Forest Service
U.S. DEPARTMENT OF AGRICULTURE

Southwestern Region Lincoln National Forest MB-R3-08-11 August 2021

Lincoln National Forest Draft Land Management Plan

Chaves, Eddy, Lincoln and Otero Counties, New Mexico

Cover Photo: Sierra Blanca Peak and the White Mountain Wilderness; located within Smokey Bear Ranger District, Lincoln National Forest.

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Draft Land Management Plan

Chaves, Eddy, Lincoln and Otero Counties, New Mexico

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List of Acronyms

CFR	Code of Federal Regulations
FSH	Forest Service Handbook
FSM	Forest Service Manual
NEPA	National Environmental Policy Act
USDA	U.S. Department of Agriculture
USDI	U.S. Department of Interior

Note: Additional acronyms commonly used by the agency are included in the glossary.

Chapter 1. Introduction

This land management plan (or "plan") guides the Lincoln National Forest (also referred to as "the Lincoln" or "the national forest") in fulfilling its stewardship responsibilities to best meet the current and future needs of the American people. This plan provides the vision, strategy, and constraints that guide integrated resource management, provide for ecological sustainability, and contribute to social and economic sustainability on the Lincoln National Forest and the broader landscape.

Land Management Plan Structure

Chapter 1. Introduction describes the purpose of the land management plan, introduces the plan area and its context, describes the need for changing the land management plan and the themes of the new land management plan, explains the contents and concepts of the land management plan, and describes how the land management plan is implemented.

Chapter 2. Forestwide Management Direction includes plan components for forestwide desired conditions, objectives, standards, and guidelines for ecological resources and socioeconomic resources. Standards and guidelines are typically located in the relevant activity section of the plan, but when standards or guidelines pertain to multiple activities, they may be located in only one of the applicable resource sections.

Chapter 3. Area-Specific Management Direction contains the plan components applicable to specific areas that call for site-specific management. This chapter is divided into two sections: "Designated Areas" and "Management Areas." Designated areas are mostly designated by statute, but some categories may be established administratively through the federal executive branch. Plan components for a designated area may differ from forestwide guidance and must provide for appropriate management of the designated area based on the applicable authorities and the specific purposes for which the area was designated or recommended for designation.

Management areas are used to describe how plan components apply to specific parcels of National Forest System lands. A management area represents a management emphasis for an area or several similar areas on the landscape.

Plan components in this chapter may differ from forestwide guidance by:

1. Constraining an activity where forestwide direction does not;
2. Constraining an activity to a greater degree than forestwide direction; or
3. Providing for an exception to forestwide direction, when forestwide direction is in conflict with the management emphasis of the management area.

Forestwide plan components apply unless there is management direction for a designated area or management area that is different or more restrictive.

Chapter 4. Land Management Plan Monitoring outlines the monitoring and evaluation of plan implementation that is used to determine progress toward achieving desired conditions and objectives and how well management requirements, such as standards and guidelines, are being applied. The monitoring strategy provides a framework for subsequent monitoring and evaluation designed to inform adaptive management.

Several appendices provide additional information:

- Appendix A: Maps
- Appendix B: List of Resource Codes for Plan Components
- Appendix C: Fire Return Interval
- Appendix D: Eligible Wild and Scenic Rivers
- Appendix E: Proposed Probable and Possible Future Actions
- Appendix F: Relevant Laws, Regulations and Policy
- Appendix G: Climate Change Vulnerability Analysis and Adaptation Strategies

Purpose of the Land Management Plan

Every national forest managed by the Forest Service is required to have a land management plan that is consistent with the National Forest Management Act[1] of 1976 and other laws. The National Forest Management Act directs that land management plans be revised on a 10- to 15-year cycle. It has been 33 years since the regional forester approved the original 1986 Lincoln National Forest Land and Resource Management Plan (USDA FS 1986a). During that time, the land management plan was amended 18 times. Scientific information, circumstances, agency and public understanding, as well as economic, social, and ecological conditions, have changed or evolved over the past 33 years and, as a result, management emphasis has shifted from outputs to outcomes. Forest land management plans are one of three levels of planning and decisionmaking that guide how National Forest System lands are managed.

The first and broadest level of planning occurs every 5 years at the national level through the U.S. Department of Agriculture Forest Service Strategic Plan. The 5-year plan allows public transparency of the agencies' goals, objectives, and accomplishments. The second level of planning occurs at the level of National Forest System administrative units through land management plans. The third level of planning includes development of on-the-ground projects and activities, which are designed to make progress toward the desired conditions and objectives of the land management plan. Projects and activities must be consistent with the land management plan.

