consultation, authority to facilitate reburial of Native American human remains on National Forest System lands, the allowance for tribes to collect forest products, and the protection of sensitive information. This legal framework has also created pathways to greater collaboration and connection between the Forest and the tribes at all management levels of the Forest Service.

Desired Conditions

DC-ATI-1: Areas of tribal importance that include acknowledged Traditional Cultural Properties are present for their cultural importance and are generally free of impacts from other uses. (Forestwide)

DC-ATI-2: Access for tribal members is provided for the exercise of treaty rights and to provide opportunities to practice traditional, cultural, and religious activities, such as plant gathering and ceremonial activities, that are essential to sustaining their way of life, cultural integrity, social cohesion, and economic well-being. (Forestwide)

DC-ATI-3: The significant visual qualities of eligible areas acknowledged as traditional cultural properties are preserved. (Forestwide)

DC-ATI-4: The Forest provides a setting for educating tribal youth in culture, history, and land stewardship, and for exchanging information between tribal elders and youth. (Forestwide)

DC-ATI-5: Traditionally used resources, such as oshá, are not depleted and are available for future generations. (Forestwide)

Guidelines

G-ATI-1: Minimize restoration and recreation activities and uses, as well as the development of new facilities and infrastructure, near areas of tribal importance, such as areas acknowledged as traditional cultural properties. (Forestwide)

G-ATI-2: The scenic and physical integrity of sacred sites, areas acknowledged as Traditional Cultural Properties, or as part of an important cultural landscape, should be retained when approving, locating, and maintaining activities, including, but not limited to communication sites and powerlines. (Forestwide)

G-ATI-3: Adhere to and maintain the Intertribal and Interagency San Luis Valley Native American Graves Protection and Repatriation Act Memorandum of Understanding, first enacted in 2009. (Forestwide)

G-ATI-4: Adhere to and maintain the Brunot Agreement(s) between the State of Colorado, Ute Mountain, Ute, and Southern Ute Tribes. (Primitive Wilderness Geographic Area)

Management Approaches

MA-ATI-1: Cooperatively develop interpretive and educational exhibits or other media that focus on the history of Forest lands in collaboration with tribes to provide the public with a greater understanding and appreciation of our shared history, culture, and traditions. (Forestwide)

MA-ATI-2: When identifying and mapping for select populations of oshá, consider setting aside collection areas for tribal use that would rotate through time. (Forestwide)

MA-ATI-3: Relationships with tribes are meaningful, built on trust, and maintained. (Forestwide)

MA-ATI-4: Develop an interpretive and educational site to help prevent vandalism at the Natural Arch. (Specially Designated Geographic Area)

MA-ATI-5: Develop interpretive and educational site materials in concert with tribes that can aid in protecting areas of tribal importance. (Forestwide)

MA-ATI-6: Determine eligibility of Mount Blanca as a traditional cultural property to the National Register of Historic Places in partnership with interested tribes. (Forestwide)

MA-ATI-7: Work with staff from the San Luis Valley, Bureau of Land Management, Pike-San Isabel National Forest, interested tribes, the U.S. Fish and Wildlife Service Sangre de Cristo Conservation Area, and other non-Federal partners to develop a management plan to assist in maintaining cultural values. (Forestwide)

MA-ATI-8: Confidential and/or sensitive information regarding sacred sites is held in the strictest confidence. (Forestwide)

MA-ATI-9: The purposeful excavation, photography, and/or destructive analysis of human remains for educational purposes, such as research or field schools, is not permitted. (Forestwide)

MA-ATI-10: Accommodate and facilitate traditional use of areas acknowledged as traditional cultural properties and other culturally important places that are essential to maintaining the continuing cultural identity of associated communities. (Forestwide)

MA-ATI-11: Coordinate with tribes to develop collaborative proposals and partnerships to implement projects of mutual benefit and/or economic development, using federally authorized or advocated programs where available. (Forestwide)

MA-ATI-12: Identify, evaluate, and protect areas acknowledged as traditional cultural properties and work with associated communities to collaboratively manage areas acknowledged as traditional cultural properties by developing programmatic agreements, management plans, memoranda of understanding, or other management tools. (Forestwide)

MA-ATI-13: Consult with tribes at initial planning stages and project design. As appropriate, tribal perspectives, needs, and concerns, as well as traditional knowledge, should be incorporated into project design and decisions, such as areas acknowledged as Traditional Cultural Properties. (Forestwide)

Congressionally Designated Trails (CDT)

Direction included below applies to the management of two congressionally designated trails on the Forest: the Continental Divide National Scenic Trail and the Old Spanish National Historic Trail.

The National Trails System Act of 1968 authorized creation of a national trail system consisting of national scenic, historic, and recreation trails. National scenic and national historic trails may be designated only by an act of Congress. Two congressionally designated trails traverse portions of the Forest. The Continental Divide National Scenic Trail and the Old Spanish National Historic Trail were designated by Congress in 1978 and 2002, respectively.

The 3,100-mile-long Continental Divide National Scenic Trail follows the backbone of the Rocky Mountains from Canada to Mexico. The trail traverses portions of 25 national forests, three national parks, and four Bureau of Land Management districts, as well as various private lands in Colorado, Idaho, Montana, New Mexico and Wyoming. About 170 miles of the trail is routed through the Rio Grande National Forest, from its northern boundary with the Gunnison National Forest, to the New Mexico state line. As described in the 2009 Comprehensive Management Plan, the nature and purposes of the Continental Divide National Scenic Trail are to:

- Provide for high-quality scenic, primitive hiking, and horseback riding opportunities, and
- Conserve natural, historic, and cultural resources along the Continental Divide National Scenic Trail corridor.

The Forest Service is the lead agency responsible for management of the Continental Divide National Scenic Trail. Management of the trail is consistent with the nature and purposes of the trail as described in the 2009 Continental Divide National Scenic Trail Comprehensive Plan, and any revisions.

The Old Spanish National Historic Trail was designated in 2002, with a feasibility study conducted in 2006. Pioneered by Antonio Armijo in 1829, the Old Spanish Trail was a trade network with several routes that carried woolens and slaves between Santa Fe and Los Angeles in trade for horses in Mexico's California territory. The congressionally designated East Fork of the North Branch of the Old Spanish National Historic Trail runs through the Forest, generally following the west flanks of the Sangre de Cristo Mountains through Fort Garland, the Great Sand Dunes, and the town of Crestone, and then turning west to the present day town of Saguache. From there, the trail winds up Saguache Creek and over Cochetopa Pass into the Gunnison Basin. Inventory and research have taken place within the Baca Tract Special Interest Area and in the North Pass area on the Saguache Ranger District. At least one known significant archaeological site along the trail, the Bunker Site, occurs on the Forest.

When completed, the Old Spanish National Historic Trail Comprehensive Management Plan will guide management of the trail across six states and several different management zones. Many opportunities for further research, education, and interpretation exist for this unique resource within the planning unit.

Desired Conditions

DC-CDT-1: Viewsheds from the Continental Divide National Scenic Trail have high scenic values. The foreground of the trail is naturally appearing, and generally appears unaltered by

human activities. The potential to view wildlife is high and evidence of ecological processes such as fire, insects, and diseases exists. (Forestwide)

DC-CDT-2: The landscape of the North Branch of the Old Spanish National Historic Trail is managed to:

- Maintain its nature and purpose,
- Sustain its historic, rugged, spacious character, and
- Preserve the viewshed, cultural landscapes, landmarks, and traditional cultural properties along the trail. (Forestwide)

DC-CDT-3: Travelers along the Old Spanish National Historic Trail have opportunities to learn about the history and significance of the trail, and to experience and appreciate the cultural and natural environment that traders experienced in their travels. (Forestwide)

DC-CDT-4: Trailside interpretation and related visitor information services enhance visitor appreciation of the outdoors, natural resources, history, and scenic values along the Old Spanish National Historic Trail, while also promoting stewardship and protection of the trail. (Forestwide)

DC-CDT-5: The management of the Old Spanish National Historic Trail cultivates economic development opportunities for heritage tourism in coordination with local communities. (Forestwide)

DC-CDT-6: The Old Spanish National Historic Trail is well signed, passable, and safely accessible to the public where feasible. (Forestwide)

DC-CDT-7: The Continental Divide National Scenic Trail is a well-defined trail that provides for high-quality primitive hiking and horseback riding opportunities, and other compatible nonmotorized trail activities, in a highly scenic setting along the Continental Divide. The significant scenic, natural, historic, and cultural resources along the trail corridor are conserved. Where possible, the trail provides visitors with expansive views of the natural landscapes along the Continental Divide. (Forestwide)

DC-CDT-8: The setting of the Continental Divide National Scenic Trail corridor is consistent with or complements a primitive or semiprimitive nonmotorized setting. The Continental Divide National Scenic Trail may intermittently pass through more-developed settings to provide for a continuous route. (Forestwide)

DC-CDT-9: The Continental Divide National Scenic Trail is accessible from access points that provide opportunities to select the type of terrain, scenery, and trail length, ranging from long-distance to day use, that best provide for the compatible outdoor recreation experiences being sought. Wild and remote backcountry segments of the route provide opportunities for solitude, immersion in natural landscapes, and primitive outdoor recreation. Front-country and more easily accessible trail segments complement local community interests and needs and help contribute to a sense of place. (Forestwide)

DC-CDT-10: Use conflicts among Continental Divide National Scenic Trail users are infrequent. (Forestwide)

DC-CDT-11: The Continental Divide National Scenic Trail is well maintained, signed, and passable. Alternative routes are made available in the case of temporary closures resulting from natural events, such as fire, flood or land management activities. (Forestwide)

Objectives

OBJ-CDT-1: Restore or relocate two segments of the Continental Divide National Scenic Trail to improve scenic viewing opportunities and/or to provide for a nonmotorized experience. (Forestwide)

Standards

S-CDT-1: The congressionally designated trail corridors are not suitable for oil and gas or geothermal energy development, or other leasable mineral activities. (Forestwide)

S-CDT-2: No common variety mineral extraction (e.g., limestone, gravel, pumice, etc.) shall occur on or within the congressionally designated trail corridors. (Forestwide)

S-CDT-3: Motorized events and motorized special use permits shall not be permitted on nonmotorized segments of the Continental Divide National Scenic Trail. Motorized events and special use permits could be authorized along existing motorized trail segments not yet converted to nonmotorized use. (Forestwide)

S-CDT-4: Management activities in the congressionally designated trail corridors shall be consistent with, or make progress toward achieving, high or very high scenic integrity objectives to protect or enhance scenic qualities. (Forestwide)

Guidelines

G-CDT-1: To retain or promote the character for which the trail was designated, new or relocated trail segments should be located primarily within settings consistent with or complementing primitive or semiprimitive nonmotorized recreation opportunity spectrum classes. To the extent possible, avoid road and motorized trail crossings and other signs of modern development. (Forestwide)

G-CDT-2: To protect or enhance the scenic qualities of the Continental Divide National Scenic Trail, management activities should be consistent with, or make progress toward achieving scenic integrity objectives of high or very high within the foreground of the trail (up to 0.5 mile on either side). (Forestwide)

G-CDT-3: If forest-health projects result in short-term impacts to the scenic integrity of the trail, mitigation measures should be included, such as screening to reduce short-term impacts to the scenic integrity from management activities adjacent to the trail. (Forestwide)

G-CDT-4: In order to promote a nonmotorized setting, the Continental Divide National Scenic Trail should not be permanently relocated onto routes open to motor vehicle use. (Forestwide)

G-CDT-5: Provide adequate trail facilities to accommodate the amount and types of use anticipated on any given segment to provide for visitor health and safety. Facilities provided should be minimal in order to preserve or promote a setting that appears natural. (Forestwide)

G-CDT-6: New communication sites, utility corridors, and renewable energy sites should not be allowed within the visible foreground (up to one-half mile) and middle-ground viewshed (up to 4 miles) to protect the scenic values of the trail. (Forestwide)

G-CDT-7: Limit linear utilities and rights-of-way to a single trail crossing unless additional crossings are documented as the only prudent and feasible alternative. (Forestwide)

G-CDT-8: New temporary or permanent roads or motorized trail construction across or adjacent to the Continental Divide National Scenic Trail should be avoided unless needed for resource protection, private lands access, or to protect public health and safety. This provides for a naturally appearing setting while avoiding visual, aural, and resource impacts from motorized use. (Forestwide)

G-CDT-9: The use of the Continental Divide National Scenic Trail for landings or as a temporary road for any purpose should not be allowed to provide for a naturally appearing setting while avoiding visual, aural, and resource impacts. (Forestwide)

G-CDT-10: Allow hauling or skidding along the trail only when the trail is colocated with an open road and no other options are available. Apply design criteria to minimize impacts to trail infrastructure. (Forestwide)

G-CDT-11: Manage unplanned fires in the foreground (up to one-half mile) of the trail using minimum impact suppression tactics, or other appropriate tactics, for the protection of the congressionally designated trail values. Allow heavy equipment line construction within the corridor only when necessary for emergency protection of life and property. (Forestwide)

G-CDT-12: Manage wildfires and prescribed fires within 0.5 mile of trails using strategies and tactics that will minimize impacts and emphasize protection of the congressionally designated trail. (Forestwide)

G-CDT-13: Management of the Continental Divide Trail shall comply with the most recent version of the Continental Divide Comprehensive Plan or other current direction. (Forestwide)

Management Approaches

MA-CDT-1: Develop appropriate measures to protect high-potential sites and segments from deterioration due to natural forces, visitor use, vandalism, and other impacts. (Forestwide)

MA-CDT-2: Work to:

- Comprehensively document at least 3 miles of the congressionally designated Old Spanish National Historic Trail
- Study one paraje (camp)
- Study one new segment that was part of the original feasibility study. (Forestwide)

MA-CDT-3: Provide appropriate signage at prominent access points along the Old Spanish National Historic Trail to enhance trail user experience and safety. (Forestwide)

MA-CDT-4: Where applicable, follow the Old Spanish National Historic Trail Comprehensive Management Plan in consultation with trail administrators and across partner Federal agencies. (Forestwide)

MA-CDT-5: Plan for, develop, maintain, and manage high potential segments, sites, and segments under study for the Old Spanish National Historic Trail with trail administrators, the recreation program, volunteers, and trail organizations. (Forestwide)

MA-CDT-6: Coordinate trail management and activities for consistency across and adjacent to unit and jurisdictional boundaries. (Forestwide)

MA-CDT-7: Consult with federally recognized tribal governments, appropriate Federal, state, and local agencies, and trail administrators regarding planning and development activities for the Old Spanish National Historic Trail. (Forestwide)

MA-CDT-8: Encourage trail partners and volunteers to assist in the planning, development, maintenance, and management of the Continental Divide National Scenic Trail, where appropriate and consistent with the Continental Divide National Scenic Trail Comprehensive Plan. (Forestwide)

MA-CDT-9: Evaluate proposed relocations or new segment locations for the Continental Divide National Scenic Trail by using defined optimal location criteria. (Forestwide)

MA-CDT-10: Identify and pursue opportunities to acquire lands or rights-of-way in or adjacent to the Continental Divide National Scenic Trail corridor. (Forestwide)

MA-CDT-11: Consider how activities outside the visible foreground may affect viewsheds and user experiences and mitigate potential impacts to the extent possible. (Forestwide)

MA-CDT-12: Provide consistent signage along the trail corridor at road and trail crossings to adequately identify the trail and provide interpretive signs at key trail entry points and limited historic and/or cultural sites to orient visitors and enhance the visitor experience. (Forestwide)

MA-CDT-13: Ensure that incident commanders are aware of the Continental Divide National Scenic Trail as a resource to be protected during wildfire suppression activities and clearly identify fire suppression rehabilitation and long-term recovery of the trail corridor as high priorities for incident commanders, Burned Area Emergency Rehabilitation team leaders, and post-fire rehabilitation efforts. (Forestwide)

MA-CDT-14: Establish appropriate carrying capacities for specific segments of the Continental Divide National Scenic Trail, monitoring use and conditions, while taking appropriate management actions to maintain or restore the nature and purposes of the trail if the results of the monitoring or other information indicate a trend away from the desired condition. (Forestwide)

Cultural Resources (CRT)

The Forest has been under Federal management since 1908, a little more than 100 years. The Forest contains cultural resources that demonstrate human occupation and use for at least the last 12,000 years. American Indian, Hispanic, and Euro-American communities continue to use the Forest for economic, social, recreational, and religious purposes. These include long-term, rural, land-based traditional communities that use the Forest for subsistence purposes. An understanding of cultural resources and historic uses is important to understanding shared heritage and the social, economic, and ecological sustainability of the planning area, the State of Colorado, the Rocky Mountain region, and the Nation as a whole.

Currently, about 2,099 cultural resources have been documented, including prehistoric and historic remains. About 18 percent of the Forest has been inventoried for cultural resources to some degree. Resources within the Forest represent the processes and events important to the identity and history of both tribal groups and long-term land-based communities. Cultural resources can contain a wealth of information for potential scientific research regarding social and ecological conditions and changes through time, including human successes and failures in coping with these transformations over the past 12,000 years. This information can be of value to managers making decisions regarding contemporary and future ecological management as well as educating the public about the complex ecological sustainability of the Forest. The solid foundation for an efficient Heritage Program that protects cultural resources and maximizes their benefits for the public and the Agency is detailed in Forest Service Manual 2360. Based on Federal historic preservation law and Forest Service manual and policy direction, the Heritage Program Managed to Standard allows line officers to assess the health of the program on their units and direct attention to activities that fall short of the minimum stewardship level. The indicators of the Heritage Program Managed to Standard correspond to key elements of Forest Service Manual 2360: planning, inventory, evaluation, allocation to management use categories, protection, stewardship, public education, and outreach. The seven indicators of the Heritage Program Managed to Standard are program planning, cultural resource inventory, cultural resource evaluation and official designations, condition assessment and allocation, stewardship and protection, public outreach and benefit, and heritage volunteerism.

Desired Conditions

DC-CRT-1: Significant cultural resources (e.g., buildings, sites, districts, structures, and objects), including areas acknowledged as traditional cultural properties, having scientific, cultural, or social values, are identified, preserved, protected, and/or restored for their cultural importance. (Forestwide)

DC-CRT-2: Cultural resources provide educational opportunities that connect people, past and present, to the land and its history. Through positive heritage experiences provided by interpretive sites, historic standing structures, and other materials, the public has an appreciation for the history of the region and develops an awareness of preservation efforts. (Forestwide)

DC-CRT-3: Historic Agency administrative buildings reflect agency history, identity, and function, and where appropriate are available for public use. Restored historic buildings placed on the Agency facility rental program add to Forest recreation program capacity and diversity and generate revenue. (Forestwide)

DC-CRT-4: Heritage-based recreation opportunities are connected with other recreation opportunities, such as trails. (Forestwide)

DC-CRT-5: Cultural and natural resources and historic uses that help sustain cultural communities and contribute to social and economic sustainability are preserved. The uniqueness of long-standing, land-based rural communities that have depended on the Forest for generations is recognized and valued. (Forestwide)

DC-CRT-6: Cultural resources and historic uses that help sustain cultural communities and contribute to social and economic sustainability are preserved. (Forestwide)

DC-CRT-7: Significant cultural resources have no deterioration from natural forces, visitor use, vandalism, and other impacts. (Forestwide)

Standards

S-CRT-1: Include provisions in applicable contracts, agreements, and special use permits for National Register-listed or eligible properties to protect cultural resources. (Forestwide)

Guidelines

G-CRT-1: Preserve cultural artifacts in place, or curated when necessary, following current standards. (Forestwide)

Management Approaches

MA-CRT-1: Protect fire-sensitive sites from activities that may include vegetation treatment, including prescribed fire and thinning, in and adjacent to site boundaries provided that appropriate protective measures are in place. Erosion, severe fire effects, and livestock congregation can result from “islanding” if sites are only avoided and not treated. (Forestwide)

MA-CRT-2: Cultural resource findings are synthesized, interpreted, and shared with the scientific community and public through prehistoric and historic contexts, formal presentations, publications, and educational venues. (Forestwide)

MA-CRT-3: Complete non-project inventory annually to uphold the Section 110 mandate of the National Historic Preservation Act by prioritizing the following:

- Areas where eligible cultural resources are threatened or ongoing impacts are unknown and need to be assessed
- Areas indicated to have high cultural value or high density of cultural resources
- Areas of importance to traditional communities
- Areas where additional survey will contribute to a greater regional understanding of a specific management unit or special interest area. (Forestwide)

MA-CRT-4: Collaborative partnerships and volunteer efforts are developed and maintained to assist the Forest Service in researching and managing its cultural resources. Develop partnerships with traditional communities, nonprofits, volunteers, professional organizations, and schools. (Forestwide)

MA-CRT-5: Develop research questions in concert with those put forth in *Colorado Prehistory: A Context for the Rio Grande Basin* (Martorano et al. 1999) and *Colorado History: A Context for Historical Archaeology* (Church et al. 2007), or more current content. (Forestwide)

MA-CRT-6: Develop management and preservation plans for administrative facilities and infrastructure that are significant cultural resources with special significance, or are sites that receive heavy visitor use. (Forestwide)

MA-CRT-7: Areas acknowledged as traditional cultural properties, cultural landscapes, and other culturally significant areas identified by local communities provide tangible links to historically rooted beliefs, customs, and practices. These resources are protected through consultation, traditional cultural practitioners, consulting parties, and project design. (Forestwide)

MA-CRT-8: Volunteers participate in cultural resource conservation activities such as research, site stabilization, conservation, and interpretation. Cultural resource programs, interpretive presentations, or publications provide the public with opportunities to learn about, understand, and experience the history of the Forest. (Forestwide)

MA-CRT-9: Local communities are engaged in cultivating economic development opportunities for heritage tourism. (Forestwide)

MA-CRT-10: The Heritage Program is integrated into all resource management decisions and aligns with the affirmative management (including protection) of significant cultural resources. (Forestwide)

MA-CRT-11: Develop a database of fire-sensitive sites, structures, and other resources to facilitate resource protection during fire management. (Forestwide)

MA-CRT-12: Provide opportunities for line officers and Forest Service employees to receive training to gain a broader understanding of the unique legal relationship between the Federal Government and Indian tribes, and to learn about American Indian law, customs, traditions, and values. (Forestwide)

MA-CRT-13: Through consultation, identify other plants that may be important to tribes. (Forestwide)

MA-CRT-14: Map oshá populations. (Forestwide)

MA-CRT-15: Work with tribes to understand community needs and build respectful, collaborative relationships to achieve mutually desired conditions. (Forestwide)

MA-CRT-16: Maintain the current heritage database. (Forestwide)

MA-CRT-17: Properly preserve historic documents, such as photographs and maps, and make them available for research and interpretation. (Forestwide).

MA-CRT-18: Cultivate economic development opportunities for heritage tourism in coordination with local communities. (Forestwide)

MA-CRT-19: For activities that are authorized by special use permits and use sites that are eligible for inclusion in the National Register of Historic Places, the Operation and Maintenance Plan for the permitted activities will stipulate that the maintenance and upkeep must maintain the historic characteristics of the site. (Forestwide)

MA-CRT-20: Prescribed burn projects will follow the *Culturally Modified Tree Guidelines* developed by fuels specialists and the Forest archaeologist. (Forestwide)

MA-CRT-21: For recreation residences that are eligible for listing on the National Register of Historic Places, the operation and maintenance plan for the special use authorization should stipulate that the maintenance and upkeep must maintain the historic characteristics of the residence. (Forestwide).

Fire Management (FIRE)

The fire management section provides guidance on the management of wildland fires, both unplanned and prescribed, as well as fuels treatment activities to meet various desired conditions and objectives. This guidance carries forward into the Forest spatial fire management plan that resides within the Wildland Fire Decision Support System, which provides the strategic objectives and management requirements for managing unplanned wildland fires.

Desired Conditions

DC-FIRE-1: Major vegetation types reflect little or no departure from historic natural range of variation of fire frequency and intensity (e.g., reflects Fire Regime Condition Class 1). (Forestwide)

DC-FIRE-2: Fuels on lands adjacent to developed areas and communities are maintained at levels where wildfires would not result in damage to property, thereby providing a safer environment for firefighters and the public. (Forestwide)

DC-FIRE-3: Wildland fire and fuels reduction treatments create vegetation conditions that reduce the threat to real property and infrastructure from wildfire. (General Forest Geographic Area, Specially Designated Geographic Area)

DC-FIRE-4: Lands adjacent to private property and infrastructure have defensible space and dispersed patterns of fuel conditions that favorably modify wildfire behavior and reduce the rate of wildfire spread in and around communities at risk. (Forestwide)

DC-FIRE-5: Unplanned natural ignitions play their natural role in ecosystem dynamics when and where they do not threaten human life and property. (Forestwide)

Objectives

OBJ-FIRE-1: Over the life of the plan, complete an average of 100 acres of hazardous fuels reduction per year in areas adjacent to private development and/or critical infrastructure. (Forestwide)

OBJ-FIRE-2: Over the life of the plan, complete an average of 2,000 acres of fuels reduction and resource enhancement per year using fire managed for resource benefit and/or prescribed fire on Forest lands. (Forestwide)

Standards

S-FIRE-1: All unplanned human-caused ignitions will be suppressed in the safest and most effective manner possible. (General Forest Geographic Area, Specially Designated Geographic Area)

S-FIRE-2: Fire control lines will be rehabilitated to prevent their use as trails and/or roads. (Forestwide)

Guidelines

G-FIRE-1: The construction of fire control lines with heavy equipment should be authorized only when necessary for the protection of life, property, and sensitive resources. (General Forest Geographic Area, Roadless Geographic Area, Specially Designated Geographic Area)

Management Approaches

MA-FIRE-1: Where unplanned natural ignitions are allowed to play their natural role in the ecosystem, those wildfires are managed to accomplish resource objectives without unnecessarily risking or jeopardizing the ability of the site to sustain ecosystems. (Forestwide)

MA-FIRE-2: Wildland fire management is balanced between fire suppression and use of wildland fire (including both prescribed fire and natural ignitions) to regulate fuels and maintain forest ecosystems in desired conditions, and help achieve ecosystem sustainability, including its interrelated ecological, economic, and social components. (Forestwide)

MA-FIRE-3: Use appropriate and authorized tools, including but not limited to grazing, mechanical treatment, prescribed fire, or naturally occurring unplanned wildfires to meet ecosystem needs, and reduce vegetation build-up to lower the risk to communities and other values from damage or loss from wildfires. (Forestwide)

MA-FIRE-4: Use prescribed fire to dispose of slash, return inorganic and organic chemicals in the foliage and small woody debris to the soils, reduce hazardous fuel loadings, and create seedbeds for natural regeneration where feasible and appropriate. (Forestwide)

MA-FIRE-5: Manage unplanned natural ignitions for multiple objectives (including resource benefit) in fire-adapted ecosystems when conditions are favorable to achieve desired resource benefits and protect values at risk. (Forestwide)

MA-FIRE-6: Take suppression actions to mitigate the threats from unplanned natural ignitions to public safety, communities, and unique resource values while allowing the wildfire to play its natural role in fire-dependent ecosystems. (Forestwide)

MA-FIRE-7: Implement fire management activities to minimize impacts to important and/or unique values within the management area(s) where they occur. (Forestwide)

MA-FIRE-8: Fuels management activities may be implemented to protect unique features, reduce fire behavior to an acceptable level, or replicate natural disturbance regimes within the constraints of the management area where the management activity is proposed. (Forestwide)

MA-FIRE-9: Include evaluations for immediate suppression, management for resource benefit, or a combination of both actions for wildland fire response on fires occurring on the Forest, in communication with resource advisors. (Forestwide)

MA-FIRE-10: Burned areas will be assessed to determine suitable and effective emergency stabilization and rehabilitation needs to meet current and anticipated environmental conditions. (Forestwide)

MA-FIRE-11: Rehabilitation and restoration activities will be evaluated to assess effectiveness of treatments. (Forestwide)

Forest Products (FP)

Special forest products include products or natural resources that are not the traditional timber and fiber products, such as sawtimber or houselogs. Special forest products are permitted (or contracted) for removal from public lands for commercial, personal, Native American tribal, educational, or scientific purposes. Plan components in this section cover a variety of special forest products, including but not limited to firewood, building rock, herb and vegetable

products, medicinal and pharmaceutical products, wild edible mushrooms, wild berries and fruit, landscaping products, craft products, and floral and greenery products.

Objectives

OBJ-FP-1: Over the planning period, identify and map a minimum of five select populations of oshá and other ethnobotanically important plants for tribes in concert with the heritage, botany, and timber programs. (Forestwide)

Standards

S-FP-1: When there is a shortage of any special forest products for tribal use, commercial permits are issued only to the extent that the tribal use can be accommodated. (Forestwide)

Guidelines

G-FP-1: Special forest products, including but not limited to firewood, building rock, herb and vegetable products, medicinal and pharmaceutical products, wild edible mushrooms, wild berries and fruit, landscaping products, craft products, and floral and greenery products, are available. Plants include trees, shrubs, water plants, forbs, grasses, mosses, lichens, and fungi. Plant parts include leaves, boughs, bark, bulbs, corms, seeds, nuts, and fruits. (Forestwide)

Management Approaches

MA-FP-1: When identifying and mapping for select populations of oshá, it is expected that private and rotating collection areas would be set aside for tribal use behind closed gates for privacy during ceremony. Areas would change through time. (Forestwide)

MA-FP-2: The gathering of forest products meets sustainable limits of the resource. These uses may require a permit. (Forestwide)

MA-FP-3: The needs of people from the San Luis Valley and surrounding areas are recognized, and the Forest Service strives to meet their needs for forest and wood products while protecting those resources for future generations. (Forestwide)

MA-FP-4: Provide tribes with trees, parts of trees, or forest products for traditional and cultural purposes free of charge without requiring a permit. Uses must be noncommercial. (Forestwide)

Infrastructure (INFR)

The developed infrastructure within the Forest includes roads, trails, utility corridors, dams, and buildings for administrative, recreational, or special use purposes.

Desired Conditions

DC-INFR-1: Safe, accessible, functionally efficient, aesthetically pleasing, energy-efficient, and cost-effective buildings and related facilities (owned, operated, occupied, or authorized by the Forest Service) needed to achieve resource management objectives are maintained or constructed. (General Forest Geographic Area, Specially Designated Geographic Area)

DC-INFR-2: Discharges from all wastewater disposal facilities owned and operated by the Forest Service, or that are under special-use permit from the Forest Service, comply with

applicable Federal or State water quality and effluent discharge standards. (General Forest Geographic Area, Specially Designated Geographic Area)

DC-INFR-3: The road system provides access for the public to use and enjoy the Forest. Road construction is limited, and the amount of reconstruction is commensurate to the needs of resource management. Road closure may occur in areas to enhance wildlife and fisheries habitat, soil, and watershed resources, among other values. (General Forest Geographic Area, Specially Designated Geographic Area)

DC-INFR-4: Trail systems will offer a wide range of recreation opportunities, both motorized and nonmotorized. Consider a wide range of barrier-free opportunities for all new construction and rehabilitation proposals. (Forestwide)

Objectives

OBJ-INFR-1: Over the planning period, improve five facilities or built features to be visually consistent with principles of the Built Environment Image Guide. (General Forest Geographic Area, Specially Designated Geographic Area)

Guidelines

G-INFR-1: Wherever feasible and practicable, construct or restore structures to blend with the natural surroundings. (Forestwide)

Management Approaches

MA-INFR-1: Do not retain facilities acquired by land donation, exchange, or purchase unless they serve a definite future purpose and funding is available for their maintenance, or they are determined to be historically significant. (Forestwide)

MA-INFR-2: Manage all facilities according to the current Facilities Master Plan. (Forestwide)

MA-INFR-3: Closed or restricted roads may be used for administrative purposes if the use is approved by the responsible official. (Forestwide)

MA-INFR-4: Designated travelways, as displayed on the Forest motor vehicle use map, and newly constructed travelways are open to motorized vehicle use unless a documented decision shows that:

- Motorized use conflicts with forest plan objectives,
- Motorized use is incompatible with the recreation opportunity spectrum class,
- Travelways are in areas closed to motorized use and are not designated routes,
- Motorized use creates user conflicts that result in unsafe conditions unrelated to weather conditions,
- Physical characteristics of travelways are hazardous for motorized use,
- Travelways do not serve an existing or identified future public need, or
- Financing is not available for maintenance necessary to protect resources. (Forestwide)

MA-INFR-5: On all lands except designated travelways, motorized use is restricted unless the motor vehicle use map or a forest order indicates that such use is specifically allowed. Over-the-

snow motorized vehicle use on snow is allowed unless specifically restricted. (General Forest Geographic Area, Specially Designated Geographic Area)

MA-INFR-6: To protect resource values and provide for public education, allowable modes of travel should be clearly signed at trailheads and/or identified on the motor vehicle use map. (General Forest Geographic Area, Specially Designated Geographic Area)

MA-INFR-7: When necessary, new trails are developed to expand the range of recreation opportunities, ensure user safety, and disperse existing use into different areas to be consistent with other resource objectives. (Forestwide)

MA-INFR-8: Manage road use by seasonal closure if:

- Use is causing unacceptable damage to soil and water resources due to weather or seasonal conditions
- Use is causing unacceptable wildlife conflicts or habitat degradation
- Use is resulting in unsafe conditions due to weather conditions
- The road(s) serve a seasonal public or administration need
- The area accessed has seasonal need for protection or non-use. (General Forest Geographic Area, Specially Designated Geographic Area)

MA-INFR-9: Consider the impact of potential alterations in timing, magnitude, and duration of peak flows on infrastructure design and construction. (Forestwide)

MA-INFR-10: All dams on National Forest System land are inspected to ensure public safety and comply with all appropriate laws and regulations. High- and moderate-hazard dams have current Emergency Preparedness Plans. (Forestwide)

MA-INFR-11: Facilities with potable water use are inspected to ensure public safety and comply with all appropriate laws and regulations. (Forestwide)

MA-INFR-12: The transportation system is designed to minimize resource damage. (General Forest Geographic Area, Specially Designated Geographic Area)

MA-INFR-13: Consider the travel analysis process during project-level analysis to move toward a sustainable road system. (General Forest Geographic Area, Specially Designated Geographic Area)

Lands (LAND)

The three primary functions of the Forest lands program are land survey and boundary management, land adjustments, and special uses, for both recreation and non-recreation. Boundary management ensures that the Forest secures and protects the rights, title, values, and interests of the American public on National Forest System lands. This includes the management of boundary lines within the Forest that border state, private, and other Federal agency lands, as well as secured rights-of-way for access to the Forest. Land adjustments consolidate and improve management efficiency through real estate transactions including sales, purchases, exchanges, conveyances, and rights-of-way within and outside the proclaimed Forest boundary. Special uses are managed in a manner that protects natural resources, public health, and safety, and are consistent with National Forest System management plans. Special uses are administered on the basis of sound resource management objectives and business principles.

Desired Conditions

DC-LAND-1: Utility corridors and transmission lines are designed to blend with the existing character of the landscape. (Forestwide)

DC-LAND-2: Occupancy of electronic sites is consolidated wherever possible and compatible.

- Blend with the existing character of the landscape
- Consolidate occupancy with electronic sites wherever possible and compatible. (Forestwide)

Objectives

OBJ-LAND-1: Over the planning period, acquire a minimum of 100 acres through land acquisitions from willing sellers within the Forest. (Forestwide)

OBJ-LAND-2: Over the planning period, resolve six trespass or encroachment cases. (Forestwide)

Standards

S-LAND-1: Bury electrical utility lines of 33 kilovolts or less, and telephone lines, unless one or more of the following applies:

- Scenic integrity objectives of the area can be met using an overhead line
- Burial is not feasible due to geologic hazards or unfavorable geologic conditions
- Burial would result in greater long-term site disturbance
- Burial is not technically feasible. (Forestwide)

S-LAND-2: Do not authorize conflicting uses of activities in transportation and utility corridors. (Forestwide)

Management Approaches

MA-LAND-1: Conserve existing and designated inventoried rights-of-way that are identified in the 1996 forest plan to protect them for future construction and occupancy. (Forestwide)

MA-LAND-2: Design utility corridors and transmission lines to be fully developed prior to authorizing new sites, unless new sites are determined to be necessary to fill coverage gaps (i.e., cell towers) or to meet public needs (Forestwide).

MA-LAND-3: To the extent possible, management activities in linear corridors should be compatible with the desired condition for the individual management areas through which corridors pass. (Forestwide)

MA-LAND-4: The land ownership pattern supports land and resource goals and objectives, reduces future management costs, responds to urban and community needs, protects critical resource areas, increases recreation opportunities, and improves legal public access. (Forestwide)

MA-LAND-5: The survey program and land status records facilitate the resolution of land ownership cases related to title claims, trespass, and unauthorized uses and to protect public access and achieve effective management. (Forestwide)

MA-LAND-6: The authorization and administration of special uses by individuals, companies, groups, and government entities protects natural resource values and public health and safety. (Forestwide)

MA-LAND-7: Adhere to specific management area stipulations related to suitability. (Forestwide)

Minerals (MIN)

National Forest System lands are important storehouses of domestic minerals and energy resources. The search for and production of minerals and energy resources are authorized uses of National Forest System lands, except those lands formally withdrawn from mineral activities by acts of Congress or by executive authority. Mineral activities on National Forest System lands are facilitated in compliance with the national Mining and Mineral Policy Act and are consistent with the Agency mission.

Minerals activities are administered through a plan of operations, which includes permits as well as the reclamation and mitigation measures necessary to protect resources.

Guidelines

G-MIN-1: Recreational dredging does not cause substantial surface disturbance. Activities in or near streams are conducted to maintain water quality and avoid impacts to fish habitat. (Forestwide)

G-MIN-2: To protect water quality and fish habitat in recreational dredging:

1. Limit the use of the practice to outside of critical life-stage periods in streams that have Rio Grande cutthroat trout core conservation populations.
2. The Forest geologist (or designated authority) will review the notice of intent prior to the commencement of activities.
3. Where possible, retain existing instream and riparian vegetation and other features, including but not limited to trees, bushes, shrubs, weeds, or tall grasses along streambanks, natural, large wood debris, and large boulders.
4. Operations should not change the stream channel to direct water flow into a streambank or cause bank erosion or destruction of the natural form or the stream channel.
5. Whenever practical, prevent the release of silt, sediment, sediment-laden water, or any other deleterious substances into the watercourse.
6. Keep equipment and machinery in good operating condition, power washed, and free of leaks, excess oil, and grease.
7. Locate the point of discharge to the creek immediately downstream of the worksite to minimize disturbance to downstream populations and habitats. (Forestwide)

G-MIN-3: Follow instream activity maps (Appendix H). Carry out activities during conditions of low flow, when trout redds (spawning sites with potential eggs and larval fish present in the gravel) are not present, and when there is the least risk to fish and wildlife populations and habitat. (Forestwide)

G-MIN-4: All motorized vehicles (cars, trucks, jeeps, off-road vehicles) are restricted to motorized trails or legally open roads. This reduces impacts to vegetation and minimizes erosion, stream turbidity, and sedimentation. (Forestwide)

G-MIN-5: Contain all fuel-operated tools (generators, etc.) in a spill tray during operation, maintenance, and refueling. Do not refuel or service equipment within 100 feet of a stream. (Forestwide)

G-MIN-6: Operate machinery and tools from the bank of the stream to minimize impacts and to better enable mitigation of sedimentation. (Forestwide)

G-MIN-7: Upon completion of the operations:

1. Restore all disturbed in-channel or active floodplain habitats upon completion of operations to a condition that is enhanced from their original state.
2. Remove all equipment, supplies, and nonbiodegradable materials from the site.
3. Remove all plants, animals, or mud and drain all water from equipment prior to leaving the site. (Forestwide)

Recreation Management (REC)

Direction below applies to the recreation management program. The natural environment of the Forest offers settings for a wide range of high-quality recreational opportunities, including motorized and nonmotorized opportunities. The Forest provides a variety of summer and winter recreation opportunities that allow visitors to escape from urban environments and enjoy a range of experiences in a variety of rural to primitive settings. Outdoor recreation opportunities include hiking, biking, fishing, hunting, wildlife viewing, driving for pleasure, and the pursuit of spiritual values provided by the natural environment.

Desired Conditions

DC-REC-1: A variety of enduring recreation opportunities (i.e., trails, campgrounds, and day-use areas) are available across a variety of resilient settings that foster high-quality, year-round developed and dispersed experiences. (Forestwide)

DC-REC-2: Sustainable, persistent and changing needs of the Forest are addressed. (Forestwide)

DC-REC-3: Relationships with cooperators are long lasting and sustainable and are leveraged to accomplish Forest goals. (Forestwide)

DC-REC-4: Use conflicts among users are infrequent. (Forestwide)

DC-REC-5: Sites and facilities are designed to be long-lasting, require low maintenance, and incorporate “green” operations. The sites and facilities should also complement the natural setting. (Forestwide)

Objectives

OBJ-REC-1: Over the planning period, develop two to three trail connections between strategic community areas and National Forest System trails. (Forestwide)

Standards

S-REC-1: Recreation development and travel routes shall be consistent with the recreation opportunity spectrum class designations. (Forestwide)

S-REC-2: Provide for universal accessibility at recreation sites and trails unless doing so fundamentally alters the setting or character of the program. (Forestwide)

S-REC-3: Close, rehabilitate, or otherwise mitigate dispersed sites when:

- Campsite condition reaches Frissell-Cole Class 4 or 5
- Site occupancy does not meet the adopted scenic integrity objective
- User conflicts substantially disrupt user experience and/or safety and closure is the only alternative
- Unacceptable environmental damage is occurring. (Forestwide)

S-REC-4: Camping will be limited to 14 continuous days in any one location within a 30 day period. (Forestwide)

Guideline

G-REC-1: Manage winter recreation activities within lynx analysis units such that lynx habitat connectivity is maintained or improved where needed. (Forestwide)

G-REC-2: Manage recreation within the capacity for the recreation opportunity spectrum objective, as shown in Table 9. This table assists in developing appropriate thresholds for considering recreational permitted uses and wilderness use. (Forestwide)

Table 9. Recreation opportunity spectrum capacity levels

[Capacity range is defined as follows: **Very Low** and **Low** apply to rock, mountain grass, and clearcuts 1 to 20 years old. **Moderate** applies to mountain grass, mature and pole-sized ponderosa pine, mature aspen, shelterwood cuts 90 to 120 years old. Selection cut 1 to 20 years old and clearcuts 80 to 120 years old. **High** applies to mature and pole-sized spruce, pole-sized aspen, and clearcuts 20 to 80 years old; **ROS**, recreation opportunity spectrum; **PAOT**, persons at one time; **M acres**, 1,000 acres.]