The land management plan guides the Lincoln National Forest in fulfilling its stewardship responsibilities to best meet the current and future needs of the American people. This plan provides forest-specific guidance and information for project and activity decisionmaking over the plan period, generally considered to be 10 to 15 years. It provides the vision, strategy, and constraints that guide integrated resource management, provide for ecological sustainability, and contribute to social and economic sustainability on the Lincoln National Forest and the broader landscape.

1. See 16 U.S.C. 1604 – National Forest System land and resource management plans.

The land management plan does not compel any agency action or guarantee specific outcomes. It does not prioritize projects or activities. Forest priorities and specific projects fit within the framework set forth in the land management plan desired conditions and objectives. Priorities evolve and are reassessed continually by Lincoln National Forest leadership in collaboration with the public. Within the constraints of this plan, management adapts to better achieve the vision the land management plan lays out. Decisionmaking is informed by feedback from monitoring that actively tests assumptions, tracks relevant conditions over time, and measures management effectiveness.

A land management plan guides and constrains Forest Service actions. Any action that affects or constrains public use needs to be imposed by law, regulation, or through the issuance of an order by the responsible official under 36 Code of Federal Regulations (CFR) part 261, subpart B. Management of National Forest System lands is also guided and constrained by laws, regulations, policies, practices, and procedures contained in the Forest Service Directive System, and are generally not repeated in land management plans. This land management plan is the result of a revision process conducted in accordance with the 2012 Land and Resource Management Planning Rule (36 CFR section 219) and its 2015 planning directives (FSH 1909.12).

Description of the Plan Area

The Lincoln National Forest (figure 1) is a recreation destination for New Mexico residents and visitors from neighboring states, especially west Texas and northern Mexico. The 1.1-million-acre national forest is located in Chaves, Eddy, Lincoln, and Otero counties in south central New Mexico. The Lincoln is comprised of four major mountain ranges—the Sacramento, Guadalupe, Capitan, and Jicarilla—with elevations ranging from about 4,000 to 12,000 feet. The mountains and surrounding desert include five different life zones, from Chihuahuan desert to subalpine forest. The Lincoln National Forest includes the White Mountain and Capitan Mountain wilderness areas.

People are drawn to the area for its open spaces, outdoor recreation activities, cool climate, beautiful scenery, stunning views, and spirit of the West. Known as the birthplace of Smokey Bear and backdrop to the historic Lincoln County War, the diverse scenery includes mountains with snow-capped peaks, desert canyons and mesas, piñon-juniper woodlands and subalpine forests, high mountain meadows, rugged canyons and escarpments, world-class caves, and water play areas such as Bonito Lake and Sitting Bull Falls. This spectrum of contrasts provides for sweeping, expansive views and uncrowded spaces. The variety of historic elements are rich in character and culture. Excellent wildlife viewing and hunting opportunities are found throughout the landscape. The Lincoln National Forest is predominately a naturally appearing landscape with vegetation shaped by recent and historical fires. Visitors to the Lincoln enjoy viewing scenery and reliving history while traveling on scenic byways and auto tours, including the Billy the Kid Scenic Byway, the road to Ski Apache, Sunspot Scenic Byway, and the Rim Road on the Guadalupe Ranger District. These routes and several national recreation trails offer stunning views of the national forest and surrounding lands.

The Lincoln National Forest provides habitat for elk, deer, bighorn sheep, pronghorn, turkey, bear, mountain lion and many other wildlife species. Habitats across the forest support many endangered, threatened, or candidate species including the Mexican spotted owl, New Mexico meadow jumping mouse, Sacramento Mountains salamander, and others.

Figure 1. Lincoln National Forest vicinity map and plan revision area

The Lincoln serves the roughly 208,000 residents of four counties (Otero, Lincoln, Eddy, and Chaves) and 3,000,000 neighbors in adjacent areas who rely on the national forest to varying degrees as a source of sustenance. People's reliance on the forest is manifested through various means such as using natural resources for livelihood; creating community synergy around issues and events; offering a place for groups to commune, work, and recreate together; and providing solitude, peace, and relaxation for individuals who want to escape the social pressures and pace of their everyday world. Firewood gathering is an important traditional activity that occurs on the Lincoln National Forest, as many local residents still rely on wood to heat their homes during the winter months. Permitted livestock grazing, hunting, and outfitting and guiding are long-standing traditions on the national forest. The Lincoln also provides outdoor recreational activities for area residents and tourists. Forest management continues to bring community members together over issues that affect them or to foster involvement through volunteer work that benefits their favorite places on the Lincoln National Forest. All of these forest uses help maintain social cultures and longstanding traditions.