ROS Class/Capacity Range	Very Low	Low	Moderate	High
Primitive				
Trail (PAOT/mile)	0.5	1	2	3
Area-wide (PAOT/M acres)	1	2	7	25
Semiprimitive Nonmotorized				
Trail (PAOT/mile)	2	3	9	11
Area-wide (PAOT/M acres)	4	8	50	80
Semiprimitive Motorized				
Trail (PAOT/mile)	2	3	9	11
Area-wide (PAOT/M acres)	4	8	10	40
Roaded Natural				
Trail (PAOT/mile)	2	3	9	11
Area-wide (PAOT/M acres)	40	80	1,200	2,500
Rural				
Trail (PAOT/mile)	2	3	9	11
Area-wide (PAOT/M acres)	500	800	5,000	7,500

Management Approaches

MA-REC-1: Strategically invest available resources (e.g., time, budget, expertise) to support long-term recreation program goals. Developed recreation assets are aligned with projected facility budgets, partnership capabilities, and other re-investment strategies. (Forestwide)

MA-REC-2: Engage cooperators in stewardship activities and framework design. (Forestwide)

MA-REC-3: Leverage recreation special use permits to accomplish recreation program goals and best serve the public. (Forestwide)

MA-REC-4: At fee campgrounds, furnish readily available offsite and onsite information about recreation opportunities. (Forestwide)

MA-REC-5: When campground occupancy is less than 20 percent for at least one season, the site should be examined to decide whether to close the campground, convert it to a concentrated dispersed site, or take other action. (Forestwide)

MA-REC-6: Trail development shall be coordinated with trail systems developed by municipalities, counties, states, other Federal agencies, and partners to allow for integration and connectivity. (Forestwide)

MA-REC-7: Loop trails should be considered for trail networks, especially those at low elevations, for year-round use, and should be associated with campgrounds or other attractions. (Forestwide)

MA-REC-8: Base the availability of outfitter-guide special use permits on a capacity study. Prohibit new permits when capacity has been met for a certain special use authority. (Forestwide)

MA-REC-9: Consider the use of concessionaire operations when attempting to charge a fee at a developed site. (Forestwide)

MA-REC-10: If use exceeds the area capacity for a given recreation opportunity spectrum class, the following management actions should be employed to address the impacts or effects on the recreation setting:

1. Inform the public and restore the site
2. Regulate use
3. Restrict the number of users
4. Close the area or site. (Forestwide)

Scenery (SCNY)

The Scenery management system provides a systematic approach for determining the relative value and importance of scenery on the Forest. Scenery management involves identifying scenic components as they relate to people, mapping these components, and assigning a value for aesthetics. Forest plan direction helps incorporate scenery as a part of ecosystems to determine trade-offs at the project level.

Desired Conditions

DC-SCNY-1: Areas of high scenic quality are provided, especially in areas seen from roads and trails, developed recreation sites, administrative sites, and towns and cities near the Forest. (Forestwide)

DC-SCNY-2: Views reflect naturally appearing forested stands consistent with the area's natural range of variability. Recent vegetation treatments visually blend with existing scenic character. (Forestwide)

DC-SCNY-3: The transition from Forest lands to adjacent lands with similar desired conditions is seamless and does not exhibit abrupt changes in visual or ecological integrity. (Forestwide)

Objectives

OBJ-SCNY-1: Over the planning period, meet or improve scenic integrity and stability through vegetation management within two watersheds (hydrologic unit code level 6). (Forestwide)

OBJ-SCNY-2: Over the planning period, improve five facilities or built features into compliance with the principles in the Built Environment Image Guide. (General Forest Geographic Area, Specially Designated Geographic Area)

Standards

S-SCNY-1: Facility and infrastructure projects that require exterior lighting for safety must employ “dark sky preservation” techniques to reduce excess light pollution and preserve valued views of night skies. (General Forest Geographic Area, Specially Designated Geographic Area)

S-SCNY-2: Management activities will achieve identified scenic integrity objectives, or improve existing scenic integrity in support of achieving the mapped scenic integrity objective. Short-term impacts inconsistent with the scenic integrity objectives may occur for a duration of 3 to 5 years. (Forestwide)

Guidelines

G-SCNY-1: Limit management activities that impact valued scenic attributes and mitigate effects on visual characteristics of the surrounding landscape, including line, form, color, texture, size, shape, edge effect, and patterns of natural vegetation openings. (Forestwide)

G-SCNY-2: Rehabilitate areas with low scenic integrity to support achievement of the mapped scenic integrity objectives and long-term management and stewardship of valued scenic character. (Forestwide)

G-SCNY-3: Design utility and transmission line corridors to visually blend with the existing character consistent with the mapped scenic integrity objective. (Forestwide)

Management Approaches

MA-SCNY-1: Reinforce the Forest Service identity by constructing, restoring, and maintaining structures and built features consistent with the principles of the Built Environment Image Guide to complement the scenic character of the natural surroundings. (Forestwide)

MA-SCNY-2: Design management practices to produce forest composition, structure, and patterns similar to those that would have occurred under natural disturbance regimes. (General Forest Geographic Area)

Chapter 3. Geographic Areas, Fire Management Zones, and Management Areas

This chapter summarizes the physical, biological, social, and economic environments of the planning area and the effects of implementing each alternative on that environment.

Context and Background Descriptions

Geographic Areas Management Approach Summaries

Forest management provides direction for a mix of environments across the landscape. Much like city zoning divides land in a municipality into zones in which certain land uses are permitted or prohibited, a forest plan divides a national forest into areas with similar management emphasis.

In response to comments received during the assessment phase of the plan revision process, the proposed action clarifies direction on the basis of land status and reduces overlapping direction. The proposed format maintains much of the previous direction but adds place-based desired conditions to better focus overall direction. The proposed action incorporates geographic areas that combine management areas with similar emphases into larger groupings based on land status and line officer discretion. Four geographic areas are proposed: General Forest, Primitive Wilderness, Roadless, and specially Designated.

General Forest Geographic Area Management Approach Summary

Forest and grassland communities are characteristic of the General Forest Geographic Area, which is managed with a multiple-use emphasis to achieve a variety of goals. Resource use and management across the landscape are balanced.

This area includes lands focused on timber production. The Forest timber sale program now and into the future is one of change and adaptation. For the upcoming decade, salvage harvest in the spruce-fir cover type will dominate the timber harvest program. It is anticipated that during the second decade of the plan, as the dead spruce loses more value, less salvage harvesting will take place and more green timber will be harvested in other forest types, such as mixed-conifer. Long term, the timber harvest program on the Forest is expected to be smaller, as it will take many years for the spruce-fir forests to once again reach commercial size.

The area has a well-developed transportation system that allows for easy access and movement of forest products and livestock while providing for visitor and employee safety. Roads are located in the proper locations to avoid excess impacts from sedimentation or erosion.

Where appropriate, quality forage and cover for bighorn sheep, deer, elk, lynx, and other native wildlife as well as livestock are available.

Visitors should expect to see managed but natural-appearing forested stands throughout these areas. Recent vegetation treatments are visible but blend with the landscape over time.

Visitors could anticipate frequent contact with other forest users along recreation trails and in developed and dispersed recreation sites.

Water quality and quantity are managed to be maintained or restored. Riparian values and habitat are maintained or restored using active management where appropriate.

Timber is harvested by using a full range of silvicultural treatments, methods, and prescriptions. Rotation periods are designated on the basis of species-specific needs. Vegetation is managed for wood production or to benefit other resources.

All vegetation management is sustainable and focused on restoring or maintaining resiliency in the face of changing environmental conditions. Resource management allows for flexibility and the ability to adapt in accordance with resource response. Management follows a plan-act-monitor-evaluate process.

Roadless Geographic Area Management Approach Summary

The Roadless Geographic Area emphasizes protection of roadless area values and characteristics. The Colorado Roadless Rule was enacted on July 3, 2012. The Roadless Rule provided management direction to conserve 4.2 million acres of National Forest System land in Colorado for roadless area values, including 518,600 acres in 53 areas on the Forest.

The Colorado Roadless Rule created an additional layer of management for the Forest and established two designations: roadless and upper tier roadless, which are addressed below. To better incorporate that direction and simplify decision making in identified roadless areas, that management prescription is incorporated as a geographic area with two newly established management areas: 3.5 and 3.6.

These acres are not to be included as part of the identified suitable timber base.

The areas designated under the 2012 Colorado Roadless Rule on the Forest are listed in Table 10.

The intent stated in the Colorado Roadless Rule “is to protect roadless values by restricting tree cutting, sale, and removal; road construction and reconstruction; and linear construction zones within Colorado Roadless Areas, with narrowly focused exceptions.” (Federal Register, vol. 77, no. 128, Tuesday July 3, 2012, pp. 39602–39612). These restrictions are described in the desired condition statements for the newly established management areas, which are detailed below.

Roadless area characteristics defined in the Colorado Roadless Rule include:

- High quality or undisturbed soil, water, and air
- Sources of public drinking water
- Diversity of plant and animal communities
- Habitat for threatened, endangered, proposed, candidate, and species of conservation concern, and for those species dependent on large, undisturbed areas of land
- Primitive, semiprimitive, nonmotorized, and semiprimitive motorized classes of dispersed recreation
- Reference landscapes
- Natural-appearing landscapes with high scenic quality
- Traditional cultural properties and sacred sites
- Other locally identified unique characteristics.

Table 10. Roadless areas established by the 2012 Roadless Rule on the Forest

Roadless Area Name	Includes Upper Tier Acres	Roadless Area Name	Includes Upper Tier Acres
Alamosa River	Yes	Lake Fork	Yes
Antora Meadows–Bear Creek	Yes	Lower East Bellows	Yes
Beartown	Yes	Middle Alder	Yes
Beaver Mountain	Yes	Miller Creek	No
Bennett Mountain–Blowout–Willow Creek–Lion Point–Greenie Mountain	Yes	Pole Creek	No
Big Buck–Kitty–Ruby	Yes	Pole Mountain–Finger Mesa	Yes
Box-Road Canyon	Yes	Red Mountain	Yes
Bristol Head	Yes	Ruby Lake	Yes
Butterfly	No	Sawlog	Yes
Chama Basin	Yes	Sheep Mountain	Yes
Conejos River–Lake Fork	No	Silver Lakes–Stunner	Yes
Copper Mountain–Sulphur	Yes	Snowshoe Mountain	Yes
Cotton Creek	No	Spectacle Lake	No
Crestone	No	Spruce Hole–Sheep Creek	Yes
Cumbres	Yes	Stunner Pass–Dolores Canyon	Yes
Deep Creek–Boot Mountain	Yes	Sulphur Tunnel	No
Dorsey Creek	Yes	Summit Peak–Elwood Pass	Yes
Elkhorn Peak	Yes	Taylor Canyon	Yes
Fourmile Creek	Yes	Tewksberry	Yes
Fox Creek	Yes	Tobacco Lakes	Yes
Fox Mountain	Yes	Trout Mountain–Elk Mountain	Yes
Gibbs Creek	No	Ute Pass	Yes
Gold Creek–Cascade Creek	Yes	Wason Park	Yes
Hot Springs	No	Wightman Fork–Upper Burro	Yes
Indiana Ridge	Yes	Wightman Fork–Lookout	Yes
Kitty Creek	No	Willow Mountain	Yes
La Garita	Yes		

The Forest is proposing to establish two new management areas: Proposed Management Area 3.5 would include designated roadless areas, and Proposed Management Area 3.6 would include upper tier roadless areas. These proposed management areas are described below.

More detailed direction for this geographic area is contained in the 2012 Colorado Roadless Rule (36 CFR Part 294).

Specially Designated Geographic Area Management Approach Summary

Specially Designated Geographic Area designations include agency designations such as research natural areas; Wheeler Geologic Area; wild, scenic, or recreational river segments; scenic byways; and areas designated for rare or unique botanical, cultural, geologic, historical, or

scenic values. The rare or unique botanical, cultural, geologic, historical, or scenic values of designated areas are sustained and managed.

Where appropriate, features are interpreted for the public. The proposed action includes consideration of several new designated areas as identified in the need to change document. The following areas will be considered for designation in the analysis: the Continental Divide Trail, Old Spanish National Historic Trail, Cumbres and Toltec National Historic Landmark, and Mt. Blanca Massif. New information regarding the boundary of the John C. Fremont Winter Camp Special Interest Area will also be considered.

Some portions of the Specially Designated Geographic Area are included in the suitable timber base, including Management Area 4.21.

Ecological values are in balance with human occupancy, and consideration is given to both. Resource management activities may occur where authorized, but natural ecological processes and resulting patterns typically predominate. These areas are generally characterized by natural-appearing landscapes. An array of management tools may be used to restore or maintain relatively natural ecological processes and patterns; thus, some evidence of human activities will be noticeable. Uses, including mechanized use, will vary from area to area and may vary by season. The following management areas are included in this geographic area: 2.2, 3.1, 3.4, 4.21, and 8.22.

Primitive Wilderness Geographic Area Management Approach Summary

The Primitive Wilderness Geographic Area is managed to protect and perpetuate natural ecological processes and conditions. Natural ecological conditions are not measurably affected by human use. These areas are managed to protect the wilderness character described in the Wilderness Act of 1964 for which they were established. Currently about 430,000 acres, or 23 percent, of the Forest has been designated as Primitive Wilderness Geographic Area.

The Primitive Wilderness Geographic Area is not included in the suitable timber base.

Parts of four designated wilderness areas are located within the Forest boundaries. All four are administered by more than one Forest Service unit, and each one has a designated lead Forest that directs management. Each of the four designated wilderness areas has a specific wilderness plan that directs and guides management within the area.

Fire Management Zones Management Approach Summaries

Fire management zones are introduced in this section to facilitate the discussion of geographic areas that follows.

The Forest is proposing to implement strategic fire management zones that are most applicable at the geographic area level, though some specific direction may be needed at the management area level. Assigning strategic fire management zones supports decision-making before ignition occurs by pre-assessing areas for wildland fire (prescribed fire and wildfire) risks and benefits. Two strategic fire management zones are proposed:

- Wildfire management zone: resource restoration. (WFMZ-R)
- Wildfire management zone: resource protection and benefit. (WFMZ-PB)

All wildland fires can be managed for multiple objectives.

Wildland Fire Management Zone: Resource Restoration (WFMZ-R)

This zone applies to the Wilderness and Roadless Geographic Areas. These areas present a lower risk to resource values from wildfire, and conditions allow natural resources to benefit from wildland fire. Management of wildfire to meet resource objectives in this zone is the least constrained. Ecological restoration is accomplished by managing wildland fire under a wide range of weather, fuel moistures, and other environmental conditions that allow fire to play its natural role in an ecosystem. The use of prescribed fire to meet specific resource objectives is appropriate in this zone. All naturally occurring unplanned wildfires in these areas will be managed primarily to restore and maintain the natural role of fire in the ecosystem with a minimal emphasis on suppression. However if a natural, unplanned wildfire ignites in an area of this zone where the fire threatens communities and other non-natural resource values, suppression action will be taken to mitigate this threat, while allowing the wildfire to play its natural role in the ecosystem. All wildland fires can be managed for multiple objectives. All human-caused unplanned wildfires will be managed under a full suppression strategy commensurate with the values at risk.

Wildland Fire Management Zone: Resource Protection and Benefit (WFMZ-PB)

This zone applies to the General Forest Geographic Area and Specially Designated Geographic Areas.

Current conditions may put some natural resource values at varying degrees of risk of damage from wildfire. This zone also contains areas where conditions place communities and other non-natural resource values at risk of damage from wildfire. Mechanical treatments and prescribed burning may be used to promote ecological restoration before using wildfire under a wider range of weather, fuel moistures, and other environmental conditions. Wildfires that burn in this zone may benefit natural resources under certain conditions. All lightning-caused wildfires in these areas will be assessed on an individual basis for the most appropriate response based on values at risk and potential benefits to natural resources from a wildfire.

All human-caused wildfires will be managed under a full suppression strategy commensurate with the values at risk.

Management Areas

Proposed changes include creation of two new management areas related to the Colorado Roadless Rule, reduction of some management areas, and combination of some current management areas to better facilitate clarity and understanding of the direction.

Individual Management Area Integrated Desired Conditions, Plan Components, and Management Approaches

Overlapping Management Areas

Overlapping levels of management occur within management areas 1.1 and 2.2. Generally, the most constraining management would be applied where overlap occurs.

For Management Area 1.1 – Designated Wilderness, any management proposed in areas where other management areas overlap would have to be done in compliance with wilderness direction. Overlapping management areas are described below.

Approximately 12,431 acres of Management Area 2.2 – Research Natural Areas occur within the boundaries of designated wilderness. Research natural areas are recommended by forest supervisors in coordination with Forest Service research station directors and are designated by the Chief of the Forest Service. These areas are used as a baseline for measuring ecological changes and as control areas for evaluation and monitoring. The estimated 12,431 acres of research natural areas that overlap with designated wilderness include three areas in the Sangre de Cristo Mountains: the Mill Creek, Deadman Creek, and North Zapata Research Natural Areas. A portion of the Mill Creek Research Natural Area overlaps with recommended wilderness as well.

An estimated 15,575 acres of designated wilderness is also managed as Management Area 3.4 – Designated Suitable and Eligible Wild, Scenic, and Recreational Rivers. These areas would be managed to enhance or maintain the outstandingly remarkable features responsible for river designation while complying with wilderness practices and restrictions. Approximately 2,393 acres of Management Area 3.4 overlap with Management Area 1.1a – Recommended Wilderness.

Additionally, an estimated 554 acres of overlapping management area occurs with research natural areas (Management Area 2.2) and designated suitable and eligible wild, scenic, and recreational rivers (Management Area 3.4). Management activities that might occur in these areas would need to be in compliance with all management areas.

Approximately 856 acres of recommended wilderness (Management Area 1.1a) overlap with Management Area 3.4 – Designated Suitable and Eligible Wild, Scenic, and Recreational Rivers and Management Area 3.1 – Special Interest Areas. Management proposed on these acres would have to be in compliance with wilderness requirements if that area is carried forward in the analysis of wild, scenic, and recreational river direction and any direction for that specific special interest area.

Lastly, approximately 2,948 acres of recommended wilderness (Management Area 1.1a) overlap with existing special interest areas (Management Area 3.1). Any activities or management proposed in this area would have to be done in compliance with wilderness practices and meet direction for that specific special interest area.

Overlapping management areas also occur in Management Area 2.2 for Research Natural Areas. As stated previously, the most restrictive management direction would apply when working in areas with overlapping direction. When this occurs, the most restrictive level of management would be the most constraining.

Research natural areas also overlap with the acres designated as Colorado roadless areas. The 4,825 acres overlap with roadless areas in the Finger Mesa Research Natural Area on the Divide Ranger District. If management were to occur on these acres, it would have to be compliant with both the direction for the research natural area and the roadless designation.

Special interest areas (Management Area 3.1) also occur in designated research natural areas. Any management proposed on the 8,510 acres where overlaps occur would have to meet direction for the research natural area as well as the intent of the special interest area.

Proposed Management Area 1.1 – Designated Wilderness

Integrated Desired Conditions

Wilderness can be designated only by Congress and is managed in accordance with the Wilderness Act of 1964. Natural succession occurs in all vegetation types and is influenced by natural processes and disturbances. Structure, composition, function, and spatial distribution of vegetative types are the result of natural succession. Where no natural disturbance has occurred, vegetation is mostly in late-successional stages. Age and structure classes may vary where natural disturbance agents, such as fire or insects, have influenced the succession process. Plant species are native and indigenous to the immediate area. Nonnative invasive species are limited and increases are controlled. Forage for wildlife, permitted livestock, and packstock is available in meadows and natural openings, although availability may be limited due to topography and short growing seasons. Human influences on vegetation is minimal. Timber harvest is prohibited and this area is not included in the suitable timber base.

Wildlife species are buffered from human influences. No additional nonnative plant or animal species are introduced. Human influence on physical features, such as soil and geologic materials, is minimal. Human influence on aquatic life and riparian areas and processes is minimal in most areas. The composition, structure, and function of aquatic ecosystems are minimally disturbed by human influence. Stocking is used as a tool to enhance threatened, endangered, and candidate species and to enhance recreational opportunities. Water impoundments, ditches, and diversions may be present in designated wilderness areas.

Designated wilderness areas favor solitude; users are expected to be familiar with and use primitive skills in an environment that offers a high degree of risk and challenge. Success or failure is directly dependent on the ability, knowledge, and initiative of the visitor. Contact with other users or Forest Service personnel decreases with increasing distance from the entry portals. Near the entry portals, users may have contact with larger groups. Commercial permitting for day-use activities is allowed in high-use areas. Evidence of established campsites and base camps may be present. An element of discovery is maintained. The presence of interpretive signs, markers, and posts decreases with increasing distance from the entry portals, though cairns may be present. Near the entry portals, trails are marked at intersections to indicate routes. Evidence of cultural and historic sites may be present, and these sites may be signed and interpreted near entry points. Structures or facilities may be present but only as necessary for resource protection when less obtrusive measures were not successful in the past. Outfitter-guide recreation special uses support identified public needs and provide service to the extent necessary for realizing the recreational or wilderness purpose.

Trails are the primary mode of travel from the entry portals. Trail systems favor user safety and comfort. Bridges may be present when needed for resource protection or user safety. The presence of constructed trails decreases with increasing distance from entry portals, and travel deep within wilderness is primarily cross-country with no established trails. User-created trails may exist but are not maintained or designated on maps or trail guides. Trails support wilderness experiences and preserve wilderness characteristics.

Livestock grazing is present except where previously delineated.

Evidence of past mining activity may be present but is rare. Designated wilderness areas are withdrawn from locatable mineral entry and are legally unavailable for oil and gas leasing.

Visibility is generally unimpaired. Smoke from wildfires may be visible. The scenic integrity ranges from very high to high, and the recreation opportunity spectrum class ranges from primitive to semiprimitive nonmotorized.

Each designated wilderness area has a prepared wilderness management plan that describes specific levels of management. Management plans are prepared in cooperation with other managing units or agencies.

Management Area Specific Standards

1.1-S-1: Protect and preserve wilderness values and character in congressionally designated wilderness, as well as areas recommended for wilderness designation.

1.1-S-2: Activities authorized by special use permit within wilderness:

- Will involve minimal physical, visual, and noise disturbance
- Will not result in permanent structures
- May exceed the group size limitation when the activity:
 - Will benefit the wilderness character
 - Is necessary for public health and human safety.

1.1-S-3: Group size may not exceed more than 15 people per group, with a maximum combination of people and stock not to exceed 25.

1.1-S-4: Unless justified by terrain, prohibit recreational livestock within 100 feet of lakes and streams.

Management Area Specific Guidelines

1.1-G-2: Pristine management areas of a wilderness should not be changed to a lesser standard of naturalness in order to disperse recreation use from other parts of the wilderness.

Management Area Specific Management Approaches

1.1-MA-1: Existing trails are primitive and maintained to minimize resource damage. The following actions will be taken where needed:

- Reduce evidence of trails
- Eliminate duplicate routes
- Remove trails from maps where repeated travel over the same route is to be discouraged.

1.1-MA-2: Signs are restricted to trail intersections. Bridges and other reminders of management control are limited to those needed for resource protection.

1.1-MA-3: Manage eligible and listed historic structures to be compatible with the wilderness setting.

1.1-MA-4: Build bridges for user safety, not for user convenience, using native materials.

1.1-MA-5: Maintain campsites in Frissell-Cole Class 2 or 3.

1.1-MA-6: Fish stocking will emphasize a wild fishery, where species perpetuate themselves over time and are affected primarily by the forces of nature. Some high mountain lakes may be stocked to support indigenous threatened, endangered, and proposed species. Species of fish that are not indigenous to the area or that are exotic will not be stocked.

1.1-MA-7: Rockhounding activity must not exceed 50 pounds per person per day or interfere with existing rights, and specimens may only be collected for personal, noncommercial uses.

1.1-MA-8: Minimize controlled driving of permitted livestock in designated wilderness.

1.1-MA-9: Prohibit pets from harassing wildlife or people. Voice control or physical restraints are acceptable.

1.1-MA-10: Consider the following to minimize human impacts in wilderness:

- Limit the number of private outfitter-guide camps
- Encourage the use of self-contained stoves or prohibit campfires
- Implement a permit system
- Implement party-size and pack-animal limitations
- Prohibit dogs or implement an on-leash requirement.

1.1-MA-11: Where appropriate, post printed wilderness information at trailheads outside of the wilderness boundary.

1.1-MA-12: Use a Minimum Requirements Decision Guide, or current tool, when considering any action that involves motorized and/or mechanized use in wilderness.

1.1-MA-13: Restoration activities (e.g., prescribed fire, active weed management) may be used in recommended wilderness areas to protect and/or enhance the wilderness characteristics of these areas.

1.1-MA-14: Significant historic structures can be considered as having cultural values and, when present, may be eligible for protection and/or restoration.

1.1-MA-15: Signage and other infrastructure is minimal and constructed of rustic, native, or natural-appearing materials.

Recommended Wilderness

Areas of recommended wilderness maintain their existing wilderness characteristics to allow for future inclusion in the National Wilderness Preservation System. These areas are designated as Management Area 1.1a. The ecological and social characteristics that provide the basis for each area's suitability for wilderness would be protected and preserved. Direction is applied the same as it is applied for Management Area 1.1. See the previous *Overlapping Management Areas* section for a discussion of overlapping management direction.

Management Area 2.2 – Research Natural Areas

Integrated Desired Conditions

Research natural areas preserve representative areas that typify important forest, shrubland, grassland, alpine, aquatic, geologic, or other natural environments. These areas are designated to preserve representative areas that typify important forest, shrubland, grassland, alpine, aquatic, geologic, or other natural environments, or areas that have special or unique characteristics, or scientific importance. These areas also may have special or unique characteristics of scientific importance. The management emphasis of these areas focuses on protecting or enhancing unique or exemplary ecosystems designated for non-manipulative research, monitoring, and education.

Research natural areas contribute to the preservation and maintenance of key elements of biological diversity at the genetic, species, population, community, and landscape levels. These areas are intended as baseline areas for measuring ecological changes, and as control areas for evaluation and monitoring.

Livestock grazing is present when it is not in direct conflict with the resource values that prompted establishment of the area.

Management Area Specific Standards

2.2-S-1: Prohibit motorized and mechanized use, except when necessary for research or educational access.

Management Area Specific Guidelines

2.2-G-1: Activities should meet the assigned recreation opportunity spectrum class and scenic integrity objectives.

Management Area Specific Management Approaches

2.2-MA-1: Allow low-impact uses such as camping, fishing, horseback riding, and hunting to continue. Restrict increases in recreation use that would threaten or interfere with the objectives or purposes for which the research natural area was established.**2.2-MA-2:** Allow trails created prior to establishing the area to be used for recreation and scientific research or educational access, except when values for establishment are threatened. No new trail construction should occur unless needed to correct resource damage from existing trails.

2.2-MA-3: Allow outbreaks of native insects and diseases to proceed without intervention, unless they are a substantial threat to important resources outside of the research natural areas. Use control methods for insect and disease outbreaks that minimize disturbance.

2.2-MA-4: Allow habitat manipulation for the protection of threatened, endangered, and proposed species, or where it is necessary to perpetuate or restore natural conditions.

2.2-MA-5: Permit special uses that do not conflict with the values for which the research natural area was established. Require approval of proposals for non-manipulative research by the station director and the district ranger.

2.2-MA-6: Comprehensive management plans should be developed as needed.

2.2-MA-7: Where feasible, undesirable nonnative plant and animal species should be managed.

Management Area 3.1 – Special Interest Areas—Use and Interpretation Emphasis

Integrated Desired Conditions

Special interest areas favor the protection or enhancement of unique characteristics that occur across the Forest. Special interest areas typically contain unique botanical, geologic, historical, scenic, or cultural areas and values. Management plans for these areas should be prepared.

Livestock grazing is present.

Also see Management Area 2.2 direction regarding overlapping areas of management.

Management Area Specific Guidelines

3.1-G-1: Activities should meet the assigned recreation opportunity spectrum class and scenic integrity objectives.

Management Area Specific Management Approaches

3.1-MA-1: Develop facilities as needed to meet management objectives.

3.1-MA-2: Vegetation treatment may be used to maintain or enhance special or unique values of the area.

3.1-MA-3: Allow grazing if it does not conflict with the values for which the area was created.

3.1-MA-4: Authorize special use permits for scientific or educational activities that are compatible with the values for which the area was created.

Management Area 3.4 – Designated Suitable and Eligible Wild, Scenic, and Recreational Rivers

Integrated Desired Conditions

The National Wild and Scenic Rivers System was created by Congress in 1968 (Public Law 90-542) to preserve selected rivers that have outstanding natural, cultural, and recreational values in a free-flowing condition for the enjoyment of present and future generations. The Wild and Scenic Rivers Act is notable in that it seeks to protect these rivers while at the same time acknowledging the benefits and necessity of appropriate developments within the river corridor. A detailed description of the application of the Wild and Scenic Rivers Act to the Forest is contained in Appendix B.

The Forest does not currently manage any river segments that have been designated under the Wild and Scenic Rivers Act. With the exception of Deadman Creek, the eligible and suitable river segments listed in Table 11 have been carried forward from the 1996 forest plan. Segments of Medano and Little Medano Creeks have been removed from the inventory of eligible streams because they are now administered by the National Park Service (Great Sand Dunes National Park and Preserve Act of 2000).

Table 11. Suitable and eligible river segments for inclusion in the National Wild and Scenic Rivers System

[Note: Management of river segments on Medano and Little Medano Creeks have been transferred to the National Park Service per the Great Sand Dunes National Park and Preserve Act of 2000; NA, not applicable.]

Stream or River Name	Length (miles) ¹	Acres	Status	Outstandingly Remarkable Values	Classification
Archuleta Creek	5.69	1,889	Eligible	Scenic, Recreational	Scenic
Deadman Creek	3.26	1,087	Eligible	Scenic, Recreational, Historic, Biological	Scenic
East Fork Rio Chama	3.18	1,078	Eligible	Scenic, Recreational	Scenic
Hansen Creek	6.72	2,067	Eligible	Scenic, Recreational	Wild
Lower Rio de los Pinos	4.50	1,364	Eligible	Scenic, Recreational, Historic	Scenic
Lower Rio Grande	4.42	1,081	Eligible	Scenic, Recreational, Historic	Recreational
Rio Grande (Box Canyon)	8.73	2,720	Eligible	Scenic, Recreational, Historic	Scenic
Saguache Creek	8.40	2,478	Eligible	Scenic, Historic, Cultural	Wild
Toltec Creek	2.88	525	Eligible	Scenic, Recreational, Historic	Wild
West Bellows Creek	6.31	2,065	Eligible	Scenic, Recreational, Geologic	Scenic
West Fork Rio Chama	4.81	1,239	Eligible	Scenic, Recreational	Scenic
South Fork Rio Grande					
South Fork Rio Grande (above Big Meadows Reservoir)	5.19	1,633	Eligible	Scenic, Recreational, Historic	Scenic
South Fork Rio Grande (below Big Meadows Reservoir)	11.98	3,016	Eligible	Scenic, Recreational, Historic	Recreational
South Fork Rio Grande Total	17.17	4,649	NA	NA	NA
Conejos River					
El Rito Azul	3.80	1,168	Suitable	Scenic, Recreational, Wildlife	Wild
North Fork Conejos River	3.93	1,208	Suitable	Scenic, Recreational, Wildlife	Wild
Middle Fork Conejos River	4.59	1,411	Suitable	Scenic, Recreational, Wildlife	Wild
Conejos River (Three Forks to Platoro Reservoir)	3.33	1,023	Suitable	Scenic, Recreational, Wildlife	Wild
South Fork of the Conejos River	12.76	3,985	Suitable	Scenic, Recreational, Wildlife	Wild
Conejos River below Platoro Reservoir	12.54	3,539	Suitable	Scenic, Recreational, Wildlife	Recreational
Conejos River Total	40.95	12,334	NA	NA	NA
Wild Rivers Subtotal	46.41	13,865	NA	NA	NA
Scenic Rivers Subtotal	41.67	13,075	NA	NA	NA
Recreational River Subtotal	28.94	7,636	NA	NA	NA
Rio Grande National Forest Total	117.02	34,576	NA	NA	NA

¹ Length, in miles, of the reaches has been updated from the 1996 forest plan to reflect the best available information, changes do not reflect alterations to the eligible or suitable river segments.

Management areas associated with suitable and eligible wild, scenic, and recreational river segments are sized to extend a minimum of one-quarter mile on either side of the mean high water mark, but may be larger to protect identified outstandingly remarkable values.

Activities meet the assigned recreation opportunity spectrum class and scenic integrity objectives.

Forest Service Handbook 1909.12, 2015-1, Chapter 80 prescribed the following desired conditions for all suitable or eligible river segments:

- The outstandingly remarkable values that were identified for each eligible or suitable river segment are preserved or enhanced until the river segment is designated or released from consideration.
- The current free-flowing nature of all eligible or suitable river segments is preserved or enhanced until the river segment is designated or released from consideration.
- The water quality of all eligible or suitable river segments is preserved or enhanced until the river segment is designated or released from consideration.
- On all eligible or suitable river segments, the conditions that lead to classification as wild, scenic, or recreational are preserved or enhanced such that no segments are changed from wild to scenic or recreational, or from scenic to recreational.

Also see the *Management Area 1.1 and 2.2* sections, above, for direction regarding overlapping areas of management.

Management Area Specific Standards

3.4-S-1: Management actions shall preserve the classification, outstandingly remarkable values, and water quality of eligible and suitable river segments.

3.4-S-2: Consistent with existing water rights decrees in Colorado Water Division 3, the free-flowing nature of eligible and suitable river segments shall be preserved.

3.4-S-3: For eligible and suitable river segments, the width of the management area may vary to protect outstanding values, but will extend at least one quarter mile on either side of the river segment.

Management Area Specific Guidelines

3.4-G-1: Management actions within the river corridors of eligible and suitable river segments shall be consistent with management direction contained in FSH 1909.12, Chapter 80, Section 84, or current direction.

3.4-G-2: For eligible or suitable wild river segments:

- The recreation opportunity spectrum class is primitive
- The scenic integrity objective is very high.

3.4-G-3: For eligible or suitable scenic river segments:

- The recreation opportunity spectrum class is semiprimitive motorized
- Activities will meet the adopted scenic integrity objective.

3.4-G-4: For eligible or suitable recreational river segments:

- The recreation opportunity spectrum class is semiprimitive motorized
- Activities will meet the adopted scenic integrity objective.

Management Area Specific Management Approaches

3.4-MA-1: A suitability analysis should be initiated when a proposed action threatens the free-flowing nature, outstandingly remarkable values, water quality, or scenic classification of an eligible or suitable river segment.

3.4-MA-2: The Forest intends to engage the local community on the status of eligible and/or suitable wild, scenic, and recreational river segments and include information on currently decreed federal reserved water rights in Colorado Water Division 3.

Proposed Management Area 3.5 – Colorado Roadless Areas

Integrated Desired Conditions

Colorado roadless areas are generally undeveloped parts of the Forest that provide a variety of settings at different elevations. They are managed to protect roadless characteristics and to maintain plant and animal habitats that are shaped primarily through natural processes. These areas provide backcountry recreational experiences to the public in areas with less evidence of human activities.

Landscapes in these areas are predominantly natural appearing and relatively undisturbed by humans. Natural processes within the context of the range of natural variability (insects, disease, and fire) are generally allowed to occur with minimal human intervention.

The probability of experiencing solitude in these areas is high. Frequent opportunities for challenge and risk require a degree of self-reliance. Facilities are minimal and exist primarily for site protection. Recreational improvements, such as signs, may be present. Trailheads offer information and directional signing. Cross-country motorized travel is limited to snow machines in the winter (where other restrictions do not apply).

Trails provide a wide range of challenging recreational opportunities including horseback riding, mountain bike riding, and motorized travel on designated routes. Hunting and fishing opportunities are available for those seeking a more remote experience. No new road construction occurs in designated roadless areas.

The number of miles of motorized and nonmotorized travel will not substantially change over the planning period. Activities meet the assigned recreation opportunity spectrum class and scenic integrity objectives.

Colorado Roadless Rule Integration

Trees may be cut, sold, and removed if the responsible official determines that the activity is consistent with the applicable land management plan. One or more of the roadless area characteristics will be maintained or improved over the long-term, with exceptions and only if one of the following conditions exists:

1. The regional forester determines that tree cutting, sale, or removal is needed to reduce the amount of hazardous fuels in an at-risk community.

2. The regional forester determines that tree cutting, sale, or removal is needed outside of the community protection zone and where wildland fire disturbance is a significant risk that could adversely affect a municipal water supply system or the maintenance of that system.
3. Tree cutting, sale, or removal is needed to maintain or restore the characteristics of ecosystem composition, structure, and processes.
4. Tree cutting, sale, or removal is needed to improve habitat for federally threatened, endangered, proposed, or agency-designated species. Such management decisions are made, and actions taken, in coordination with the Colorado Department of Natural Resources.
5. Tree cutting, sale, or removal is incidental to the implementation of a management activity not otherwise prohibited.
6. Tree cutting, sale, or removal is needed and appropriate for personal or administrative use as provided for in 36 CFR 223, subpart A.

A road or temporary road could only be constructed and reconstructed if the responsible official determines that:

1. A road is needed pursuant to reserved or outstanding rights, or is provided for by statute or treaty.
2. Road realignment is needed to prevent irreparable resource damage that arises from the design, location, use, or deterioration of a National Forest System road that cannot be mitigated by road maintenance.
3. Road reconstruction is needed for road safety improvement.
4. The regional forester has determined that a road is needed to allow for construction, reconstruction, or maintenance of an authorized water conveyance structure.
5. A temporary road is needed to protect health and safety in cases of imminent flood, fire, or other catastrophic event.
6. The regional forester has determined that a temporary road is needed to facilitate tree cutting or removal within the first one-half mile of a community protection zone for construction of a water conveyance structure to reduce wildfire hazard to a community.
7. A temporary road is needed pursuant to the exploration or development of an existing oil and gas lease that does not prohibit road construction or reconstruction.

A linear construction zone may not be constructed except when the regional forester determines that one is needed:

- Pursuant to reserve or outstanding rights or as provided in a statute or treaty.
- For construction, reconstruction, or maintenance of an authorized water conveyance structure.

Additionally, the regional forester must approve projects for:

- The construction, reconstruction, or maintenance of power lines or telecommunication lines.
- Construction, reconstruction, or maintenance of a pipeline for oil and gas leasing.

Other restriction and prohibitions are described in detail in the Colorado Roadless Rule direction (36 CFR Part 294).

Proposed Management Area 3.6 – Upper Tier Colorado Roadless Area

Upper tier roadless areas are described in the 2012 Colorado Roadless Rule and are identified in Table 10.

These areas are generally undeveloped parts of the Forest that provide a variety of settings at different elevations. They are managed to protect roadless characteristics and to maintain plant and animal habitats that are shaped primarily through natural processes. These areas provide backcountry recreational experiences to the public in areas with less evidence of human activities.

Limited vegetation manipulation may occur in this management area. Trees may be cut, sold, and removed only when incidental to implementation of an authorized management activity. Further clarification is contained in the 2012 Colorado Roadless Rule (36 CFR 223). Trees may also be cut, sold, and removed when needed for personal or administrative use as provided for in the rule.

Landscapes in these areas are predominantly natural appearing and relatively undisturbed by humans. Natural processes within the context of the range of natural variability (insects, disease, and fire) are generally allowed to occur with minimal human intervention.

The probability of experiencing solitude in these areas is high. Frequent opportunities for challenge and risk require a degree of self-reliance. Facilities are minimal and exist primarily for site protection. Recreational improvements, such as signs, may be present. Trailheads offer information and directional signing. Cross-country motorized travel is limited to snow machines in the winter (where other restrictions do not apply).

Trails provide a range of challenging recreational opportunities including horseback riding, mountain bike riding, and motorized travel on designated routes. Hunting and fishing opportunities are available. Road and trail construction and reconstruction follows direction outlined in the 2012 Colorado Roadless Rule (36 CFR 223). Generally, roads may only be approved for construction where there are outstanding rights or a previous statute or treaty that prescribes the need. Road construction may be authorized when there is an imminent threat to public health and safety, for example in a flood, fire, or other catastrophic event that requires intervention to reduce the loss of life or property.

The number of motorized and nonmotorized travelways will not substantially change over the planning period. Activities meet the assigned recreation opportunity spectrum classes and scenic integrity objectives.

Colorado Roadless Rule Integration

Trees may be cut, sold, and removed if the responsible official determines that the activity is consistent with the forest plan and:

- Is incidental to a management activity not otherwise prohibited.
- Is needed and appropriate for personal or administrative use as provided in 36 CFR 223, Subpart A.

A road may only be constructed or reconstructed if the responsible official determines that:

1. A road is needed pursuant to reserved or outstanding rights, or is provided for by statute or treaty.
2. A road is needed to protect public health and safety in cases of an imminent threat of flood, fire, or other catastrophic event, that without intervention would cause the loss of life or property.

Management Area 4.21 – Scenic Byways and Scenic Railroads

Integrated Desired Conditions

These areas are managed to protect or preserve the scenic and recreation values and uses in designated scenic byways and scenic railroad corridors while concurrently managing the multiple-use values of the landscape. This management prescription applies to the Silver Thread and Los Caminos Antiguos Scenic Byways, and the Cumbres and Toltec Scenic Railroad and National Historic Landmark.

This management area is included as part of the suitable timber base.

Multiple-use management such as commercial timber harvest, wildlife management, recreation activities, and mineral extraction is present but not dominant or visible in these landscapes, which feature high-quality scenery. Features may be interpreted for the public. Facilities may be developed to enhance opportunities for viewing scenery and wildlife. All activities and interactions are managed to maintain the scenic beauty for which the area is designated.

Opportunities for solitude are limited. Visitors can expect frequent contact with other visitors. Roads, recreation facilities, range improvements, and other developments are evident but are managed to be in harmony with the natural environment. Recreation facilities could include scenic overlooks, interpretive signs, and rest areas as appropriate. Developed campgrounds are situated off the main travelway. Trailheads are easily accessible, but also are situated off the main travelway.

Road systems are well signed and roads are generally passable by a passenger car but can be gravel or paved. This area has access for motorized recreation activities off of the main travelways. Nonmotorized activities such as biking and horseback riding are focused on the available trails and roads.

Livestock grazing is present. This area is included in the suitable timber base.

Activities meet the assigned recreation opportunity spectrum classes and scenic integrity objectives.

Management Area Specific Management Approaches

4.21-MA-1: Allow vegetation treatments that maintain or enhance viewing opportunities.

Management Area 4.3 – Dispersed and Developed Recreation

Integrated Desired Conditions

Dispersed and developed recreation areas are designated mostly along road corridors where opportunities for developed and undeveloped recreation can be managed as an integrated resource. These popular areas generally have access to water features or other natural attractions and offer a more social recreation experience with frequent visitor contacts.

Vegetation composition and structure are managed to meet the recreation objectives for this area, maintain vegetation cover for wildlife, and protect soil stability. Commercial harvest is authorized for reasons other than production of forest products.

Insects and disease are managed to maintain the recreation resource.

Summer homes, resorts, and organizational camps are present and managed to provide unique recreation opportunities. Developed recreation sites and facilities, such as campgrounds and picnic sites, are maintained and updated to meet customer needs. Management actions in dispersed sites maintain the natural characteristics that make the area popular.

Activities meet the assigned recreation opportunity spectrum classes and scenic integrity objectives.

Management Area Specific Management Approaches

4.3-MA-1: Allow vegetation treatments that maintain or enhance recreation opportunities or contribute to visitor safety.

4.3-MA-2: Limit conflicts by scheduling vegetation manipulation projects.

4.3-MA-3: Treat activity fuels resulting from vegetation manipulation projects commensurate with the risk of human-caused ignition.

4.3-MA-4: Harden or enforce additional restrictions on high-use sites to protect sensitive natural resources.

Management Area 5.11 – General Forest and Intermingled Rangelands

Integrated Desired Conditions

A variety of management activities are present, including livestock grazing, wildlife habitat, dispersed recreation, exploration and development of minerals and energy resources, and timber harvest. Characterized by forest and grassland communities, this area is managed with a multiple-use emphasis to achieve a variety of goals.