Historical Context

The plan area has been managed by the Forest Service since in 1902, a period of more than 100 years. When the land area known today as the Lincoln National Forest was first designated as forest preserve in the early 1900s, the land management goals were relatively straightforward: to protect watersheds and manage timber and forage resources. Over time, managing this land became more complex, incorporating responsibilities related to wildlife, grazing, mining, and more. Recreational uses grew, along with an awareness that environmental conditions around the Lincoln National Forest had degraded owing to a variety of reasons. Today, traditional Native American, Hispanic, and Anglo-American rural communities, along with people from across the country and world, continue to use the forest for economic, social, and religious purposes.

Cultural and historic resources and their uses in the plan area are important to the social, economic, and ecological sustainability of the immediate area, the Southwest region, and the Nation. Historic properties within the plan area are a record of historic events important in the identity of local communities, the State of New Mexico, the region, and the Nation. Contemporary uses of resources in the plan area by traditional Native American, Hispanic, and Anglo-American rural communities are critical to maintaining the identity of these communities.

The Lincoln National Forest has been the setting of considerable human activity for thousands of years and is a rich source of cultural history. The plan area contains historic properties and archaeological resources that demonstrate human occupation and use for about 12,000 years. The occupation and use of the plan area by Native Americans (American Indians) with Pueblo and Athabaskan ethnic affiliations and their ancestors has occurred over this entire time span.

It is likely that all cultural periods from the Paleo-Indian, Archaic, Mogollon, and Apache through modern history are represented. Earliest occupation of the forest probably began during the Paleo-Indian Period, which dates from around 10,000 B.C. to about 5500 B.C. Most of the evidence for this period comes from the surrounding area in the form of hunting sites, processing sites, and base camps. Climatic changes throughout the Southwest began to occur around 6000 B.C., resulting in drier conditions than the previous Paleo-Indian Period. This led to a reduction in big game populations and a change in the distribution of plant species. During the Archaic Period, hunting was increasingly supplemented with plant foods obtained from a variety of environmental zones ranging

from basin floors to mountain slopes. When horticulture began to develop, early forms of corn were introduced. The Jornada Mogollon tradition emerged between 300 B.C. and A.D. 700 as regionally distinctive cultural traditions developed in the Greater Southwest. The Mogollon tradition emerged from an Archaic hunting and gathering adaptation.

Apache occupation of the forest may have occurred around A.D. 1500, although some experts estimate that the semi-nomadic Apaches were in New Mexico as early as the 13th century. Mescalero Apache were essentially nomadic hunters and warriors who remained in one location for a temporary period; they lived in brush shelters known as "wickiups," short rounded dwellings made of twigs, or teepees made of elk hides and buffalo hides. Apache women were skillful providers who gathered wild plants for foods and other needs. The Mescalero roamed freely throughout the Southwest including Texas and Arizona; Chihuahua, México; and Sonora, México. The Mescalero Apache Reservation—long recognized by Spanish, Mexican, and American treaties—was formally established through an executive order issued by President Ulysses S. Grant on May 27, 1873. When the reservation was established more than 100 years ago, Mescalero on the reservation numbered about 400. Today, three subtribes—Mescalero, Lipan, and Chiricahua—make up the Mescalero Apache Tribe. The Mescalero Apache Reservation is located between the Smokey Bear and Sacramento districts of the Lincoln National Forest.

Occupation and use of the plan area by Europeans and their descendants and other people from the Old World occurred over the past 500 years. Very little of the present-day national forest was settled by non-Indians prior to the 1850s. The Homestead Acts from 1860 through 1876 led to the development of small farms across the plan area. Ranching became a major economic activity that continues to this day. The discovery of gold in Jicarilla and White mountains during the 1870s also had an important impact on the area. Railroad-assisted logging was another important historical economic venture in the plan area after the turn of the century. President Franklin Roosevelt introduced the New Deal program to help combat the adverse effects of the Great Depression. As a result of this program, the Lincoln National Forest benefited from the Civilian Conservation Corps construction of erosion control features, roads, recreational sites, fire towers, and telephone lines. Some of these historic Civilian Conservation Corps structures are still in use today.

Development of a transcontinental highway system began during the 1920s and 1930s, and along with the railroads brought new settlers and increased tourism to the area. This led to direction from the Forest Service promoting outdoor recreation for visitors from across the country. One approach included the issuance of permits for recreation residences, allowing members of the public to build cabins on National Forest System land for recreational use. Population growth, settlement expansion, and economic diversification at the end of the 19th century and beginning of the 20th century resulted in expanded use of the land. As the railroad era in the Sacramento Mountains ended, a new era of scientific advancement began, spurred by competition with the Soviet Union. The focus of this advancement was in two areas, astrophysics (specifically solar) and rocketry. Military training and testing continue today as an economic backbone for the area.

Distinctive Roles and Contributions of the Lincoln National Forest

Every national forest in the National Forest System provides a distinctive role and contribution to the surrounding local area and larger region. The rich history and cultural uniqueness of southeast New Mexico help frame the roles and contributions the Lincoln National Forest provides to the local area and region.

The Lincoln National Forest is predominately a community forest. There are numerous small unincorporated communities within the Lincoln's boundaries, as well as several small incorporated towns and villages adjacent to the national forest. Historically, the surrounding communities have relied on the forest for timber and forage to support their families, and the Lincoln is home to many historical railroad logging grades now used as recreation trails. The Mexican Canyon Trestle, located on the Sacramento Ranger District, is an interpretive site today. In addition, ranching in the area has roots in the era of John Chisum and Billy the Kid, and events associated with these historical figures of the Lincoln County War take place on the Lincoln National Forest.

Most of these traditional communities and families continue to look to the Lincoln National Forest for raw materials and resources. During the development of this land management plan, a forest user described the importance of the Lincoln by stating, "The forest is what makes the community a community." People's attachment to the landscape and the cultural uniqueness of those who settled in the area provide the framework for the roles and contributions of the Lincoln National Forest.

Natural resources now managed by the Lincoln National Forest have provided for families and communities in southeast New Mexico for centuries, including before the establishment of the national forest. The Lincoln National Forest contributes resources and uses that are important to the Mescalero Apache, Hopi, and Zuni tribes; traditional communities; and many contemporary residents—all with historic, cultural, and social connections to the Lincoln. Sacred sites important to federally recognized tribes are located in the Lincoln National Forest. The mountains and their natural assets provide the basis for traditional customs and practices that contribute to cultural life and to social institutions important to the people who live in the area. The Lincoln's assets include fuelwood for heating, opportunity for hunting and fishing, forage for livestock grazing, medicinal plants and herbs, family recreation opportunities, and water.

The Lincoln National Forest comprises some of New Mexico's most productive and important watersheds—an important component for biological diversity in the landscape of the Southwestern United States. Over 1,000 species of plants and animals occur on the Lincoln National Forest. High, rugged mountains and ridges are major sources of snowpack, rainfall, and stream runoff that contribute to the flow of water into rivers like the Rio Bonito, Rio Ruidoso, Rio Peñasco, Sacramento River, Last Chance Canyon, Dark Canyon, and the Pecos. Lincoln National Forest staff manage varied landscapes, vegetation, and wildlife that provide unique combinations of resources and recreation opportunities that attract a wide spectrum of forest users. The Lincoln is an incredibly diverse environment, where natural life forms range from the Chihuahuan desert floor to subalpine vegetation above the tree line. The Sunspot Scenic Byway provides an opportunity to enjoy high-elevation forest and view golden-colored aspen trees in the fall.

The Lincoln National Forest is home to large mammals, such as elk, mule deer, whitetail deer, bighorn sheep, mountain lions, and black bears, and many other species. Diverse wildlife provides enjoyment and aesthetic value for photographers, bird-watchers, nature lovers, hikers, campers, and hunters. Game species support traditional ways of life and employment for hunting outfitters and guides; elk and turkey hunting are especially popular activities on the Lincoln.

In winter, the mountains of the Lincoln National Forest provide skiing, snowboarding, and snowshoeing opportunities in developed and undeveloped settings. Ski Apache draws visitors from the surrounding states and Mexico. The rest of the year, the mountains attract hikers, mountain bikers, campers, and recreationists from New Mexico and other states. In the spring of 1950, a bear

cub was found in the Capitan Mountains following a forest fire. This well-known black bear from Lincoln National Forest is Smokey Bear, an iconic image associated with fire prevention.

Most visitors to the Lincoln National Forest engage in some form of recreation, making tourism the single largest contributor to the local economy for surrounding communities and states. The Lincoln National Forest manages over 83,000 acres of designated wilderness, three national recreation trails, two nationally designated scenic byways, and over 120 significant caves. Some caves are relatively level while others plunge downward—over 600 feet below the cave entrance—via vertical shafts and steep inner slopes. The 11-mile long Snowy River Cave, partially on the Smokey Bear Ranger District, is the third longest cave in New Mexico and is the world's longest calcite formation. Sitting Bull Falls on the Guadalupe Ranger District offers visitors a rare opportunity to picnic near and enjoy flowing water in a high desert setting.