Management goals are met using a full range of silvicultural options. Rotation periods are longer and timber harvest entries are less frequent than in Management Area 5.13 – Forest Products. Timber management activities focus on what is retained in the stand instead of on wood production. All successional stages are represented. Natural landscape diversity is perpetuated including composition, structure, and function, and includes consideration within a spatial context—for example: what species, what kind of stand structure, and what kind of landscape patterns are natural, by ecosystem. Habitat of sufficient quality for wildlife dispersion exists between undeveloped areas of the Forest.

The area has a well-developed transportation system with numerous open roads that offer commercial access and roaded recreation opportunities, while roads with restricted access offer nonmotorized recreation opportunities.

Watersheds, scenic resources, and wildlife habitat are restored in locations where past management actions have reduced resource effectiveness.

Appropriate settings are offered that are suitable for a broad range of recreation opportunities. Recreation facilities are improved on the basis of user demand. Users can expect to have a more social experience.

Livestock grazing occurs in this area.

Activities meet the assigned recreation opportunity spectrum classes and scenic integrity objectives.

Management Area Specific Management Approaches

5.11-MA-1: Coordinate domestic livestock grazing with vegetation management activities to ensure adequate regeneration of vegetation and prevent impacts on range improvements and natural barriers.

5.11-MA-2: Authorize retrieval of game using off-road vehicles from 12:00 pm to 17:00 pm daily, but only under the condition that resource damage does not occur.

Management Area 5.13 – Forest Products

Integrated Desired Conditions

A full range of activities are present with an emphasis on the production of commercial wood products. These areas have a high potential for timber growth, and operations focus on wood production. Suitable forested areas are maintained with commercially valuable species at ages, densities, and sizes that allow growth rates and stand conditions that are conducive to providing a sustained yield of forest products.

Landscape diversity is similar to natural conditions (composition, structure, and function) and includes consideration within a spatial context—for example: what species, what kind of stand structure, and what kind of landscape patterns are natural, by ecosystem. All succession stages are represented, including old forest. Mature stands are identified for old-forest characteristics (See Appendix A).

Habitat of sufficient quality for wildlife dispersion exists between undeveloped areas of the Forest.

The area has a well-developed transportation system with numerous open roads that offer commercial access and roaded recreational opportunities, while restricted access roads offer nonmotorized recreation opportunities.

Forest visitors can expect to experience managed forest. Evidence of management includes stumps, logging slash, skid trails, and soil disturbance.

Opportunities exist for exploration and development of mineral and energy resources.

Livestock grazing is present.

Activities meet the assigned recreation opportunity spectrum classes and scenic integrity objectives.

Management Area Specific Management Approaches

5.13-MA-1: Coordinate domestic livestock grazing with vegetation management activities to ensure adequate regeneration and prevent impacts on range improvements and natural barriers.

5.13-MA-2: Reduce fire hazard by treating fuels consistent with other resource uses and need.

Management Area 5.41 – Big Game Winter Range

Integrated Desired Conditions

Forested cover is interspersed with foraging areas and managed so that quality forage is readily available, depending upon site-specific conditions. Cover types on winter range areas frequently consist of lower-elevation pinyon-juniper communities, ponderosa pine, and warm-dry ecosystem types that may include Douglas fir, white fir, and aspen. Various shrub species such as mountain mahogany, sagebrush, rabbitbrush, gooseberry, and bitterbrush are interspersed with low-elevation grasses including fescues, squirrel tail, oatgrass, and needle and thread grass. Water sources provide water for both wildlife and livestock where it is a limiting factor on the landscape.

This management area is included in the suitable timber base.

Recreation opportunities and human disturbance are balanced to allow big game species to effectively use these resources while conserving energy reserves. Disturbance from motorized and mechanized activities is limited during the primary winter use period, generally from December 1 through March 31, or as needed. Winter weather increases secure habitat by limiting access; however, seasonal road closures or area closures are also used to attain the desired conditions.

The transportation system provides access for recreation opportunities and management. Access may be limited to reduce disturbance during the winter. Vegetation treatments occur during the winter to mitigate impacts to habitat security values. Access during other season is based on travel management objectives.

Coordination with Colorado Department of Parks and Wildlife staff occurs to develop herd and/or population (data analysis unit) objectives for all species during planning efforts by the State. Where feasible, mutual population objectives are established to provide maximum recreation opportunities while minimizing habitat and resource conflicts. Partnerships are developed that strive to improve or enhance habitat and species numbers.

Viewing areas provide interpretation of the resources and management.

Livestock grazing is present. Grazing systems are managed to provide quality forage for use by big game species. Grazing by domestic sheep is managed to achieve effective separation between the bighorn and domestic sheep populations and minimize the risk of contact between the species.

Activities meet the assigned recreation opportunity spectrum classes and scenic integrity objectives.

To provide for habitat effectiveness for deer and elk, road densities of 1.5 miles or less per square mile of open road should be attained in areas providing critical wildlife needs, such as areas within winter concentration and critical winter range, calving areas, and transition habitat.

Management Area Specific Standards

5.41-S-1: To minimize disturbance, do not allow off-road travel on big game winter range areas, including over-the-snow vehicles, during the primary use seasons (December 1 – March 31) for big game. Exceptions may be allowed under special use authorization.

Management Area Specific Management Approaches

5.41-MA-1: Avoid or mitigate impacts to winter range in the operating and reclamation plan for locatable minerals.

5.41-MA-2: Avoid placing new roads in locations with important forage and cover.

5.41-MA-3: Forage and cover across the landscape is managed to sustain ungulate populations and supports Colorado Parks and Wildlife population objectives.

5.41-MA-4: Design and manage livestock grazing strategies to provide the forage quantity and quality needed to sustain desired ungulate populations during the winter period.

Management Area 6.6 – Grassland Resource Production

Integrated Desired Conditions

Grassland resource production areas produce forage. These areas are composed of grassland ecosystems that maintain and improve desired vegetation conditions for livestock, wildlife, and recreational stock. The areas are characterized by a mix of grassland and forested ecosystems that features open meadows and other grasslands, intermixed with stands of aspens and conifers.

Plant communities occur in a variety of successional stages to provide biological diversity of both plant and animal species. A variety of tools and methods are applied, including but not limited to timber harvest, prescribed burning, and planting.

Visitors to these areas can expect to see livestock and wildlife along with range improvements.

Livestock grazing is present.

The recreation opportunity spectrum class is modified roaded. Activities undertaken meet the prescribed scenic integrity objectives.

Management Area 8.22 – Ski-based Resorts

Integrated Desired Conditions

These areas are managed for their existing or potential use as ski-based resort sites. The lands on which Wolf Creek Ski Area is located are the only lands currently included in the management area. This is an area of concentrated use. Visitors can expect a high degree of interaction and many facilities associated with the ski resort industry.

Protection of recreation resources and public safety, including management of insects and disease, is the primary focus. Project implementation in this area maintains the possibility of

winter sports recreation. Resource management activities are designed and implemented to maintain or enhance existing resources.

Development in the area will be consistent with the terms and conditions of the special use permit, including submission of a master development plan. These lands are not part of the suitable timber base. They are also withdrawn from locatable mineral entry, and grazing is not authorized or permitted.

Facilities are designed and constructed to blend with the natural area. Line and form, indicating past activities, and geometric shapes associated with ski-trail and lift development should be “softened” as opportunities becomes available.

Activities meet the assigned recreation opportunity spectrum classes and scenic integrity objectives.

Management Area Specific Management Approaches

8.22-MA-1: Include vegetation management in resort management plans.

8.22-MA-2: Authorize grazing on a limited basis with agreement and cooperation of the permit holder.

Suitable activities by Management Area

Suitable activities by management area are listed in Table 12.

Grazing is only suitable in one research natural area, specifically Hot Creek Research Natural Area. Motorized and mechanized travel is only suitable on designated routes.

Communication sites and renewable energy development are also subject to project-specific environmental review. Over-snow motorized travel is suitable in only three special interest areas, specifically the Bachelor Loop, Elephant Rocks, and Wagon Wheel Gap Experimental Station, and may be subject to timing restrictions to protect deer and elk winter range.

Table 12. Suitable activities for each management area

Activity	Management Area													
	1.1	1.1a	2.2	3.1	3.4	3.5	3.6	4.21	4.3	5.11	5.13	5.41	6.6	8.22
Hiking trail construction				x	x	x	x	x	x	x	x	x	x	
Bicycle trail construction				x		x	x	x	x	x	x	x	x	
Horseback riding trail construction				x		x	x	x	x	x	x		x	
Livestock grazing	x		x	x	x	x	x	x	x	x	x	x	x	
Commercial timber harvest										x	x			
Motorized travel			x	x	x			x	x	x	x	x	x	
Mechanized travel			x	x	x	x	x	x	x	x	x	x	x	
Off road travel for dispersed recreation/firewood gathering									x	x	x	x		
Salvage/sanitation harvest								x	x	x	x	x	x	
Silvicultural treatments not for timber production				x					x	x	x	x		
Oil and gas leasing			x	x	x	x	x	x	x	x	x	x	x	
Off-road game retrieval									x	x	x	x	x	x
Renewable energy development								x	x	x	x	x	x	
Communication sites								x	x	x	x	x	x	x
Over-snow motorized travel				x	x	x	x	x	x	x	x	x	x	

Chapter 4. Monitoring

Introduction

During the revision process, the existing monitoring program will be reevaluated in accordance with direction contained in the 2012 Planning Rule and in Forest Service Handbook 1909.12. The monitoring program to be developed as part of the forest plan should be strategic, effective, and useful. Monitoring forms the basis for continuous improvement of the plan and the adaptive management process. Plan monitoring is one part of the overall approach. Broader-scale monitoring is driven by the regional forester and addresses relevant plan monitoring questions that are best answered at a geographic level.

The Role of Monitoring under the 2012 Planning Rule

The National Forest Management Act requires “continuous monitoring and assessment in the field” to evaluate “the effects of each management system to the end that it will not produce substantial and permanent impairment of the productivity of the land” (16 USC 1604(g)(3)(C)). The 2012 Planning Rule emphasizes a three-part iterative cycle of assessment, planning, and monitoring in a continuous feedback loop. Monitoring is meant to support the assessment process and evaluate plan implementation over time. This planning framework is designed to “inform integrated resource management and allows the Forest Service to adapt to changing conditions, including climate change, and improve management based on new information and monitoring” (§ 219.5 (a)).

Specific Requirements for Monitoring under the 2012 Planning Rule

A monitoring plan will consist of “monitoring questions and associated indicators” that “must be designed to inform the management of resources on the plan area, including by testing relevant assumptions, tracking relevant changes, and measuring management effectiveness and progress toward achieving or maintaining the plan’s desired conditions or objectives” (219.12 (a)(2)). The monitoring program must also be “coordinated with the Regional Forester and Forest Service State and Private Forestry and Research and Development” (§ 219.12 (a)(1)), and it may draw on and/or supplement the broader-scale monitoring strategy, to be developed at the regional level, that addresses monitoring questions at a geographic scale broader than one plan area (§ 219.12 (b)). Furthermore, in developing the monitoring plan, the responsible official should also provide opportunities for public participation, “taking into account the skills and interests of affected parties,” as well as the scope, methods, forum, and timing of those opportunities (§ 219.4 (a)).

Monitoring may involve evaluating if standards and guidelines are implemented (implementation monitoring), if management actions and standards and guidelines are effective in achieving goals and objectives (effectiveness monitoring), the long-term trend, and condition of key resources (condition or surveillance monitoring). At a minimum, the plan monitoring program must contain one or more monitoring questions and associated indicators that address the following eight items (see §219.12[a][5][i-viii]):

- (i) —The status of select watershed conditions,
- (ii) —The status of select ecological conditions including key characteristics of terrestrial and aquatic ecosystems,
- (iii)—The status of focal species to assess the ecological conditions required under § 219.9,
- (iv)—The status of a select set of the ecological conditions required under § 219.9 to contribute to the recovery of federally listed threatened and endangered species, conserve proposed and candidate species, and maintain a viable population of each species of conservation concern,
- (v)—The status of visitor use, visitor satisfaction, and progress toward meeting recreation objectives,
- (vi)—Measurable changes on the plan area related to climate change and other stressors that may be affecting the plan area,
- (vii)—Progress toward meeting the desired conditions and objectives in the plan, including for providing multiple use opportunities, and
- (viii)—The effects of each management system to determine that they do not substantially and permanently impair the productivity of the land (16 U.S.C. 1604(g)(3)(C)).

A monitoring evaluation report is to be produced and made available to the public every two years (§ 219.12 (d)). It “must indicate whether or not a change to the plan, management activities, or the monitoring program, or a new assessment, may be warranted based on the new information... [and] must be used to inform adaptive management of the plan area” (§ 219.12 (d)(2)). The monitoring program and evaluation report are part of the administrative record (§ 219.14 (b)), and the forest supervisor must document “how the best available scientific information was used to inform planning, the plan components, and other plan content, including the plan monitoring program” (§219.13 (a)(4)).

Use of Best Available Scientific Information

Evaluating ecosystem integrity and sustainability is a challenging task. It requires the synthesis and interpretation of high quality data and information from multiple scales of social and ecological organization. And while the rule directs national forests to use the best available scientific information in developing and implementing the plan monitoring program, monitoring implementation needs to remain within financial and technical capabilities. To meet these goals, the proposed forest plan monitoring strategy supplements data and information collected by Forest staff with the best available scientific information available from Forest Service Research and other high capacity partners, within existing staffing and budgetary limitations.

For instance, to evaluate trends and changes in terrestrial ecological conditions, the Forest proposes to use data and spatial products from Forest Service Research’s Forest Inventory and Analysis program, the Remote Sensing Application Center’s Monitoring Trends in Burn Severity program, LANDFIRE (Landscape Fire and Resource Management Planning Tools project), Forest Health Monitoring program, and Bird Conservancy of the Rockies. Forest Inventory and Analysis program data represent the most robust source of information available on the status and *trend* associated with forest conditions at landscape scales. While the Forest Inventory and Analysis program can be used to monitor broadscale trends in forest cover and composition

across regions, it can also be used to track changes in fine-grain characteristics at the landscape scale—including measures of crown cover, stand density, snags, and downed woody material that are relevant for the conservation of threatened and endangered species, and species of conservation concern (Chojnacky 2000, Witt 2015). At the same time, “coarse-grain” changes in ecological conditions at landscape scales, such as structural connectivity and patch size and distribution, may be evaluated using new and existing spatial datasets and remote sensing products from the Remote Sensing Application Center, Forest Health Monitoring program, U.S. Geological Survey, and Forest Inventory and Analysis program. Monitoring trends and changes in Gunnison prairie dog distribution in montane ecosystems, for instance, can be efficiently accomplished by using National Agriculture Imagery Program aerial photography datasets (Sidle et al. 2002). Data collected by the Bird Conservancy of the Rockies also represents an important and scientifically robust source of information. While data on breeding bird occupancy and density is important for understanding trends associated with individual species, the Forest is also proposing to use a suite of birds as “focal species,” identified in consultation with experts at Bird Conservancy of the Rockies, which can be used to infer changes in the structure, function, and composition of terrestrial forest ecosystems.

The Forest is also proposing to monitor ecological conditions in aquatic, riparian and wetland, and alpine systems using a variety of approaches. To monitor trends and changes in riparian vegetation and condition at the forest plan level, the Forest is proposing to use new products developed by the Washington Office of the Forest Service that were piloted during the assessment phase of the forest plan revision (Abood 2015). Information on key aquatic ecological conditions, such as streamflow and temperature, may also be acquired from the U.S. Geological Survey and generated through a broadscale strategy implemented in collaboration with Rocky Mountain Research Station’s NORWEST stream temperature monitoring program. Macroinvertebrates and beavers are also proposed as focal species for aquatic and riparian systems. After consulting with beaver and riparian systems experts at Utah State University, the Forest is proposing to monitor the number of HUC-12 (Hydrologic Unit Code-12) watersheds with beaver activity over time—a cost-effective strategy that allows the Forest to track beaver presence and range expansion, identify potential areas where beaver introduction may be appropriate, and provide opportunities for citizen science and outreach. These approaches are also complementary. For instance, information on trends in sedimentation, streamflow, riparian cover, and stream temperature are all particularly relevant for the management and conservation of many aquatic and riparian species of conservation concern, such as the Rio Grande cutthroat trout, Rio Grande chub, and Rio Grande sucker.

The Forest is also proposing to use data from partners to track trends and conditions in climatic variability and ecological conditions in alpine ecosystems. For instance, monitoring data and products from the National Oceanic and Atmospheric Administration, Oregon State’s PRISM program, Natural Resources Conservation Service SNOTEL, National Phenology Network, and National Park Service Inventory and Monitoring program can be used to monitor drought, long-term climatic change, atmospheric deposition, vegetative phenology, and alpine vegetation and conditions across the broader plan area.

Proposed Forest Monitoring Framework

The proposed monitoring framework addresses each of the eight monitoring requirements, uses the best available scientific information, and is feasible to implement with existing resources. It is designed to promote iterative evaluation of plan components associated with social and ecological desired conditions, and to facilitate effective and efficient biennial reporting.

The proposed monitoring framework is composed of the following elements.

Goals are broad themes associated with core aspects of the Forest Service mission, including goals for social and ecological sustainability and resilience. Monitoring questions, plan components, and indicators are organized under these broad goals.

Monitoring Requirement identifies which of the eight monitoring requirements a specific question and set of indicators addresses. In many cases, questions meet the requirements of two or more monitoring requirements.

Monitoring Question is the plan-level monitoring question. Monitoring questions are priority questions of high relevance for forest planning and decision-making that can be used to test relevant assumptions, track relevant changes, and measure progress toward achieving desired conditions.

Desired Conditions are select desired conditions that represent priority goals and approaches for maintaining or improving the resilience of social and ecological conditions within and across the broader landscape context of the forest plan area.

Indicators are measurable attributes of social and ecological conditions that are used to answer monitoring questions and evaluate progress toward maintaining or achieving desired conditions.

Data Source represents the data repositories or sources of information from which measures of indicators are derived. Internal data collected and managed by Forest staff are indicated in red text, with data and information from Research or partners that may become part of a regional broadscale strategy written in black text.

Frequency describes the timing and frequency of monitoring evaluation and reporting. Evaluation and reporting frequencies are determined by the frequency of data collection and/or the spatial and temporal variability of resources (i.e., it takes several years of data collection to establish a trend for many resources).

Sample Adaptive Management Questions: The Forest's monitoring plan also includes sample adaptive management questions that are paired with most monitoring questions. These questions are intended to serve two primary functions. First, they highlight the relevancy of the monitoring questions and data to land management decision-making. Without this lens it can be difficult to sift through volumes of data and analyses and identify salient, possibly actionable information and decision-points. Second, they offer some specific examples of ways that monitoring data may be used to identify needs to adapt our land management decisions. These needs may spring from information on changing conditions, stagnant conditions where the goal is to achieve some improvement, or new information about the status of natural resources on the Forest.

These questions are not an exhaustive list of potential management applications. Instead, they highlight some realistic ways in which monitoring data might be interpreted, evaluated, and used

by line officers and land managers to inform their decision-making. They are also intended to stimulate the development of additional questions among Forest staff.

Finally, it is important to note that the sample adaptive management questions are not intended to trigger, or require, decisions or management actions. Monitoring information is one piece of a larger puzzle that must be put together during land management decision-making processes; line officers will need to couple insights from monitoring data with other information, including resource availability, staffing capacity, multiple use priorities, and public opinion.

Goal 1: Protect and restore watershed health, water resources, aquatic ecosystems, and the systems that rely on them

National forests that exist today were initially created under the guidance of the National Forest Reserve Act of 1891. The Act allowed the President of the United States to set aside forest reserves from land in the public domain. This Act, provided for wise use of the lands, provides protection of timber at the headwaters of streams, reduces downstream flooding, and provides a summer-long water supply for irrigation in the arid West (Muhn 1992). Protecting and restoring watershed health reaffirms the Act that created today’s national forests.

Opportunities exist to emphasize collaborative stewardship of watersheds and the interrelated biological, economic, and social factors that affect these areas. Healthy and functioning watersheds contribute to overall resource health.

Monitoring questions and indicators of measure for Goal 1 are contained in Table 13.

Table 13. Forest plan-level monitoring questions and indicators of measure for Goal 1

[Red text indicates a Forest-level collection commitment.]

Monitoring Requirement	Monitoring Question	Indicator	Data Source	Frequency	Sample Adaptive Management Questions
2, 4, 6	MQ1: What is the status and trend of aquatic ecosystem conditions, including those needed to sustain fish populations?	• Stream temperature	• Rocky Mountain Research Station – NORWEST	2 years	<ul style="list-style-type: none"> • Do stream temperatures and future projections point to areas where cold-water fish habitat may be maintained? • Coupling this with other riparian vegetation condition data, are there restoration opportunities in these places that might be priorities?
		• Number of fish barriers removed/improved	• Forest Service Activity Tracking System (FACTS) / fisheries reports	2 years	<ul style="list-style-type: none"> • Is the Forest achieving goals for improving fish habitat connectivity, or is there a need to increase this effort?
		• Macroinvertebrates	• Forest staff macro-monitoring	2–4 years	<ul style="list-style-type: none"> • Do trends in macroinvertebrate communities point to the need for adjusting management practices or implementing restoration activities?
		• Beaver presence/absence	• HUC-12 watersheds or stream reaches with beaver activity	2 years	<ul style="list-style-type: none"> • Where other aquatic ecosystem indicators suggest potential restoration needs, are beavers absent, and if so, would beaver relocation be beneficial?

Monitoring Requirement	Monitoring Question	Indicator	Data Source	Frequency	Sample Adaptive Management Questions
		<ul style="list-style-type: none"> Presence/distribution of non-native aquatic invasive species and pathogens 	<ul style="list-style-type: none"> Colorado Parks and Wildlife / U.S. Geological Survey- Nonindigenous Aquatic Species (NAS) 	2 years	<ul style="list-style-type: none"> Are non-native aquatic invasive species and pathogens such as chytrid fungus spreading, and if so, are there control efforts that could be considered?
2, 4, 6	MQ2: What is the status and trend of aquatic ecosystem conditions, including those needed to sustain fish populations?	<ul style="list-style-type: none"> Trends in streamflow 	<ul style="list-style-type: none"> U.S. Geological Survey Colorado Division of Water Resources 	4 years	<ul style="list-style-type: none"> Is there an increase in the number of impaired streams, and if so, are there measures that can be adopted to curb this increase? Are there measures that could be considered to remedy this impairment? Has progress been made in removing streams from the impaired list? Do trends in sedimentation/water quality, stream temperature, or flow warrant management actions to conserve and protect Rio Grande cutthroat, Rio Grande Chub, and Rio Grande Sucker?
		<ul style="list-style-type: none"> Number of impaired streams (303d) 	<ul style="list-style-type: none"> Colorado Department of Public Health and Environment 	2 years	
2, 4, 6	MQ3: What is the status of populations of fishes that are species of conservation concern?	<ul style="list-style-type: none"> Status of Rio Grande cutthroat trout, Rio Grande sucker, and Rio Grande chub conservation populations 	<ul style="list-style-type: none"> Rio Grande cutthroat trout, Rio Grande sucker, and Rio Grande chub conservation team 	All populations monitored every 5 years	<ul style="list-style-type: none"> Is the overall goal of the RGCT, RGS, and RGC Conservation Strategy (to provide for the long-term viability of the species) being met?

Monitoring Requirement	Monitoring Question	Indicator	Data Source	Frequency	Sample Adaptive Management Questions
1	MQ4: Is the unit improving condition in priority watersheds?	<ul style="list-style-type: none"> • Number of projects completed in priority watersheds • Number of watersheds moved to new watershed condition class • Best management practices monitoring 	<ul style="list-style-type: none"> • Forest Service Watershed Improvement Tracking (WIT) • Monitoring protocols rating system • Forest Service Watershed Condition Framework Classification and Assessment Tracking Tool (WCF-WCATT) 	2 years	To be developed
2, 4	MQ5: What is the status and trend of riparian and wetland vegetation and conditions across the Forest?	<ul style="list-style-type: none"> • Changes in riparian vegetation (forest, pasture, willow, grass/forb, wetland, shrub) 	<ul style="list-style-type: none"> • Forest Service Washington Office or Rocky Mountain Regional Office 	2 years	<ul style="list-style-type: none"> • If multi-year declines in riparian/wetland vegetation are observed at the Forest level, what is causing them and are planning or management decisions needed to address them?
		<ul style="list-style-type: none"> • Beaver presence/absence (see above) 	<ul style="list-style-type: none"> • Number of HUC-12 watersheds with beaver activity 	2 years	<ul style="list-style-type: none"> • Where other riparian and wetland ecosystem indicators suggest potential restoration needs, are beavers absent, and if so would beaver relocation be beneficial?

Goal 2: Maintain and restore sustainable, resilient terrestrial ecosystems

Ecosystems are a barometer of the quality of land management practices. A natural variety of species, genetic composition, and ecological processes is key to providing the diversity needed for resiliency in the face of environmental disturbances and changes.

Diversifying age classes and structure, seral stage, and habitat classes, where appropriate, in the next planning horizon would provide benefits including, but not limited to, providing resilience to insect and disease outbreaks, responsiveness to anticipated changes in climate, ecosystem services, recreation, increased social and economic benefits, and more.

Monitoring questions and indicators of measure for Goal 2 are contained in Table 14.

Table 14. Forest plan-level monitoring questions and indicators of measure for Goal 2

[Red text indicates a Forest-level collection commitment.]

Monitoring Requirement	Monitoring Question	Indicator	Data Source	Frequency	Sample Adaptive Management Questions
4, 7	MQ6: What is the status and trend of populations of Rocky Mountain elk, Rocky Mountain bighorn sheep, and pronghorn primary use areas?	Populations of: <ul style="list-style-type: none"> Elk Pronghorn Mule deer Rocky Mountain bighorn sheep 	<ul style="list-style-type: none"> Colorado Parks and Wildlife 	2 years	<ul style="list-style-type: none"> Are there changes in ungulate populations that are outside of expected levels of fluctuation? If so, do they correlate with changes in habitat conditions that might be addressed through management activities?
4, 7	MQ7: What is the status and trend of forage and cover for big game species?	<ul style="list-style-type: none"> Trends in forage availability 	<ul style="list-style-type: none"> Forest Service Natural Resource Information System (NRIS) (data from allotments in winter range) 	4 years	<ul style="list-style-type: none"> Are there declines in forage availability and amount of canopy cover that could impact key wildlife species? If so, where are opportunities to address these through management activities?
		<ul style="list-style-type: none"> Acres of cover and security habitat in mapped winter range affected by disturbance/mortality 	<ul style="list-style-type: none"> Forest Health Monitoring program Forest Inventory and Analysis program Fire data 	Analysis and reporting only when significant disturbance/mortality is	

Monitoring Requirement	Monitoring Question	Indicator	Data Source	Frequency	Sample Adaptive Management Questions
		<ul style="list-style-type: none"> Changes in crown cover in mapped winter range 	<ul style="list-style-type: none"> National Agriculture Imagery Program Photointerpretation 	observed in mapped winter range	
4	MQ8: What is the status and trend of key ecosystem characteristics associated with species of conservation concern, threatened and endangered species, and resident and migratory bird species?	<p>Landscape-level indicators</p> <ol style="list-style-type: none"> Acres/location impacted by disturbance and management actions (i.e., in Lynx Analysis Units/lynx habitat) Road density (open--annual/seasonal, non-decommissioned) Crown closure, number of patches and patch size, distribution, and understory characteristics Distribution and condition of old-forest/late-successional conditions 	<ul style="list-style-type: none"> Forest Service Activity Tracking System (FACTS) spatial / FSVeg Forest Inventory and Analysis program, and Forest Inventory and Analysis program land cover and disturbance maps Forest Health Monitoring program – aerial surveys Monitoring Trends in Burn Severity program, or fire layers 	Analysis and reporting every 2 years (or as appropriate)	<ul style="list-style-type: none"> Are there changes to the status of at-risk species that warrant additional plan direction? Do significant changes to lynx habitat warrant additional plan direction? Do significant changes to key ecosystem characteristics for species of conservation concern warrant additional plan direction?
		<ul style="list-style-type: none"> Acres and extent of Gunnison prairie dog colonies 	<ul style="list-style-type: none"> National Agriculture Imagery Program Colorado Parks and Wildlife Health Program Partnership 	2 years	<ul style="list-style-type: none"> Do Gunnison prairie dog colonies continue to expand? If not, are there opportunities to improve their habitat or to reduce uses that may be negatively impacting them?

Monitoring Requirement	Monitoring Question	Indicator	Data Source	Frequency	Sample Adaptive Management Questions
4	<p>MQ9: What is the status and trend of ecosystem characteristics associated with species of conservation concern, threatened and endangered species, and resident and migratory bird species?</p>	<p>Fine-scale indicators: Canada lynx and species of conservation concern—owls, bats, goshawk, and marten</p> <ol style="list-style-type: none"> 1. Number of live trees per acre 15-20, >20 in DBH (for all indicators, Forestwide and in major types – aspen, spruce-fir, mixed conifer) 2. Number of live and dead trees per acre >15 inches DBH 3. Percentage with <40, 40–70, >70 percent live crown cover 4. Number of snags per acre 10–15, 15–20, >20-inch DBH 5. Number of pieces of coarse woody debris (CWD) per acre 5–10, >15 inches DBH, and >15 feet long; volume of CWD per acre 6. Mortality – net volume and percentage of dead vs live 	<ul style="list-style-type: none"> • Forest Inventory and Analysis program 	<ul style="list-style-type: none"> • 2 years 	To be developed

Monitoring Requirement	Monitoring Question	Indicator	Data Source	Frequency	Sample Adaptive Management Questions
		7. Number of abandoned mines gated, and maintained for bats	<ul style="list-style-type: none"> Abandoned Mine Lands Program CNHP 	<ul style="list-style-type: none"> 2 years 	<ul style="list-style-type: none"> Are abandoned mines being successfully inventoried for bat use and gated prior to mine closure? Are gated mines retaining effectiveness from a human safety and bat use perspective? What is the trend in pathogens such as white-nose syndrome?
4	MQ10: What is the status and trend of ecosystem characteristics associated with SCCs, TES, and resident and migratory bird species?	Resident and migratory birds <ol style="list-style-type: none"> Occupancy: priority species from each priority habitat type Species richness and density 	<ul style="list-style-type: none"> Bird Conservancy of the Rockies Colorado Landbird Conservation Plan Forest Staff Migratory Bird Reports 	2 years	<ul style="list-style-type: none"> What is the likely cause of any significant changes in bird species occupancy, richness, or density, and are there implications for planning or management decisions?
8	MQ11: What are the status and trends of soil productivity and function?	<ul style="list-style-type: none"> Type, degree, and extent of soil disturbance and risk rating to determine the effect of soil disturbance on soil productivity and hydrologic function 	<ul style="list-style-type: none"> Soil Disturbance Field Guide National Soils Information System (NASIS) database Soil Best Management Practices monitoring 	4 years	<ul style="list-style-type: none"> Are management prescriptions, standards, guidelines, and management approaches effectively maintaining or improving soil productivity by reducing or minimizing impacts to soil resources? If not, do they need to be changed?
2, 3, 6	MQ12: What are the trends in climatic variability (including drought and long-term climate change), and how are they affecting vegetative phenology, snowpack, streamflow, and alpine vegetation?	<ul style="list-style-type: none"> Length, spatial extent, severity of drought (Palmer Drought index, Evaporative Demand Drought Index) 	<ul style="list-style-type: none"> U.S. Drought Monitor ESRI drought mapper Evaporative Demand Drought Index (WWA) 	2 years	<ul style="list-style-type: none"> Do drought trends fall within expected ranges, or if outlier events are occurring, are there management activities that should be considered (e.g., reduction in animal unit months)? Do outlier events warrant additional or revised plan direction?

Monitoring Requirement	Monitoring Question	Indicator	Data Source	Frequency	Sample Adaptive Management Questions
2, 3, 6	MQ13: What are the trends in climatic variability (including drought and long-term climate change), and how are they affecting vegetative phenology, snowpack, streamflow, and alpine vegetation?	<ul style="list-style-type: none"> Long-term trends in temperature and precipitation 	<ul style="list-style-type: none"> National Oceanic and Atmospheric Administration – National Centers for Environmental Information (NCEI) Oregon State – PRISM 	2020 2030	<ul style="list-style-type: none"> Are longer-term climatic trends consistent with those expected and underpinning current plan content? If not, is there a need for additional or revised plan direction?
		<ul style="list-style-type: none"> Snowpack/snow water equivalent 	<ul style="list-style-type: none"> USDA Natural Resources Conservation Service – SNOTEL 	2020 2030	
		<ul style="list-style-type: none"> Trends in streamflow 	<ul style="list-style-type: none"> U.S. Geological Survey 	10 years	
		<ul style="list-style-type: none"> National Phenology Network [first bloom index] Extended spring indices 	<ul style="list-style-type: none"> National Phenology Network 	2 years	<ul style="list-style-type: none"> Do Extended Spring Indices reflect conditions that fall within ranges expected during plan development? If not, are there needs to reconsider vegetation management or other management strategies?
		<ul style="list-style-type: none"> Pika 	<ul style="list-style-type: none"> Mountain Studies Institute Colorado Parks and Wildlife 	2 years	<ul style="list-style-type: none"> Knowing that pika are considered an indicator species for their sensitivity to climate change, are there trends in pika abundance or distribution that suggest a need to worry about other effects from climate change? Are there any management solutions that could be considered?
		<ul style="list-style-type: none"> Occupancy and trend of Uncompahgre fritillary butterfly colonies 	<ul style="list-style-type: none"> Uncompahgre fritillary butterfly monitoring partnership 	6 and 10 years	<ul style="list-style-type: none"> How is climate change or other factors influencing vulnerable alpine systems such as snow willow, the phenology of flowering nectar plants, and occupancy of Uncompahgre fritillary butterfly colony sites?
		<ul style="list-style-type: none"> Alpine vegetation 	<ul style="list-style-type: none"> National Park Service / Alpine Vegetation & Soils (GLORIA) 	2 years	

Monitoring Requirement	Monitoring Question	Indicator	Data Source	Frequency	Sample Adaptive Management Questions
	MQ14: What are the conditions and trends of visibility and air quality/ deposition in selected Class II areas on the unit?	<ul style="list-style-type: none"> • Visibility • Nitrates and sulfate deposition 	<ul style="list-style-type: none"> • IMPROVE (Interagency Monitoring of Protective Visual Environments) • U.S. Geological Survey • National Atmospheric Deposition Program (NADP) 	2 years	To be developed
2, 6	MQ15: How are key characteristics of forest ecosystems (structure, composition, function and disturbance regimes) changing over time, and are they within the natural range of variation?	<ul style="list-style-type: none"> • Percentage cover of different forest ecosystems • Percent of different structural classes in major forest ecosystems • Mortality: Number of snags per acre; net volume live vs dead • Regeneration: Number of saplings per acre; species composition of saplings in all ecosystem • CWD: (Same as for MQ) 	<ul style="list-style-type: none"> • Forest Inventory and Analysis program 	Acquisition every 5, reporting 6 and 10 years	<ul style="list-style-type: none"> • Do key characteristics of vegetation structure and composition fall within the natural range of variation, or are changes trending in this direction? • If not, what is the role of climatic variability, management actions, and disturbance frequencies and intensities in driving these patterns? • Where are management actions most likely to be effective for reducing the potential severity of disturbances and improving vegetative conditions?
		<ul style="list-style-type: none"> • Changes in fire regime condition class 	<ul style="list-style-type: none"> • Landscape Fire and Resource Management Planning Tools project (LANDFIRE) 		

Monitoring Requirement	Monitoring Question	Indicator	Data Source	Frequency	Sample Adaptive Management Questions
		<ul style="list-style-type: none"> Size and severity of fires >1,000 acres (net change in volume / Number of live vs dead trees) 	<ul style="list-style-type: none"> Monitoring Trends in Burn Severity program 	Reporting cycle after years with fires larger than 1,000 acres	
		<ul style="list-style-type: none"> Acres / location of vegetation management in different forest types 	<ul style="list-style-type: none"> Forest Service Activity Tracking System (FACTS) Spatial FSVeg 	2 years	
		<ul style="list-style-type: none"> Bird Conservancy of the Rockies – bird species (same as in species of conservation concern question) 	<ul style="list-style-type: none"> Bird Conservancy of the Rockies 		
		<ul style="list-style-type: none"> Number and acreage of all fires (natural, human caused, prescribed, managed for resource benefit) 	<ul style="list-style-type: none"> Forest Service Activity Tracking System (FACTS) Spatial FSVeg 		
		<ul style="list-style-type: none"> Extent of insect mortality 	<ul style="list-style-type: none"> Forest Health Monitoring program 		

Goal 3: Actively contribute to social and economic sustainability in the broader landscape and connect citizens to the land

The Forest contributes forest products and tourism opportunities that are important to local economies, and provides ecosystem services for current and future generations.

The Forest maintains places with human influence while protecting areas of tribal importance and traditional uses in addition to other areas of religious or cultural importance.

Opportunities are available for individuals, partners, and organizations to be active participants in managing, monitoring, and implementing projects that achieve integrated resource management.

The Forest provides natural-appearing landscapes with diverse scenery. The Forest maintains and provides access to a multitude of recreation opportunities within the expected capacity of the budget. Designated areas, such as wilderness and wild, scenic, and recreational rivers, will be maintained to protect their integrity and avoid damage incurred by overuse of these resources. The Forest provides a wide range of outdoor experiences ranging from primitive to highly developed that are within the overall capacity of the Forest. Where possible, interpretive opportunities increase public knowledge, provide historical background, and promote a connection of the current people to the past and their land.

Monitoring questions and indicators of measure for Goal 3 are contained in Table 15.

Table 15. Forest plan-level monitoring questions and indicators of measure for Goal 3

[Red text indicates a Forest-level collection commitment.]

Monitoring Requirement	Monitoring Question	Indicator	Data Source	Frequency	Sample Adaptive Management Questions
7	MQ16: What are the economic contributions of the range, timber, recreation, and minerals programs, and how are they changing over time?	<ul style="list-style-type: none"> • Employment, income, and contribution to gross domestic product • Board feet of timber sold or harvested • Acres treated 	<ul style="list-style-type: none"> • Forest Service IMPLAN model • Forest Service Timber Information Manager (TIM) • National Visitor Use Monitoring • Forest Service Activity Tracking System (FACTS) 	<ul style="list-style-type: none"> • 2 years • National Visitor Use Monitoring (NVUM) every 5 years 	<ul style="list-style-type: none"> • Does the Forest continue to provide sufficient economic benefits to different communities through various program areas? If not, are there programmatic changes that could be considered?

Monitoring Requirement	Monitoring Question	Indicator	Data Source	Frequency	Sample Adaptive Management Questions
2, 7	MQ17: What are the economic contributions of the wildlife and fisheries program to the local economy and how are they changing over time?	<ul style="list-style-type: none"> Number of recreational user/activity days related to hunting, fishing, and wildlife viewing, and economic contribution to local counties 	<ul style="list-style-type: none"> Colorado Parks and Wildlife annual data 	2 years	<ul style="list-style-type: none"> How do fish and wildlife values contribute to the recreational pursuits of various communities in the San Luis Valley and what are the benefits of these programs to agency goals such as Kids in the Woods, and helping to get people outside?
		<ul style="list-style-type: none"> Number of special events hosted such as Free Fishing Day, Migratory Bird Day, etc. Number of viewing sites developed or maintained. 	<ul style="list-style-type: none"> Internal Forest Service staff data 		
2, 7	MQ18: What is the status and trend of rangeland health?	<ul style="list-style-type: none"> Range condition Changes in number of allotments with active grazing Number of surveyed allotments not meeting, moving toward, or meeting desired conditions 	<ul style="list-style-type: none"> NRIS/ Forest Service Activity Tracking System (FACTS) 	2 years	To be developed
		<ul style="list-style-type: none"> Presence and extent of cheatgrass and noxious weeds 	<ul style="list-style-type: none"> Forest Service Nonnative Invasive Species (NNIS) 	2 years	

Monitoring Requirement	Monitoring Question	Indicator	Data Source	Frequency	Sample Adaptive Management Questions
5	MQ19: What is the status and trend of roads and trails in terms of access, use, and condition?	<ul style="list-style-type: none"> Miles of roads and trails open year-round or open seasonally Miles of roads and trails built and decommissioned Miles of roads and trails maintained by maintenance level Miles of roads and trails maintained or improved to standard 	<ul style="list-style-type: none"> Forest Service Infrastructure database (INFRA) 	2 years	To be developed
		<ul style="list-style-type: none"> Use of roads and trails 	<ul style="list-style-type: none"> National Visitor Use Monitoring 	5 years	
5	MQ20: How is the public utilizing the Forest, what activities are they participating in, and what is their current satisfaction level of the recreational benefit provided?	<ul style="list-style-type: none"> Visitation on the Forest Forest economic benefits to the community Percent satisfaction for: <ol style="list-style-type: none"> Very satisfied Somewhat satisfied Total satisfaction 	<ul style="list-style-type: none"> National Visitor Use Monitoring 	5 years	<ul style="list-style-type: none"> If and where trends in recreational satisfaction and use are increasing or decreasing? What factors or trends are leading to this change? What changes could be made to improve current and future visitor satisfaction? How is the public contributing to the local community? Where are people coming from to use the Forest?
7	MQ21: Is the Forest effectively preserving, protecting, and/or restoring cultural and heritage resources, including traditional cultural properties and landscapes?	<ul style="list-style-type: none"> Number of areas of tribal importance, cultural, and heritage resources and properties identified, preserved, protected, and/or restored 	<ul style="list-style-type: none"> NRM upward reporting for Heritage Program Managed to Standard (HPMtS) 	Monitoring of 25 percent of Priority Heritage Assets (PHA) each year. All PHAs monitored at least once every 5 years	To be developed

Monitoring Requirement	Monitoring Question	Indicator	Data Source	Frequency	Sample Adaptive Management Questions
7	MQ22: How is the Forest engaging visitors, local communities, tribes, and partners to achieve desired conditions, goals, and objectives (i.e., through outreach, education, consultation, and collaboration)?	<ul style="list-style-type: none"> Number and type of outreach, education, consultation, and collaboration, and volunteer activities 	<ul style="list-style-type: none"> Forest Service Natural Resource Monitoring (NRM) upward reporting for Heritage Program Managed to Standard (HPMTs) that included outreach, education, and volunteer targets. Forest Service NatureWatch, Interpretation and Conservation Education (NICE) vs reports (volunteer reporting) 	Annually	To be developed
2, 7	MQ23: Is wildland fire and fuel management reducing the threat to real property and infrastructure and maintaining or achieving desired conditions for forest ecosystems?	<ul style="list-style-type: none"> Acres and location of fuel management and restoration treatments (mechanical and prescribed fire) 	<ul style="list-style-type: none"> Forest Service Activity Tracking System (FACTS) 	2 years	To be developed

Chapter 5. Adaptive Management

The adaptive management domain puts in place a process that implements plan direction, analyzes the impacts, monitors, and then evaluates adjustments that may be needed to be adaptive and responsive in a timely manner. Changes will be incorporated through interdisciplinary analysis and will include public involvement.

To be more responsive to necessary changes in forest plan content, Forest staff will annually post proposed changes and the rationale for the changes, which could include annual monitoring results, on the Forest website. In conjunction with release of the changes, a stakeholder meeting would be held to discuss the changes proposed in detail followed by a comment period. Upon receiving and reviewing all comments, the responsible official would determine the proper authority to be used in making necessary changes to the forest plan content. The entire process would be open and transparent.

Changes to plan components require a forest plan amendment that could use any of the approved authorities available at the time. Changes to optional plan content, corrections in clerical errors to any content (including plan components), changes needed to conform to new statutory or regulatory requirements for which there is no discretion, and other changes to plan content, excluding changes to the substance of plan components or to the application of plan components to specific areas, may be adjusted through an administrative change. This would be done in compliance with the 2012 Planning Rule (36 CFR 219.7(f)) and Forest Service direction from Forest Service Handbook 1909.12 § 21.5.

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Glossary

A

Access

Road or trail route over which a public agency claims a right-of-way for public use; a way of approach.

Activity fuels

Fuels resulting from or altered by forestry practices such as timber harvest or thinning, as opposed to naturally created fuels.

Adaptive management

An approach to natural resource management where actions are designed and executed and effects are monitored for the purpose of learning and adjusting future management actions, which improves the efficiency and responsiveness of management.

Age class

Age class is one of the intervals, commonly 10 years, into which the age range of trees is divided for classification or use. Age class distribution refers to the location and/or proportionate representation of different age classes in a forest.

Air quality: Class I, II, and III areas

The area classification scheme established by Congress to facilitate implementation of the prevention of significant deterioration of the air quality provisions of the Clean Air Act.

Class I areas receive the highest degree of protection, with only a small amount of certain kinds of additional air pollution allowed.

Mandatory Class I areas were designated by Congress and include international parks, national wilderness areas or national memorial parks larger than 5,000 acres, or national parks larger than 6,000 acres, that were in existence (or authorized) on August 7, 1977. The 1990 amendments to the Clean Air Act specified that acreage added to these areas after 1977 must also receive Class I designation. Mandatory Class I areas may not be redesignated to any other classification.

Congress initially designated all other attainment areas as **Class II** and allowed a moderate increase in certain air pollutants.

No **Class III areas**, where a large amount of new air pollution would be allowed, were designated by Congress, but a process was established for redesignating Class II areas to the more protective Class I or the less protective Class III status. Only states or Native American governing bodies have authority to redesignate these areas, except as noted above.

Air quality related values

Resource that may be adversely affected by a change in air quality. The resource may include visibility or a specific scenic, cultural, physical, biological, ecological, or recreational resource. Values are specific for each designated wilderness area.

Area of Influence

An area influenced by the management of the plan area that is used during the land management planning process to evaluate social, cultural, and economic conditions. The area is usually a grouping of counties.

Assessment

For the purposes of land management planning at 36 CFR 219, an assessment is the identification and evaluation of existing information to support land management planning. Assessments are not decision-making documents, but provide current information on select topics relevant to the plan area in the context of their borders.

At-risk species

A term used to collectively refer to the federally recognized threatened, endangered, proposed, and candidate species and species of conservation concern within the planning area.

Aquatic ecosystem

Waters of the United States that serve as habitat for interrelated and interacting communities and populations of plants and animals. It includes the stream channel, lake or estuary bed, water, biotic communities, and the habitat features that occur.

B

Bark beetles

Bark beetles are members of the family Scolytidae whose adults and larvae tunnel in the cambium region (bark and sapwood) of living, dying, and recently dead or felled trees.

Basal area

The cross-sectional area, in square feet, of a tree measured at breast height (4.5 feet). Basal area of an area is generally estimated in terms of square feet per acre.

Best management practices

Methods or techniques that have been determined to be the most effective and practical means of achieving an objective while making the optimum use of resources.

Big game

Those species of large mammals normally managed for sport hunting, generally including antelope, bighorn sheep, deer, elk, moose, and mountain goat.

Big game (crucial) winter range

Big game winter range is where a population or portion of a population of animals uses the documented suitable habitat within this range annually, in substantial numbers only during the winter. Crucial winter range describes any portion of the range which has been documented as the determining factor in a population's ability to maintain itself at a certain level over the long term.

Biological diversity, or biodiversity

The full variety of life in an area, including the ecosystem, plant, and animal communities, species and genes, and the processes through which individual organisms interact with one another and with their environment.

Biotic

Typically refers to living organisms in their ecological rather than their physiological relations.

Browse

The buds, shoots, and leaves of woody plants eaten by livestock or wild animals.

C

Canada lynx

The Canada lynx (*Lynx canadensis*) is a North American mammal of the cat family, Felidae, which ranges across Canada and into Alaska as well as some parts of the northern United States, including Colorado.

Candidate species

For species under the purview of the U.S. Fish and Wildlife Service (Service), a species for which the Service possesses sufficient information on vulnerability and threat to support a proposal to list as endangered or threatened, but for which no proposed rule has yet been published.

Canopy

The uppermost spreading, branchy layer of a forest.

Canopy cover

The proportion or percentage of the forest floor covered by the vertical projection of tree crowns.

Capability

The potential of an area to produce resources, supply goods and services, and allow resource uses under an assumed set of management practices and at a given level of management intensity. Capability depends on current management practices at a given level of management intensity. It is also dependent on existing resource and site conditions such as climate, slope, landform, soil, and geology, as well as the application of management practices, such as silviculture or the protection from fire, insects, and disease.

Carr

A type of waterlogged wooded terrain that typically represents a successional stage between swamp and the eventual formation of forest. Characteristic trees include alder and willow.

Cavity-nesting species

Wildlife species that excavate and/or occupy cavities in trees and snags.

Channel

A passage, either naturally or artificially created, that periodically or continuously contains moving water, or that forms a connecting link between two bodies of water. River, creek, run, branch, and tributary are some of the terms used to describe natural channels, which may be single or braided. Canal and floodway are some of the terms used to describe artificial channels.

Clearcut

1. A stand in which essentially all trees have been removed in one operation to produce an even-aged stand. Depending on management objectives, a clearcut may or may not have

reserve trees left to attain goals other than regeneration (see regeneration method two-aged methods).

2. A regeneration or harvest method that removes essentially all trees in a stand. A minor live component of the stand may be retained for purposes other than regeneration. The retained trees, referred to as leave trees, should generally comprise less than 10 percent of the growing space of the stand.

Climax

The culminating stage in plant succession for a given site where the vegetation has reached a highly stable condition.

Clone

A group of plants (for example, aspen) growing in close association, derived by asexual reproduction from a single parent plant.

Coarse woody debris

Provides living spaces for a host of organisms and serves as long-term storage sites for moisture, nutrients, and energy. Coarse woody debris consists of any woody material greater than 3 inches in diameter and is derived from tree limbs, boles, roots, and large wood fragments and fallen trees in various stages of decay.

Code of Federal Regulations (CFR)

The listing of various regulations pertaining to management and administration of national forests and other Federal lands.

Collaboration

Working with someone to produce or create something.

Commercial thinning

An intermediate harvest of commercial-sized trees to meet a variety of management objectives including reducing stand density to improve tree growth, improving forest health, or to meet other stand structural or composition objectives.

Confluence

The point where two streams meet.

Connectivity

Ecological conditions that exist at several spatial and temporal scales that provide landscape linkages that permit the exchange of flow, sediments, and nutrients; the daily and seasonal movements of animals within home ranges; the dispersal and genetic interchange between populations; and the long distance range shifts of species, such as in response to fluctuations in climate.

Conservation status rank

Conservation status ranks estimate a species risk of elimination. Status ranks are based on a 1 to 5 scale, 1 denoting a species is critically imperiled and 5 denoting a species is secure. Species status is assessed at three geographic scales: global (G), national (N), and state/province (S). The overall status of a species is denoted by its G-rank, while its condition in a particular country is denoted by its N-rank, and its condition in a particular state/province is denoted by its S-rank. Subspecies, varieties, or any other designation below the level of a global ranked species, receive a T-rank that denotes their conservation status. A species may receive a B- or N-rank that

refers to the conservation status of the breeding (B) or nonbreeding (N) population in a particular nation or state/province. (NatureServe 2017)

Conservation strategy

A conservation strategy is a management scheme or plan to conserve or sustain particular ecosystem elements such as rare species or habitats. An example of a conservation strategy is to survey for potential habitats during project planning in order to protect known populations of a rare species through project-specific measures.

Constraint

A qualification of the minimum or maximum amount of an output or cost that could be produced or incurred in a given time period.

Construction

The displacement of vegetation, soil, rock, and the installation of human-made structures involved in the process of building a complete, permanent road facility. The activities occur at a location or corridor that is not currently occupied by a road.

Contain

To surround a fire and any spot fires with a control line as needed, which can reasonably be expected to check the fire's spread under prevailing conditions.

Coppice (Coppice with standards)

Coppice is a vegetation reproduction method with clear felling or clearcutting. Clear felling stimulates sprouting from the residual roots. Standards are selected overstory trees reserved for a longer rotation at the time each crop of coppice material is cut.

Corridor (utility or right-of-way)

A linear strip of land defined for the present or future location of transportation or utility right-of-way within its boundaries.

Council on Environmental Quality

An advisory council to the President established by the National Environmental Policy Act of 1969. It reviews Federal programs for their effects on the environment, conducts environmental studies, and advises the President on environmental matters.

Cover type

The dominant vegetation in an area—for example, aspen, ponderosa pine, or sedges.

Critical habitat

For a threatened or endangered species, (1) the specific areas within the geographical area occupied by the species, at the time it is listed under the Endangered Species Act, on which are found those physical or biological features (a) essential to the conservation of the species, and (b) which may require species management considerations or protection; and (2) specific areas outside of the geographical area occupied by the species at the time it is listed, upon a determination by the Secretary that such areas are essential for the conservation of the species. Critical habitat is designated through rule making by the Secretary of the Interior or Commerce.

Crown

The upper part of a tree or other woody plant carrying the main branch system and foliage.

Culmination of mean annual increment

Mean annual increment of growth and culmination of mean annual increment of growth. Mean annual increment of growth is the total increment of increase of volume of a stand (standing crop plus thinnings) up to a given age divided by that age. Culmination of mean annual increment of growth is the age in the growth cycle of an even-aged stand at which the average annual rate of increase of volume is at a maximum. In land management plans, mean annual increment is expressed in cubic measure and is based on the expected growth of stands, according to intensities and utilization guidelines in the plan.

Cultural landscapes

Cultural resources that represent the combined works of nature and humans.

Cultural resource inventory

The record of cultural resources known to occur within a defined geographic area. An inventory includes a compilation and synthesis of existing information and field surveys for evidence of past human activity. In areas where the ground surface is difficult to see, field survey may include subsurface probing to determine the presence or absence of cultural material.

Cultural resources

An object or definite location of human activity, occupation, or use identifiable through field survey, historical documentation, or oral evidence. Cultural resources are prehistoric, historic, archaeological, or architectural sites, structures, places, or objects and traditional cultural properties. Cultural resources include the entire spectrum of resources for which the Heritage Program is responsible, from artifacts to cultural landscapes, without regard to eligibility for listing on the National Register of Historic Places.

Cumulative impacts

Impacts on the environment that result from the incremental impact of an action when added to other past, present, and reasonably foreseeable future actions regardless of what agency (Federal or non-Federal) or person undertakes such other actions. Cumulative impacts can result from individually minor but collectively significant actions taking place over a period of time.

D

Decadence

A process, condition, or period of deterioration or decline.

Deciduous

A deciduous tree or shrub sheds its leaves annually.

Decommission

Demolition, dismantling, removal, obliteration, and/or disposal of a deteriorated or otherwise unneeded asset or component, including necessary cleanup work. This action eliminates the deferred maintenance needs for the fixed asset. Decommissioning roads includes activities that result in the stabilization and restoration of unneeded roads to a more natural state.

Degradation

To wear down by erosion, especially through stream action.

Demand

The amount of an output that users are willing to take at a specified price, time period, and condition of sale.

Designated wilderness

Designated wilderness refers to any area of land designated by Congress as part of the National Wilderness Preservation System that was established by the Wilderness Act of 1964.

Desired condition

A description of specific social, economic, and/or ecological characteristics of the plan area, or a portion of the plan area, toward which management of the land and resources should be directed. (36 CFR 219.7(e)(1)(i))

Developed recreation

Recreation that occurs at man-made developments such as campgrounds, picnic grounds, resorts, ski areas, trailheads, etc. Facilities might include roads, parking lots, picnic tables, toilets, drinking water, ski lifts, and buildings. Campgrounds and picnic areas are examples of developed recreation sites.

Developed site

Developed recreation sites are relatively small, distinctly defined areas where facilities are provided for concentrated public use, such as campgrounds and picnic areas.

Diameter at breast height (dbh)

The diameter of a standing tree measured at a point 4 feet 6 inches from ground level on the uphill side.

Dispersed recreation

Outdoor recreation that is spread out over the land and in conjunction with roads, trails, and undeveloped waterways. Activities are typically day-use oriented and include hunting, fishing, boating, hiking, off-road vehicle use, cross-country skiing, motorbiking, and mountain climbing.

Disturbance

Any relatively discrete event in time that disrupts ecosystem, watershed, community, or species population structure and/or function and changes resources, substrate availability, or the physical environment.

Diversity

The distribution and abundance of different plant and animal communities and species within an area. This term is not synonymous with "biological diversity."

Down or downed

A tree or portion of a tree that is dead and lying on the ground.

Downed woody material or debris

Woody material, from any source, that is dead and lying on the forest floor.

E

Easement

A right afforded a person or agency to make limited use of another's real property for access or other purposes.

Ecological conditions

The biological and physical environment that can affect the diversity of plant and animal communities, the persistence of native species, and the productive capacity of ecological systems. Ecological conditions include habitat and other influences on species and the environment. Examples of ecological conditions include the abundance and distribution of aquatic and terrestrial habitats, connectivity, roads, and other structural developments, human uses, and invasive species.

Ecological integrity

The quality or condition of an ecosystem when its dominant ecological characteristics (for example, composition, structure, function, connectivity, and species composition and diversity) occur within the natural range of variation and can withstand and recover from most perturbations imposed by natural environmental dynamics or human influences.

Ecological process

The actions or events that link organisms (including humans) and their environment, such as disturbance, successional development, nutrient cycling, carbon sequestration, productivity, and decay.

Ecological sustainability

The capability of ecosystems to maintain ecological integrity.

Economic sustainability

The capability of society to produce and consume or otherwise benefit from goods and services, including contributions to jobs and market and nonmarket benefits.

Ecosystem

A spatially explicit, relatively homogenous unit of the Earth that includes all interacting organisms and elements of the abiotic environment within its boundaries. Usually described in terms of its composition, structure, function, and connectivity.

Ecosystem services

The direct and indirect contributions of ecosystems to human well-being. They directly or indirectly support survival and quality of life. Ecosystem services can be categorized into types:

Provisioning services – products obtained from ecosystems such as food, fresh water, wood, fiber, genetic resources, and medicines.

Regulating services – benefits obtained from the regulation of ecosystem processes such as climate and natural hazards, water purification, waste management, pollination, and pest control.

Cultural services – nonmaterial benefits that people obtain from ecosystems such as spiritual enrichment, intellectual development, recreation, and aesthetic values.

Supporting services – ecosystem services that are necessary for the production of all other ecosystem services. Examples include biomass production, production of atmospheric oxygen, soil formation and retention, nutrient cycling, water cycling, and provisioning of habitat.

Edaphic

Of, produced by, or influenced by the soil; related or caused by particular soil conditions, as of texture or drainage, rather than by physiographic or climatic factors.

Edge

The place where plant communities meet or where successional stages or vegetative conditions within plant communities come together.

Endangered species

Any species that the Secretary of Interior or the Secretary of Commerce has determined is in danger of extinction throughout all or a significant portion of its range.

Endangered Species Act

Public Law 93-205, approved in 1973 and since amended, the Endangered Species Act provides for the conservation of ecosystems upon which threatened and endangered species of fish, wildlife, and plants depend.

Environmental Impact Statement (EIS)

A formal public document prepared to analyze the impacts on the environment of a proposed project or action and released for comment and review. It is prepared first in draft or review form and later in final form. An EIS must meet the requirements of the National Environmental Policy Act (NEPA), the Council on Environmental Quality (CEQ) guidelines, and directives of the agency responsible for the proposed project. An impact statement includes the following points: 1) the environmental impact of the proposed action, 2) any adverse impacts that cannot be avoided by the action, 3) the alternative courses of actions, 4) the relationships between local short-term use of the human environment and the maintenance and enhancement of long-term productivity, and 5) a description of the irreversible and irretrievable commitment of resources, which would occur if the action were accomplished.

Erosion

Detachment or movement of the land surface by water, wind, ice, gravity, or other geological activity. Accelerated erosion is much more rapid than normal, natural, geologic erosion, primarily as a result of the influence of activities of man, animals, or natural catastrophes.

Even-aged management

The application of a combination of actions that results in the creation of stands in which trees of essentially the same age grow together. Managed even-aged forests are characterized by a distribution of stands of varying ages (and therefore, tree sizes throughout the forested area). The difference in age between trees forming the main canopy level of a stand generally does not exceed 20 percent of the age of the stand at harvest rotation age. Regeneration in a particular stand is obtained during a short period at or near the time that a stand has reached the desired age or size for regeneration and is harvested. Clearcut, shelterwood, or seed-tree cutting methods produce even-aged stands (36 CFR 219.3).

Executive order

An order of regulation issued by the President or some administrative authority under his or her direction.

F

Facility

Structures needed to support the management, protection, and use of the national forests, including buildings, utility systems, dams, and other construction features. There are three types of facilities: recreation, administrative, and permittee.

Fen

An ancient wetland ecosystem dependent on nutrient-rich local or regional groundwater flow systems maintaining perennial soil saturation and supporting continuous organic soil (i.e., peat) accumulation. (FS-990A)

Fire management plan

A plan that identifies and integrates all wildland fire management and related activities within the context of approved land and resource management plans. It defines a program to manage wildland fires (wildfire and prescribed fire). The plan is supplemented by operational plans, including but not limited to preparedness plans, preplanned dispatch plans, prescribed fire burn plans, and prevention plans. Fire management plans assure that wildland fire management goals and components are coordinated.

Fire regime

Description of the patterns of fire occurrences, frequency, size, severity, and sometimes vegetation and fire effects as well, in a given area or ecosystem. A fire regime is a generalization based on fire histories at individual sites. Fire regimes typically are described as cycles because some parts of the histories are repeated, and the repetitions can be counted and measured, such as fire return interval.

Fire regime condition class

Fire regime condition class is an expression of the departure of the current condition from the historical fire regime. It is derived from the historical fire regime and the current fire severity. It is used as a proxy for the probability of severe fire effects, e.g., the loss of key ecosystem components—soil, vegetation, structure—or alteration of key ecosystem processes—nutrient cycles, hydrologic regimes. The fire regime condition class is an index of ecosystem risks attributable to wildland fire.

Fire suppression

All the work and activities connected with fire-extinguishing operations, beginning with discovery and continuing until the fire is completely extinguished. The four fire suppression strategies are:

Monitor – the systematic process of observing, collecting, and recording fire-related data, particularly with regard to fuels, topography, weather, fire behavior, fire effects, smoke, and fire location. This may be done onsite, from a nearby or distant vantage point in person or using a sensor, or through remote sensing (aircraft or satellite).

Confine – to restrict a wildfire to a defined area by using a combination of natural and constructed barriers that will stop the spread of the fire under the prevailing and forecasted weather conditions until out. This means that “some action is or has been taken” (line construction, bucket drops, etc.) to suppress portions of the fire perimeter.

Point zone protection – Point or zone protection involves protecting specific points from the fire while not actively trying to line the entire fire edge. Points being protected may be communities, individual homes, communication sites, areas of high resource value, etc.

Full suppression – a strategy to put the fire out as efficiently and effectively as possible, while providing for firefighter and public safety. To complete a fireline around a fire to halt fire spread, and cool down all hot spots that are an immediate threat to the control line or outside the perimeter, until the lines can reasonably be expected to hold under foreseeable conditions. Synonymous with “full perimeter containment” and “control.”

Floodplain

The flat area of land adjacent to a river channel that is composed of unconsolidated sediments (alluvium) deposited when the river overflows its banks at flood stages.

Focal species

A small subset of species whose status infers the integrity of the large ecological system to which it belongs and provides meaningful information regarding the effectiveness of the plan in maintaining or restoring the ecological conditions to maintain the diversity of plant and animal communities in the plan area.

Forage

All browse and herbaceous foods that are available to grazing animals.

Forb

Any herbaceous flowering plant other than grasses.

Foreground

A term used in scenery management to describe the portions of a view between the observer and as far as one-quarter to one-half mile distant.

Forested land

Land at least 10 percent occupied by forest trees of any size, or formed having had such tree cover and not currently developed for nonforest use. Lands developed for nonforest use include areas for crops, improved pasture, residential or administrative areas, improved roads of any width, and adjoining road clearing and power line clearing of any width.

Forest health

The perceived condition of a forest derived from concerns about such factors as its age, structure, composition, function, and vigor, presence of unusual levels of insects and diseases, and resilience to disturbance.

Forest plan

Source of management direction for an individual national forest that specifies activity and output levels for a period of time. Management direction in the plan is based on the issues identified at the time of the plan’s development.

Forest plan revision

The process for revising a forest plan includes preliminary identification of the need to change the plan based on the assessment, development of a proposed plan, consideration of the environmental effects of the proposal and preparation of a draft environmental impact statement, providing an opportunity for the public to comment on the proposed plan, providing an opportunity for the public to object before the proposal is approved, and finally, approval of the plan and preparation of the final environmental impact statement.

Fragmentation

A process that occurs wherever a large, contiguous habitat is transformed into smaller patches that are isolated from each other by a landscape matrix unlike the original. This matrix can differ from the original habitat in either composition or structure. The crucial point is that it functions as either a partial or total barrier to dispersal for species associated with the original habitat. A clear threat to population viability occurs when fragmentation isolates pairs and populations, as opposed to fragmentation within the home range of individual pairs.

Fuel

Organic material that will support the start and spread of a fire: duff, litter, grass, weeds, forbs, brush, trees, and dead wood materials.

Fuel load

The amount of fuel present expressed quantitatively in terms of weight of fuel per unit area. This may be available (consumable) fuel or total fuel and is typically dry weight.

Fuels management

The manipulation of vegetation for the purpose of changing the characteristics of a fire as it burns.

Fuels reduction treatment

Manipulation or removal of fuels to lessen potential damage and resistance to control (includes mechanical and prescribed fire treatments). Fuels reduction treatments result in a change in the amount, configuration, and spacing of live and dead vegetation, with the purpose of creating conditions that result in more manageable fire behavior and reduced severity during wildfires.

Fuelwood

Round, split, or sawed wood of general refuse material, which is cut into short lengths for burning as fuel.

G

Game species

Any species of wildlife or fish for which hunting seasons and bag limits have been established, and are normally harvested by hunters and fishermen.

General Mining Act of 1872

Provides for claiming and gaining title to locatable minerals on public lands. Also referred to as the "general mining laws" or "mining laws."

Geographic area

A spatially contiguous land area identified within the planning area. A geographic area may overlap with management areas.

Geographic information system (GIS)

An information processing technology to input, store, manipulate, analyze, and display spatial resource data to support the decision-making processes of an organization. Generally, an electronic medium for processing map information.

Goal

A concise statement that describes a desired condition to be achieved sometime in the future. It is normally expressed in broad, general terms, and is timeless in that it has no specific date by which it is to be completed. Goal statements form the principal basis from which objectives are developed. (36 CFR 219.3)

Grass/forb

An early forest successional stage during which grasses and forbs are the dominant vegetation.

Groundwater

Water within the earth that supplies wells and springs. Specifically, water in the zone of saturation where all openings in soil and rock are filled. The upper surface level forms the water table.

Group selection

A method of regenerating uneven-aged stands in which trees are cut, in small groups, and new age classes are established. The width of groups is commonly approximately twice the height of the mature trees, with small openings providing suitable microclimates for shade-tolerant tree species to regenerate, and the larger openings providing suitable microclimates for more shade-intolerant tree species to regenerate.

Guideline

A constraint on project or activity decision-making that allows for departure from its terms, so long as the purpose of the guideline is met. Guidelines are intended to help achieve or maintain a desired condition or conditions, avoid or mitigate undesirable effects, or meet applicable legal requirements.

H

Habitat

The natural environment of a plant or animal. In wildlife management, the major components of habitat are considered to be food, water, cover, and living space.

Healthy ecosystem

An ecosystem in which structure and functions allow the maintenance of biological diversity, biotic integrity, and ecological processes over time.

Herbaceous

Of, denoting, or relating to herbs.

Heritage resources

Buildings, sites, areas, architecture, memorials, and objects having scientific, prehistoric, historic, or social values.

Hibernacula

Habitat niches where certain animals, e.g., bats, over-winter, such as caves, mines, tree hollows, or loose bark.

Historic property

Any prehistoric or historic district, site, building, structure, or object included in, or eligible for inclusion in, the National Register of Historic Places. This term includes artifacts, records, and remains that are related to and located within such properties. The term also includes properties of traditional religious and cultural importance to an Indian tribe or Native Hawaiian organization and that meet the National Register criteria.

Hydrologic unit code

A sequence of numbers that identifies a hydrologic feature like a river, river reach, lake, or area like a drainage basin, watershed, or catchment.

I

Ignition

The initiation of combustion.

IMPLAN

Acronym for the computer model used as an analysis tool to display social effects of various alternatives developed during the land management planning effort.

Indicator species

Species identified in the planning process that are used to monitor the effects of planned management activities on viable populations of wildlife and fish species, including those species that are socially or economically important.

INFRA

INFRA is a collection of web-based data entry forms, reporting tools, and GIS tools that enable the Forest Service to manage and report accurate information about the inventory of constructed features and land units as well as the permits sold to the public and to partners.

Infrastructure

The facilities, utilities, and transportation system needed to meet public and administrative needs for operation, e.g., buildings, roads, and power supplies.

Inholding

Land within the proclaimed boundaries of a national forest that is owned by a private citizen, an organization, or an agency.

Instream flow

The volume of surface water in a stream system passing a given point at a given time.

Interdisciplinary team

A group of individuals with different training assembled to solve a problem or perform a task. The team is assembled out of recognition that no one scientific discipline is sufficiently broad enough to adequately solve the problem.

Intermittent stream

A stream or reach of stream channel that flows, in its natural condition, only during certain times of the year or in several years. Characterized by interspersed, permanent surface water areas

containing aquatic flora and fauna adapted to the relatively harsh environmental conditions found in these types of environments (Briggs 1996).

Interpretation

Explaining the meaning or significance of something.

Invasive species

Native species are those that have occurred, now occur, or may occur in a given area as a result of natural processes.

Exotic (a.k.a. nonnative, foreign, or alien) species are those that live outside their native range and arrived there by human activity, either deliberate or accidental.

Invasive species have the ability to thrive and spread aggressively outside their natural range. They affect both aquatic and terrestrial areas and can be plants, vertebrates, invertebrates, and pathogens.

Invertebrate

An animal lacking a spinal column.

Irretrievable

Applies to losses of production, harvest, or uses of renewable natural resources. For example, some or all of the timber production from an area is irretrievably lost while an area is used as a road surface. If the use is changed, timber production can be resumed. The production lost is irretrievable, but the action is not irreversible.

Irreversible

Applies primarily to the use of nonrenewable resources, such as minerals or cultural resources, or to those factors that are renewable only over long time spans, such as soil productivity. Irreversible also includes loss of future options.

L

Land exchange

The conveyance of non-Federal land or interests to the United States in exchange for National Forest System land or interests in land.

Landscape

A defined area irrespective of ownership or other artificial boundaries, such as a spatial mosaic of terrestrial and aquatic ecosystems, landforms, and plant communities, repeated in similar form throughout such a defined area.

Landscape scale

A heterogeneous land area composed of a cluster of interacting ecosystems that are repeated in similar form throughout. Landscapes vary in size, from many thousands of acres to only a few kilometers in diameter.

Landslide

The moderately rapid to rapid downslope movement of soil and rock that may or may not be water-saturated.

Late-successional forest

A stage of forest succession where the majority of trees are mature or overmature.

Large woody debris

Large pieces of relatively stable woody material located within the bankfull channel and appearing to influence bankfull flows.

Single – A single piece that has a length equal to or greater than 3 meters or two-thirds of the wetted stream width and 10 centimeters in diameter one-third of the way from the base.

Aggregate – Two or more clumped pieces, each of which qualifies as a single piece.

Rootwad – Rootmass or boles attached to a log less than 3 meters in length.

Leasable minerals

Those minerals or materials designated as leasable under the Minerals Leasing Act of 1920. They include coal, phosphate, asphalt, sulfur, potassium, sodium minerals, and oil and gas. Geothermal resources are also leasable under the Geothermal Steam Act of 1970.

Lease

A legal contract that provides for the right to develop and produce oil and gas resources for a specific period of time under certain agreed-upon terms and conditions.

Leave tree

A tree marked to be left standing in an area where it would otherwise be felled.

Litter

A surface layer of loose organic debris, consisting of freshly fallen or slightly decomposed organic materials.

Locatable minerals

Minerals or materials subject to claim and development under the Mining Law of 1872, as amended. Generally includes metallic minerals such as gold and silver, and other materials not subject to lease or sale, like some bentonites, limestone, talc, some zeolites, etc.

Lynx analysis unit

An area of at least the size used by an individual lynx, from about 25 to 50 square miles.

M

M

1,000 units (thousands)

Maintenance

The upkeep of the entire Forest Development Transportation Facility, including surfaces and shoulders, parking and side areas, structures, and such traffic control devices as are necessary for its safe and efficient use (36 CFR 212.1). Maintenance is not for the purpose of upgrading a facility, but to bring it to the originally constructed or subsequently reconstructed conditions.

Maintenance level

The level of service provided by, and maintenance required for, a specific road. For more information, see the entry for **road maintenance level**.

Management action or activity

An action or activity humans impose on a landscape for the purpose of managing natural resources.

Management approach

Management approaches describe the principal strategies and program priorities the responsible official intends to employ to carry out projects and activities developed under the plan. They can convey a sense of priority and focus among objectives and likely management emphasis. They are optional plan content.

Management area

A land area identified within the planning area that has the same set of applicable plan components. A management area does not have to be spatially contiguous.

Management concern

An issue, problem, or a condition that constrains the range of management practices identified by the Forest Service in the planning process. (36 CFR 219.3)

Management direction

A statement of multiple-use and other goals and objectives, the associated management prescriptions, and standards and guidelines for attaining them. (36 CFR 219.3)

Management prescription

Management practices and intensity selected and scheduled for application on a specific area to attain multiple use and other goals and objectives. (36 CFR 219.3)

Mass movement

Downslope unit movement of a portion of the land surface. A single landslide of the gradual, simultaneous downhill movement of the entire mass of loose earth material on a slope face.

MBF

One thousand board feet of timber.

Mechanical treatment

Mechanical vegetation treatment is any activity undertaken to modify the existing condition of the vegetation accomplished with mechanical equipment.

Mechanized

Wheeled forms of transportation, including nonmotorized carts, wheelbarrows, bicycles, and any other nonmotorized, wheeled vehicle.

Memorandum of understanding

A legal agreement between the Forest Service and other agencies resulting from consultation between agencies that states specific measures the agencies will follow to accomplish a large or complex project. A memorandum of understanding is not a fund-obligating document.

Metapopulation

A group of populations separated by space but that consist of the same species. These spatially separated populations interact as individual members move from one population to another.

Mineral

Locatable – Hard rock minerals that are mined and processed for the recovery of metals. They may include certain nonmetallic minerals and uncommon varieties of mineral materials such as valuable and distinctive deposits of limestone or silica.

Leasable – Coal, oil, gas, phosphate, sodium, potassium, oil shale, sulfur, and geothermal resources.

Salable (or mineral materials) – A collective term to describe common varieties of sand, gravel, stone, pumice, cinders, clay, and other similar materials. Common varieties do not include deposits of those materials that may be locatable. In general, these minerals are widely spread and are relatively low in unit value. They are generally used for construction materials and for road building purposes.

Mineral entry

Claiming public lands administered by the Forest Service under the Mining Law of 1872 for the purpose of exploiting minerals. May also refer to mineral exploration and development under the mineral leasing laws and Mineral Sale Act of 1947.

Mineral withdrawal

The exclusion of locatable mineral deposits from mineral entry on areas required for administrative sites by the Forest Service, and other areas highly valued by the public. Public lands withdrawn from entry under the General Mining Laws and/or the Mineral Leasing Laws.

Minimum stocking standard

The stocking that must be present on regenerated areas before a new stand can be considered established. Minimum stocking is generally stated in terms of number of trees per acre and tree-stem heights by species.

Mining

Extraction of valuable minerals or other geological materials from the earth.

Mitigate, or mitigation

To avoid, minimize, rectify, reduce, or compensate the adverse environmental impacts associated with an action.

Modification

A description in scenic quality objectives when activities may dominate, but must use naturally established form, color, and texture. These areas should appear natural when viewed in the background.

Monitoring

A systematic process of collecting information to evaluate effects of actions or changes in conditions or relationships.

Montane

Of or inhabiting mountainous country.

Mosaic

The intermingling of plant communities and their successional stages in such a manner as to give the impression of an interwoven design.

Motorized equipment

A machine that uses a motor, engine, or other nonliving power source. This includes, but is not limited to, machines such as chain saws, aircraft, snowmobiles, generators, motorboats, and motor vehicles. It does not include small battery or gas powered hand carried devices such as shavers, wristwatches, flashlights, cameras, stoves, or other similar small equipment.

Motorized route

A National Forest System road or trail that is designated for motorized use on a motor vehicle use map pursuant to 36 CFR 212.51.

Motorized use

The designation of roads, trails, and areas that are open to motor vehicle use as specified in the Federal Register / Vol. 70, No. 216 / Wednesday, November 9, 2005 / 36 CFR Parts 212, 251, 261, Travel Management; Designated Routes and Areas for Motor Vehicle Use; Final Rule.

Motor vehicle use map

A map reflecting designated roads, trails, and areas open to motorized public use on an administrative unit or a ranger district of the National Forest System.

Multiple use

The management of all the various renewable surface resources of the national forests so that they are used in the combination that will best meet the needs of the American people; making the most judicious use of the land for some or all of these resources or related services over areas large enough to provide sufficient latitude for periodic adjustments in the use to conform to changing needs and conditions; that some lands will be used for less than all of the resources; and harmonious and coordinated management of the various resources, each with the other, without impairment of the productivity of the land, with consideration being given to the relative values of the various resources, and not necessarily the combination of uses that will give the greatest dollar return or the greatest unit output. (36 CFR 219.19)

N

National Environmental Policy Act (NEPA)

A 1969 act declaring a national policy that encourages productive and enjoyable harmony between humankind and the environment, to promote efforts that will prevent or eliminate damage to the environment and biosphere and stimulate the health and welfare of humanity, to enrich the understanding of the ecological systems and natural resources important to the nation, and to establish a Council on Environmental Quality. (The Principal Laws Relating to Forest Service Activities, Agriculture Handbook No. 453, USDA, Forest Service, 359 pp.) The NEPA process is an interdisciplinary process that concentrates decision-making around issues, concerns, alternatives, and the effects of alternatives on the environment. NEPA regulations are set out in Forest Service Handbook 1909.15.

National Forest Management Act

A law passed in 1976 as an amendment to the Forest and Rangeland Renewable Resources Planning Act, requiring the preparation of regional guides and forest plans, and the preparation of regulations to guide that development.

National Forest System lands

All national forest lands reserved or withdrawn from the public domain of the United States, all national forest lands acquired through purchase, exchange, donation, or other means, the national grasslands and land utilization projects administered under title III of the Bankhead-Jones Farm Tenant Act (50 Stat. 525, 7 USC 1010-1012), and other lands, waters, or interests therein which are administered by the Forest Service or are designated for administration through the Forest Service as a part of the system. 16 USC 1609(a).

National Historic Preservation Act

Extends the policy in the Historic Sites Act to State and local historical sites as well as those of national significance, expands the National Register of Historic Places, establishes the Advisory Council on Historic Preservation and the State Historic Preservation Officers, and requires agencies to designate Federal Preservation Officers. Section 106 directs all Federal agencies to take into account the effects of their undertakings (actions, financial support, and authorizations) on historic properties included in or eligible for the National Register. Section 110 establishes inventory, nomination, protection, and preservation responsibilities for federally owned historic properties.

National Register of Historic Places

The Nation's official list of cultural resources worthy of preservation. Authorized under the National Historic Preservation Act of 1966, the National Register is part of a national program to coordinate and support public and private efforts to identify, evaluate, and protect our historic and archaeological resources. Properties listed in the Register include districts, sites, buildings, structures, and objects that are significant in American history, architecture, archaeology, engineering, and culture. The National Register is administered by the National Park Service.

Native American Graves Protection and Repatriation Act (NAGPRA)

Provides a process for museums and Federal agencies to return certain Native American cultural items—human remains, funerary objects, sacred objects, or objects of cultural patrimony—to lineal descendants, and culturally affiliated Indian tribes and Native Hawaiian organizations. NAGPRA includes provisions for unclaimed and culturally unidentifiable Native American cultural items, intentional excavation, and unanticipated discovery of Native American cultural items on Federal and Tribal lands, and penalties for noncompliance and illegal trafficking. The Act requires agencies and museums to identify holdings of such remains and objects and to work with appropriate Native American groups toward their repatriation. Permits for the excavation and/or removal of “cultural items” protected by the Act require Tribal consultation, as do discoveries of “cultural items” made during activities on Federal or Tribal lands.

Natural range of variation

The variation of ecological characteristics and processes over scales of time and space that are appropriate for a given management application. In contrast to the generality of historical ecology, the natural range of variation concept focuses on a distilled subset of past ecological knowledge developed for use by resource managers; it represents an elicited effort to incorporate a past perspective into management and conservation decisions. The pre-European influenced reference period considered should be sufficiently long, often several centuries', to include the full range of variation produced by dominant natural disturbance regimes such as fire and flooding and should also include short-term variation and cycles in climate. The natural range of variation is a tool for assessing the ecological integrity and does not necessarily constitute a management

target or desired condition. The natural range of variation can help identify key structural, functional, compositional, and connectivity characteristics, for which plan components may be important for either maintenance or restoration of such ecological conditions.

Nonmotorized activities

Activities that do not incorporate the use of a motor, engine, or other nonliving power source. This includes such machines as aircraft, hovercraft, motorboats, automobiles, motor bikes, snowmobiles, bulldozers, chainsaws, rock drills, and generators.

Notice of intent

Written notice to announce the Forest Service's intent to begin forest plan revision and prepare an environmental impact statement.

O

Objective

A concise, measureable, and time-specific statement of a desired rate of progress toward a desired condition or conditions. Objectives should be based on reasonable foreseeable budgets.

Old forest

The overstory is dominated by late seral or climax species of a certain age and size, and has other characteristics such as snags, canopy layers, downed woody material, and trees with rotten, dead, or broken tops.

Openings

Meadows, clearcuts, and other areas of vegetation that do not provide cover.

Oshá

Oshá, also known as osha (*Ligusticum porteri*), is a perennial herb found in parts of the Rocky Mountains and northern Mexico, especially in the southwestern United States. Oshá is strictly a mountain plant that requires partial shade. It is most commonly found in deep, moist soils rich in organic material.

Outputs

The goods, end products, or services that are purchased, consumed, or used directly by people. Goods, services, products, and concerns produced by activities that are measurable and capable of being used to determine the effectiveness of programs and activities in meeting objectives.

Overstory

That portion of a plant community consisting of the taller plants on the site; the forest or woodland canopy.

Over-the-snow vehicle

Vehicles that are designed for use over snow and that run on a track or tracks and/or a ski or skis, while in use over snow.

P

Party

A group of people readily recognized as traveling together.

Peak flow

The highest discharge of water recorded over a specified period of time at a given stream location. Often thought of in terms of spring snowmelt.

Perennial stream

A stream or reach of a channel that flows continuously or nearly so throughout the year and whose upper surface is generally lower than the top of the zone of saturation in areas adjacent to the stream.

Persons at one time (PAOT)

A recreational capacity measurement term indicating the number of people who can use a facility or area at one time. Equal to five persons per family unit for camp and picnic grounds.

Planned ignition

The intentional initiation of a wildland fire by a hand-held, mechanical, or aerial device where the distance and timing between ignition lines or points and the sequence of igniting them is determined by environmental conditions (weather, fuel, topography), firing technique, and other factors that influence fire behavior and fire effects (see prescribed fire).

Planning period

The lifetime of the plan. The time interval within the planning horizon that is used to show incremental changes in yields, costs, effects, and benefits.

Planning Rule

The 2012 Planning Rule provides the overarching framework for individual forests and grasslands in the National Forest System to use in developing, amending, and revising land management plans, which are also known as forest plans. The planning rule identifies a framework for revising land management plans that consists of three phases: assessment, plan revision, and monitoring.

The Forest Service is required by statute to have a national planning rule: the Forest and Rangeland Renewable Resources Planning Act of 1974, as amended by the National Forest Management Act of 1976, requires the Secretary of Agriculture to issue regulations under the principles of the Multiple-Use Sustained-Yield Act of 1960 for the development and revision of land management plans.

Plant community

Any assemblage of plants that occur in the same area and form a distinct ecological unit.

Pole or pole timber

Smaller diameter trees larger than saplings that do not meet the specifications for sawtimber.

Population viability

Ability of a population to sustain itself.

Pre-commercial thinning

Cutting non-sawtimber trees to meet a variety of management objectives including improving tree vigor, stand species composition, wildlife habitat, or reducing fuels.

Prescribed fire

A wildland fire originating from a planned ignition to meet specific objectives identified in a written, approved, prescribed fire plan for which National Environmental Policy Act requirements (where applicable) have been met prior to ignition (see planned ignition).

Prescription

Management practices selected and scheduled for application on a specific area to attain goals and objectives.

Preservation

A scenic condition objective in which only ecological changes are allowed. Management activities, except for low impact recreation facilities, are prohibited. This objective applies mainly to wilderness, primitive areas, and areas with special classifications.

Also, a technique of conservation that maintains the resource in or on the ground into perpetuity.

Primitive road

A road constructed with no regard for grade control or designed drainage, sometimes by merely repeatedly driving over an area. These roads are of single lane, typically with native surfacing, and sometimes usable with 4-wheel-drive vehicles only.

Priority heritage asset

A historic property that meets the criteria for a priority heritage asset with a current documented condition assessment and a recommended management use that realizes its agency and public benefit(s).

Productive

The ability of an area to provide goods and services and sustain ecological values.

Project record

The documents and materials considered in the making of a forest plan, plan revision, or plan amendment. Also known as the planning record.

Proposed action

In terms of the National Environmental Policy Act (NEPA), the project, activity, or decision that a Federal agency intends to implement or undertake, which is the subject of an environmental impact statement or environmental assessment.

Public access

Generally refers to a road or trail route over which a public agency claims right-of-way for public use.

Public participation

Meetings, conferences, seminars, workshops, tours, written comments, responses to survey questionnaires, and similar activities designed and held to obtain comments from the public about Forest Service planning.

Proposed species

Any species that is proposed by the U.S. Fish and Wildlife Service or National Marine Fisheries Service to be listed as threatened or endangered under the Endangered Species Act.