Need for Changing the 1986 Land Management Plan

The conditions, trends, and sustainability of ecological, social, and economic resources on the Lincoln National Forest were published in 2019 (USDA FS 2019a, 2019b, 2019c) as part of an assessment required by the 2012 Planning Rule (36 CFR 219). The assessment was the first phase of the land management plan revision process and provided a baseline of current conditions and trends for 15 resource topics. The assessment helped identify portions of the Lincoln National Forest's 1986 land management plan that were working well and meeting desired management objectives, and it also identified those parts of the plan that were not working well. These areas where the 1986 plan was not working well lead to the development of desired conditions that informed the resource specific "need for change" statements and provided focus for this revised plan, particularly in creating plan components to help ensure management meets desired conditions for each resource. Extensive public and interdisciplinary team involvement, along with science-based evaluations, helped to further identify and refine the focus of the need for change (USDA FS 2019c, 2019f).

Focus Areas and Themes Identified for Land Management Plan Revision

The Forest Service identified current ecological and socioeconomic conditions and trends taking place on the Lincoln National Forest and the associated needs for change to be addressed in the revised forest plan. Findings from the assessment (USDA FS 2019a, 2019b) resulted in need for change statements for 21 focus areas, grouped into three main themes: restoration of watersheds and vegetation, recreation and special uses, and traditional communities. The plan revision focus areas are presented below.

Monitoring and Adaptive Management

Monitoring is a critical element of adaptive management and is used to determine if management is meeting desired conditions laid out by the land management plan.

- There is a need for monitoring plans that track progress toward desired conditions and allow for responsive adaptive management with available resources.

Collaboration, Partnerships, and Relationships

Relationships are a key factor that can impact the success of how the land management plan is implemented. Relationships and effective partnerships are key to the successful implementation of the land management plan that will protect the land and serve the people.

- There is a need to include management approaches that will strengthen existing relationships, promote new relationships, and incorporate strategies that prioritize partnerships (focused on local, state, and federal agencies; tribal governments; law enforcement; permittees; recreation and forest user groups; environmental groups; users with historical ties to the forest, and youth groups).

Terrestrial Ecosystems

Fire exclusion and past management activities have led to higher stand densities (more trees and shrubs per acre); changes in tree species composition, homogenization of forest structure; loss of open forest interspaces; a loss of grass and forb diversity; an overall reduction in herbaceous cover; and a landscape more prone to atypical wildfires (generally high-severity fires).

- There is a need to develop plan components that emphasize landscape-scale ecosystem restoration and resiliency through adaptive management strategies to changing environmental conditions and stressors.
- There is a need to develop plan components that allow for managing toward terrestrial habitat and population connectivity for terrestrial species.
- There is need for plan direction that allows managers the flexibility to manage unplanned wildfires to meet resource objectives based on weather and site-specific conditions (for example, fuel conditions, topography, safety concerns, and values). These actions may include the use of fire, improving wildlife and range habitat, encouraging aspen regeneration, and improving watershed and overall forest health.
- There is a need to develop desired conditions (at multiple scales) for vegetation structure and composition to promote a characteristic diversity of seral states and species composition as well as meet management considerations for wildlife. This includes a suite of desired conditions for patch size, ecological status (composition), ground cover, coarse woody debris, and snags that characterize different ecological response units.

Riparian Ecosystems

Riparian areas are where ecosystems develop from the influence of water, along streams, lakes, springs and other waterbodies. Riparian systems have been degraded and are at risk on the Lincoln National Forest.

- There is a need for plan components that identify appropriate riparian characteristics (for example, biodiversity, connectivity, and water availability) that promote functionality and resiliency while taking into account multiple stressors.
- There is a need for plan components that lead to restoration of functioning at-risk or non-functioning riparian areas, thereby enhancing aquatic and terrestrial habitat connectivity.
- There is a need for plan components that guide management in improving and maintaining the ecological integrity of riparian areas on the forest because most of the at-risk species on the Lincoln National Forest are associated with aquatic, wet, or relatively moist microenvironments and habitats.

Soil Resources

Satisfactory soil condition (soil quality) is important in maintaining long-term soil productivity and is key to sustaining ecological diversity. About 33 percent of the Lincoln National Forest is currently in unsatisfactory and impaired soil condition. In areas with moderate and severe erosion, there is a high probability that accelerated erosion will occur if erosion control measures are not addressed when disturbances occur.

- There is a need for plan components that promote the maintenance and restoration of soil condition and function (for example, hydrology, stability, and nutrient cycling) by limiting the amount of exposed bare soil and by restoring and maintaining sufficient vegetative cover, including downed woody material.

Watershed and Water Resources

Watershed and water resources are important to terrestrial and aquatic habitat, aquatic biota, and vegetation, along with soil condition and watershed conditions. Both natural and human caused disturbances impact the condition of water resources across the Lincoln National Forest. Wildfires from both natural and human-caused ignitions lead to increased rates of erosion and sedimentation, negatively impacting water quality. Drought also impacts water resources through reduced flow in streams and springs. Roads near stream channels increase delivery of sediment to streams on and off the national forest. Water resources provide for recreation and are a substantial benefit as drinking water as well as for agricultural and industrial uses in the area. Water resources on the Lincoln National Forest include streams, springs, wetlands, riparian corridors, and the underlying groundwater that support these features. Most of these water resources are used for consumptive purposes such as drinking water, livestock watering, and agricultural irrigation, as well as oil and gas exploration and development.

- There is a need for updating and developing plan components that provide for the management of a sustainable water supply for multiple uses.
- There is a need for plan components to address water quality in addition to supply, including partnerships with private landowners, local government entities, and the New Mexico Environment Department.
- There is a need to include plan components for maintaining or restoring the integrity of aquatic ecosystems and watersheds.
- There is a need for plan components that lead to improved hydrological function and condition of water-dependent systems by maintaining and restoring upland and riparian vegetation cover and reducing erosion and sedimentation from disturbed sites (for example, reclaim headcuts) where feasible.
- There is a need to develop plan components to ensure stream channels and floodplains are dynamic and resilient to disturbance.
- There is a need to develop more effective aquatic biotic monitoring items in order to better assess biological condition and trends.
- There is a need to manage forest resources to improve groundwater recharge and surface water flow.
- There is a need to use change in watershed condition class as an outcome-based performance measure to track progress toward desired conditions for watersheds on the Lincoln National Forest.

At-Risk Species

Lincoln National Forest staff identified at-risk species that occur on the forest. There are two categories of at-risk species: 1) those recognized under the Endangered Species Act as endangered, threatened, proposed, or candidate species; and 2) those recognized as species of conservation concern. Species of conservation concern are those for which the regional forester of the Southwest Region has determined substantial concern about the species capability to persist over the long term in the plan area. Species of conservation concern are native to and known to occur in the plan area. Threats most frequently associated with at-risk species were related to fire regime, climate change, disturbance, and invasive species.

- There is a need for plan components that support ecological conditions that contribute to the recovery and conservation of federally listed species (threatened and endangered), maintaining stable to increasing populations of the species of conservation concern, and maintaining common and abundant species.
- There is a need for plan components that will support documentation and establishment of baseline conditions for terrestrial and aquatic habitat linkages and connectivity for species migration and movement across the landscape.
- There is a need to develop plan components that encourage working with neighboring land managers to implement projects at a scale that improves landscape-scale connectivity across mixed ownership where natural systems, such as watersheds and wildlife corridors, span multiple administrative boundaries.

Social and Economic Conditions, and Multiple Uses

For over a century, communities surrounding the Lincoln National Forest have relied on it as a source of sustenance and income.

- There is a need for plan components that recognize the Lincoln National Forest's role in contributing to local economies (timber, grazing, and other multiple-use activities and products, etc.).
- There is a need for plan components to support building stronger relationships with the public—including but not limited to state and federal agencies, cities and counties, tribal governments, recreational and forest user groups, environmental groups, local communities, youth, vendors, and other users with cultural and historical ties to the forest—for the management of resources such as water, timber and other forest products.
- There is a need to recognize the economic and social importance of outdoor recreation, wildlife habitat, and water resources for visitors and local communities.

Rangeland Resources

Livestock grazing has important economic and cultural value to communities surrounding the Lincoln National Forest. Factors affecting current grazing management and resource conditions include concerns for the management of endangered species along with the spread of invasive species, encroachment of woody vegetation, loss of riparian resources**,** and drought. These factors all lead to reduced forage availability either in the short or long term.

- There is a need to add plan components for rangeland management that guide the maintenance or restoration of ecological integrity and productivity of rangelands.

Timber and Forest Products

Historically, timber products have been an important economic component of communities surrounding the Lincoln National Forest. Current stand conditions on the Lincoln are generally overly crowded with young and mid-aged trees, often with moderate-to-high levels of dwarf mistletoe and root rot that create conditions more prone to insect outbreaks and greater susceptibility to fire.

- There is a need for plan components to ensure the sustainability and availability of forest products such as timber, firewood, and other special forest products for economic uses.

Fish, Wildlife, and Plant Resources

Wildlife, fish, and plants on the Lincoln National Forest contribute to social wellbeing and quality of life by promoting recreational and educational opportunities. The Forest Service maintains a stewardship responsibility for wildlife, fish, and plant habitat. Culturally, hunting and fishing is an important activity for the people of New Mexico, where early inhabitants hunted and lived off the land.