R

Range allotment

Rangelands are managed as allotments and pastures. An allotment is a designated area of land available for permitted livestock grazing. Grazing is authorized for a specified number and kind of livestock. It is the basic land unit used to facilitate management of the range resource on National Forest System lands administered by the Forest Service.

Range condition

The state of the plant community on a range site in relation to the potential natural community or the desired plant community for that site. It is typically rated in the general category of satisfactory or unsatisfactory.

Rangeland

Land on which vegetation is predominantly grasses, forbs, or shrubs suitable for grazing or browsing. Rangeland may include some forest and barren land.

Ranger district

Administrative subdivision of a national forest, supervised by a district ranger who reports to the forest supervisor.

Reclamation

Returning disturbed lands to a form and productivity that will be ecologically balanced and in conformity with a predetermined land management plan.

Reconstruction

Activities performed on an existing road or other facility to restore it to a specified standard.

Recreation opportunity spectrum (ROS)

Allocations that identify a variety of recreation experience opportunities categorized into six classes on a scale from primitive to urban. Each class is defined in terms of the degree to which it satisfies certain recreation experience needs, based on the extent to which the natural environment has been modified, the type of facilities provided, the degree of outdoor skills needed to enjoy the area, and the relative density of recreation use. The six classes are:

Primitive – Very high probability of experiencing solitude, self-reliance, and challenge; natural landscape with natural processes allowed to function; very low interaction between users; restrictions and controls not evident; access limited; generally cross-country travel.

Semiprimitive nonmotorized – Good probability of experiencing solitude, self-reliance, and challenges; natural primitive landscapes; some evidence of users; minimum subtle controls; access by low standard trails and cross-country travel; natural processes allowed to function with subtle vegetative alterations. Managed for nonmotorized use.

Semiprimitive motorized – Moderate probability for self-reliance and experiencing solitude away from travelways (roads/trails); risk associated with motorized equipment;

predominantly natural landscapes; low concentration of users and interaction by users along travelways; minimum but subtle restrictions; vegetative alterations visually blend with the landscape. Existing routes are designated for off highway vehicles and other high clearance vehicles. Mountain bikes and other mechanized equipment are present.

Roaded natural – Low opportunity to avoid other users; little opportunity for risk or challenge; substantial modified landscapes; moderate evidence and interaction of users; controls and restrictions present; variety of motorized users and access; various shapes and sizes of vegetative alterations that blend with the landscape. The road system is well defined and can accommodate sedan travel.

Rural – Good opportunity to affiliate with others; facilities important; self-reliance of little importance; altered landscapes but attractive; high interaction among users; obvious and prevalent controls; extensive motorized use; vegetation maintained. Rural settings represent most developed recreation sites.

Urban – Opportunity to affiliate with others important; outdoor skills associated with competitive events; landscapes extensively changed with dominant structures; large numbers of user interactions; intensive controls are numerous; motorized use prevalent, including mass transit; vegetation planted and maintained. Highly developed ski areas and resorts are examples of a typical urban setting on National Forest lands.

Recreation setting

The social, managerial, and physical attributes of a place that, when combined, provide a distinct set of recreation opportunities. The Forest Service uses the recreation opportunity spectrum to define recreation settings and categorize them into six distinct classes: primitive, semiprimitive nonmotorized, semiprimitive motorized, roaded natural, rural, and urban.

Recreation site

A defined, public recreation area. The Forest Service uses two categories for recreation sites: dispersed and developed. Both types may have improvements needed to protect resources such as signs, road closure devices, bear resistant food storage devices, and/or sanitation facilities. Some recreation sites are designed and managed for overnight use and some are designed and managed for day-use only (e.g., interpretive signs at roadside pull-outs, trailheads at roadside pull-outs or at road closures, picnic areas or boat launches that are closed at night, ski areas that do not have overnight lodging).

Developed sites have agency improvements made out of manmade materials that are intended to provide for public recreation and user comfort/convenience. Examples on National Forest Service lands include, but are not limited to: ski areas, campgrounds, sites with cabins, huts, lodges, recreation residences, visitor centers, and trailheads.

Dispersed sites have minimal to no agency improvements made out of manmade materials. Dispersed sites may include outfitter camps or other primitive camping spots along a road, trail, or water body, or at a road closure.

Reforestation

Management activities used to increase or accelerate the establishment of forest cover to meet resource objectives.

Regeneration

Natural – A group or stand of young trees created from germination of seeds from trees on the site or sprouting from trees on the site.

Artificial – A group or stand of young trees created by direct seeding or by planting seedlings or cuttings.

Regeneration harvest

Timber harvest system intended to create a new age class (see regeneration method).

Regeneration method

A cutting procedure by which a new age class is created. The major methods are clearcutting, seed-tree, shelterwood, selection, and coppice. Regeneration methods are grouped into four categories: coppice, even-aged, two-aged, and uneven-aged.

Region

An administrative unit within the National Forest System based on geographical location. Each of the nine Forest Service regional offices is supervised by a regional forester. The Rio Grande National Forest is part of the Rocky Mountain Region, also known as Region 2. The Rocky Mountain Regional Office is strategically located in Lakewood, Colorado, between the foothills of the Rocky Mountains and downtown Denver.

Rehabilitation

- 1) Actions taken to protect or enhance site productivity, water quality, or other values for a short period of time.
- 2) A short-term scenic condition objective used to restore landscapes containing undesirable visual or other resource impacts to the desired scenic or other acceptable quality level.

Research natural area (RNA)

Designated areas of land established by the Chief of the Forest Service under 36 CFR 251.23 for research and educational purposes and to typify important forest and range types of the Forest, as well as other plant communities that have special or unique characteristics of scientific interest and importance.

Resilience

The ability of a system to recover from disturbance in the event that the disturbance exceeds the capacity of the system to resist changing. The concepts of resistance and resilience are jointly referred to as resilience.

Resistance

The capacity of ecosystems to tolerate disturbances without exhibiting significant change in structure and composition. The concepts of resistance and resilience are jointly referred to as resilience.

Responsible official

The Forest Service employee who has the delegated authority to make a specific decision. For example, the regional forester will select the preferred alternative for the forest plan.

Restore/restoration

Assisting the recovery of an ecosystem that has been degraded, damaged, or destroyed. It is an intentional activity that initiates or accelerates the recovery of an ecosystem with respect to its health, integrity, and sustainability.

Revegetation

The reestablishment and development of a plant cover. This may take place naturally through the reproductive processes of the existing flora or artificially through the direct action of reforestation or reseedling.

Right-of-way

Land authorized to be used or occupied for the construction, operation, maintenance, and termination of a project or facility passing over, upon, under, or through such land (36 CFR 251.51). The privilege that one person or persons particularly described may have of passing over the land of another in some particular line (FSH 2709.12 05 10).

Riparian area

A riparian ecosystem is a transition area between the aquatic ecosystem and the adjacent terrestrial ecosystem, identified by soil characteristics or distinctive vegetation communities that require free or unbound water (FS-990A). Riparian areas may be associated with lakes, reservoirs, estuaries, hot springs, marshes, streams, bogs, wet meadows, and intermittent or permanent streams where free and unbound water is available. This habitat is transitional between true bottomland wetlands and upland terrestrial habitats, and while associated with watercourses, may extend inland or upland for considerable distances.

Road

A motor vehicle route more than 50 inches wide, unless identified and managed as a trail.

Road construction

Activity that results in the addition of system or temporary road miles.

Road corridor

A strip of land between two points used by a road, or some future road whose exact location remains to be determined; generally with an indefinite width.

Road density

The number of road miles per square mile of land (i.e., 1 mile/square mile is 1 mile of road within a given square mile). This includes the total density of primary, secondary, and primitive roads.

Road maintenance level

Defines the level of service provided by, and maintenance required for, a specific road, consistent with road management objectives and maintenance criteria (FSH 7709.58, section 12.3). The maintenance levels are:

Maintenance level 1 – Intermittent service roads during the time they are closed to vehicular traffic. The closure period is 1 year or longer. Basic custodial maintenance is performed.

Maintenance level 2 – Roads open for use by high-clearance vehicles, minor traffic, no warning signs. Passenger car traffic is not a consideration.

Maintenance level 3 – Roads open and maintained for a prudent driver in a standard passenger car, low speed travel, warning signs provided. User comfort and convenience are not considered priorities.

Maintenance level 4 – Roads that provide a moderate degree of user comfort and convenience at moderate travel speeds, single or double lane, aggregate or paved surface.

Maintenance level 5 – Roads that provide a high degree of user comfort and convenience, single or double lane, generally paved surface, or aggregate-surfaced with dust abatement.

Rocky Mountain Region

The Forest Service organizational unit consisting of Colorado, Wyoming, South Dakota, Nebraska, and Kansas. Also called Region 2.

Rotation

The planned number of years between the formation of a generation of trees and its final cutting at a specified stage of maturity.

S

Sacred site

Per Executive Order 13007 – any specific, discrete, narrowly delineated location on Federal land that is identified by an Indian tribe, or Indian individual determined to be an appropriately authoritative representative of an Indian religion, as sacred by virtue of its established religious significance to, or ceremonial use by, an Indian religion; provided that the Indian tribe or appropriately authoritative representative of an Indian religion has informed the agency of the existence of such a site.

Salvage harvest

Removal of trees that are damaged, dead, or dying or being damaged by injurious agents other than competition between trees, such as insect and disease epidemics, wildfire, or storms, to recover timber before it loses its commercial value.

Sanitation harvest

Intermediate harvest to remove trees to improve stand health by stopping or reducing the actual or anticipated spread of insects and diseases.

Sawtimber

Larger diameter trees of sufficient size and quality to be manufactured into dimensional lumber products. Species and minimum diameters of sawtimber trees are established by regional timber markets.

Scale

The degree of resolution at which ecological processes, structures, and changes across space and time are observed and measured.

Scenic character

A combination of the physical, biological, and cultural images that gives an area its scenic identity and contributes to its sense of place; scenic character provides a frame of reference from which to determine scenic attractiveness and to measure scenic integrity.

Scenic condition

Measurable standard for scenic resource management based on the acceptable degree of alteration of the characteristic landscape. The acceptable degree of alternation for a given landscape is dictated by the area's scenic integrity objective.

Scenic integrity objective

Scenic integrity objectives serve as the desired conditions for the scenic resources and represent the degree of intactness of positive landscape attributes. Scenic integrity objectives are

categorized into five levels. The highest ratings are given to those landscapes where valued landscape attributes will appear complete with little or no visible deviations. Lower ratings are given to those landscapes where modifications will be more evident.

Very high – Landscape is intact with changes resulting primarily through natural processes and disturbance regimes.

High – Management activities are unnoticed and the landscape character appears unaltered.

Moderate – Management activities are noticeable but are subordinate to the landscape character. The landscape appears slightly altered.

Low – Management activities are evident and sometimes dominate the landscape but are designed to blend with surroundings by repeating line, form, color, and texture of valued landscape character attributes. The landscape appears altered.

Very low – Human activities of vegetation and landform alterations may dominate the original, natural landscape character but should appear as natural occurrences when viewed at background distances.

Scenic resource

The composite of basic physiographic features, patterns, and land-use effects that typify a land unit and influence the scenic appeal the unit may have for visitors.

Scoping

Determination of the significant issues to be addressed in an environmental impact statement.

Secure habitat

An area where wildlife retreat for safety when disturbance in their usual range is intensified, such as by logging activities or during hunting seasons.

Sedge

A grass-like plant with triangular stems and inconspicuous flowers, typically growing in wet ground.

Sediment

Material suspended in water or that has been deposited in streams and lakes.

Seedling/sapling

A forest successional stage in which trees are less than 5 inches in diameter.

Sensitive species

Those plant and animal species identified by the regional forester for which population viability is a concern as evidenced by significant current or predicted downward trends in a) population numbers or density, or b) habitat capability that would reduce a species' existing distribution.

Seral

The gradual supplanting of one community of plants by another, the sequence of communities being termed a sere and each stage seral (successional).

Seral stage

A phase in the sequential development of a climax community.

Shelterwood regeneration method with reserves

A regeneration method that creates a two-aged stand in which some or all of the shelter trees are retained to attain goals other than regeneration. The reserve trees generally comprise at least 10 percent of full stocking after the last harvest. Similarly, when the shelterwood regeneration method with reserves is used, there may be one or more harvest entries:

Shelterwood preparatory cut – An optional cut that enhances conditions for seed production and/or develops wind firmness for a future shelterwood establishment cut.

Shelterwood establishment cut – A cut to establish a moderated microenvironment, prepare the seed bed, and create a new age class.

Shelterwood removal with reserves cut – An optional removal cut that releases established regeneration from competition with shelter trees after they are no longer needed for shelter while retaining reserve trees to create a two-aged stand.

Shrub/seedling

A forest successional stage in which shrubs and seedling trees are the dominant vegetation.

Silvicultural treatment

A forest management activity such as thinning, harvesting, planting, pruning, prescribed burning, and site preparation that is designed to alter the establishment, growth, composition, health, and quality of forests and woodlands to meet the diverse needs and values of landowners and society on a sustainable basis.

Silviculture

The art and science of controlling the establishment, growth, composition, health, and quality of forests and woodlands to meet the diverse needs and values of landowners and society on a sustainable basis.

Single-tree selection regeneration method

An uneven-aged method where individual trees of all size classes are removed more or less uniformly throughout the stand, to promote growth of remaining trees and to provide space for regeneration.

Skidding

Moving logs by sliding from stump to a collecting point.

Slash

Woody material left after logging, pruning, thinning, brush cutting, or other management activities and/or accumulating there as a result of storm, fire, or other damage.

Slope

The amount or degree of deviation from the horizontal or vertical.

Slope stability

The resistance of any inclined surface, as the wall of an open pit or cut, to failure by sliding or collapsing.

Snag

A standing, dead tree.

Social sustainability

The capability of society to support the network of relationships, traditions, culture, and activities that connects people to the land and to one another and supports vibrant communities.

Soft snag

A snag composed primarily of softwood in advanced stages of decay and deterioration, particularly in the sapwood portions.

Softwood

A conventional term for timber and trees belonging to the evergreen group, such as pine, spruce, and fir.

Soil productivity

The capacity of a soil to support the growth of specified plants, plant communities, or a sequence of plant communities. Soil productivity may be expressed in terms of volume or weight/unit, area/year, percentage of plant cover, or other measures of biomass accumulation.

Soil survey

The systematic examination, description, classification, and mapping of soils in an area.

Spatial

Referring to the distance, interval, or area between or within things.

Special area

Area designated by law (by Congress) or statute or through administrative process (by the Secretary of Agriculture or a Forest Service official).

Special interest area

A type of management area designated by the forest supervisor for scenic, geologic, botanic, zoologic, paleontological, archaeological, historic, scenic, or recreational values, or combinations of these values. A special interest area is a type of special area designated through administrative process. Special interest areas are addressed in Forest Service Manuals 2360 and 2372.

Special use authorization or permit

A permit, term permit, lease, or easement that allows occupancy, use, rights, or privileges of National Forest System land.

Species

Organisms that successfully reproduce among themselves and cannot reproduce successfully with other organisms.

Stand

A community of trees or other vegetation sufficiently uniform in composition, constitution, age, spatial arrangement, or condition to be distinguishable from adjacent communities that form a silvicultural or management entity.

Standards and guidelines (S&Gs)

Principles specifying conditions or levels of environmental quality to be achieved.

Standard – a mandatory constraint on project and activity decisionmaking, established to help achieve or maintain the desired condition or conditions, to avoid or mitigate undesirable effects, or to meet applicable legal requirements. (36 CFR 219.7(e)(1) (iii))

Standards are required criteria for the design of projects and activities. Design criteria are the technical design details to ensure that projects and activities maintain or move toward the desired conditions, or at least to ensure that projects and activities do not preclude their maintenance or attainment. Design criteria provide the sideboards (i.e., define the limits) for projects and activities. Examples of other sources of constraints on the design of projects and activities include congressional direction, oil and gas leasing stipulations, regulations, timber sale contract clauses, and special use authorization standard clauses. In addition, the responsible official may develop project-specific design criteria to constrain a project. A standard differs from a guideline in that a standard is strict design criterion, allowing no variation, whereas a guideline allows variation if the result would be equally effective.

Guideline – a constraint on project and activity decisionmaking that allows for departure from its terms, so long as the purpose of the guideline is met. Guidelines are established to help achieve or maintain a desired condition or conditions, to avoid or mitigate undesirable effects, or to meet applicable legal requirements. (36 CFR 219.7(e)(1) (iv))

Guidelines are similar to standards in that they are design criteria for projects and activities to help achieve the desired conditions and objectives, or at least to ensure that projects or activities do not foreclose their maintenance or attainment. Guidelines differ from standards in that they provide flexibility for compliance, while standards are concrete limitations.

Stewardship

Caring for the land and associated resources and passing healthy ecosystems to future generations.

Stipulation

A provision that modifies standard lease rights and is attached to and made a part of the lease.

Stocking

Live trees per acre needed to meet resource objectives as identified in the forest plan or through other management decisions.

Structural stage

Any of several developmental stages of tree stands described in terms of tree age or size and density. In general, the habitat structural stages developed by the Forest Service Rocky Mountain Region staff are used. This classification has different structural stages based on tree size (diameter at breast height) and tree canopy cover percent.

Structure

The horizontal and vertical physical elements of forests and grasslands and the spatial interrelationships of ecosystems.

Stubble

The basal portion of plants remaining after the top portion has been harvested. Also, the portion of the plants, principally grasses, remaining after grazing is completed.

Substrate

The rock material varying in size from boulders to silt that is found in the bed of rivers and streams.

Succession

The sequential process of long-term plant community change and development that occurs following a disturbance.

Successional stage (seral stage)

The relatively transitory communities that replace one another during development to potential natural community.

Suitability for grazing

The appropriateness of applying certain resource management practices to a particular area of land, as determined by an analysis of economic and environmental consequences, and the alternative uses forfeited. A unit of land may be suitable for a variety of individual or combined management practices. Suitability is a determination of the appropriateness of grazing on the capable lands based on economic and environmental consequences and consideration of alternative uses forfeited if grazing is allowed.

Suitability for timber production

Lands that may be suited for timber production is a preliminary classification in the process of determining lands that are suited for timber production. This preliminary classification excludes National Forest System lands that are not suitable for timber production based on legal or technical reasons, such as lands where State, Executive order, or regulation prohibits timber production; lands that have been withdrawn from timber production; lands where timber harvest cannot be done without causing irreversible damage to soil, slope, or other watershed conditions; lands where there is no reasonable assurance of adequate restocking; and land that is not forest land.

Suitable timber base

Lands within the National Forest System that are capable, available, and suitable for timber production.

Suppression

The work of extinguishing a fire or confining fire spread.

Surface water

Water on the surface of the earth.

Sustainability

The capability to meet the needs of the present generation without compromising the ability of future generations to meet their needs.

Sustained yield

The amount of renewable resources that can be produced continuously at a given intensity of management.

“Sustained yield of the several products and services” means the achievement and maintenance in perpetuity of a high-level annual or regular periodic output of the various renewable resources of the national forests without impairment of the productivity of the land. (36 CFR 219.3)

Sustained yield limit

The amount of timber, meeting applicable utilization standards that can be removed from a forest annually in perpetuity on a sustained yield basis. It is the volume that could be produced in perpetuity on lands that may be suitable for timber production. Calculation of the limit includes volume from lands that may be deemed not suitable for timber production after further analysis during the planning process. The calculation of sustained yield limit is not limited by land management plan desired condition, other plan components, or the planning unit's fiscal capability and organizational capacity. The sustained yield limit is not a target but is a limitation on harvest, except when the plan allows for a departure.

T

Talus

The loose accumulation of fragmented rock material on slopes, especially at the base of a cliff.

Temporary road

A road necessary for emergency operations or authorized by contract, permit, lease, or other written authorization. Temporary roads are not included in a national forest's transportation atlas.

Terrestrial ecosystem

A plant community that is not dependent on a perpetual source of water to grow.

Thinning

Intermediate treatment to reduce stand density or stocking levels to meet a variety of management objectives including increasing tree growth or vigor, improving stand health or species composition, reducing fuels, or improving wildlife habitat.

Threatened and endangered species

An endangered species is a plant or animal species listed under the Endangered Species Act that is in danger of extinction throughout all or a significant portion of its range. A threatened species is any species that is likely to become an endangered species within the foreseeable future throughout all or a significant portion of its range.

Threshold

The point or level of activity beyond which an undesirable set of responses begins to take place within a given resource system.

Tiering

Covering general matters in broad environmental impact statements with subsequent, narrow statements, or environmental analyses incorporating by reference the general discussions and concentrating solely on the issues specific to the statement prepared.

Timber classification

Forested land is classified under each of the land management alternatives according to how it relates to the management of the timber resource. The following are definitions of timber classifications:

Nonforested – Land that has never supported forests and land formerly forested where use for timber production is precluded by development or other uses.

Forested – Land at least 10-percent stocked (based on crown cover) by forest trees of any size, or formerly having had such tree cover and not currently developed for nonforest use.

Suitable – Land to be managed for timber production on a regulated basis.

Unsuitable – Forest land withdrawn from timber use by statute or administrative regulation (for example, wilderness), or identified as inappropriate for timber production in the forest planning process.

Timber harvest

The removal of trees for wood fiber utilization and other multiple-use purposes.

Timber production

The purposeful growing, tending, harvesting, and regeneration of regulated crops of trees to be cut into logs, bolts, or other round sections for industrial or consumer use.

Managing land to provide commercial timber products on a regulated basis with planned, scheduled entries.

Timber sale

Selling of forest products with monetary value to meet forest plan objectives, including providing raw material for both commercial manufacturing and personal use.

Trail

A route 50 inches or less in width, or a route greater than 50 inches wide that is identified and managed as a trail.

Traditional cultural property

A property affiliated with traditional religious and cultural importance to a distinct cultural group, such as an American Indian tribe or Native Hawaiian group, that is eligible for the National Register of Historic Places because of its association with cultural practices or beliefs of a living community that (a) are rooted in that community's history, and (b) are important in maintaining the continuing cultural identity of the community. Traditional cultural properties include built or natural locations, areas, or features considered sacred or culturally significant by a group or people. While traditional cultural properties are closely associated with Native American cultures, a site need not be associated with a Native American cultural group to qualify as a traditional cultural property for the purposes of the National Register of Historic Places.

Travel management

Providing for safe, environmentally responsible, and customer-responsive movement of vehicles and people to and through public lands.

U

Understory

That portion of a plant community growing underneath the taller plants on the site.

Uneven-aged management

The application of a combination of actions needed to simultaneously maintain continuous high-forest cover, recurring regeneration of desirable species, and orderly growth and

development of trees through a range of diameter or age classes to provide a sustained yield of forest products. Cutting is typically regulated by specifying the number or proportion of trees of particular sizes to retain within each area, thereby maintaining a planned distribution of size classes. Cutting methods that develop and maintain uneven-aged stands are single-tree and group selection. (36 CFR 219.3)

Ungulate

A hoofed animal.

Unplanned ignition

The initiation of a wildland fire by lightning, volcanoes, or unauthorized or accidental human-caused fire (see wildfire).

Use of wildland fire

Management of either wildfire or prescribed fire to meet resource objectives specified in land and resource management plans.

V

Values to be protected

Include property, structures, physical improvements, natural and cultural resources, community infrastructure, and economic, environmental, and social values.

Vegetation management

Activities designed primarily to promote the health of forest vegetation in order to achieve desired results. When vegetation is actively managed, it is manipulated or changed by humans to produce desired results. Where active management of vegetation is required, techniques are based on the latest scientific research and mimic natural processes as closely as possible. Vegetation management is the practice of manipulating the species mix, age, fuel load, and/or distribution of wildland plant communities within a prescribed or designated management area in order to achieve desired results.

Viable population

A population of plants or animals large enough and distributed in such a way as to ensure its continued existence, despite all the hazards to survival such as illness, predators, old age, etc. throughout its existing range within the planning area.

Viewshed

The visible portion of the landscape seen from viewpoints. Viewpoints can include residences, recreational facilities, and travelways.

W

Water right

A property right granted by a State for the use of a portion of the public's surface water resource obtained under applicable legal procedures.

Watershed

An area of land with a characteristic drainage network that contributes surface or ground water to the flow at that point; a drainage basin or a major subdivision of a drainage basin.

Wetlands

Those areas that are inundated or saturated by surface or groundwater at a frequency and duration sufficient to support and that, under normal circumstances, do support, a prevalence of vegetation typically adapted for life in saturated soil conditions. Wetlands generally include swamps, marshes, bogs, and similar areas.” (40 CFR 122. 2)

Wild, Scenic, and Recreational Rivers

A river or section of a river designated under the 1968 Wild and Scenic Rivers Act as wild, scenic, or recreational. Rivers may be designated by Congress or, if certain requirements are met, the Secretaries of Interior or Agriculture, as appropriate. Once designated under the Act, rivers receive special management direction that ensures the maintenance of the free-flowing nature and the outstanding natural, cultural, and recreational values of the river segment. Under the Act, river segments are required to be classified as wild, scenic, or recreational:

Wild Rivers – Those rivers or sections of rivers that are free of impoundments and generally inaccessible except by trail, with watersheds or shorelines essentially primitive and waters unpolluted. These represent vestiges of primitive America.

Scenic Rivers – Those rivers or sections of rivers that are free of impoundments, with shorelines or watersheds still largely primitive and shorelines largely undeveloped, but accessible in places by roads.

Recreational Rivers – Those rivers or sections of rivers that are readily accessible by road or railroad, that may have some development along their shorelines, and that may have undergone some impoundment or diversion in the past.

Wilderness

All lands included in the National Wilderness Preservation System by public law; generally defined as undeveloped Federal land retaining its primeval character and influence without permanent improvements or human habitation.

Wildfire

An unplanned, unwanted wildland fire, including unauthorized human-caused fires, escaped prescribed fires, and all other wildland fires where the objective is to put the fire out; any wildland fire not designated and managed as a prescribed fire within an approved prescription. All wildfires will receive appropriate suppression action.

Wildland fire

A general term describing any nonstructural fire that occurs in the wildland. Wildland fires are categorized into two distinct types:

Wildfires – Unplanned ignitions or prescribed fires that are declared wildfires

Prescribed fires – Planned ignitions.

Wildland-urban interface

The line, area, or zone where structures and other human developments meet or intermingle with undeveloped wildland or vegetation fuels.

Windthrow

The act of trees being uprooted by the wind.

Winter range

An area used by deer and elk during the winter months; generally at lower elevations and/or south and west exposures.

Withdrawal

An action that restricts the use of public land and segregates the land from the operation of some or all of the public land and mineral laws. Withdrawals are also used to transfer jurisdiction of management of public lands to other Federal agencies.

Appendices

- Appendix A** Old Forest Criteria
- Appendix B** Wild, Scenic, and Recreational River Eligibility Determination Process
- Appendix C** Timber Suitability and Analysis
- Appendix D** Species of Conservation Concern Presence and Concern for Persistence
- Appendix E** Southern Rockies Lynx Amendment Direction
- Appendix F** Riparian Management Zones
- Appendix G** Design Features for Raptors
- Appendix H** Priority Watersheds
- Appendix I** Relevant Federal Statutes, Regulations, Policies, and Agreements
- Appendix J** Proposed and Possible Actions

Appendix A. Old Forest Criteria

The criteria used for determining old forests (Table 16) on the Rio Grande are based on the Regional Guidelines (with slight modifications), which are documented in a publication called “Old-Growth Forests in the Southwest and Rocky Mountain Regions Proceedings of a Workshop,” March 9-13, 1992, Portal, Arizona, General Technical Report RM-213.

The old-forest characteristics for each cover type are as follows. To be identified as old forest, most of the characteristics need to be present.

Ponderosa Pine

- Age greater than or equal to 175
- Large trees per acre (greater than or equal to 16” DBH) greater than or equal 10
- Rot + dead/broken tops per acre greater than or equal 1
- Snags (10” min DBH) greater than or equal 2

Mixed Conifer

- Age greater than or equal 175
- Large trees per acre (greater than or equal 16” DBH) greater than or equal 10
- Rot + dead/broken tops per acre greater than or equal 1
- Snags (10” min DBH) greater than or equal 2
- Layers greater than or equal 2
- Downed Woody Material greater than or equal 5 tons per acre

Spruce/Fir

- Age greater than or equal 200
- Large trees per acre (greater than or equal 16” DBH) greater than or equal 10
- Rot + dead/broken tops per acre greater than or equal 1
- Snags (10” min DBH) greater than or equal 2
- Layers greater than or equal 2
- Downed Woody Material greater than or equal 10 tons/acre

Aspen

- Age greater than or equal 100
- Large trees per acre (greater than or equal 14” DBH) greater than or equal 10
- Rot plus dead/broken tops per acre greater than or equal 1

Pinyon-Juniper

- Age greater than or equal 200
- Large trees per acre (greater than or equal 12” DRC) greater than or equal 30

- Rot + dead/broken tops per acre greater than or equal 1
- Snags (10" min DRC) greater than or equal 1

Table 16. Criteria used to determine old forest

Minimum Attributes	Ponderosa Pine	Spruce/Fir	Mixed Conifer	Aspen	Pinyon-Juniper
Age	175	200	175	100	200
DBH/DRC (inches)	16	16	16	14	12 (DRC)
Large trees/ac >= DBH/DRC	10	10	10	10	30
Rot + dead/broken tops per acre	1	1	1	1	1
Snags per acre	2	2	2	n/a	1
Layers (#)	n/a	2	2	n/a	n/a
Downed Woody Material (tons/acre)	n/a	10	5	n/a	n/a

Appendix B: Wild, Scenic, and Recreational River Eligibility Determination Process

Background

The National Wild and Scenic Rivers System was created by Congress in 1968 (Public Law 90-542) to preserve certain rivers with outstanding natural, cultural, and recreational values in a free-flowing condition for the enjoyment of present and future generations. The Wild and Scenic Rivers Act is notable in that it seeks to protect these rivers while at the same time acknowledging the benefits and necessity of appropriate developments within the river corridor. To be designated under the Act, a river segment must meet two fundamental requirements: the river segment must be “free-flowing” as defined by Section 16(b) of the Act, and the river segment must have one or more outstandingly remarkable values (Section 1(b)).

Rivers may be designated by Congress or, if certain requirements are met, the Secretaries of Interior or Agriculture, as appropriate. Once designated under the Act, rivers receive special management direction that ensures the maintenance of the free-flowing nature and the outstanding natural, cultural, and recreational values of the river segment. Under the Act, river segments are required to be classified as wild, scenic, or recreational:

- Wild Rivers – Those rivers or sections of rivers that are free of impoundments and generally inaccessible except by trail, with watersheds or shorelines essentially primitive and waters unpolluted. These represent vestiges of primitive America.
- Scenic Rivers – Those rivers or sections of rivers that are free of impoundments, with shorelines or watersheds still largely primitive and shorelines largely undeveloped, but accessible in places by roads.
- Recreational Rivers – Those rivers or sections of rivers that are readily accessible by road or railroad, that may have some development along their shorelines, and that may have undergone some impoundment or diversion in the past.

Section 5(d)(1) of the Wild and Scenic Rivers Act requires that “*consideration shall be given by all Federal agencies involved to potential national wild, scenic, and recreational river areas*” during land management planning. To meet this requirement, Forest Service units conduct a systematic inventory of all river segments to determine if they meet the requirements for designation under the Act. In addition to studies initiated by land management agencies, Congress can direct the study of specific rivers (Section 5(a)). Rivers that have been inventoried and determined to meet the requirements of the Act, but that have not yet been designated, are considered to be either eligible or suitable (those that have been recommended to Congress and the President). These eligible and suitable segments are managed to maintain their free-flowing nature and outstandingly remarkable values until such time as they are designated under the Act or released from consideration.

Wild and Scenic Rivers Act and the Rio Grande National Forest

In 1975, Public Law 93-621 amended the original Wild and Scenic Rivers Act (PL 90-542) and directed that the three tributary forks of the Conejos River, as well as the main stem of the Conejos (excluding Platoro Reservoir) to its crossing of Highway 17 be studied for potential inclusion in the National Wild and Scenic Rivers System. In 1979, following substantial efforts,

recommendations regarding the Conejos River were made to the Secretary of Agriculture from the State of Colorado and the Forest Service. The recommended wild river segments were: El Rito Azul; the North, Middle, and South forks of the Conejos; as well as the main stem of the Conejos from Three Forks to Platoro Reservoir. Additionally, the main stem of the Conejos from the town of Platoro to the confluence with South Fork of the Conejos was recommended as a recreational river segment. No legislative action has yet been taken on these recommendations (USDA Forest Service 1982).

During the 1996 revision of the forest plan, the Forest engaged in a systematic inventory and eligibility evaluation for all labeled rivers on U.S. Geological Survey 7.5-minute quadrangle maps. The eligibility evaluations from this process were combined with the results of the congressionally mandated Conejos River Study to develop a list of river segments that were potentially eligible for designation under the Wild and Scenic Rivers Act. These potentially eligible segments were included in the alternatives of the 1996 forest plan. The selected alternative, G, found that the river segments listed in Table 17 were eligible for inclusion in the National Wild and Scenic Rivers System. Further language within the 1996 forest plan directed that suitability determinations would be held in abeyance pending the proposal of significant actions that would impact the identified outstandingly remarkable values or the free-flowing nature of the river segments. Management areas and direction were developed for all eligible river segments that included the river and the lands within one-quarter mile on both sides of the mean high water mark. The length, outstanding remarkable values, and designation of each of the rivers and streams are listed in Table 17.

Wild and Scenic Rivers Act and the 2017 Rio Grande National Forest Plan Revision

The Forest engaged in the revision of the 1996 forest plan under the final directives of the 2012 Planning Rule. These directives state that when developing a plan or plan revision, the Responsible Official shall:

Identify the eligibility of rivers for inclusion in the National Wild and Scenic Rivers System, unless a systematic inventory has been previously completed and documented, and there are no changed circumstances that warrant additional review. (36 CFR sec. 219.7(c)(2)(vi))

Given that a systematic inventory of rivers was completed and documented concurrent with the 1996 forest plan revision, the responsible official determined that no changed conditions existed and chose to limit the extent of the study process during the current revision to those river segments that were not previously inventoried.

Segments Determined to be Eligible in the 1996 Forest Plan

The river segments listed in Table 17 as eligible for inclusion in the National Wild and Scenic Rivers System will be carried forward in the forest plan revision. These river segments will retain the same classification, outstandingly remarkable values, river segment termini, and management direction. The only exceptions will be those segments of Medano Creek and Little Medano Creek that are on lands now managed by the National Park Service, which will administer these river segments through the National Park Service land management planning process.

Table 17. Eligible rivers for inclusion in the National Wild and Scenic Rivers System from the 1996 Rio Grande Forest Plan

River or Stream Name	Length (miles)	Outstandingly Remarkable Values	Designation
Archuleta Creek	5.35	Scenic, Recreational	Scenic
East Fork Rio Chama	2.05	Scenic, Recreational	Scenic
Hansen Creek	6.35	Scenic, Recreational	Wild
Little Medano Creek – Note A	2.95	Scenic, Geologic	Scenic
Lower Rio de los Pinos	7.5	Scenic, Recreational, Historic	Scenic
Lower Rio Grande	5.0	Scenic, Recreational, Historic	Recreational
Rio Grande (Box Canyon)	8.0	Scenic, Recreational, Historic	Scenic
Saguache Creek	7.8	Scenic, Historic, Cultural	Wild
Toltec Creek	2.7	Scenic, Recreational, Historic	Wild
West Bellows Creek	10.75	Scenic, Recreational, Geologic	Scenic
West Fork Rio Chama	3.5	Scenic, Recreational	Scenic
Medano Creek^{1,2}			
Medano Creek (Upper Reach)	3.15	Recreational, Fishery	Scenic
Medano Creek (Lower Reach)	5.30	Recreational, Fishery	Recreational
Medano Creek Total	8.45		
South Fork Rio Grande			
South Fork Rio Grande (Above Big Meadows Res.)	4.75	Scenic, Recreational, Historic	Scenic
South Fork Rio Grande (Below Big Meadows Res.)	13.9	Scenic, Recreational, Historic	Recreational
South Fork Rio Grande Total	18.65		
Conejos River			
El Rito Azul	3.5	Scenic, Recreational, Wildlife	Wild
North Fork Conejos River	3.5	Scenic, Recreational, Wildlife	Wild
Middle Fork Conejos River	4.0	Scenic, Recreational, Wildlife	Wild
Conejos River (Three Forks to Platoro Reservoir)	2.6	Scenic, Recreational, Wildlife	Wild
South Fork of the Conejos River	12.0	Scenic, Recreational, Wildlife	Wild
Conejos River below Platoro Reservoir ³	11.2	Scenic, Recreational, Wildlife	Recreational
Conejos River Total	36.8		
Wild Rivers Sub-total	42.5		
Scenic Rivers Sub-total	48.0		
Recreational River Sub-total	35.4		
Rio Grande National Forest Total	125.9		

¹ Per the Great Sand Dunes National Park and Preserve Act of 2000, these streams are now part of the Great Sand Dunes National Preserve, managed by the National Park Service.

² The mileage division between the Scenic and Recreational Reaches is estimated based on the location of the Medano Pass Road; original documentation could not be found.

³ The Conejos Wild and Scenic River Study – Final Environmental Impact Statement initially determined 13.2 miles to be eligible; however, the 1982 recommendation from the Secretary of Agriculture to the President of the United States (Block 1982) eliminated 2 miles from the recommendation to avoid potential conflicts with private lands immediately below Platoro Reservoir.

Inventory of River Segments Not Evaluated as Part of the 1996 Forest Plan

A review of the inventory from the 1996 forest plan revision was conducted to determine those river segments that had been missed, or those that lacked sufficient documentation to determine the exact extent of the river segment that was evaluated. Initially, 34 stream segments were identified for review; however, four of these segments were not in the U.S. Geological Survey National Hydrography Dataset and were eliminated from consideration. One additional river segment, Osier Creek, which flows south to north and is tributary to the Rio de los Pinos (approximately 0.8 mile downstream from a separate Osier Creek that enters the Rio de los Pinos near Osier, Colorado), was identified during a review of the Carson National Forest Wild and Scenic River inventory. The 31 river segments that required inventory are listed in Table 18 and can be divided into 2 categories: 24 segments on National Forest System lands that were missed in the 1996 inventory, and 7 segments located on the Baca Mountain Tract, which were acquired as part of the Great Sand Dunes National Park and Preserve Act of 2000. These new segments on the Baca Tract were described in detail in the Baca Tract Environmental Assessment (USDA Forest Service and USDI National Park Service 2009).

The 31 river segments listed in Table 18 were evaluated in accordance with the direction provided in section 82.7 of FSH 1909.12-2015-1. The evaluation of the river segments was conducted by a sub-group of those individuals participating as members of the Forest Plan revision.

The process applied to the river segments listed in Table 18:

1. Determination of the free-flowing condition for each river segment (82.71 - FSH 1909.12-2015-1)
2. Evaluation of outstandingly remarkable values (82.73 - FSH 1909.12-2015-1)
 - The State of Colorado was selected as the region of comparison for all outstandingly remarkable values.
3. Preliminary classification of eligible river segments (82.8 - FSH 1909.12-2015-1)
 - This step determines if the eligible river segment should be wild, scenic, or recreational.
4. Engagement with ranger district staff
 - The process and results of the newly evaluated segments were presented to ranger district staff members. This step was designed to solicit more local expertise on the river segments in question, and to give local resource professionals the opportunity to concur with, or modify, all parts of the eligibility evaluation.
5. Delivery of the results of the preliminary evaluation to the responsible official
 - Under this evaluation, the responsible official has discretion over whether or not a river segment is eligible for inclusion in the National Wild and Scenic Rivers System.

Recommendations to the Responsible Official

The preliminary evaluation conducted by the interdisciplinary team resulted in a portion of Deadman Creek being recommended to the responsible official as eligible, with a scenic classification, for inclusion in the National Wild and Scenic Rivers System. The recommended reach is 3.3 miles long and is located on lands that were obtained as part of the Baca Mountain

Tract. The evaluated reach was determined to be free-flowing and contain the following outstandingly remarkable values:

- Scenery: An exceptional mature cottonwood and juniper gallery exists on the lower reaches.
- Fisheries: This is a Rio Grande Cutthroat Trout stream with exceptional habitat.
- Historic and Cultural: Unique features of the Old Spanish Trail exist within the river corridor.
- Other – Botanic: The mature cottonwood and juniper gallery represents a unique feature within the region of comparison. Additionally, there are occurrences of the plant species *Draba smithii* and *Draba grayana*; both are Forest Service Rocky Mountain Region Sensitive plant species and NatureServe Global Rank of G2 (Globally Imperiled), N2 (Nationally Imperiled) and S2 (Imperiled) in the State of Colorado.

Updated Data for Eligible River Segments

As part of the forest plan revision process, background data for the eligible river segments was updated to reflect the best available scientific information. Specifically, river segment lengths were updated to reflect the most recent National Hydrography Dataset issued by the U.S. Geological Survey. These updates do not reflect changes to the river segments determined to be eligible; rather, they reflect the improvement in data quality since 1996.