- There is a need to develop plan components that support ecological conditions of the various habitat types that contribute to the conservation of native plant and animal species for hunting, fishing, and wildlife viewing.

Cultural and Historic Resources

Human occupation of the areas in and around the Lincoln National Forest has spanned thousands of years. There is substantial concern for the effect of erosion on archaeological sites. The Mescalero Apache Tribe also relies on forest products for personal, commercial, and ceremonial use.

- There is a need for plan components to evaluate, stabilize, preserve, interpret, and protect prehistoric, historic, and sensitive properties (including archeological sites, historic structures, sacred sites, and traditional cultural properties).
- There is a need for plan components for tribal uses to ensure the sustainability and availability of forest products such as timber, firewood, medicinal and ceremonial plants, edible plants, and other special forest products for economic and cultural practices.

Recreation and Scenic Character

Outstanding recreational opportunities from the most primitive and wild to the highly developed are available on the Lincoln National Forest throughout the year. Visitors participate in a variety of activities, with the most popular being viewing natural features, hiking and walking, relaxing, and driving for pleasure.

- There is a need for plan components to address changing trends in services, activities, and types of facilities desired by the public, while balancing those trends with management of other resources such as soils and vegetation.
- There is a need for plan components to better integrate scenery management within all forest management (such as restoration, habitat diversity, and timber management) to advance positive outcomes for all resources.

Designated Areas

A designated area is an area or feature identified and managed to maintain its unique special character or purpose. Currently designated or eligible areas on the Lincoln National Forest include: wilderness areas (2), wilderness study area (1), eligible wild and scenic rivers (17), national recreation trails (2), inventoried roadless areas (12), significant caves (246), proposed research natural areas (3), national forest scenic byway and national scenic byway (2), and critical habitat areas under the Endangered Species Act (2).

- There is a need to re-evaluate designated and proposed special areas (research natural areas, botanical areas, etc.)—excluding congressionally-designated areas—as considerable time has passed and conditions may have changed.

Infrastructure

The Lincoln National Forest's ability to maintain its current infrastructure of trails, roads, and recreation and administrative facilities is threatened by lack of maintenance resources. For example, only about 29 percent of trails on the Lincoln are maintained to standard.

- There is a need for plan components to address the long-term sustainability of infrastructure (trails, administrative and recreation facilities, range improvements, roads, etc.) through design, construction, and maintenance.

Land Management Plan Content

A land management plan consists of plan components and other plan content. Each of these is discussed below, along with a description of the coding system used for plan components.

Land Management Plan Components

Plan components guide future project and activity decisionmaking, are required in the land management plan, and are the main substance of the document. They include: desired conditions, objectives, standards, guidelines, suitability of lands, and goals. Plan components should (1) provide a strategic and practical framework for managing the Lincoln National Forest; (2) should be applicable to the resources and issues related to the forest; and (3) should reflect the forest's distinctive roles and contributions. As a whole, the set of plan components must provide for social, economic, and ecological sustainability and multiple uses. Plan components were developed collaboratively with input from a variety of external and internal stakeholders, with broad interdisciplinary representation. Plan components do not need to reiterate existing law, regulation, or policy; however, some laws, regulations, or policy may be included for emphasis. Except for desired conditions, other plan components are not necessarily in every resource section. An interdisciplinary team refined the final form and organization of the land management plan to be understandable, useable, and integrated. The five plan components are described below.

Desired Conditions describe the vision toward which the management of the land and resources in the plan area is directed. Desired conditions are not commitments or final decisions approving specific projects or activities; rather, they guide the development of projects and activities. Projects are designed to maintain or move toward desired conditions and to be consistent with the plan over the long term. The desired conditions in this land management plan have been written to contain enough specificity so that progress toward their achievement may be determined through monitoring. In some cases, desired conditions may already be achieved, while in other cases they may only be achievable over hundreds of years.

Objectives describe how the Lincoln National Forest intends to move toward the desired conditions. Objectives are concise projections of measurable, time specific, and fiscally achievable intended outcomes. Objectives have been established for the work considered most important to address the needs for change and make progress toward desired conditions. They also provide metrics for evaluating accomplishments.

Standards are technical design constraints that must be followed when an action is being taken to make progress toward desired conditions. Along with guidelines, standards make-up the "rules" that land managers must follow. Standards differ from guidelines in that standards do not allow for any deviation without a plan amendment.

Guidelines are required technical design criteria or constraints on project and activity decisionmaking that help make progress toward desired conditions. Along with standards, guidelines make up the "rules" that we must follow. However, unlike standards, guidelines allow for departure from their terms so long as the intent of the guideline is met. Deviation from a guideline must be specified in the site-specific decision document with supporting rationale. When deviation from a guideline does not meet the original intent, a plan amendment is required.