Table 18. Preliminary evaluation for inclusion in the National Wild and Scenic Rivers System, river segments missed in the 1996 Forest Plan

Characteristic				Presence of Outstandingly Remarkable Values							Preliminary Evaluation: Is the river segment eligible for WSR inclusion?
Segment Name	District	Length (miles)	Free-Flowing Condition?	Scenery	Recreation	Geology	Fish	Wildlife	Historic and Cultural Values	Other Similar River-related Values	
Baca Mountain Tract Acquisition											
Alpine Creek	Saguache	2.9	Yes	No	No	No	No	No	Yes	No	No
Cottonwood Creek	Saguache	2.8	Yes	No	No	No	Yes	No	No	No	No
Deadman Creek	Saguache	3.3	Yes	No	No	No	Yes	No	Yes	Yes	Yes-Scenic
Pole Creek	Saguache	4.4	Yes	No	No	No	No	No	Yes	No	No
Short Creek	Saguache	2.4	Yes	No	No	No	No	No	No	No	No
South Spanish Creek	Saguache	2.4	Yes	No	No	No	No	No	No	No	No
Spanish Creek	Saguache	5.4	Yes	No	No	No	No	No	No	No	No
Missed or not documented in the 1996 Eligibility Evaluation											
Asiatic Creek	Conejos Peak	2.1	Yes	No	No	No	No	No	No	No	No
Bird Creek	Divide	1.9	Yes	No	No	No	No	No	No	No	No
Cat Creek	Conejos Peak	3.9	Yes	No	No	No	Yes	No	No	No	No
Coal Creek	Conejos Peak	1.2	Yes	No	No	No	No	No	No	No	No
Cropsy Creek	Conejos Peak	1.7	Yes	No	No	No	No	No	No	No	No

Characteristic				Presence of Outstandingly Remarkable Values							Preliminary Evaluation: Is the river segment eligible for WSR inclusion?
Segment Name	District	Length (miles)	Free-Flowing Condition?	Scenery	Recreation	Geology	Fish	Wildlife	Historic and Cultural Values	Other Similar River-related Values	
East Fork Navajo River	Conejos Peak	0.9	Yes	No	No	No	No	No	No	No	No
Flagstaff Creek	Saguache	2.2	Yes	No	No	No	No	No	No	No	No
Jarosa	Conejos Peak	0.6	Yes	No	No	No	No	No	No	No	No
La Jara (north sections)	Conejos Peak	1.1 total	Yes	No	No	No	No	No	No	No	No
La Jara (south sections)	Conejos Peak	above	Yes	No	No	No	No	No	No	No	No
Little Red Creek	Saguache	1.3	Yes	No	No	No	No	No	No	No	No
Merkt Creek	Saguache	2.2	Yes	No	No	No	No	No	No	No	No
Middle Fork Cotton Creek	Saguache	1.5	Yes	No	No	No	No	No	No	No	No
Middle Fork North Crestone Creek	Saguache	2.1	Yes	No	No	No	No	No	No	No	No
Middle Fork Pole Creek	Divide	2	Yes	No	No	No	No	No	No	No	No
Middle Zapata Creek	Conejos Peak	3.1	Yes	No	No	No	No	No	No	No	No
North Fork Cedar Creek	Saguache	1.3	Yes	No	No	No	No	No	No	No	No
North Fork Pole Creek	Divide	3.4	Yes	No	No	No	No	No	No	No	No

Characteristic				Presence of Outstandingly Remarkable Values							Preliminary Evaluation: Is the river segment eligible for WSR inclusion?
Segment Name	District	Length (miles)	Free-Flowing Condition?	Scenery	Recreation	Geology	Fish	Wildlife	Historic and Cultural Values	Other Similar River-related Values	
North Fork South Zapata Creek	Conejos Peak	2.1	Yes	No	No	No	No	No	No	No	No
Osier Creek	Conejos Peak	0.8	Yes	No	No	No	No	No	No	No	No
Peterson Creek	Saguache	3.1	Yes	No	No	No	No	No	No	No	No
Rock Creek	Saguache	0.1	Yes	No	No	No	No	No	No	No	No
San Luis Creek	Saguache	2.1	Yes	No	No	No	No	No	No	No	No
South Fork Cedar Creek	Saguache	0.9	Yes	No	No	No	No	No	No	No	No

References Cited

- Block, J.R. 1982. Letter from Secretary of Agriculture John R. Block to President of the United States Ronald W. Reagan, dated June 11, 1982, regarding the segment of the Conejos River downstream from Platoro Reservoir for 2 miles. Available in the project record at the Rio Grande National Forest Supervisor's Office in Monte Vista, Colorado.
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Appendix C. Timber Suitability and Analysis

Lands that May be Suited for Timber Production

Lands that may be suited for timber production were determined using the criteria in the Land Management Planning Handbook FSH 1909.12 Chapter 60. These areas and associated acreage were determined by starting with the total area of the Rio Grande National Forest and removing areas that are not suited for timber production, listed below:

- In-holdings
- Level 2 through 5 roads
- Lands not suited for timber production because timber production is prohibited or the lands are withdrawn from timber production:
 - Wilderness areas
 - Eligible wild rivers
 - Colorado Roadless areas
 - Research Natural Areas
- Lands on which technology to harvest timber is not currently available without causing irreversible damage:
 - Certain soil map units having “high mass movement potential” were removed due to this criteria. The criteria differed based on geographic area.
 - In the Sangre de Cristos, the following Soil Resource Inventory codes were removed: 410S, 605Y, 625S, 670S, 704S, 835X.
 - On the west side (everywhere except the Sangre de Cristos), soils were removed using a field called mass movement potential, with the exception of those polygons in the Cumbres area that have a Soil Resource Inventory of 139 or 151.
 - Note: In the 2000 amendment, Soil Types 460 and 750M were removed in only particular locations. This was not done because the 460 code is no longer used and because the locations where 750M was unsuitable had already been removed in prior steps.
- Lands on which there is no reasonable assurance that lands can be adequately restocked within 5 years of final regeneration harvest:
 - Elevations above 11,000 feet with south and southwest aspects
 - Elevations below 9,500 feet with south and southwest aspects
 - Areas with greater than 33 percent rock
- Land that is not Forest land
 - Areas with less than 10 percent canopy cover of trees were removed in this step. Areas that were formerly occupied by trees but with low canopy cover due to recent disturbance were not removed if tree species were regenerating.
- Areas with nonindustrial species, such as limber pine, bristlecone pine, pinyon, and juniper.
- True riparian areas (defined as an FSVeg Spatial local type of RIP (riparian) and cover type of grass, forb, or cottonwood).

The final area considered *may be suitable* for timber production is 499,936 acres.

Sustained Yield Limit Calculations

The sustained yield limit (SYL) is the amount of timber that can be produced on all lands that *may be suitable* for timber production, assuming all of these lands were managed to produce timber without considering other multiple uses or fiscal or organizational capability. The sustained yield limit was calculated using the Forest Vegetation Simulator (FVS, 7/19/16 version), the Forest Service’s national forest growth and yield model. Site information from the stand exams collected over the last 20 years was used for this analysis. Sustained yield limit was calculated by the following strata, with the number of stands used in parentheses:

- Spruce-fir (405 stands)
- Aspen (103 stands)
- Lodgepole pine (59 stands)
- Ponderosa pine (64 stands)
- Mixed-conifer (243 stands)

Additional areas were also included separate from these main strata. This includes 1) 1M and 2S areas with low canopy cover (10 to 25 percent) that key out as grasslands or other non-timber types and which are not previously treed and 2) areas with low canopy cover (less than 25 percent) that have had recent disturbance but were previously treed.

Results from each stand were averaged together to get strata averages.

The management system, rotation age/entry interval, and associated harvest volume (cubic feet per acre) that were used to determine the sustained yield limit are listed in Table 19.

Table 19. Assumptions used for the sustained yield limit calculation

Strata	Management System	Rotation age / Entry Interval (years)	Acres of May be Suitable Lands	Harvest Volume (cubic feet/acre)
Spruce-fir	Uneven-aged – Group Selection	160	165,756	2,932
Lodgepole pine	Even-aged - Clearcut	120	22,198	2,697
Aspen	Even-aged - Clearcut	120	114,979	2,178
Mixed-conifer	Even-aged - Shelterwood	140	106,807	1,569
Ponderosa pine	Uneven-aged – Individual Tree Selection	30	18,542	400
Other - 1M and 2S		200	20,211	500
Other – timber		200	51,388	1,000
Other – Rock – Bare Soil	--	--	55	0

Numerous adjustments were made in Forest vegetation simulations to determine the appropriate harvest volume. These adjustments included factoring in defect, using local merchantability specifications, adjusting the stand density maximum values, calibrating tree growth based on collected tree growth data, and capping tree size based on observed tree sizes. Mortality due to insects and disease, such as spruce beetle, spruce budworm, Douglas-fir beetle, mountain pine beetle and/or engraver beetles, and tent caterpillar, aspen disease, and wood borers was included. Additional details on Forest vegetation simulation assumptions are available on request.

The estimated sustained yield limit is 7,374,937 cubic feet per year or 73,749 CCF per year.

Lands that Are Suited for Timber Production

The land suited for timber production under each alternative was defined using the criteria below. Starting with the may be suitable timber areas, the following areas were removed because timber production is not compatible with the desired conditions and objectives for these areas:

- Recommended wilderness, research natural areas, and wild rivers for the specific alternative
- National Scenic and Historic Trails – Continental Divide National Scenic Trail and Old Spanish Trail, including a ½ mile buffer on each side
- National Recreation Trails - Lost Fork and West Lost Fork, including a ½ mile buffer on each side
- Scenic rivers
- Current and proposed special interest areas (Management Area 3.1)
- Ski-based resorts (Management Area 8.22)
- Backcountry areas (Management Area 3.3) in any alternatives that have this

Two main timber suitability changes from the 1996 Rio Grande Revised Land and Resource Management Plan pertain to the Grassland Resource Production areas (Management Area 6.6) and Bighorn Sheep management areas. The Grassland Resource Production areas are being considered suitable for timber production, a change from the 1996 plan, where they were not suitable. In addition, most, but not all, of the Bighorn Sheep management areas in the 1996 plan were merged into the Big Game Winter Range management area (Management Area 5.41) and are now considered suitable for timber production as a result.

All areas of the suitable timber base were included because timber production is allowed and is consistent with the desired conditions and objectives for the area. However, some inclusions in the suitable timber base may not be currently feasible for timber production. This includes areas that are very difficult to reach (either because of distance or because they lack an appropriate transportation system), areas that would require helicopter logging, cable yarding, and areas that are extremely isolated.

Maps of the areas that are suitable for timber production under each alternative are contained on the DVD that is located at the back of the Rio Grande National Forest Plan Revision Draft Environmental Impact Statement.

Suitable timber acres are listed by alternative in Table 20.

Table 20. Suitable timber acreage for alternatives A through D

[Reported in acres]

	May Be Suitable	Alternative A	Alternative B	Alternative C	Alternative D
Acres Suitable for Timber Production	499,936	320,567	468,311	480,683	401,414

Appendix D. Species of Conservation Concern Presence and Concern for Persistence

Background

The 2012 Planning Rule and Forest Service Handbook 1909.12, Chapter 20, require that species of conservation concern are identified for the planning area. More detailed analysis of these species can be found in Chapter 3 of the draft environmental impact statement for the forest plan. The 2012 Planning Rule requires the Forest Service to consider species that are known to occur in the planning area and that are established or are becoming established. We recognize that in practice, data on rare and declining species is often variable and incomplete, which complicates making confident presence/absence conclusions and introduces some potential risk for species not further considered for species of conservation concern status (or removing a species from the list).

For the purposes of “known to occur,” we have elected to require a record for a species on the planning unit to qualify for species of conservation concern status. Species that exist close to the planning area but that have not been recorded on the planning area are not considered to be known to occur on the planning unit. Species that are thought to be present in the plan area, but that have not been documented there are also not considered as known to occur. The species must be documented on National Forest System lands within the boundary of the Forest. Species identified as Forest species of conservation concern and rationale for inclusion are contained in Table 21. All information pertains to the planning area.

The 2012 Planning Rule does not require the Agency to consider those that are only transient or accidental, or that are well outside existing range of the species. Only species that are considered established or are becoming established can be species of conservation concern.

An overview for each species has been prepared and is available on the Forest’s webpage. The overview considers each species’:

- Status
- Taxonomy
- Distribution, abundance, and trend in the planning area
- A brief description of the natural history and key ecosystem functions
- Overview of ecological conditions for recover, conservation, and viability
- Threats and other risk factors.

Several criteria can be used to determine if a species is established. For plants, “established” means that it has roots in the ground or is otherwise attached to a substrate in the planning area, or has viable seeds in the seed bank produced by a plant that grew in the planning area in the last 20 years or so. Seeds do not remain viable forever, at least not in a naturalistic outdoor setting; the presence of viable seeds is generally an indication that the plants that produced the seeds were alive no more than a few decades ago.

For wildlife species, the determination of what is “established” is less clear. Reproduction by animals on the planning unit would certainly be considered a sign of that species being established. Frequent presence on the Forest, even if the animal breeds elsewhere, would also be considered established. A single record for a species in the planning area may or may not qualify it for species of conservation concern status, depending on the overall context of the available information for that species when considering the record.

Occurrence data have been collected from multiple sources, including the Colorado Natural Heritage Program database (continually updated, the Forest Service acquires an updated copy once a year), Herbarium records, mist-netting and sight/song bird surveys, and specialist reports.

Information from more detailed assessments and other sources used in determining eligibility for status as a species of conservation concern is summarized in Table 21 and Table 22. Links are provided in digital versions of the tables to take readers to overview assessments that are available on the Forest website. Information contained below applies to the Forest unless stated otherwise.

Most references contained here can be found in the *References Cited* section of the *Draft Environmental Impact Statement* or in the species overviews that are linked below. Those references not listed in those locations are listed below the tables.

Table 21. Current species of conservation concern and evaluation criteria

Category	Species	Evidence of Occurrence	Substantial Concern About the Species Capability to Persist over the Long Term
Invertebrates	Western bumblebee Bombus occidentalis	Located in 2016 by Rio Grande NF and USFS Region 2 staff members during botany surveys.	This species has undergone a severe, range-wide population decline over the past decade, estimated at 40-90 percent. (Cameron et al. 2011) The population on the Forest appears to have mirrored this decline, which is on-going. The U.S. Fish and Wildlife Service currently has this species under review for possible listing under Endangered Species Act. The subspecies <i>occidentalis</i> found in the Rocky Mountain Region has declined about 70-99 percent since the late 1990s. The main cause of declines is thought to be the effects of a microsporidian <i>Nosema bombi</i> and an imported protozoan parasite from Europe. Other causes of decline include land use changes and habitat loss, changes in nectar flora, overgrazing, poorly timed fire in suitable nesting habitat, changes to temperature and precipitation regimes, competition with honey bees, and effects of pesticides especially persistent neonicotinoids. All of these threats occur.
Invertebrates	White-veined arctic butterfly Oeneis bore	Two records on the Forest from 2004, one in Hinsdale County and one in Saguache County. Records verified by USGS Northern Prairie Wildlife Research Center. One record from 1996.	As with many tundra relict species, changes in temperature and precipitation regimes could be a threat, as temperatures warm, species can move north or uphill to cooler refuges. In the case of species that exist on tundra in the southern Rockies, moving uphill is not an option as local populations already only survive on mountain tops. It is possible that warmer temperatures could lead to a loss of nectar plants to the butterfly, or the timing of the nectar bloom is changed relative to the life history needs of <i>O. bore</i> . Climate change vulnerability assessments in the vicinity of the Forest note that the white-veined arctic could be lost.

Category	Species	Evidence of Occurrence	Substantial Concern About the Species Capability to Persist over the Long Term
Amphibians	Boreal toad <i>Anaxyrus boreas</i>	Boreal toads have been reported at 10 sites in the past 20 years with the most recent observations occurring in 2014.	Primary localized threats on the Forest involve chytrid fungus with 4 of 5 known sites testing positive. Other local concerns involve water and air quality factors, nonnative species, recreation management and perhaps fire and timber management in localized areas. Climate change vulnerability assessments for areas surrounding the Forest have determined that this species is “highly vulnerable” to negative impacts from changes in temperature and precipitation regimes.
Fish	Rio Grande chub Gila pandora	Present in 3 stream segments; surveys by Colorado State University	The primary threats to this species include reduction of stream flows, increased sediment loads, and competition with and predation by nonnative fish. The limited remaining habitat for this species also renders the species at risk from stochastic events. NatureServe ranks this species as “Critically Imperiled” and Colorado Parks and Wildlife lists the species as “Tier 1, Species of Greatest Conservation Need”. Currently under review by the U.S. Fish and Wildlife Service for listing under the Endangered Species Act.
Fish	Rio Grande cutthroat trout Oncorhynchus clarkia virginialis	Present in 27 stream segments and 2 lakes.	Some recorded presence contradicts dramatic decline over its historic range that is now limited to small, isolated populations in the upper Rio Grande drainage in Colorado. Many of these populations are not self-sustaining and very vulnerable to habitat degradation from a variety of causes, competition and hybridization with non-natives, over-utilization, and stochastic events. The Climate Change Vulnerability Assessment for the Colorado Bureau of Land Management described this species as having greatly increased vulnerability in its physiological, thermal, and hydrological niches due to potential changes in temperature and precipitation patterns. This species is wholly dependent upon human management to survive. Under current conditions, if management activities were to cease, the subspecies would be expected to resume a declining trend as a result of invasion of populations by non-native salmonids, stochastic environmental events, whirling disease, and the demographic and genetic factors associated with small, isolated populations (Pritchard and Cowley 2006). Species is ranked by Colorado Parks and Wildlife as Species of Greatest Conservation Need Tier 1.
Fish	Rio Grande sucker Catostomus plebeius	Currently known from 9 stream segments.	Competition with and predation by non-native species are extensive threats to the health and viability of Rio Grande sucker populations. Nonnative predators include northern pike and brown trout. The introduced white sucker tends to be well adapted to a variety of degraded environmental conditions, allowing it a competitive advantage on a spatial or temporal scale over the Rio Grande sucker. The larger white sucker competes with Rio Grande sucker for available food sources (periphyton and macroinvertebrates), and also has the ability to hybridize with Rio Grande sucker (Rees and Miller 2005).

Category	Species	Evidence of Occurrence	Substantial Concern About the Species Capability to Persist over the Long Term
Birds	Boreal owl Aegolius funereus	Eleven records in the past 20 years.	<p>Boreal owls are threatened by loss of nesting habitat and changes in prey base resulting from substantially beetle killed spruce-fir habitat. Resulting in a reduction of closed canopy habitat available. Dramatic change (90 percent) in spruce-fir landscape conditions suggest potential declining habitat trend and viability.</p> <p>Other risk factors that may affect species density and distribution are likely to include large-scale stand replacement fire, and large-scale insect outbreaks.</p> <p>The Gunnison Basin Climate Change Vulnerability Assessment indicates that this species is “Highly Vulnerable” to changes resulting from changes in temperature and precipitation regimes. Colorado Natural Heritage Program S2 (Imperiled), Colorado Parks and Wildlife Species of Greatest Conservation Need Tier 2.</p>
Birds	Brewer's sparrow Spizella breweri	10 records in the past 10 years, most recently in 2014.	<p>Rangewide concerns for substantial declines in sagebrush and mountain shrub habitats. The primary concern regarding the persistence of Brewer's sparrow is the continued decline of the species numbers in the area surrounding the Forest as well as pinyon juniper encroachment in the limited suitable sagebrush habitat. Trend estimates show significant decreases in relative abundance from 1966 to 2002. Detection frequencies during this period on routes in southern and eastern Colorado declined. Sauer et al. (2011) report significant declining trends of this species in the Southern Rockies/Colorado Plateau for the period 1966-2010. In addition, the Climate Change Vulnerability Assessment for the Colorado Bureau of Land Management shows that the species may experience a “Greatly Increased” vulnerability” due to the impacts that changes in temperature and precipitation regimes may have on the species that influence the habitat features required by Brewer's sparrow.</p>
Birds	Flammulated owl Otus flammeolus	65 records in the past 20 years, the most recent observations in 2014	<p>Flammulated Owls are threatened by loss of suitable nesting habitat. Replacement of open, old-growth ponderosa pine and mixed conifer forest with younger, high-density vegetation is considered detrimental to this species. Immediate threats include the loss of remaining areas of open, mature forest habitat due to departure from historic fire regimes and landscape scale disturbances such as stand replacement fire and bug infestations.</p>
Birds	Northern goshawk Accipiter gentiles	As of 2015, at least 15 known active nesting territories, three historic territories, and two other potential territories	<p>Approximately 90 percent of the species habitat in the Southern Rockies is found on National Forest System lands. This species has experienced a decline in active nests over time. The loss of large nest trees in spruce-fir habitat is correlated with the impacts of beetles. A recent landscape study conducted in the San Juan Mountains of Colorado suggests substantial changes in landscape structure and fragmentation of mature forest have occurred in this area between 1950 and 1993. Many factors contribute to the changed condition including fire exclusion and maturing stand conditions in ponderosa pine. If this trend is representative of regional trends, goshawk habitat is probably declining in Region 2 (Kennedy 2003). Increase in younger tree age classes and loss of older trees associated with beetle kill are also a concern. Extensive habitat changes due to impacts of the bark beetle raises questions about long-term persistence on the forest and surrounding area. Detections and nest territory occupancy has declined in recent years based on project work and monitoring.</p>

Category	Species	Evidence of Occurrence	Substantial Concern About the Species Capability to Persist over the Long Term
Bird	Olive-sided flycatcher Contopus cooperi	30 records	The concern for persistence of this species is based on a decline range-wide and Forestwide. This species has experienced at least a 50 percent decline based on Rocky Mountain Bird Observatory/Bird Conservancy of the Rockies data. Similar patterns of decline are evident on the Forest based on results of local Breeding Bird Survey results over the past decade. Primary species habitat on the Forest (spruce-fir) has experienced a 90 percent decline.
Birds	Peregrine falcon Falco peregrinus anatum	22 records with at least 12 eyries identified, of which six are active eyries, five are recent or historic eyries, and one is potential	Local eyrie occupancy is declining. Delisted population is still monitored by the USFWS. Recovery of this species in other areas does not appear to be mirrored on the Forest. Stochastic impacts from recreational climbing have potential to cause nesting failure. Due to the small numbers of this species Forestwide, even a small number of failed nests could result in the extirpation of the species.
Birds	Southern White-tailed ptarmigan Lagopus leucurus altipetens	26 records	In the Rocky Mountains, approximately 95 percent of occupied ptarmigan habitats are on federal lands, 85 percent of which are National Forest System lands in Colorado and Wyoming. Region 2 populations are isolated from nearest northerly populations by long distances. As with many tundra relict species, changes in temperature and precipitation regimes could be a threat, as temperatures warm, species can move north or uphill to cooler refuges. In the case of species that exist on tundra in the southern Rockies, moving uphill is not an option as local populations already only survive on mountain tops. Warmer temperatures could lead to a loss of alpine tundra on the Forest. In this case, the Southern white-tailed ptarmigan could be lost from the Forest. Climate change vulnerability assessments for areas surrounding the Forest have determined that this species is “Highly Vulnerable” to negative impacts from changes in temperature and precipitation regimes. The species is under a 12 month review for possible Endangered Species Act listing by the U.S. Fish and Wildlife Service due to concerns for the present or threatened destruction, modification, or curtailment of the species’ habitat or range due to changes to temperature and precipitation regimes. (Review is still ongoing as of 16 May 2017); state Tier 1 Species of Greatest Conservation Need.
Mammals	American marten Martes americana	9 records	Marten is a closed canopy species therefore the 90 percent mortality in spruce fir, due to beetle kill, creates a concern. This change in suitable habitat, including related declines in associated prey species such as the red squirrel as documented by Colorado Parks and Wildlife (Ivan 2017), creates a persistence concern for the species.

Category	Species	Evidence of Occurrence	Substantial Concern About the Species Capability to Persist over the Long Term
Mammals	Fringed myotis Myotis thysanodes	Roost site records include an underground mine occurring at 8,941 ft. elevation. Acoustic surveys have positively identified the species at a low elevation ponderosa pine stand in the Hot Creek RNA in 2013.	Concern for long-term persistence of this species stems from white-nose syndrome. Although not yet detected within Colorado, the disease continues to spread west. The Agency has measures in place to protect bat roosts and maternity sites from white-nose syndrome, but it remains possible for the disease to infect colonies despite these measures. Based on patterns occurring elsewhere a loss of 80 to 90 percent of the affected bat species could be realized which includes the potential loss of entire colonies. Protection and maintenance of roost sites is also a potential issue. Since only one colony occurs on the Forest, extirpation remains possible. In addition, the Climate Change Vulnerability Assessment for the Colorado Bureau of Land Management suggests that fringed myotis may experience a "slight Increase" in vulnerability due to changes in its' hydrological niche and physical habitat due to changes in temperature regimes and precipitation patterns.
Mammals	Gunnison's prairie dog Cynomys gunnisoni	8 known records in two general areas.	The persistence concern for this species is sylvatic plague, which often wipes out most if not all of infected colonies and often involving much larger populations than found on the Forest.
Mammals	Northern pocket gopher Thomomys talpoides agrestis	Confirmed presence of the vulnerable <i>agrestis</i> subspecies (CNHP 2006)	Stochastic human or natural events could extirpate this species due to the very small size of the area occupied by this subspecies. The subspecies is also very rare across its range, which is limited to the San Luis Valley (endemic).
Mammals	Plains pocket mouse Perognathus flavescens	Two recent records (CNHP)	The concern for persistence is due to the limited habitat and very small area occupied by the species. Due to this small size, stochastic natural or human caused events could extirpate this species.
Mammals	River otter Lontra canadensis	Records from 2004 and 2010	Otters are threatened with extirpation mostly because they are already uncommon, and as such they are susceptible to stochastic events and human harassment. Relatively recent records indicate otters may be recolonizing the valley after an extended absence, perhaps stimulated by state recovery efforts. Opportunities exist to support that re-establishment through ongoing special habitat management attention.
Mammals	Townsend's big-eared bat Corynorhinus townsendii townsendii	11 records in the past 20 years.	Concern for the persistence stems from white-nose syndrome. Although not yet detected within Colorado, the disease continues to spread west. The Agency has measures in place to protect bat roost and maternity sites from white-nose syndrome, but it remains possible for the disease to infect colonies despite these measures. An 80 to 90 percent loss of the species could be realized, including the loss of entire colonies. In addition, Climate change vulnerability assessments for the state indicate that this species may experience a slight increase in vulnerability due to changes in its physiological hydrological niche and physical habitat due to changes in temperature regimes and precipitation patterns.
Plants	Black Canyon gilia Aliciella penstemonoides	Known from 6 occurrences. Last observed in 1998.	This species is found in rocky areas with a spruce-fir overstory, the approximately 90 percent mortality of spruce is a threat to this species because of the resulting loss or alteration of this species' habitat from the loss of that canopy cover. Climate change vulnerability assessments for areas surrounding the Forest indicate that this species is moderately vulnerable to negative impacts from changes in temperature and precipitation regimes, particularly because there are limits to dispersal. Forest occurrences are small and isolated populations which are susceptible to genetic drift and stochastic events.

Category	Species	Evidence of Occurrence	Substantial Concern About the Species Capability to Persist over the Long Term
Plants	Stonecrop gilia Aliciella sedifolia	This G1 species is known from 2 locations. Last observed in 2016. Of the entire global distribution of this species, 2 of the 3 occurrences are on the Forest.	Climate change vulnerability assessments for areas surrounding the Forest indicate that this species is extremely vulnerable to negative impacts from changes in temperature and precipitation regimes because of the loss of alpine habitat. Of the entire global distribution of this species, 2 of the 3 occurrences are on the Forest.
Plants	Brandegee milkvetch Astragalus brandegeei	Known from 2 occurrences. Both observed in 1986, aerial imagery indicates no evidence that the bristlecone habitat at these 2 locations has changed, thus there is no evidence to assume that the species is no longer present.	Climate change vulnerability assessments for areas surrounding the Forest indicate that the bristlecone pine habitat of this species is highly vulnerable to negative impacts from changes in temperature and precipitation regimes across Colorado. Isolated and small Forest populations are susceptible to threats from genetic drift and stochastic events.
Plants	Ripley's milkvetch Astragalus ripleyi	There are 22 known occurrences of this species last observed in 2016. The entire global distribution of this species is on or near the Forest.	Climate change vulnerability assessments for areas surrounding the Forest indicate that this species is extremely vulnerable to negative impacts from changes in temperature and precipitation regimes. This vulnerability is due to likely reductions in suitable habitat as well as alterations in the disturbance regime and its restriction to an uncommon geology.
Plants	Northern moonwort Botrychium pinnatum	Known from 3 occurrences, most recent observation in 2003.	Climate change vulnerability assessments for areas surrounding the Forest indicate that this species is moderately vulnerable to negative impacts from changes in temperature and precipitation regimes that would result in the loss of the alpine portion of this species' habitat. Documented threats to this species include disturbance from vegetation management as well as sedimentation from roads. This species also occurs in spruce-fir and is threatened by the loss or alteration of that habitat from over story mortality. Aerial imagery from 2016 indicates that the canopy cover of spruce at all 3 of the occurrences of this species have been lost. One of the occurrences consists of a single individual while the largest is only 75. Small and Isolated populations are susceptible to genetic drift and stochastic events.

Category	Species	Evidence of Occurrence	Substantial Concern About the Species Capability to Persist over the Long Term
Plants	<i>Least moonwort</i> <i>Botrychium simplex</i>	Known from a single occurrence. Last observation in 1995. Aerial imagery shows that the habitat at this occurrence is unchanged since 1995 and thus there is no evidence to assume the species is no longer present.	This species is found in spruce-fir habitat which has undergone a 90 percent mortality event resulting in a loss or alteration of this species' habitat. Aerial imagery from 2016 indicates that the canopy cover of spruce at this species' single occurrence has been lost. Climate change vulnerability assessments for areas surrounding the Forest indicate that the spruce-fir, fen, and montane riparian habitats are moderately threatened by changes in temperature and precipitation regimes. The single Forest occurrence consists of only 17 individuals. Small and isolated populations are susceptible to threats from genetic drift and stochastic events. Species with single occurrences have particular viability concerns because a single event can remove the species entirely.
Plants	<i>Downy Indian-paintbrush</i> <i>Castilleja puberula</i>	This G2 species is known from 3 locations, the most recent observation is 2006.	Climate change vulnerability assessments for areas surrounding the Forest indicate that this species is extremely vulnerable to negative impacts from changes in temperature and precipitation regimes, has a limited dispersal ability, is dependent on snow and ice, and has migration barriers. Additionally, climate change vulnerability assessments for areas surrounding the Forest indicate that the alpine habitat of this species is considered to be highly vulnerable to negative impacts from changes in temperature and precipitation regimes in southwest Colorado and this species is thus threatened by the loss of its alpine habitat. One of the observations on the Forest is a few individuals scattered over a hundred acres. Small and isolated populations are susceptible to threats from genetic drift and stochastic events.
Plants	<i>Weber's catseye</i> <i>Cryptantha weberi</i>	This species is known from a single observation in 2005.	Climate change vulnerability assessments for areas surrounding the Forest indicate that the alpine habitat of this species is considered to be highly vulnerable to negative impacts from changes in temperature and precipitation regimes in southwest Colorado and this species is thus threatened by the loss of its alpine habitat. Small and Isolated populations are susceptible to threats from genetic drift and stochastic events. Species with single occurrences have particular viability concerns because a single event can remove the species entirely.
Plants	<i>Weber's catseye</i> <i>Cryptantha weberi</i>	Known from 3 locations, the most recent observation in 1998.	This species is documented to be negatively impacted by domestic livestock grazing.
Plants	<i>Slender rock-brake</i> <i>Cryptogramma stelleri</i>	Known from a single occurrence. Last observation in 1988.	This species is found in spruce-fir habitat which has undergone a 90 percent mortality event resulting in a loss or alteration of this species' habitat. Aerial imagery from 2016 indicates that the canopy cover of spruce at the single occurrence of this species has been lost. Climate change vulnerability assessments for areas surrounding the Forest indicate that this species is extremely vulnerable to negative impacts from changes in temperature and precipitation regimes that may alter the cool moist dripping spring cliff habitat of this species. There are dispersal and migratory barriers for this species. Small and isolated populations are susceptible to threats from genetic drift and stochastic events. Species with single occurrences have particular viability concerns because a single event can remove the species entirely.

Category	Species	Evidence of Occurrence	Substantial Concern About the Species Capability to Persist over the Long Term
Plants	Mountain bladder fern Cystopteris montana	Known from a single occurrence. Last observation in 1986.	This species is found in spruce-fir habitat which has undergone a 90 percent mortality event resulting in a loss or alteration of this species' habitat. Aerial imagery from 2016 indicates that the canopy cover of spruce at the single occurrence of this species has been lost. Climate change vulnerability assessments for areas surrounding the Forest indicate that the spruce-fir habitat of this species is moderately threatened by changes in temperature and precipitation regimes. Small and isolated populations are susceptible to threats from genetic drift and stochastic events. Species with single occurrences have particular viability concerns because a single event can remove the species entirely.
Plants	Colorado larkspur Delphinium alpestre	There are 3 known occurrences of this G2 species, the most recent being in 1998.	Vulnerability Assessments for areas surrounding the Forest assessed the alpine habitat of this species and determined that it is considered to be highly vulnerable to negative impacts from changes in temperature and precipitation regimes in southwest Colorado and this species is threatened by the loss of its alpine habitat. Small and Isolated populations are susceptible to threats from genetic drift and stochastic events. Since small and isolated population only occur in a certain area and have a smaller population they are more susceptible to loss.
Plants	San Juan draba Draba graminea	This G2 species is known from 3 locations and the most recent observation is from 2013.	Climate change vulnerability assessments for areas surrounding the Forest indicate that this species is extremely vulnerable to negative impacts from changes in temperature and precipitation regimes that may alter the alpine habitat of this species. The assessments indicate that the alpine habitat of this species is considered to be highly vulnerable to negative impacts from changes in temperature and precipitation regimes in southwest Colorado and this species is threatened by the loss of its alpine habitat. The species is reliant on ice and snow. There are dispersal and migratory barriers for this species. Small and isolated populations are susceptible to threats from genetic drift and stochastic events.
Plants	Gray's draba Draba grayana	This G2 species is known from 2 locations and the most recent observation is from 1985. Aerial imagery indicates that the alpine scree slope where this species was observed is unaltered and thus there is no evidence to assume the species is no longer present.	Climate change vulnerability assessments for areas surrounding the Forest indicate that the alpine habitat of this species is considered to be highly vulnerable to negative impacts from changes in temperature and precipitation regimes in southwest Colorado and this species is threatened by the loss of its alpine habitat. Additional threats to this species include recreation and mountain goats. The occurrences are small and isolated and are thus susceptible to threats from genetic drift and stochastic events.

Category	Species	Evidence of Occurrence	Substantial Concern About the Species Capability to Persist over the Long Term
Plants	Smith's draba Draba smithii	G2 Species. There are 12 occurrences the most recent observation was in 2002.	Climate change vulnerability assessments for areas surrounding the Forest indicate that the alpine habitat of this species is considered to be highly vulnerable to negative impacts from changes in temperature and precipitation regimes in southwest Colorado and this species is thus threatened by the loss of its alpine habitat. These assessments indicate that this species is extremely vulnerable to negative impacts from changes in seasonal precipitation as well as threats from energy development, its restriction to specific geologic substrates, dispersal barriers, and migration barriers. Small and isolated populations are susceptible to threats from genetic drift and stochastic events.
Plants	Colorado Divide whitlow-grass Draba streptobrachia	Species is known from 4 occurrences, the most recent observation is from 2002.	Climate change vulnerability assessments for areas surrounding the Forest indicate that the alpine habitat of this species is considered to be highly vulnerable to negative impacts from changes in temperature and precipitation regimes in southwest Colorado and this species is thus threatened by the loss of its alpine habitat. The species is reliant on ice and snow. There are dispersal and migratory barriers for this species. Small and isolated populations are susceptible to threats from genetic drift and stochastic events.
Plants	Philadelphia fleabane Erigeron philadelphicus	Known from a single observation in 1990. Aerial imagery indicates that the wet meadow habitat where this species was observed is unaltered and thus there is no evidence to assume the species is no longer present.	Climate change vulnerability assessments for areas surrounding the Forest indicate that the low elevation riparian and wetland habitat of this species is highly susceptible to changes in temperature and precipitation regimes. Small and isolated populations are susceptible to threats from genetic drift and stochastic events. Species with single occurrences have particular viability concerns because a single event can remove the species entirely.
Plants	Many-flowered gilia Ipomopsis multiflora	Known from a single occurrence in 1986. Analysis of aerial imagery indicates that the open woodland habitat of this occurrence is unaltered and thus there is no evidence to assume the species is no longer present.	The single occurrence of this species is threatened by invasive plant species and impacts from the management of those invaders. Small and isolated populations are susceptible to threats from stochastic events and genetic drift. Species with single occurrences have particular viability concerns because a single event can remove the species entirely.
Plants	Spiny-spored quillwort Isoetes tenella	Known from 4 occurrences. The most recent was from 2000.	This species and its aquatic and fen habitat are threatened by alterations in flow from development and diversion. Similarly, climate change vulnerability assessments for areas surrounding the Forest indicate that the aquatic and fen habitat of this species is moderately vulnerable to changes in temperature and precipitation regimes. The occurrences of this species on the Forest are small and isolated which are susceptible to threats from genetic drift and stochastic events.

Category	Species	Evidence of Occurrence	Substantial Concern About the Species Capability to Persist over the Long Term
Plants	Colorado woodrush Luzula subcapitata	Known from 3 occurrences, the most recent in 2004.	Climate change vulnerability assessments for areas surrounding the Forest indicate that this species and its fen habitat are extremely vulnerable to negative impacts from changes in temperature and precipitation. This species lives on the margins of fens and riparian habitats which are susceptible to negative impacts from small changes in hydrology. The occurrences are small and isolated which are susceptible to threats from genetic drift and stochastic events
Plants	Colorado tansy aster Machaeranthera coloradoensis	Known from 4 occurrences. The most recent was from 1997.	Threats include recreation and road construction/maintenance, pipeline construction, and construction of radio towers.
Plants	House's sandwort Minuartia macrantha	Species was collected in 2003. The single occurrence was from alpine habitat just east of Stony Pass.	Climate change vulnerability assessments for areas surrounding the Forest indicate that this species is extremely vulnerable to negative impacts from changes in temperature and precipitation regimes. These assessments indicate that the alpine habitat of this species is considered to be highly vulnerable to negative impacts from changes in temperature and precipitation regimes in southwest Colorado and thus this species is threatened by the loss of its alpine habitat. Small and isolated populations are susceptible to genetic drift and loss from stochastic events. Species with single occurrences have particular viability concerns because a single event can remove the species entirely.
Plants	Parry's crazy-weed Oxytropis parryi	Species was collected in 1998 and 1999, on rocky slopes north of Saguache and at the head of Raspberry Canyon.	Climate change vulnerability assessments for areas surrounding the Forest indicate that the alpine habitat of this species is considered to be highly vulnerable to negative impacts from changes in temperature and precipitation regimes in southwest Colorado and this species is thus threatened by the loss of its alpine habitat. Small and isolated populations are susceptible to negative impacts from genetic drift and stochastic events.
Plants	Southern Rocky Mountain cinquefoil Potentilla ambigens	There are 3 occurrences of this species, the most recent observation is from 1998.	Threats to the species include recreation and trail use. Occurrences are less than 100 individuals. Small populations are susceptible to negative impacts from stochastic events, particularly species like this one that live close to rivers, streams, trails, and roads where these events are more likely.
Plants	Arizona willow Salix arizonica	G2 species found in a single location. Species was observed to be extant in 2016.	The single occurrence is documented to be threatened by livestock grazing, wildlife damage, and recreation. Climate change vulnerability assessments for areas surrounding the Forest indicate that the high elevation fen habitat of this species is also threatened by changes in temperature and precipitation resulting in changes in the hydrology. The single occurrence of Arizona willow is isolated from other occurrences of the species. Isolated populations are subject to negative impacts from genetic drift. Species with single occurrences have particular viability concerns because a single event can remove the species entirely.

Category	Species	Evidence of Occurrence	Substantial Concern About the Species Capability to Persist over the Long Term
Plants	<u>Tundra saxifrage</u> <u><i>Saxifraga caespitosa</i></u> <u>ssp. <i>monticola</i></u>	Known from a single occurrence. Documented in 1998.	Climate change vulnerability assessments for areas surrounding the Forest indicate that the alpine habitat of this species is considered to be highly vulnerable to negative impacts from changes in temperature and precipitation regimes in southwest Colorado and this species is thus threatened by the loss of its alpine habitat. The occurrence is isolated from other populations of this species. Isolated populations are susceptible to negative impacts from genetic drift. Species with single occurrences have particular viability concerns because a single event can remove the species.
Plants	<u>King's campion</u> <u><i>Silene kingii</i></u>	G2 species known from a single occurrence, documented in 2005.	Climate change vulnerability assessments for areas surrounding the Forest indicate that the alpine habitat of this species is considered to be highly vulnerable to negative impacts from changes in temperature and precipitation regimes in southwest Colorado and thus this species is threatened by the loss of its alpine habitat. The occurrence is isolated from other populations of this species. Isolated populations are susceptible to negative impacts from genetic drift. Species with single occurrences have particular viability concerns because a single event can remove the species entirely.
Plants	<u>Fine bog-moss</u> <u><i>Sphagnum angustifolium</i></u>	There is a single occurrence along Iron Creek in 2016.	Climate change vulnerability assessments for areas surrounding the Forest indicate that this species and its high elevation fen habitat are threatened by changes in temperature and precipitation regimes. The population is small and isolated, and small and isolated populations are subject to threats from genetic drift and stochastic events. Species with single occurrences have particular viability concerns because a single event can remove the species.
Plants	<u>Rothrock townsend-daisy</u> <u><i>Townsendia rothrockii</i></u>	G2 species known from 3 occurrences. The species was known to be extant in 2016.	Climate change vulnerability assessments for areas surrounding the Forest indicate that this species is extremely vulnerable to negative impacts from changes in temperature and precipitation regimes, particularly because it is dependent on ice and snow. These assessments indicate that the alpine habitat of this species is considered to be highly vulnerable to negative impacts from changes in temperature and precipitation regimes in southwest Colorado and this species is thus threatened by the loss of its alpine habitat. Additionally, the occurrences are small and isolated. Small and isolated populations are subject to threats from genetic drift and stochastic events.

Species that were considered during the development of the species of conservation concern list are contained in Table 22. The rationale for not including these species is included.

Table 22. Species considered early but after further review were not identified as species of conservation concern

Category	Species	Evidence of Occurrence	Rationale for not including the species as Draft SCC
Amphibian	Leopard frog <i>Rana pipiens</i>	Not known to occur	Locally this is primarily a lower-elevation species. Limited, but historical occurrence on Forest. No known existing populations or occurrences.
Bird	Grasshopper sparrow <i>Ammodramus savannarum</i>	Not known to occur	Very limited occurrence in select locations in the San Luis Valley. Very limited, if any, potential habitat on Forest.
Bird	Sage sparrow Amphispiza belli	Known to occur	Limited suitable habitat on the Forest and most occurrence records are peripheral, with only one documented occurrence in 2004. Very limited ability to influence species through management actions.
Bird	Golden eagle Aquila chrysaetos	Known to occur	Associated with primarily low-elevation open grasslands with rocky outcrops. Appears to be secure, occupying these habitats where expected, and, in some cases, at relatively high densities (up to 7 nesting eagles at locations). Also continues to enjoy protections under the Bald & Golden Eagle Protection Act.
Bird	Burrowing owl Athene cunicularia	Not known to occur	No occurrence on Forest documented through continuous survey efforts, including high-use areas such as prairie dog colonies.
Bird	Juniper titmouse <i>Baeolophus griseus</i>	Known to occur	Global and state rankings suggest species is secure globally and locally. No known substantial conservation concern.
Bird	Ferruginous hawk Buteo regalis	Not known to occur	Limited nesting occurrences are restricted to the valley floor. Very little if any potential habitat.
Bird	Cassin's finch <i>Carpodacus cassinii</i>	Known to occur	Global and state rankings suggest species is secure globally and locally. No known substantial conservation concern.
Bird	Veery Catharus fuscescens	Known to occur	No reported occurrences under existing databases. Potential evidence of recent breeding at one location. Presence is considered peripheral.
Bird	Mountain plover Charadrius montanus	Not known to occur	No occurrence documented through continuous survey efforts, including high-use areas such as prairie dog colonies.
Bird	Northern harrier Circus cyaneus	Not known to occur	Nesting habitat and occurrences primarily restricted to the valley floor. The Forest has little potential habitat.
Bird	Black swift Cypseloides niger	Known to occur	Survey efforts suggest the population is stable and secure statewide and locally. No documented connection or concerns about effects of Forest uses and management as primary risk factors. Unique species that may warrant other occasional monitoring efforts.
Bird	Prairie falcon <i>Falco mexicanus</i>	Known to occur	No known substantial conservation concern. Distribution is widespread and rangewide populations are thought to be stable. Cliff and outcrop breeding habitat is unchanged and secure.

Category	Species	Evidence of Occurrence	Rationale for not including the species as Draft SCC
Bird	Pinyon jay Gymnorhinus cyanocephalus	Known to occur	No known substantial conservation concern. Limited management activity in available habitat. Global and state rankings suggest the species is secure.
Bird	Bald eagle Haliaeetus leucocephalus	Known to occur	No breeding or wintering confirmed and no clear evidence of concern for persistence. Species continues to enjoy important protections under the Bald and Golden Eagle Protection Act.
Bird	Loggerhead shrike Lanius ludovicianus	Known to occur	Occurrence is peripheral. Very few documented occurrences. Very little suitable habitat.
Bird	Virginia's warbler <i>Leiothlypis virginiae</i>	Known to occur	Fairly common to abundant nesting inhabitant in western Colorado, limited occurrences. Global and state ranking suggest the species is secure. High dispersal capability. Shrubland habitats are limited in availability and stable on the Forest, no known substantial conservation concern.
Bird	Brown-capped rosy finch Leucosticte australis	Known to occur	Breeding habitat consists of cliffs, caves, and rock crevices in alpine and tundra habitats that is stable and secure. Some uncertainty about sensitivity of alpine habitat to changes to precipitation and temperature regimes. The species is fairly common. No known substantial conservation concern.
Bird	Lewis's woodpecker Melanerpes lewis	Known to occur	Occurrence is peripheral and primarily associated with lower elevation cottonwood systems such as those along the Alamosa and Conejos River drainages. There are very few documented observations over the past 20 years. Very little suitable habitat is available.
Bird	Band-tailed pigeon <i>Patagioenas fasciata</i>	Known to occur	Migratory species. Occurrence is sporadic and seasonal with no known nesting occurrence.
Invertebrate	Monarch butterfly Danaus plexippus	Not known to occur	Limited available habitat.
Invertebrate	Theano alpine <i>Erebia pawloskii</i>	Not known to occur	Globally secure, moderate concern statewide. Not known to occur.
Invertebrate	Colorado blue (butterfly) Euphilotes rita coloradensis	Not known to occur	Lower elevation, prairie species. Very limited habitat.
Invertebrate	Alberta Arctic Oeneis alberta	Known to occur	There are no records of this species occurrence. Bunchgrass habitat Forestwide is not at risk.
Invertebrate	Gold-edge gem moth Schinia avemensis	Not known to occur	Lower elevation species, limited habitat.
Invertebrate	Great Basin silverspot Speyeria nokomis nokomis	Not known to occur	Lower elevation species, limited habitat.

Category	Species	Evidence of Occurrence	Rationale for not including the species as Draft SCC
Mammal	Hoary bat Lasiurus cinereus	Known to occur	Individuals detected locally during acoustic bat surveys. Forest occupancy is limited with a 5 occurrences reported over the past 20 years. Potential habitat loss a concern due to the loss of spruce habitat due to the impacts of spruce beetle. Abundant aspen forest remains unaffected and available. Windfarms are a primary threat, but none occur or are planned.
Mammal	Southern red-backed vole <i>Myodes gapperi</i>	Known to occur	Global and state rankings suggest species is secure in Colorado and locally. No known substantial conservation concern.
Mammal	Little brown bat <i>Myotis lucifugus</i>	Known to occur	Has experienced substantial population declines in Eastern and Midwestern states affected by white-nose syndrome. White nose syndrome has not yet occurred in Colorado; therefore, there is currently no known substantial conservation concern. Plan components address regarding abandoned mine features for bat species prior to closure.
Mammal	Big free-tailed bat Nyctinomops macrotis	Known to occur	Occurrence is peripheral. Very few documented occurrences, no known breeding or roosting areas on. Very little suitable habitat.
Mammal	American pika <i>Ochotona princeps</i>	Known to occur	In Colorado, species remains common in available talus habitat. Quantity of talus habitats remains stable. May be some concerns for effects of changes in temperature and precipitation regimes to alpine habitats but uncertain at this time. No known substantial conservation concern locally although occasional monitoring may be warranted.

<p>Mammals</p>	<p>Rocky mountain bighorn sheep Ovis canadensis canadensis</p>	<p>Known to occur</p>	<p>In western North America bighorn sheep populations have declined from an estimated 500,000 at the onset of European settlement to an estimated 15,000 to 20,000 by 1960. Numbers have increased since 1960 due to population translocations and augmentations and other conservation efforts. The distribution of bighorn sheep is naturally fragmented due to the patchy nature of preferred habitats, and bighorn sheep typically make seasonal movements to alpine habitats in summer and lower elevation habitats or south-facing slopes during the winter period.</p> <p>The primary risk to persistence on the planning unit is transmission of novel pathogens from domestic sheep to bighorn sheep, and subsequent disease outbreaks and population impacts. Current and expected future domestic sheep grazing on the Forest includes some risk of contact between domestic sheep and bighorn sheep, and such contact can result in respiratory disease outbreaks in bighorn sheep. Respiratory disease in bighorn sheep can result in all age die-offs which can have lasting impacts on populations through suppressed lamb recruitment following disease outbreaks. In-breeding, loss of alpine habitat due to changing temperature and precipitation patterns, and unintentional human harassment can also represent added stressors further impacting viability of local herds and populations.</p> <p>Despite the risks to bighorn sheep from domestic sheep, Forest bighorn sheep populations have persisted for the past several decades. Colorado Parks and Wildlife has identified 12 Game Management Units (akin to herds) that occur entirely or in part on the Forest. Several herds cross administrative boundaries and occur on adjacent public or private lands during part of their life cycles. Overall population estimates for the 12 herds total approximately 1,100 individuals, and the total population estimates have fluctuated from approximately 1,000 to 1,500 animals during the past 30 years. Population die-offs due to disease have been observed or suspected in several herds during this time, and some herds have been augmented via population translocations. Currently, several bighorn sheep herds are still recovering from die-off events in the 1990's. The presence of some type of respiratory pathogen has been confirmed in 8 herds. Most herds are currently hunted with regulations and population objectives established by Colorado Parks and Wildlife.</p> <p>Among the herds whose Game Management Unit boundaries overlap the Forest, 3 occur in areas where domestic sheep grazing is not currently permitted and is not anticipated in the foreseeable future. These herds (S08, S09, and S68, though S68 includes only a small portion of the Forest) occur in the Sangre de Cristo mountains on the eastern Forest boundary and account for an estimated 40 percent of the Forestwide bighorn sheep population. While long-distance movements from other herds could potentially move pathogens into these herds, this is a relatively low likelihood concern and these herds are considered secure based on management actions under Forest authority.</p> <p>Other Forest herds are at some risk of contact with domestic sheep and transmission of pathogens is possible. Despite the risk to herds outside the Sangre de Cristo Mountains, bighorn sheep are likely to persist due to the strongholds in the Sangre de Cristo mountains and the absence of the domestic sheep grazing, the main threat to persistence.</p>
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Category	Species	Evidence of Occurrence	Rationale for not including the species as Draft SCC
			Population management by Colorado Parks and Wildlife will contribute to the persistence of bighorn sheep on the planning unit through establishing population objectives, managing hunting opportunities and potentially through population augmentation via translocations. Lastly, through collaborative monitoring with Colorado Parks and Wildlife and other partners will help provide information on the effectiveness of management actions and help identify potential changes in management needed to support the persistence of bighorn sheep.
Mammal	Abert's squirrel <i>Sciurus aberti</i>	Known to occur	Widespread through the ponderosa pine zone. No known substantial conservation concern.
Mammal	Dwarf shrew <i>Sorex nanus</i>	Not known to occur	No occurrences or known habitat.
Mammal	Botta's pocket gopher <i>Thomomys bottae pervagus</i>	Not known to occur	Species considered secure locally. Limited available habitat.
Plant	Rydberg's golden columbine <i>Aquilegia chrysantha var. rydbergii</i>	Not known to occur	
Plant	Vierhapper's/Alpine aster <i>Aster alpinus var. vierhapperi</i>	Known to occur	Too long a time has passed since observation for species to be known to occur.
Plant	Violet milkvetch <i>Astragalus iodopetalus</i>	Not known to occur	
Plant	Missouri milkvetch <i>Astragalus missouriensis var. humistratus</i>	Not known to occur	
Plant	Aztec milkvetch <i>Astragalus proximus</i>	Not known to occur	
Plant	Crandall's rockcress <i>Boechera crandallii</i>	Not known to occur	
Plant	Narrowleaf grapefern <i>Botrychium lineare</i>	Not known to occur	
Plant	Winding mariposa lily <i>Calochortus flexuosus</i>	Not known to occur	
Plant	Lesser tussock sedge <i>Carex diandra</i>	Not known to occur	

Category	Species	Evidence of Occurrence	Rationale for not including the species as Draft SCC
Plant	Mud sedge Carex limosa	Known to occur	Too long a time has passed since observation for species to be known to occur.
Plant	Slender spiderflower Cleome multicaulis	Not known to occur	
Plant	James' cryptantha Cryptantha cinerea	Known to occur	Taxonomists lumped this species together with a more widespread, stable species. No conservation concern for the larger species.
Plant	Lesser yellow lady's – slipper Cypripedium parviflorum	Not known to occur	
Plant	Wahatoya larkspur Delphinium robustum	Not known to occur	
Plant	Heil's tansy mustard Descurainia kenheilii	Not known to occur	
Plant	Stream orchid, giant helleborine Epipactis gigantea	Not known to occur	
Plant	Brandegee's buckwheat Eriogonum brandegeei	Not known to occur	
Plant	Colorado wild buckwheat Eriogonum coloradense	Not known to occur	
Plant	Whitebristle cottongrass Eriophorum altaicum var. neogaeum	Known to occur	Removed from Regional Forester Sensitive Species list due to taxonomic lumping. Good viability.
Plant	Chamisso's cottongrass Eriophorum chamissonis	Not known to occur	
Plant	Slender cottongrass Eriophorum gracile	Not known to occur	
Plant	Bill's neoparrya Neoparrya lithophila	Known to occur	Present, no conservation concern due to stable populations that are largely free of threats.
Plant	Kotzebue's grass of Parnassus Parnassia kotzebuei	Not known to occur	
Plant	Degener's beardtongue Penstemon degeneri	Not known to occur	

Category	Species	Evidence of Occurrence	Rationale for not including the species as Draft SCC
Plant	Ice cold buttercup <i>Ranunculus karelinii</i>	Known to occur	Taxonomy issues make it difficult to judge the rarity of the species, as taxonomists are uncertain if this is a distinct species or part of a large, more common species. No state ranking because of taxonomic dispute.
Plant	Sageleaf willow <i>Salix candida</i>	Not known to occur	
Plant	Autumn willow <i>Salix serissima</i>	Not known to occur	
Plant	Weber's saw-wort <i>Saussurea weberi</i>	Not known to occur	
Plant	Pale blue-eyed grass <i>Sisyrinchium pallidum</i>	Not known to occur	
Plant	Baltic sphagnum <i>Sphagnum balticum</i>	Not known to occur	
Plant	Smooth Easter daisy <i>Townsendia glabella</i>	Not known to occur	
Plant	Lesser bladderwort <i>Utricularia minor</i>	Not known to occur	
Plant	New Mexico cliff fern <i>Woodsia neomexicana</i>	Known to occur	Occurrences are small and isolated and small and isolated populations are susceptible to negative impacts from genetic drift and stochastic events. However, this is not enough to substantiate a local concern for continued persistence.
Plant	Plummer's cliff fern <i>Woodsia plummerae</i>	Known to occur	Occurrences are small and isolated and small and isolated populations are susceptible to negative impacts from genetic drift and stochastic events. However, this is not enough to substantiate a local concern for continued persistence.

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Appendix E. Southern Rockies Lynx Amendment Direction

Background

The Southern Rockies Lynx Amendment was completed in 2008 and when signed it effectively amended Forest Plan direction for the Canada Lynx (*Lynx canadensis*) on eight existing Forest Plan in the Rocky Mountain Region of the U.S. Forest Service, including the Rio Grande. That direction and the implementing guidance are not proposed to be changed at this time. Supplemental guidance is included in the Proposed Forest Plan that addresses the current conditions in the spruce-fir lynx habitat on the Forest.

The direction is incorporated here and would apply to implementation of the Proposed Forest Plan.

Southern Rockies Lynx Amendment – Management Direction

The management direction applies to lynx habitat on the following National Forests in the Southern Rockies Lynx Amendment area:

Medicine Bow Routt National Forests (two separate Plans), Arapaho-Roosevelt National Forests, Grand Mesa, Uncompahgre and Gunnison National Forests, Pike-San Isabel National Forests, Rio Grande National Forest, San Juan National Forest, and White River National Forest.

GOAL¹⁴

Conserve the Canada lynx.

ALL MANAGEMENT PRACTICES AND ACTIVITIES (ALL). The following objectives, standards, and guidelines apply to all management projects in lynx habitat in lynx analysis units (LAUs) in occupied habitat and in linkage areas, subject to valid existing rights. They do not apply to wildfire suppression, or to wildland fire use.

Objective³⁰ ALL O1

Maintain²⁶ or restore⁴⁰ lynx habitat²³ connectivity¹⁶ in and between LAUs²¹, and in linkage areas²².

Standard⁴⁴ ALL S1

New or expanded permanent developments³³ and vegetation management⁵⁰ projects³⁶ must maintain²⁶ habitat connectivity¹⁶ in an LAU²¹ and/or linkage area²².

Guideline¹⁵ ALL G1

Methods to avoid or reduce effects on lynx should be used when constructing or reconstructing highways¹⁸ or forest highways¹² across federal land. Methods could include fencing, underpasses or overpasses.

Standard⁴⁴ LAU S1

Changes in LAU²¹ boundaries shall be based on site-specific habitat information and after review by the Forest Service Regional Office.

VEGETATION MANAGEMENT ACTIVITIES AND PRACTICES (VEG). The following objectives, standards, and guidelines apply to vegetation management projects³⁶ in lynx habitat within lynx analysis units (LAUs) in occupied habitat. With the exception of Objective VEG O3 that specifically concerns wildland fire use, the objectives, standards, and guidelines do not apply to wildfire suppression, wildland fire use, or removal of vegetation for permanent developments such as mineral operations, ski runs, roads, and the like. None of the objectives, standards, or guidelines apply to linkage areas.

Objective³⁰ VEG O1

Manage vegetation to mimic or approximate natural succession and disturbance processes while maintaining habitat components necessary for the conservation of lynx.

Objective VEG O2

Provide a mosaic of habitat conditions through time that support dense horizontal cover¹⁹, and high densities of snowshoe hare. Provide winter snowshoe hare habitat⁵¹ in both the stand initiation structural stage and in mature, multi-story conifer vegetation.

Objective VEG O3

Conduct fire use¹¹ activities to restore⁴⁰ ecological processes and maintain or improve lynx habitat.

Objective VEG O4

Focus vegetation management⁵⁰ in areas that have potential to improve winter snowshoe hare habitat⁵² but presently have poorly developed understories that lack dense horizontal cover.

Standard⁴⁴ VEG S1

Where and to what this applies: Standard VEG S1 applies to all vegetation management⁵⁰ projects³⁶ that regenerate³⁸ forested stands, except for fuel treatment¹³ projects³⁶ within the wildland urban interface⁵¹ (WUI) as defined by HFRA¹⁷, subject to the following limitation:

Fuel treatment projects³⁶ within the WUI⁵¹ that do not meet Standards VEG S1, VEG S2, VEG S5, or VEG S6 shall occur on no more than 3 percent (cumulatively) of lynx habitat on each administrative unit (a National Forest or administratively combined National Forests). In addition, fuel treatment projects may not result in more than three adjacent LAUs exceeding the standard.

For fuel treatment projects³⁶ within the WUI⁵¹ see guideline VEG G10.

The standard: Unless a broad scale assessment has been completed that substantiates different historic levels of stand initiation structural stages⁴⁵ limit disturbance in each LAU as follows:

If more than 30 percent of the lynx habitat in an LAU is currently in a stand initiation structural stage that does not yet provide winter snowshoe hare habitat, no additional habitat may be regenerated by vegetation management projects³⁶.

Standard VEG S2

Where and to what this applies: Standard VEG S2 applies to all timber management⁴⁷ projects³⁶ that regenerate³⁸ forests, except for fuel treatment¹³ projects³⁶ within the wildland urban interface⁵¹ (WUI) as defined by HFRA¹⁷, subject to the following limitation:

Fuel treatment projects³⁶ within the WUI⁵¹ that do not meet Standards VEG S1, VEG S2, VEG S5, or VEG S6 shall occur on no more than 3 percent (cumulatively) of lynx habitat on each administrative unit (a National Forest or administratively combined National Forests).

For fuel treatment projects³⁶ within the WUI⁵¹ see guideline VEG G10.

The standard: Timber management⁴⁷ projects³⁶ shall not regenerate³⁸ more than 15 percent of lynx habitat on NFS lands within an LAU in a ten-year period. This 15 percent includes the entire stand within an even-age regeneration area, and only the patch opening areas within group selections. Salvage harvest within stands killed by insect epidemics, wildfire, etc. does not add to the 15 percent, unless the harvest treatment would cause the lynx habitat to change to an unsuitable condition²⁴.

Standard VEG S5

Where and to what this applies: Standard VEG S5 applies to all precommercial thinning³⁵ projects, except for fuel treatment¹³ projects that use precommercial thinning as a tool within the wildland urban interface (WUI) as defined by HFRA, subject to the following limitation:

Fuel treatment projects within the WUI that do not meet Standards VEG S1, VEG S2, VEG S5, or VEG S6 may occur on no more than three percent (cumulatively) of lynx habitat on each administrative unit (a National Forest or administratively combined National Forests) for the life of this amendment.

For fuel treatment projects within the WUI see guideline VEG G10.

The Standard: Precommercial thinning practices and similar activities intended to reduce seedling/sapling density are subject to the following limitations from the stand initiation structural stage⁴⁵ until the stands no longer provide winter snowshoe hare habitat.

Precommercial thinning³⁵ may occur only:

1. Within 200 feet of administrative sites, dwellings, or outbuildings; or
2. For research studies³⁹ or genetic tree tests evaluating genetically improved reforestation stock; or
3. For conifer removal in aspen, or daylight thinning⁵ around individual aspen trees, where aspen is in decline; or
4. Based on new information that is peer reviewed and accepted by the

regional/state levels of the Forest Service and FWS, where a written determination states:

- a) That a project is not likely to adversely affect lynx; or
 - b) That a project is likely to have short term adverse effects on lynx or its habitat, but would result in long-term benefits to lynx and its habitat.
5. In addition to the above exceptions (and above and beyond the three percent limitation for fuels projects within the WUI⁵¹), precommercial thinning may occur provided that:
- a) The additional precommercial thinning does not exceed one percent of the lynx habitat in any LAU for the life of this amendment, and the amount and distribution of winter snowshoe hare habitat within the LAU must be provided through appropriate site-specific analysis and consultation; and
 - b) Precommercial thinning in LAUs with more than 30 percent of the lynx habitat currently in the stand initiation structural stage⁴⁵ is limited to areas that do not yet provide winter snowshoe hare habitat⁵²; and
 - c) Projects are designed to maintain lynx habitat connectivity¹⁶ and provide snowshoe hare habitat over the long term; and
 - d) Monitoring is used to determine snowshoe hare response.

Exceptions 2 and 3 may not occur in any LAU in which VEG S1 is exceeded (i.e., more than 30 percent of LAU in stand initiation structural stage).

Note: This standard is intended to provide snowshoe hare habitat while permitting some thinning, to explore methods to sustain snowshoe hare habitat over time, reduce hazardous fuels, improve forest health, and increase timber production. Project design must ensure any precommercial thinning provides an appropriate amount and distribution of snowshoe hare habitat with each LAU over time, and maintains lynx habitat connectivity within and between LAUs.

Project design should focus on creating irregular shapes for the thinning units, creating mosaics of thinned and unthinned areas, and using variable density thinning, etc.

Standard VEG S6

Where and to what this applies: Standard VEG S6 applies to all vegetation management⁵⁰ practices within multi-story mature or late successional conifer forests²⁹, except for fuel treatment¹³ projects within the wildland urban interface (WUI) as defined by HFRA¹⁷, subject to the following limitation:

Fuel treatment projects³⁶ within the WUI⁵¹ that do not meet Standards VEG S1, VEG S2, VEG S5, or VEG S6 shall occur on no more than 3 percent (cumulatively) of lynx habitat on each administrative unit (a National Forest or administratively combined National Forests).

For fuel treatment projects³⁶ within the WUI⁵¹ see guideline VEG G10.

The Standard: Vegetation management projects³⁶ that reduce winter snowshoe hare habitat⁵² in multi-story mature or late successional conifer forests²⁹ may occur only:

1. Within 200 feet of administrative sites, dwellings, outbuildings, recreation sites, and special use permit improvements, including infrastructure within permitted ski area boundaries; or
2. For research studies³⁸ or genetic tree tests evaluating genetically improved reforestation stock; or
3. For incidental removal during salvage harvest⁴¹ (e.g., removal due to location of skid trails); or
4. Where uneven-aged management (single tree and small group selection) practices are employed to maintain and encourage multi-story attributes as part of gap dynamics. Project design must be consistent with VEG O1, O2 and O4, except where impacts to areas of dense horizontal cover are incidental to activities under this exception (e.g., construction of skid trails).

Exceptions 2 and 4 may not occur in any LAU in which VEG S1 is exceeded.

Guideline VEG G1

Vegetation management⁵⁰ projects³⁶ should be planned to recruit a high density of conifers, hardwoods, and shrubs where such habitat is scarce or not available.

Priority for treatment should be given to stem-exclusion, closed-canopy structural stage⁴⁶ stands to enhance habitat conditions for lynx or their prey (e.g. mesic, monotypic lodgepole stands). Winter snowshoe hare habitat⁵² should be near denning habitat⁶.

Guideline VEG G4

Prescribed fire³⁴ activities should not create permanent travel routes that facilitate snow compaction. Constructing permanent firebreaks on ridges or saddles should be avoided.

Guideline VEG G5

Habitat for alternate prey species, primarily red squirrel³⁷, should be provided in each LAU.

Guideline VEG G10

Fuel treatment projects³⁶ within the WUI⁵¹ as defined by HFRA¹⁷ should be designed considering Standards VEG S1, S2, S5, and S6 to promote lynx conservation.

Guideline VEG G11

Denning habitat⁶ should be distributed in each LAU in the form of pockets of large amounts of large woody debris, either down logs or root wads, or large piles of small wind thrown trees (“jack-strawed” piles). If denning habitat appears to be lacking in the LAU, then projects³⁶ should be designed to retain some coarse woody debris⁴, piles, or residual trees to provide denning habitat⁶ in the future.

LIVESTOCK MANAGEMENT (GRAZ): The following objectives and guidelines apply to grazing projects in lynx habitat in lynx analysis units (LAUs) in occupied habitat. They do not apply to linkage areas.

Objective³⁰ GRAZ O1

Manage livestock grazing to be compatible with improving or maintaining²⁶ lynx habitat²³.

Guideline¹⁵ GRAZ G1

In fire- and harvest-created openings, livestock grazing should be managed so impacts do not prevent shrubs and trees from regenerating.

Guideline GRAZ G2

In aspen stands, livestock grazing should be managed to contribute to the long-term health and sustainability of aspen.

Guideline GRAZ G3

In riparian areas⁴¹ and willow carrs³, livestock grazing should be managed to contribute to maintaining or achieving a preponderance of mid- or late-seral stages²⁸, similar to conditions that would have occurred under historic disturbance regimes.

Guideline GRAZ G4

In shrub-steppe habitats⁴³, livestock grazing should be managed in the elevation ranges of forested lynx habitat in LAUs²¹, to contribute to maintaining or achieving a preponderance of mid- or late-seral stages, similar to conditions that would have occurred under historic disturbance regimes.

HUMAN USE PROJECTS (HU): The following objectives and guidelines apply to human use projects, such as special uses (other than grazing), recreation management, roads, highways, and mineral and energy development, in lynx habitat in lynx analysis units (LAUs) in occupied habitat, subject to valid existing rights. They do not apply to vegetation management projects or grazing projects directly. They do not apply to linkage areas.

Objective³⁰ HU O1

Maintain²⁶ the lynx's natural competitive advantage over other predators in deep snow, by discouraging the expansion of snow-compacting activities in lynx habitat²³.

Objective HU O2

Manage recreational activities to maintain lynx habitat and connectivity¹⁶.

Objective HU O3

Concentrate activities in existing developed areas, rather than developing new areas in lynx habitat.

Objective HU O4

Provide for lynx habitat needs and connectivity when developing new or expanding existing developed recreation⁹ sites or ski areas.

Objective HU O5

Manage human activities, such as special uses, mineral and oil and gas exploration and development, and placement of utility transmission corridors, to reduce impacts on lynx and lynx habitat.

Objective HU O6

Reduce adverse highway¹⁸ effects on lynx by working cooperatively with other agencies to provide for lynx movement and habitat connectivity¹⁶, and to reduce the potential for lynx mortality.

Guideline¹⁵ HU G1

When developing or expanding ski areas, provisions should be made for adequately sized inter-trail islands that include coarse woody debris⁴, so winter snowshoe hare habitat⁵¹ is maintained.

Guideline HU G2

When developing or expanding ski areas, lynx foraging habitat should be provided consistent with the ski area's operational needs, especially where lynx habitat occurs as narrow bands of coniferous forest across mountain slopes.

Guideline HU G3

Recreation development and recreational operational uses should be planned to provide for lynx movement and to maintain the effectiveness of lynx habitat²³.

Guideline HU G4

Remote monitoring of mineral and energy development sites and facilities should be encouraged to reduce snow compaction.

Guideline HU G5

A reclamation plan should be developed (e.g., road reclamation and vegetation rehabilitation) for closed mineral and energy development sites and facilities that promote the restoration of lynx habitat.

Guideline HU G6

Methods to avoid or reduce effects to lynx habitat connectivity¹⁶ should be used when upgrading unpaved roads to maintenance levels 4 or 5²⁷, where the result would be increased traffic speeds and volumes, or contribute to development or increases in human activity.

Guideline HU G7

New permanent roads should not be built on ridge-tops and saddles, or in areas identified as important for lynx habitat connectivity¹⁶. New permanent roads and trails should be situated away from forested stringers.

Guideline HU G8

Cutting brush along low-speed, low-traffic-volume roads²⁵ should be done to the minimum level necessary to provide for public safety.

Guideline HU G9

If project level analysis determines that new roads adversely affect lynx, then public motorized use should be restricted. Upon project³⁶ completion, these roads should be reclaimed or decommissioned, if not needed for other management objectives.

Guideline HU G10

Designated over-the-snow routes or designated play areas should not expand outside baseline areas of consistent snow compaction¹, unless designation serves to consolidate use and improve lynx habitat. This may be calculated on an LAU basis, or on a combination of immediately adjacent LAUs.

This does not apply inside permitted ski area boundaries, to winter logging, to rerouting trails for public safety, to accessing private inholdings, or to access regulated by Guideline HU G12.

Use the same analysis boundaries for all actions subject to this guideline.

Guideline HU G11

When developing or expanding ski areas and trails, consider locating access roads and lift termini to maintain and provide lynx security habitat¹⁰.

Guideline HU G12

Winter access for non-recreation special uses and mineral and energy exploration and development should be limited to designated routes⁸ or designated over-the-snow routes⁷.

LINKAGE AREAS (LINK): The following objective, standard, and guidelines apply to all projects within linkage areas in occupied habitat, subject to valid existing rights.

Objective³⁰ LINK O1

In areas of intermingled land ownership, work with landowners to pursue conservation easements, habitat conservation plans, land exchanges, or other solutions to reduce the potential of adverse impacts on lynx and lynx habitat.

Standard⁴⁴ LINK S1

When highway¹⁸ or forest highway¹² construction or reconstruction is proposed in linkage areas²², identify potential highway crossings.

Guideline¹⁵ LINK G1

National Forest System lands should be retained in public ownership.

Guideline LINK G2

Livestock grazing in shrub-steppe habitats⁴³ should be managed to contribute to maintaining or achieving a preponderance of mid- or late-seral stages²⁸, similar to conditions that would have occurred under historic disturbance regimes.

Required Monitoring

1. Maps of the location and intensity of snow compacting activities and designated and groomed routes that occurred inside LAUs during the period of 1998 to 2000 constitute baseline snow compaction. Changes in activities and routes are to be monitored every five years after the decision.
2. When fuels treatment and vegetation management project decisions are signed, report the following:
 - a) Acres of fuel treatment in lynx habitat by Forest and LAU, and whether the treatment is within or outside the WUI as defined by HFRA.
 - b) Whether or not the fuel treatment met the vegetation standards or guidelines. If standard(s) were not met, report which standard(s) was not met, why it could not be met, and how many acres were affected.
 - c) Application of exceptions in Standard VEG S5:
For areas where any of the exceptions 1 through 5 listed in Standard VEG S5 were applied, report the type of activity, the number of acres, and the location (by unit, and LAU) and whether or not Standard VEG S1 was within the allowance.
 - d) Application of exceptions in Standard VEG S6:
For areas where any of the exceptions 1 through 4 listed in Standard VEG S6 were applied, report the type of activity, the number of acres, and the location (by unit, and LAU) and whether or not Standard VEG S1 was within the allowance.
 - e) Total acres of lynx habitat treated under exemptions and exceptions to vegetation standards, to assure the 4.5 percent limit is not exceeded on any Forest over the life of the amendment (15 years).
3. Application of guidelines:
 - a) Summarize what guideline(s) was not followed and why.
 - b) Document the rationale for deviations to guidelines.

Lynx Amendment Glossary

¹ *Area of consistent snow compaction* – An area of consistent snow compaction is an area of land or water that during winter is generally covered with snow and gets enough human use that individual tracks are indistinguishable. In such places, compacted snow is evident most of the time, except immediately after (within 48 hours) snowfall.

These can be areas or linear routes, and are generally found in or near snowmobile or cross-country ski routes, in adjacent openings, parks and meadows, near ski huts or plowed roads, or in winter parking areas. Areas of consistent snow compaction will be determined based on the acreage or miles used during the period 1998 to 2000.

² *Broad scale assessment* – A broad scale assessment is a synthesis of current scientific knowledge, including a description of uncertainties and assumptions, to provide an understanding of past and present conditions and future trends, and a characterization of the ecological, social, and economic components of an area. (LCAS)

³ *Carr* – Deciduous woodland or shrub land occurring on permanently wet, organic soil. (LCAS)

⁴ *Coarse woody debris* – Any piece(s) of dead woody material, e.g., dead boles, limbs, and large root masses on the ground or in streams. (LCAS)

⁵ *Daylight thinning* – Daylight thinning is a form of precommercial thinning that removes the trees and brush inside a given radius around a tree.

⁶ *Denning habitat (lynx)* – Denning habitat is the environment lynx use when giving birth and rearing kittens until they are mobile. The most common component is large amounts of coarse woody debris to provide escape and thermal cover for kittens.

Denning habitat must be within daily travel distance of winter snowshoe hare habitat – the typical maximum daily distance for females is about three to six miles. Denning habitat includes mature and old growth forests with plenty of coarse woody debris. It can also include young regenerating forests with piles of coarse woody debris, or areas where down trees are jack-strawed.

⁷ *Designated over-the-snow routes* – Designated over-the-snow routes are routes managed under permit or agreement or by the agency, where use is encouraged, either by on-the-ground marking or by publication in brochures, recreation opportunity guides or maps (other than travel maps), or in electronic media produced or approved by the agency.

The routes identified in outfitter and guide permits are designated by definition; groomed routes also are designated by definition. The determination of baseline snow compaction will be based on the miles of designated over-the-snow routes authorized, promoted or encouraged during the period 1998 to 2000.

⁸ *Designated route* – A designated route is a road or trail that has been identified as open for specified travel use.

⁹ *Developed recreation* – Developed recreation requires facilities that result in concentrated use. For example, skiing requires lifts, parking lots, buildings, and roads; campgrounds require roads, picnic tables, and toilet facilities.

¹⁰ *Diurnal security habitat (lynx)* – Places in lynx habitat that provide secure winter bedding sites in highly disturbed landscapes such as ski areas. Security habitat gives lynx the ability to retreat from human disturbance. Site characteristics and stand conditions make human access difficult and discourage human activity. Security habitats are sufficiently large to provide effective visual and acoustic insulation and to let lynx easily move away from any intrusion. Lynx security habitat must be in proximity to winter snowshoe hare habitat. (LCAS)

¹¹ *Fire use* – Fire use is the combination of wildland fire use and using prescribed fire to meet resource objectives. (NIFC) Wildland fire use is the management of naturally ignited wildland fires to accomplish resource management objectives in areas that have a fire

management plan. The use of the term wildland fire use replaces the term prescribed natural fire. (Wildland and Prescribed Fire Management Policy, August 1998)

¹² *Forest highway* – A forest highway is a forest road under the jurisdiction of, and maintained by, a public authority and open to public travel (USC: Title 23, Section 101(a)), designated by an agreement with the FS, state transportation agency, and Federal Highway Administration.

¹³ *Fuel treatment* – A fuel treatment is a type of vegetation management action that reduces the threat of ignition, fire intensity, or rate of spread, or is used to restore fire- adapted ecosystems.

¹⁴ *Goal* – A goal is a broad description of what an agency is trying to achieve, found in a land management plan. (LCAS)

¹⁵ *Guideline* – A guideline is a particular management action that should be used to meet an objective found in a land management plan. The rationale for deviations may be documented, but amending the plan is not required. (LCAS modified)

¹⁶ *Habitat connectivity (lynx)* – Cover (vegetation) in sufficient quantity and arrangement to allow for the movement of lynx. Narrow forested mountain ridges or shrub-steppe plateaus may serve as a link between more extensive areas of lynx habitat; wooded riparian communities may provide cover across open valley floors. (LCAS)

¹⁷ *HFRA (Healthy Forests Restoration Act)* - Public Law 108-148, passed in December 2003. The HFRA provides statutory processes for hazardous fuel reduction projects on certain types of at-risk National Forest System and Bureau of Land Management lands. It also provides other authorities and direction to help reduce hazardous fuel and restore healthy forest and rangeland conditions on lands of all ownerships. (Modified from Forest Service HFRA web site.)

¹⁸ *Highway* – The word highway includes all roads that are part of the National Highway System. (23 CFR 470.107(b))

¹⁹ *Horizontal cover* – The visual obscurity provided by vegetation that extends to the ground or snow surface, primarily provided by tree stems and tree boughs, but may also be provided by shrubs, herbaceous vegetation, and landscape topography.

²¹ *LAU (Lynx Analysis Unit)* – An LAU is an area of at least the size used by an individual lynx, from about 25 to 50 square miles (LCAS). An LAU is a unit for which the effects of a project would be analyzed; its boundaries should remain constant.

²² *Linkage area* – A linkage area provides landscape connectivity between blocks of lynx habitat. Linkage areas occur both within and between geographic areas, where blocks of lynx habitat are separated by intervening areas of non-lynx habitat such as basins, valleys, or agricultural lands, or where lynx habitat naturally narrows between blocks. (LCAS updated definition approved by the Steering Committee 10/23/01)

²³ *Lynx habitat* – Lynx habitat occurs in mesic coniferous forest that experience cold, snowy winters and provide a prey base of snowshoe hare. In the southern Rocky Mountains, lynx habitat generally occurs between 8,000 and 12,000 feet in elevation. Primary vegetation consists of Engelmann spruce, subalpine fir, aspen-conifer mix and lodgepole pine on spruce-fir habitat types. On cool moist sites, Douglas-fir and aspen, when interspersed with subalpine forests, may also contribute to lynx habitat. Dry forest types (e.g., ponderosa pine, climax lodgepole pine) do not provide lynx habitat. (LCAS)

²⁴ *Lynx habitat in an unsuitable condition* –Lynx habitat in an unsuitable condition consists of lynx habitat in the stand initiation structural stage where the trees are generally less than ten to 30 years old and have not grown tall enough to protrude above the snow during winter. Stand replacing fire, insect epidemics or certain vegetation management projects can create unsuitable conditions. Vegetation management projects that can result in unsuitable habitat include clearcuts and seed tree harvest, and sometimes shelterwood cuts and commercial thinning depending on the resulting stand composition and structure. (LCAS)

²⁵ *Low-speed, low-traffic-volume road* – Low speed is less than 20 miles per hour; low volume is a seasonal average daily traffic load of less than 100 vehicles per day.

²⁶ *Maintain* – In the context of this decision, maintain means to provide enough lynx habitat to conserve lynx. It does not mean to keep the status quo.

²⁷ *Maintenance level* – Maintenance levels define the level of service provided by and maintenance required for a road. (FSH 7709.58, Sec 12.3) Maintenance level 4 is assigned to roads that provide a moderate degree of user comfort and convenience at moderate travel speeds. Most level 4 roads have double lanes and an aggregate surface. Some may be single lane; some may be paved or have dust abated. Maintenance level 5 is assigned to roads that provide a high degree of user comfort and convenience.

Normally, level 5 roads are have double lanes and are paved, but some may be aggregate surfaced with the dust abated.

²⁸ *Mid-seral or later* – Mid-seral is the successional stage in a plant community that is the midpoint as it moves from bare ground to climax. For riparian areas, it means willows or other shrubs have become established. For shrub-steppe areas, it means shrubs associated with climax are present and increasing in density.

²⁹ *Multi-story mature or late successional forest* – This stage is similar to the *old multistory structural* stage (see below). However, trees are generally not as old, and decaying trees may be somewhat less abundant.

³⁰ *Objective* – An objective is a statement in a land management plan describing desired resource conditions and intended to promote achieving programmatic goals. (LCAS)

³¹ *Old multistory structural stage* – Many age classes and vegetation layers mark the old forest, multistoried stage. It usually contains large old trees. Decaying fallen trees may be present that leave a discontinuous overstory canopy. On cold or moist sites without frequent fires or other disturbance, multi-layer stands with large trees in the uppermost layer develop. (Oliver and Larson, 1996)

³² *Old growth* – Old growth forests generally contain trees that are large for their species and the site, and are sometimes decadent with broken tops. Old growth often contains a variety of tree sizes, large snags, and logs, and a developed and often patchy understory.

³³ *Permanent development* – Any development that results in a loss of lynx habitat for at least the duration of a Forest Plan, approximately 15 years. Ski trails, parking lots, new permanent roads, structures, campgrounds, and many special use developments would be considered permanent developments.

³⁴ *Prescribed fire* – A prescribed fire is any fire ignited as a management action to meet specific objectives. A written, approved prescribed fire plan must exist, and NEPA requirements met, before ignition. The term prescribed fire replaces the term management ignited prescribed fire. (NWCG)

³⁵ *Precommercial thinning* – Precommercial thinning is mechanically removing trees to reduce stocking and concentrate growth on the remaining trees, and not resulting in immediate financial return. (Dictionary of Forestry)

³⁶ *Project* - All, or any part or number of the various activities analyzed in an Environmental Impact Statement, Environmental Analysis, or Decision Memo. For example, the vegetation management in some units or stands analyzed in an EIS could be for fuel reduction, and therefore those units or stands would fall within the term *fuel treatment project* even if the remainder of the activities in the EIS are being conducted for other purposes, and the remainder of those units or stands have other activities prescribed in them. All units in an analysis do not necessarily need to be for fuel reduction purposes for certain units to be considered a *fuel reduction project*.

³⁷ *Red squirrel habitat* – Red squirrel habitat consists of coniferous forests of seed and cone-producing age that usually contain snags and downed woody debris, generally associated with mature or older forests.

³⁸ *Regeneration harvest* – The cutting of trees and creating an entire new age class; an even-age harvest. The major methods are clearcutting, seed tree, shelterwood, and group selective cuts. (Helms, 1998)

³⁹ *Research* – Research consists of studies conducted to increase scientific knowledge or technology. For the purposes of Standards VEG S5 and VEG S6, research applies to studies financed from the forest research budget (FSM 4040) and administrative studies financed from the NF budget.

⁴⁰ *Restore, restoration* – To restore is to return or re-establish ecosystems or habitats to their original structure and species composition. (Dictionary of Forestry)

⁴¹ *Riparian area* – An area with distinctive soil and vegetation between a stream or other body of water and the adjacent upland; includes wetlands and those portions of floodplains and valley bottoms that support riparian vegetation. (LCAS)

⁴² *Salvage harvest* – Salvage harvest is a commercial timber sale of dead, damaged, or dying trees. It recovers economic value that would otherwise be lost. Collecting firewood for personal use is not considered salvage harvest.

⁴³ *Shrub steppe habitat* – Shrub steppe habitat consists of dry sites with shrubs and grasslands intermingled.

⁴⁴ *Standard* – A standard is a required action in a land management plan specifying how to achieve an objective or under what circumstances to refrain from taking action. A plan must be amended to deviate from a standard.

⁴⁵ *Stand initiation structural stage* – The stand initiation stage generally develops after a stand-replacing disturbance by fire, insects or regeneration timber harvest. A new single-story layer of shrubs, tree seedlings, and saplings establish and develop, reoccupying the site.

Trees that need full sun are likely to dominate these even-aged stands. (Oliver and Larson, 1996)

⁴⁶ *Stem exclusion structural stage (Closed canopy structural stage)* – In the stem exclusion stage, trees initially grow fast and quickly occupy all of the growing space, creating a closed canopy. Because the trees are tall, little light reaches the forest floor so understory plants (including smaller trees) are shaded and grow more slowly. Species that need full sunlight usually die; shrubs and herbs may become dormant. New trees are precluded by a lack of sunlight or moisture. (Oliver and Larson, 1996)

⁴⁷ *Timber management* – Timber management consists of growing, tending, commercially harvesting, and regenerating crops of trees.

⁴⁸ *Uneven-aged timber management* - Uneven-aged management develops a stand with trees of three or more distinct age classes, either intimately mixed or in small groups of 2 acres or less (based on *The Dictionary of Forestry* Helms, 1998). Group openings do not exceed 20 percent of the stand in a single entry, but individual tree selection can occur throughout an entire stand or between the groups.

⁴⁹ *Understory re-initiation structural stage* – In the understory re-initiation stage, a new age class of trees gets established after overstory trees begin to die, are removed, or no longer fully occupy their growing space after tall trees abrade each other in the wind. Understory seedlings then re-grow and the trees begin to stratify into vertical layers. A low to moderately dense uneven-aged overstory develops, with some small shade-tolerant trees in the understory. (Oliver and Larson, 1996)

⁵⁰ *Vegetation management* – Vegetation management changes the composition and structure of vegetation to meet specific objectives, using such means as prescribed fire or timber harvest. For the purposes of this decision, the term does not include removing vegetation for permanent developments like mineral operations, ski runs, roads and the like, and does not apply to fire suppression or to wildland fire use.

⁵¹ *Wildland urban interface (WUI)* – Use the definition of WUI found in the Healthy Forests Restoration Act. The full text can be found at HFRA § 101. Basically, the wildland urban interface is the area adjacent to an at-risk community that is identified in the community wildfire protection plan. If there is no community wildfire protection plan in place, the WUI is the area 0.5 mile from the boundary of an at-risk community; or within 1.5 miles of the boundary of an at-risk community if the terrain is steep, or there is a nearby road or ridgetop that could be incorporated into a fuel break, or the land is in condition class 3, or the area contains an emergency exit route needed for safe evacuations. (Condensed from HFRA. For full text see HFRA § 101.)

⁵² *Winter snowshoe hare habitat* – Winter snowshoe hare habitat consists of places where young trees or shrubs grow densely – thousands of woody stems per acre – and tall enough to protrude above the snow during winter, so snowshoe hare can browse on the bark and small twigs (LCAS). Winter snowshoe hare habitat develops primarily in the stand initiation, understory reinitiation and old forest multistoried structural stages.

Appendix F. Riparian Management Zones

Background

Naiman et al. (2000) identifies that discoveries about the structure and dynamics of riparian zones have extended the scope of understanding about this portion of the landscape and have important implications for stream and watershed management. Forest plans must establish width(s) for Riparian Management Zones Riparian Management Zone around all lakes, perennial and intermittent streams, and open water wetlands (USDA Forest Service 2015). The following guidance has been developed to assist interdisciplinary teams in becoming familiar with and consistently applying criteria to: (1) appropriately delineate Riparian Management Zones; and (2) analyze important considerations in developing appropriate management actions within or affecting Riparian Management Zones. The objective is to ensure that interdisciplinary teams adequately consider riparian functions and ecological processes in both the delineation of Riparian Management Zones and determination of appropriate management actions within or affecting Riparian Management Zones.

Overview of the Riparian Management Zone Delineation Guidance

Aquatic and riparian systems are easily affected by land management activities on the surrounding hillslopes. Riparian Management Zones provide both a linkage and transitional habitat between hillslopes and upland terrestrial habitats and the aquatic habitats within stream channels.

In general, there is little controversy over the need to define Riparian Management Zones in order to maintain riparian functions and ecological processes. The controversy is over the width of the Riparian Management Zone, the extent and type of management activities that can occur within them, and the purposes for those activities. Management activities that occur within, or adjacent to, a Riparian Management Zone are subject to specific goals, objectives, standards and guidelines. Forest plans and the associated management direction regulate two major features of Riparian Management Zones: (1) their width; and (2) the kind and amount of activity that can take place within or influence them (Spence et al. 1996, Quigley and Arbelbide 1997, USDA 2015).

Riparian zones are among the most complex ecological systems and also among the most important for maintaining the vitality of the landscape and its rivers (Naiman et al. 2000). Evaluating the effectiveness of Riparian Management Zones to manage for riparian functions and ecological processes is difficult because of the complexities of such areas, the extended time over which impacts can occur; and the resiliency and rate of recovery. The Riparian Management Zone should be designed to maintain riparian functions and ecological processes with consideration of multiple scales (stream reach, sub-watershed, and watershed scale).

Riparian Management Zone Delineation Criteria for the Rio Grande National Forest

General Criteria

The following are criteria to be used to delineate Riparian Management Zones for perennial and intermittent streams, ponds, lakes, reservoirs, and wetlands on the Forest.

I. Forested Fish Bearing Streams*

Perennial streams (and intermittent streams providing seasonal rearing and spawning habitat) – In the absence of local field data, 300-foot slope distance from the ordinary high water mark, OR Flood-prone width, OR two site-potential tree heights, OR to the outer edges of riparian vegetation, whichever is greatest, OR defined based on a site-specific analysis by a qualified specialist with expertise in the field of riparian function and ecological processes.

II. Forested Non-Fish Bearing Streams*

In the absence of local field data, 150-foot slope distance from the ordinary high water mark, OR Flood-prone width, OR one site-potential tree height, OR to the outer edge of riparian vegetation, whichever is greatest, OR defined based on a site-specific analysis by a qualified specialist with expertise in the field of riparian function and ecological processes.

III. Ponds, Lakes, Reservoirs, and Wetlands*

In the absence of local field data, 150-foot slope distance from the ordinary high water mark, OR outer edge of seasonally saturated soils, OR outer edge of riparian vegetation, OR one site-potential tree height, whichever is greatest, OR defined based on a site-specific analysis by a qualified specialist with expertise in the field of riparian function and ecological processes.

IV. Intermittent and Non-Forested Streams*

In the absence of local field data, the outer edge of the riparian vegetation, OR 100-foot slope distance, OR one site-potential tree height whichever is greatest, OR defined based on a site-specific analysis by a qualified specialist with expertise in the field of riparian function and ecological processes.

*Note: Sediment delivery distances vary based upon the combination of proposed management actions and the inherent site characteristics. Because sediment delivery distances may exceed the selected option, Riparian Management Zones may need to be adjusted to avoid or minimize delivery to the associated water body under any option.

Step-Down Process for Riparian Management Zone Delineation

Effective use of the Riparian Management Zone delineation requires a full understanding of the selection criteria options within each of the four Categories.

Delineating a Riparian Management Zone requires two decisions to be made. First, the area needs to be correlated with one of the four Categories (I, II, III, or IV). The second decision is identifying which option, or criteria, within that Category to use.

The decision as to which option or criteria should be chosen should occur through discussions with the interdisciplinary team, resource specialists, and/or the line officer. In general, determining the level of analysis that best suits the needs of the project will be driven by the potential effects of the project, baseline conditions, management direction, and issues associated with the project/area of interest that were identified through scoping, the work of the interdisciplinary team, or the line officer.

Written documentation of the chosen Riparian Management Zone delineation option within a category, and the rationale behind the choice, should be included in record documentation for the project.

The options within a given Category have varying levels of associated analysis that are involved with delineating the Riparian Management Zone. Category IV, Non-forested Streams, differs from the other Categories in that it does not designate a set distance and therefore has two options rather than three.

Option 1

In lieu of field data, selection of the first option provides a conservative boundary--generally in excess of two site-potential tree heights in the case of the 300-foot slope distance, and greater than one site-potential tree height in the case of the 150-foot slope distance--that would be expected to account for most riparian processes including stream shading, large woody debris recruitment, fine organic litter input, bank stabilization, sediment filtration, wind-throw, riparian microclimate and productivity, and wildlife habitat. Again, selection of this option is expected to provide land managers with the option of delineating a Riparian Management Zone in the absence of field confirmation, with the expectation that the distances would account for most riparian functions and ecological processes in a system.

Option 2

The second criteria option, which is used similarly in Categories I-IV, requires field verification of certain site characteristics and provides a more site-based delineation of an Riparian Management Zone boundary for a specific location. Depending on which Category (I, II, III, or IV) is involved, options include use of site-potential tree height or riparian vegetation, whichever is greatest given the category.

Site-potential tree height is spoken to in the literature and correlated with the protection of riparian functions and ecological processes such as stream shading, LWD recruitment, fine organic litter input, bank stabilization, sediment filtration, wind-throw, riparian microclimate and productivity, and wildlife habitat (Spence et al. 1996, Quigley and Arbelbide 1997).

Riparian vegetation is defined through classification of the vegetation associated with the aquatic habitat and its outer extent (see glossary), and it generally influences riparian processes such as fine organic litter input, bank stabilization, sediment filtration, stream shading, and wildlife habitat.

Option 2 requires the use of certain field data to be collected from the project area and analyzed to determine the Riparian Management Zone boundary. It is considered an option requiring potentially less than a site-specific analysis (Option 3), but it is more appropriately tied to the landscape than a default distance might be (Option 1).

Option 3

The third option, which is used in Categories I-IV, is the use of a site-specific analysis to define the Riparian Management Zone. This option requires potentially the most analysis of the three options. When defining the Riparian Management Zone, the specialist conducts an on-site analysis of the riparian functions and ecological processes associated with the stream, pond, lake, reservoir or wetland, and defines the Riparian Management Zone based on the distance that best encompasses the extent of those functions and processes. The value gained from this effort is a site-specific Riparian Management Zone delineation appropriate to the functions and processes between upland terrestrial habitats and adjacent aquatic habitats for that area. This information

potentially provides more opportunities for project design because the existing condition is better known, and therefore effects of actions can be better assessed, and projects can be more responsive to needs of the aquatic ecosystem.

In summary, Riparian Management Zone delineation is set up in a manner that provides flexibility for different levels of analysis that, regardless of the option chosen, will provide for riparian functions and ecological processes. The decision on which option to use must involve considerations of the project in regard to potential effects, baseline conditions, and issues and their relationship to riparian functions and ecological process.

The effectiveness of delineating an accurate Riparian Management Zone provides decision-makers with the information necessary for sound decisions regarding management activities within a watershed. With an understanding of the riparian functions and ecological processes of a system, and the means by which actions may affect them, decision makers are provided an opportunity to design activities to maintain or restore listed fish species, their habitats, and other SWRA resources.

Site-Potential Tree Heights for Use in Identifying Riparian Management Zones

When planning and implementing vegetation management projects, distances equivalent to one or two site-potential tree heights may be used to determine Riparian Management Zone boundaries, provided a site visit has been completed. Current conditions and dominant potential vegetation group (PVG) for the site/project area must be verified in the field.

Once the dominant PVG has been field-verified, the site-potential tree height criteria in Table 23 will be used to determine Riparian Management Zone widths in the management units. See the glossary in this appendix for definitions of site-potential tree height, site tree, and seral tree species. For more information about forested vegetation and PVGs, refer to Appendix C of this forest plan.

Table 23. Site potential tree height by potential vegetation group

[Rounded average calculated from all available 1,044 stand exams from the Forest during 1995–2015.]

Potential Vegetation Group	Age	1 Site Tree Height (feet)	2 Site Tree Height (feet)
1 – Aspen Forest, with and without softwoods	100	60	120
2 – Bristlecone Pine / Limber Pine	100	50	100
3 – Lodgepole Pine	100	60	120
4 – Mixed Conifer (cool-dry)	100	60	120
5 – Mixed Conifer (cool-moist)	100	65	130
6 – Mixed Conifer (warm-dry)	100	60	120
7 – Pinyon-Juniper	100	20	45
8 – Ponderosa Pine	100	60	120
9 – Spruce-Fir	100	85	170

References Cited

- Megahan, W.F., and J. Hornbeck. 2000. Lessons Learned in Watershed Management: A Retrospective View USDA Forest Service Proceedings Rocky Mountain Research Station – P – 13. Naiman, R.J., R.E. Bilby, and P.A. Bisson. 2000. Riparian Ecology and Management in the Pacific Coastal Rain Forest Bioscience November 2000 Vol. 50, No. 11, pp. 996-1011.
- Quigley, T.M., and S.J. Arbelbide (eds.) 1997. An Assessment of Ecosystem Components in the Interior Columbia Basin and Portions of the Klamath and Great Basins, Volume III (PNW-GTR-405, 1997): An Ecosystem Approach to Salmonid Conservation (NMFS TR-4501-96-6057, 1996).
- Spence, B.C., and R.M. Hughes. 1996. An Ecosystem Approach to Salmonid Conservation December 1996 TR-4501- 96-6057.
- USDA Forest Service. 1997. Riparian Reserve Evaluation Techniques and Synthesis, Supplement to Section II of Ecosystem Analysis at the Watershed Scale: Federal Guide for Watershed Analysis. Version 2.2.
- USDA Forest Service. 2015. Forest Service Handbook 1909.12, Land Management Planning Handbook. Chapter 20 – Land Management Plan. Amendment 1909.12-2015-1. Effective 01.30.2015.

Appendix G. Design Features for Raptors

Background

Features that would provide for the protection and viability of raptor species on the Forest (Table 24) are described in forest plan direction (Guideline G-WLDF-1 of the Proposed Forest Plan). Raptor species are protected by law during the reproductive period under the Migratory Bird Treaty Act and the implementing regulations. These design features represent the most recent update by Colorado Parks and Wildlife and protect this guild of birds during their reproductive seasons, reduce and manage human impacts, and provide for nest area integrity (Colorado Parks and Wildlife 2008). These features represent the best available science regarding local raptor management and are a key factor in meeting the requirements of the Migratory Bird Treaty Act and contributing to species conservation, recovery, and viability of local raptor species.

As a general rule, individual raptor species react differently to human-related impacts. The significance of these impacts may vary among similar species and site-specific factors related to individual nest sites. Impacts to reproductive sites and individual species may not be immediately visible or detectable. Therefore, although there may be exceptions, the design features offered below should assure that a majority of individuals within a species group would continue to occupy an area. Other features, such as intervening terrain, vegetation screens, and cumulative impacts should also be considered when applying these features. These features are intended to provide sound guidance for nest area management and flexibility in relationship to buffer distance and timing needs of individual species and sites.

Where applicable, new structural improvements should be avoided within the buffer distances identified unless impacts can be managed to maintain site integrity. Structural improvements include, but are not limited to permanent roads, structures associated with recreational development, and radio towers. New structural improvements are those proposed following nest establishment and do not include structures that historically occurred in the area. Buffer distances for some species may vary based on site-specific information, current science, and the professional judgment of the wildlife biologist. Nesting season dates may also be flexible, particularly during the beginning and latter portions of the nesting season, but are not expected to change often or significantly. Consider area closures where appropriate and needed to maintain integrity or reproductive sites.

The most common species encountered or expected to occur on the Forest are listed in Table 24. If other species not included are encountered, consult Colorado Parks and Wildlife Buffer Zones and Seasonal Restrictions for Colorado Raptors (2008) or other best available science. Golden eagles are protected under the Bald and Golden Eagle Act. All projects and activities in the vicinity of golden eagle nests and use areas are subject to analysis and the regulations for incidental take of eagles and eagle nests (U.S. Fish and Wildlife Service, Federal Register Vol. 81, No. 242, 91494-91554).

Table 24: Raptor nest and management area buffer zone distances and timing considerations

Species	Impact/Risk	Estimated Time Frame	Buffer Distance
Golden eagle	Disturbance	Dec. 15 to July 15	Projects and activities should not occur within one-half mile of an active nest during nesting season. (CPW 2008)
Golden eagle	Structural improvements ¹	Year round	New structures should not occur within a one-quarter mile radius of active nest. (CPW 2008)
Bald eagle	Disturbance	April 15 to July 15	Projects and activities should not occur within one-half mile of nest during nesting season. (CPW 2008)
Bald eagle	Structural improvements ¹	Year round	New structures should not occur within a one-half-mile radius of active nest. (CPW 2008)
Bald eagle	Disturbance (winter roosts)	November 15 to March 15	Manage projects and activities within a one-quarter-mile radius (indirect line of sight) or a one-half-mile radius (direct line of sight) of communal winter roost sites. Limit activity between 10 AM and 2 PM if encroachment would occur within buffer zones. (CPW 2008)
Bald eagle	Structural improvements ¹	Year round	New structures should not occur within one-half mile of communal roost site. (CPW 2008)
Bald eagle	Disturbance and structural improvements ¹	Site specific, to be determined by wildlife biologist	For preferred diurnal hunting perch. (CPW 2008)
Swainson's hawk	Disturbance	May 1 to September 15	Projects and activities should not occur within one-quarter mile of nest during nesting season. (CPW 2008)
Swainson's hawk	Structural improvements ¹	Year round	New structures should not occur within a one-quarter-mile radius of active nest. (CPW 2008)
Red-tailed hawk	Disturbance	March 15 to July 15	Projects and activities should not occur within one-eighth to one-quarter mile of nest during nesting season. (CPW 2008)
Red-tailed hawk	Structural improvements ¹	Year round	New structures should not occur within a one-quarter-mile radius of active nest. (USDA 2013)
Peregrine falcon	Disturbance	April 15 to July 31	Projects and activities should not occur within one-half mile of nest during nesting season. (CPW 2008)
Peregrine falcon	Structural improvements ¹	Year round	New structures should not occur within a one-half-mile radius of active cliff nest complex. (CPW 2008)
Prairie falcon	Disturbance	April 15 to July 15	Projects and activities should not occur within one-half mile of nest during nesting season. (CPW 2008)
Prairie falcon	Structural improvements ¹	Year round	New structures should not occur within a one-half-mile radius of active nest. (CPW 2008)

Species	Impact/Risk	Estimated Time Frame	Buffer Distance
Northern goshawk	Disturbance	April 15 to August 31	Projects and activities should not occur within one-half mile of an active nest during nesting season. Management should include a 25- to 30-acre buffer of nest site, a 420-acre post-fledging area around nest area, and considerations for alternate nest sites and foraging habitat. Structural conditions for nest area, post fledging area, and foraging area should be managed similar to those recommended in Reynolds et al. (1992), unless they cannot be achieved due to site conditions or other local factors. (CPW 2008)
Northern goshawk	Structural improvements ¹	Year round	New structures should not occur within a one-half-mile radius of active nest. (CPW 2008)
Cooper's hawk	Disturbance	April 15 to July 31	Projects and activities should not occur within one-half mile of nest during nesting season.
Cooper's hawk	Structural improvements ¹	Year round	New structures should not occur within a one-quarter-mile radius of active nest.
Osprey	Disturbance	May 1 to August 31	Projects and activities should not occur within one-quarter mile of nest during nesting season. (CPW 2008)
Osprey	Structural improvements ¹	Year round	New structures should not occur within a one-quarter-mile radius of active nest.
Boreal owl	Disturbance	April 15 to August 30	Site-specific protection of aspen clone containing nest tree(s) if active; would require a minimal buffer or directional felling if operating around clone during disturbance period.
Flammulated owl	Disturbance	May 1 to August 30	Site-specific protection of aspen clone containing nest tree(s) if active; considerations for post-fledging structure within 100 meters around active nest site would apply. Directional felling if operating around clone during disturbance period.
Great Horned owl	Disturbance	Dec. 15 to May 1	Protection of nest tree during the disturbance period. Consideration for buffer clump around nest tree may be warranted based on site-specific considerations.

¹ Structural improvements include, but are not limited to: permanent roads, structures associated with recreational development, and radio towers.

References Cited

Colorado Parks and Wildlife (Division of Wildlife). 2008. Recommended buffer zone and seasonal restrictions for Colorado raptors. 7 pp.

Reynolds, R.T., Graham, R.T., Hildegard Reiser, M., and others. 1992. Management recommendations for the northern goshawk in the southwestern United States. General Technical Report RM-217. Fort Collins, CO. USDA Forest Service. Rocky Mountain Forest and Range Experiment Station. 90 pp.

USDA Forest Service. 2013. San Juan National Forest Land and Resource Management Plan. 338 pp.

Appendix H. Priority Watersheds

Background

The Forest Service uses the Watershed Condition Framework (WCF) to assess and characterize the health and condition of watersheds at the 6th level hydrologic unit code (HUC). The WCF employs a nationally consistent reconnaissance-level approach for classifying watershed condition, using a comprehensive set of 12 indicators that are surrogate variables representing the underlying ecological, hydrologic, and geomorphic functions and processes that affect watershed condition. Primary emphasis is on aquatic and terrestrial processes and conditions that Forest Service management activities can influence (USDA Forest Service 2011).

Watershed condition classification is the process of describing watershed condition in terms of discrete categories (or classes) that reflect the level of watershed health or integrity. The outcome of the classification process is to place each 6th level watershed into one of the classes described below:

- **Class 1:** Watersheds that are functioning properly exhibit high geomorphic, hydrologic, and biotic integrity relative to their natural potential condition.
- **Class 2:** Watersheds that are functioning at-risk exhibit moderate geomorphic, hydrologic, and biotic integrity relative to their natural potential condition.
- **Class 3:** Watersheds that have impaired function exhibit low geomorphic, hydrologic, and biotic integrity relative to their natural potential condition.

A discussion of watershed conditions and trends specific to the Rio Grande National Forest is contained in the *Watershed Resources* section of the environmental impact statement associated with this forest plan revision. Following classification, priority watersheds are selected and watershed restoration action plans are developed to focus efforts that treat whole watersheds with an integrated set of watershed-scale restoration activities.

Further information on the Watershed Condition Framework can be found in Forest Service publication FS-977 (USDA Forest Service 2011). Additional information, maps, and documentation can be found at the Forest Service [Watershed webpage](#).

Priority Watersheds

The 2012 Planning Rule requires land management plans to:

- (i) **Identify watershed(s) that are a priority for maintenance or restoration; (36 CFR 219.7(f)(1)).**

Identification of priority watersheds is done to focus effort on the integrated restoration of watershed conditions in these areas. Priority watersheds are those watersheds where plan objectives for restoration would concentrate on maintaining or improving watershed condition. However, selection of priority watersheds does not preclude watershed restoration efforts in other areas. The identification of priority watersheds is intended to be helpful to Forest Service managers as they schedule work after plan approval, especially in circumstances of limited budgets and resources. Changes as to which watersheds in the plan are “priority” are made by administrative change (sec. 21.5 of FSH 1909.12) (USDA Forest Service 2012).

The Rio Grande National Forest has identified the following priority watersheds:

- Archuleta Creek (130201020202)
- Headwaters Rio Chama (130201020201)21
- Middle Fork Carnero Creek (130100040401).

References Cited

USDA Forest Service. 2011. Watershed condition framework: A framework for assessing and tracking changes to watershed condition. FS-977. 34 pp. Accessed August 8, 2017, at https://www.fs.fed.us/sites/default/files/Watershed_Condition_Framework.pdf

USDA Forest Service. 2012. Forest Service Handbook 1909.12: Land Management Planning Handbook, chapter 20. 134 pp.

Appendix I. Relevant Federal Statutes, Regulations, Policies, and Agreements

Management direction in the Forest Service Directive System, including the Forest Service Manuals and Handbooks, is part of the forest plan management direction and is not repeated in the Forest Plan directions. Management direction also includes applicable laws, regulations, and policies, although they are not restated in this forest plan.

Direction for managing National Forest System land comes from a variety of levels. National and regional direction includes laws, Executive orders, regulations, and Forest Service policies. The hierarchy of management direction from national and regional direction to the site-specific, project-level direction used in implementing the forest plan is illustrated in Figure 3.

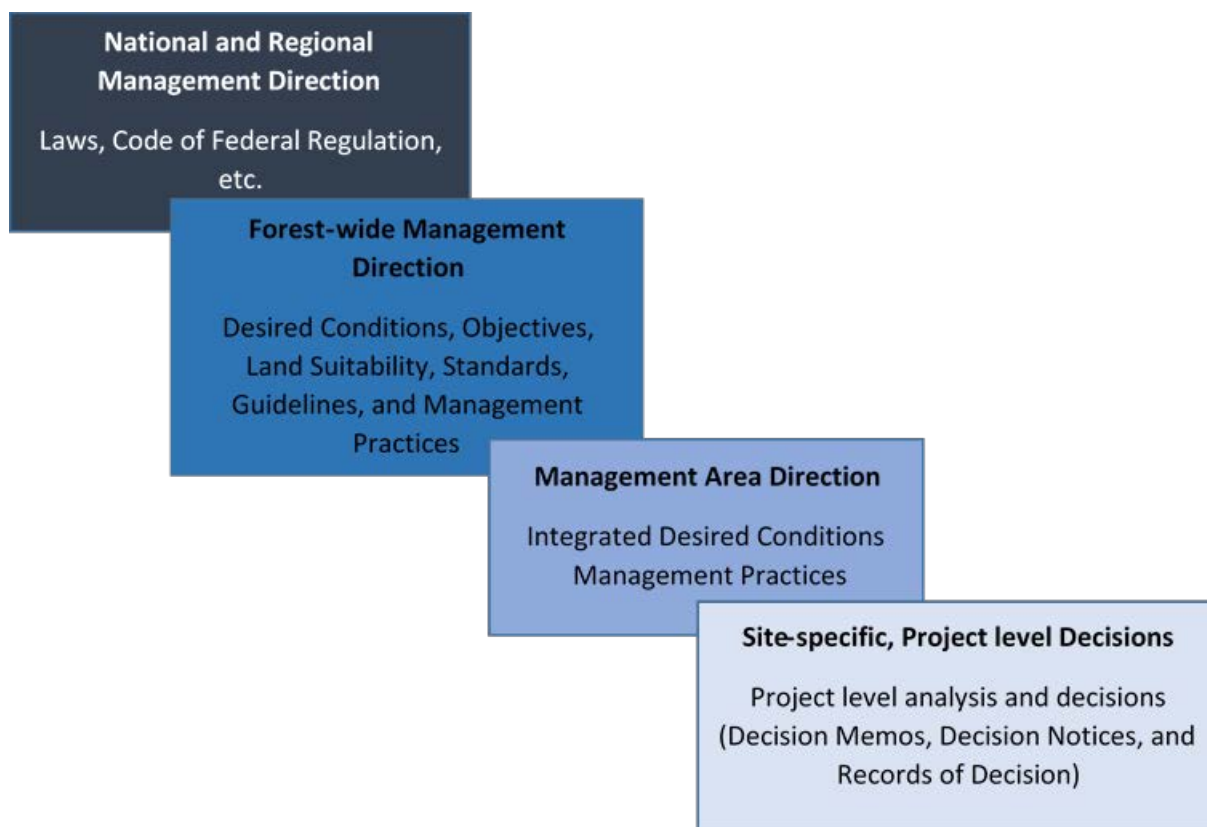


Figure 3. Hierarchy of national forest management direction

Federal Statutes

Applicable Federal statutes that forest management must be in compliance with are listed in Table 25.

Table 25. Federal Statutes applicable to forest management

Title	Initiation/Expiration
Agriculture Appropriations Act	May 23, 1908
Alaska National Interest Lands Conservation Act	December 2, 1980
American Indian Religious Freedom Act	August 11, 1978
American with Disabilities Act	1990
Anderson-Mansfield Reforestation and Revegetation Act	October 11, 1949
Antiquities Act	June 8, 1906
Architectural Barriers Act	1968
Bankhead-Jones Farm Tenant Act	July 22, 1937
Bald and Golden Eagle Protection Act	June 8, 1940, amended 1962
Cabin Fee Act	December 22, 2014
Carson-Foley Act of 1968 (PL 92-516)	
Clarke McNary Act	June 7, 1924
Clean Air Act	July 14, 1955
Clean Air Act	August 7, 1977; Amendments of 1977 and 1990
Clean Water Act as amended	1948; amended in 1972, 1977, 1981, and 1987
Color of Title Act	December 22, 1928
Cooperative Forestry Assistance Act	July 1, 1978
Department of Agriculture Organic Act	August 3, 1956
Disaster Relief Act	May 22, 1974
Emergency Flood Prevention Act (Agricultural Credit Act)	August 4, 1978
Endangered Species Act as amended	December 28, 1973
Energy Policy Act	August 8, 2005
Energy Security Act	June 30, 1980
Executive Order 13112	1999
Federal Advisory Committee Act	October 6, 1972
Federal Cave Resources Protection Act	November 18, 1988
Federal Insecticide Rodenticide, and Fungicide Act	October 21, 1972
Federal Land Exchange Facilitation Act	August 20, 1988
Federal Land Policy and Management Act	October 21, 1976
Federal Lands Recreation Enhancement Act	2004
Federal Noxious Weed Act	January 3, 1975
Federal Power Act	June 10, 1920
Federal Records Act	September 5, 1950
Federal-State Cooperation for Soil Conservation Act	December 22, 1944

Title	Initiation/Expiration
Federal Water Pollution Control Act	July 9, 1956, as amended (Water Quality Act of 1965, Clean Water Restoration Act of 1966)
Federal Water Project Recreation Act	July 9, 1965
Fish and Wildlife Conservation Act	September 15, 1960
Fish and Wildlife Coordination Act	March 10, 1934
Forest Highways Act	August 27, 1958
Forest and Rangeland Renewable Resources Planning Act	August 17, 1974
Freedom of Information Act	November 21, 1974
General Exchange Act	March 20, 1922
Granger-Thye Act	April 24, 1950
Healthy Forest Restoration Act	April 7, 1989
Highway Act	August 27, 1958
Historic and Archaeological Data Preservation Act	May 24, 1974
Historical Sites Act	August 21, 1935
Knutson-Vandenberg Act	June 9, 1930
Land Acquisition Act	March 3, 1925
Land Acquisition-Declaration of Taking Act	February 26, 1931
Land and Water Conservation Fund Act	September 3, 1964
Law Enforcement Authority Act	March 3, 1905
Migratory Bird Treaty Act	1918
Mineral Leasing Act	February 25, 1920, as amended
Mineral Leasing for Acquired Lands Act	August 11, 1955
Mineral Materials Act	July 31, 1947
Multiple-Use Sustained Yield Act	June 12, 1960
National Environmental Policy Act	January 1, 1970
National Energy Conservation Policy Act	1978
National Forest Management Act	October 22, 1976
National Forest Roads and Trails Act	October 13, 1964
National Forest Ski Area Permit Act	1986
National Historic Preservation Act	October 15, 1966, as amended
National Trails System Act	October 2, 1968
National American Graves Protection and Repatriation Act	January 23, 1990
Occupancy Permits Acts	March 4, 1915
Organic Administration Act	June 4, 1897
Pipelines Act	February 25, 1920
Public Lands Surveys Act	August 30, 1899
PL 102-575	October 30 1992
Real Property Quiet Title Action Act	October 25, 1992
Rehabilitation Act	1973, as amended
Renewable Resources Improvement Act	June 30, 1978
Research Grants Act	September 6, 1958
Right of Eminent Domain Act	August 1, 1888

Title	Initiation/Expiration
Rural Development Act	August 30, 1972
Safe Drinking Water Act	November 16, 1977, and Amendments
Secure Rural Schools and Community Self-Development Act	2000
Sikes Act	September 16, 1960
Sisk Act	December 4, 1967
Small Tracts Act	January 12, 1983
Soil and Water Resources Conservation Act	November 18, 1977
Solid Waste Disposal (Resources Conservation & Recovery Act) Act	October 21, 1976
Supplemental National Forest Reforestation Fund Act	September 19, 1972
Surface Mining Control and Reclamation Act	August 3, 1977
The Act	November 16, 1973
The Act	May 26, 2000
The Wilderness Act	1964
Timber Export Act	March 4, 1917
Timber Exportation Act	April 12, 1926
Title Adjustment Act	April 28, 1930
Toxic Substances Control Act	October 11, 1976
Transfer Act	February 1, 1905
Uniform Federal Accessibility Standards	1968
Uniform Relocation Assistance and Land Acquisition Policies Act	January 2, 1971
U.S. Criminal Code (Title 18 USC Chapter 91- Public Lands)	June 25, 1948
Volunteers in the National Forests Act	May 18, 1972
Water Quality Improvement Act	April 3, 1965
Water Resources Planning Act	July 22, 1965
Watershed Protection and Flood Prevention Act	August 4, 1954
Wild and Scenic Rivers Act	October 2, 1968
Wildfire Suppression Assistance Act	2003
Wilderness Act	September 3, 1964
Wood Residue Utilization Act	December 19, 1980
Youth Conservation Corps Act	August 13, 1970

Regulations

The Forest also abides by regulations listed in Table 26 as they pertain to the Forest Service.

Table 26. Regulations applicable to forest management

CFR	Title
36 CFR 60	National Register of Historic Places
36 CFR 63	Determinations of Eligibility for Inclusion in the National Register of Historic Places
36 CFR 68	Secretary of the Interior's Standards for the Treatment of Historic Places
36 CFR 79	Curation of Federally-Owned and Administered Archeological Collections
36 CFR 212	Forest Development Transportation System
36 CFR 213	Administration Under Bankhead-Jones Act
36 CFR 219	Planning Rule
36 CFR 220	National Environmental Policy Act
36 CFR 221	Timber Management Planning
36 CFR 223	Sale and Disposal of National Forest System Timber
36 CFR 228	Minerals
36 CFR 241	Fish and Wildlife
36 CFR 251	Land Uses
36 CFR 254	Landownership Adjustments
36 CFR 261	Prohibitions
16 U.S.C. 470ii	Protection of Archeological Resources
P.L. 114-35	Cave Resources Protection Act
36 CFR 291	Occupancy and Use of Developed Sites and Area of Concentrated Public Use
36 CFR 293	Wilderness Primitive Areas
36 CFR 294	Special Areas
36 CFR 295	Use of Motor Vehicles off Forest Development Roads
36 CFR 296	Archeological Resources Protection Act Uniform Regulations
36 CFR 297	Wild and Scenic Rivers
36 CFR 800	Advisory Council on Historic Preservation
36 CFR 1222-1238	Federal Records Act Uniform Regulations
40 CFR 121-135	Watersheds Programs
40 CFR 1500-1508	Council on Environmental Quality
	Guidance for Implementation of Federal Wildland Fire Management Policy (2009)
P.L. 108-148	The Healthy Forest Restoration Act
	Interagency Prescribed Fire Planning and Implementation Procedures Guide (2014)
NFES 2724	Interagency Standards for Fire and Fire Aviation Operations
PMS 484	National Cohesive Wildland Fire Management Strategy (2014)
43 CFR Part 10	Native American Graves Protection and Repatriation Act
43 CFR 8340	Off-road Vehicles
42 U.S.C. 7401	National Ambient Air Quality Standards
NFPA 70	National Electrical Code
NFPN70B	National Fire Code

CFR	Title
	USDA Forest Service National Fire Plan (2000)
2000	Uniform Building Code
7 CFR 15e	Enforcement of Nondiscrimination
28 CFR 36	Nondiscrimination on the Basis of disability by Public Accommodation and in Commercial Facilities

Executive Orders

Executive orders applicable to forest management are recorded in Table 27.

Table 27. Applicable Executive orders

Executive Order Number	Title
11593	Protection and Enhancement of the Cultural Environment
11990	Protection of Wetlands
11644/11989	Use of Off-Road Vehicles
11988	Floodplain Management
12088	Federal Compliance with Pollution Control Standards
12898	Environmental Justice
12962	Recreational Fisheries
13007	Indian Sacred Sites
13112	Invasive Species, as amended
13287	Preserve America

Policies and Guidelines

The revised forest plan will follow all applicable policies and guidelines, including:

- Forest Service Heritage Strategy
- All Forest Service Manuals
- All Forest Service Handbook
- Secretary of the Interior’s Standards Guidelines for Archeology and Historic Preservation
- USDA Forest Service Strategic Plan: FY2015-2020 or most current version

State and Local Direction

State and local direction applicable to forest management is listed below:

- Colorado Air Quality Protection Act
- Water Division 3, Water Decrees Forestwide.
- Memorandum of Understanding 14-MU-11132400-004 between the Forest Service and the Natural Resource Conservation Service for permitting and operating SNOTEL, SCAN, and manual snow survey sites.

Appendix J. Proposed and Possible Actions

Introduction

In compliance with 36 CFR 219.12 this appendix described proposed and probable actions that may take place on the Rio Grande National Forest at the project level over the next 3 to 5 years. These projects implement the forest plan and work to maintain existing conditions or achieve desired conditions described in the forest plan. Included are items such as program strategies; inventories, assessment, resource analysis and other planning needs; and ongoing work with partners and cooperating agencies anticipated during the next 3 to 5 years.

The listed proposed and probable management practices are not intended to be all-inclusive, nor are they intended to be decisions or commitments, but simply projections of what actions may take place in the future. A plan amendment is not required to change or modify any proposed or possible actions. The list of the actions can be updated at any time through an administrative change to the plan. More information may be found under plan objectives and management approaches.

Aquatic and Riparian Ecosystems

- Use vegetation treatments to restore the structure, function, and composition of riparian areas and meadows where encroachment is impacting meadow function.
- Restore nonfunctioning or functioning at-risk riparian areas so they are in or moving toward proper functioning condition.
- Maintain and restore habitat connectivity where appropriate to improve adaptive capacity of nation plants and animals. Collaborate with partners to establish priority locations for maintaining and restoring habitat connectivity
- Restore degraded spring sites back to providing functional habitat for spring dependent species.
- Reconstruct or restore riparian function to springs identifies as not in proper functioning condition.

Water, Soils, and Watersheds

- Plan and implement improvement activities in priority watersheds which are functionally at risk or impaired.
- Update the priority watershed list to reflect actual needs on the ground.
- Maintain and restore the connections of floodplains, channels, and water tables to distribute flood flows and sustain diverse habitats.
- Implement resource improvement projects that are beneficial for maintaining and improving soil conditions and productivity, and water quantity and quality.
- Complete on-site investigations and refinement of maps for soil disturbing projects that require site-specific, precise, and highly-detailed soil information that is beyond the scale of the current soil surveys.

Terrestrial Ecosystems

- Maintain and restore habitat connectivity where appropriate to improve adaptive capacity of native plants and animals. Collaborate with partners to establish priority locations for maintain and restoring habitat connectivity.
- Restore fire to the landscape where conditions are appropriate.
- Monitor insect and disease infestations and treat epidemic outbreaks.
- Thin and use wildfire to restore or maintain habitat when appropriate.
- Focus invasive species treatments on high priority invasive species and infestations as identified in the most recent version of the invasive species action plan. Prioritize areas such as wilderness, research natural areas, botanical areas, wild, scenic and recreational areas, and aquatic and riparian areas to maintain the integrity of native species and ecosystems. Promote early detection and rapid response as an effective approach to minimize spread.

Local Communities

- Work to maintain and expand contracting and partnering opportunities with local governments, businesses, and organizations. Develop partnerships that leverage different sources of funding to support opportunities to contribute to economic and social sustainability of local communities.

Range

- Review active allotment management plans on a regular basis.
- Maintain and replace fencing, water, and other range improvements.

Recreation

- Engage cooperators in stewardship activities and framework design.
- Furnish readily available offsite and onsite information about recreation opportunities at fee campgrounds.
- Coordinate trail development with trail systems developed by municipalities, counties, states, other Federal agencies, and partners to allow for integration and connectivity.

Scenery

- In all vegetation treatment and fuel reduction projects, consider improving scenery resources, especially in area that do not meet established scenery objectives.

Cultural Resources and Tribal Relations

- Protect fire-sensitive sites from activities that may include vegetation treatment, including prescribed fire and thinning, in and adjacent to site boundaries provided that appropriate protective measures are in place. Erosion, severe fire effects, and livestock congregation can result from “islanding” if sites are only avoided and not treated.

- Synthesize, interpret, and share cultural resource findings with the scientific community and public through prehistoric and historic contexts, formal presentations, publications, and educational venues.
- Annually complete non-project inventory to uphold the Section 110 mandate of the National Historic Preservation Act by prioritizing the following:
 - Areas where eligible cultural resources are threatened or ongoing impacts are unknown.
 - Areas indicated to have high cultural value or high density of cultural resources
 - Areas of importance to traditional communities
 - Areas where additional survey will contribute to a greater regional understanding of a specific management unit or special interest area.
- Develop and maintain collaborative partnerships and volunteer efforts to assist the Forest Service in researching and managing its cultural resources. Develop partnerships with traditional communities, nonprofits, volunteers, professional organizations, and schools.
- Develop management and preservation plans for administrative facilities and infrastructure that are significant cultural resources with special significance, or are sites that receive heavy visitor use.
- Encourage volunteer participation in cultural resource conservation activities such as research, site stabilization, conservation, and interpretation.
- Engage local communities in cultivating economic development opportunities for heritage tourism.
- Develop a database of fire-sensitive sites, structures, and other resources to facilitate resource protection during fire management.
- Provide opportunities for line officers and Forest Service employees to receive training to gain a broader understanding of the unique legal relationship between the Federal Government and Indian tribes, and to learn about American Indian law, customs, traditions, and values.
- Through consultation, identify other plants that may be important to tribes.
- Map oshá populations.
- Work to understand the community needs of tribes and build respectful, collaborative relationships to achieve mutually desired conditions.
- Maintain the current heritage database.
- Properly preserve historic documents, such as photographs and maps, and make them available for research and interpretation.
- Cultivate economic development opportunities for heritage tourism in coordination with local communities.

Areas of Tribal Importance

- Develop interpretive and educational exhibits or other media that focus on the history of Forest lands in collaboration with tribes to provide the public with a greater understanding and appreciation of our shared history, culture, and traditions.

- Develop an interpretive and educational site to help prevent vandalism at the Natural Arch.
- Develop interpretive and educational site materials in concert with tribes that can aid in protecting areas of tribal importance.
- Develop a management plan to assist in maintaining cultural values in coordination with staff from the San Luis Valley, Bureau of Land Management, Pike-San Isabel National Forest, interested tribes, the U.S. Fish and Wildlife Service Sangre de Cristo Conservation Area, and other non-Federal partners.
- Identify, evaluate, and protect areas acknowledged as traditional cultural properties and work with associated communities to collaboratively manage areas acknowledged as traditional cultural properties by developing programmatic agreements, management plans, memoranda of understanding, or other management tools.

Congressionally Designated Trails (CDT)

- Provide appropriate signage at prominent access points along the Old Spanish National Historic Trail to enhance trail user experience and safety.
- Identify and pursue opportunities to acquire lands or rights-of-way in or adjacent to the Continental Divide National Scenic Trail corridor.
- Provide consistent signage along the trail corridor at road and trail crossings to adequately identify the trail and provide interpretive signs at key trail entry points and limited historic and/or cultural sites to orient visitors and enhance the visitor experience.
- Establish appropriate carrying capacities for specific segments of the Continental Divide National Scenic Trail, monitoring use and conditions, while taking appropriate management actions to maintain or restore the nature and purposes of the trail if the results of the monitoring or other information indicate a trend away from the desired condition.

Species of Conservation Concern

- Map populations of insect species that are species of conservation concern, threatened, endangered, proposed, or candidate species so that interdisciplinary teams can use the information to design projects to avoid impacts to these species.

Threatened, Endangered, Proposed and Candidate Species

- Evaluate and update current lynx linkage areas with partners to provide the desired habitat connectivity functions, as practical and needed based on available resources.

Wildlife

- Increase the number of Naturewatch viewing sites that focus on bird conservation; participate in events for International Migratory Bird Day.
- Establish a maintenance program for existing bat gates.

Infrastructure

- Manage all facilities according to the current Facilities Master Plan.
- When necessary, develop new trails to expand the range of recreation opportunities, ensure user safety, and disperse existing use into different areas to be consistent with other resource objectives.
- Manage road use by seasonal closure if:
 - Use is causing unacceptable damage to soil and water resources due to weather or seasonal conditions
 - Use is causing unacceptable wildlife conflicts or habitat degradation
 - Use is resulting in unsafe conditions due to weather conditions
 - The road(s) serve a seasonal public or administration need
 - The area accessed has seasonal need for protection or non-use.
- Inspect dams on National Forest System lands to ensure public safety and comply with all appropriate laws and regulations. Assure that high- and moderate-hazard dams have current Emergency Preparedness Plans.
- Inspect facilities with potable water use to ensure public safety and comply with all appropriate laws and regulations.

Soils

- Map soil types that support edaphic plant species of conservation concern. Including volcanic substrates such as ash-tuffs, latitic lava flows, rhyolite, and andesitic substrates; sedimentary substrates supportive of edaphic species include calcareous substrates such as limestone and shale.

Fire

- Assess burned areas to determine suitable and effective emergency stabilization and rehabilitation needs to meet current and anticipated environmental conditions.
- Implement fuels management activities to protect unique features, reduce fire behavior to an acceptable level, or replicate natural disturbance regimes within the constraints of the management area for the proposal.

Timber Management

- In areas suitable for timber production, salvage dead or dying trees (due to fire, insects, disease) to recover the economic value of the wood while providing for ecosystem function, including but not limited to retention of downed woody material, habitat, and snags as well as public safety.

The majority of the timber harvest in the next 3 to 5 years is anticipated to be salvage to recover economic value of the beetle-killed trees (Table 28).

Table 28. Planned timber sale program (annual average volume output)

[Based on average base funding and an estimated sustained yield limit of 73.7 MCCF]

Alternatives A and B	Timber Sale Program 1st Decade		Timber Sale Program 2nd Decade	
	CCF	MBF	CCF	MBF
Timber Products	<i>Does not include salvage or sanitation volumes.</i>			
Lands suitable for timber production				
A1. Sawtimber	490	215.6	5,880	2,587.2
A2. Other products	210		2,520	
C. Projected Timber Sale Quantity (A1 + A2)	700	215.6	8,400	2,587.2
Other Estimated Wood Products	<i>Does not meet timber product utilization standards.</i>			
	CCF	Tons	CCF	Tons
D. Fuelwood	7,200	8,600	7,200	8,600
E. Projected Wood Sale Quantity (C + D)	7,900		15,600	
	CCF	MBF	CCF	MBF
F. Estimated Salvage Volume	32,100	16,050	0	0
G. Total Volume including Salvage (E + F)	40,000		15,600	



**United States Department of Agriculture
Forest Service**

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