Management Approaches are optional. If included, management approaches should briefly describe the principal strategies the responsible official is inclined to use. They should derive from, and be responsive to, the vision and the objectives. They may convey a sense of priority and focus among objectives so that the public will know where to expect the greatest management importance. Management approaches may indicate the future course or direction of change in programs, recognizing past trends of budget and program accomplishments, without making precise estimates of quantities. They may also describe partnership opportunities and collaboration arrangements that support the achievement of desired conditions and objectives.

Suitability of Lands means specific National Forest System lands within the plan area are identified as suitable for various multiple uses or activities based on the desired conditions applicable to those lands. The plan will also identify lands within the plan area as not suitable for uses that are not compatible with desired conditions for those lands. The suitability of lands need not be identified for every use or activity. The land management plan only applies suitability to timber. Suitability of other resources is addressed with the standards and guidelines applied to each resource area.

Other Land Management Plan Content

Every plan must have management areas, geographic areas, or both. The land management plan may identify designated or recommended areas as management areas or geographic areas. Geographic areas were not used in this plan. See chapter 3 for management areas and associated plan components.

The land management plan also contains "other required plan content" including identification of priority watersheds, identification of the roles and contributions of the land management plan, a plan monitoring program, and proposed and possible future actions. Other plan content is not considered a plan component.

- Distinctive Roles and Contributions of the Lincoln National Forest – Chapter 1

  Describes the Lincoln National Forest's distinctive contributions to the local area, region, and Nation, and the roles for which the Forest Service is best suited, considering the agency's mission and capabilities.

- Priority Watersheds – Chapter 2 under "Water Resources"

  Priority watersheds have been identified using the Forest Service National Watershed Condition Framework as areas where plan objectives for restoration focus on maintaining or improving watershed condition. Watershed Condition Framework classifications and priority watersheds may change over the life of the land management plan, reflecting changes in watershed conditions.

- Land Management Plan Monitoring – Chapter 4

  Monitoring includes testing assumptions, tracking changes, and measuring management effectiveness and progress toward achieving or maintaining the plan's desired conditions or objectives.

- Proposed Probable and Possible Future Actions – Appendix E

  Possible actions are the types of projects that the Lincoln National Forest may use in the next 3 to 5 years to move toward achieving desired conditions and objectives.

A land management plan may also include "optional content," such as background information, explanatory narrative, general management principles, potential management approaches, management challenges, performance history, performance risks, contextual information, or referenced material. Optional content is not labeled or worded in a way that suggests it is a plan component and does not imply or constitute a decision, but it may help clarify plan direction and how it may be applied.

A change to "other required plan content" or "optional content" does not require a plan amendment; instead, such changes may be made using an administrative correction process.

Land Management Plan Codes

The plan uses a coding system to reference plan components more easily and to determine where the plan components apply. Codes consist of a series of letters and numbers to establish what resource area and plan component is being referenced. Coding is structured using the following format: AA-BB-CC-NN.

The first series of letters reference the spatial area where the plan component applies—forestwide (FW), designated area (DA), or management area (MA). The second series of letters reference the resource, management area, or geographic area name (see appendix B for a complete list of resource codes). The third series of letters reference the type of plan components, such as desired condition (DC), objective (O), standard (S), and guideline (G). The number (NN) is the sequential order of each plan component within a specific resource area, management area, or geographic area (figure 2).

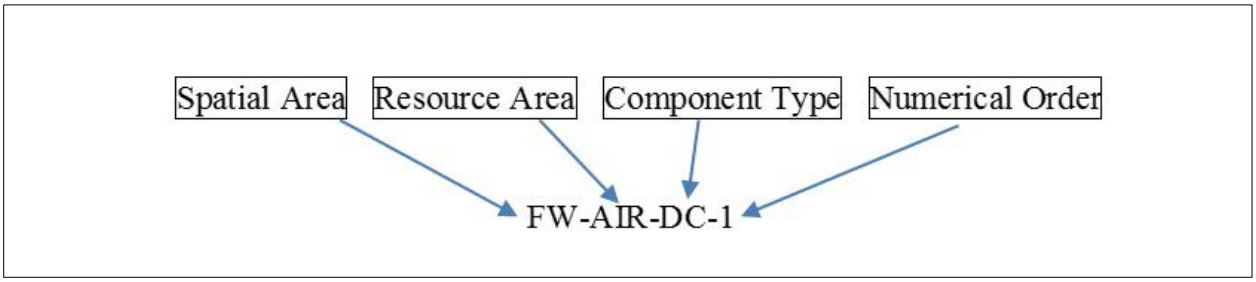

Figure 2. The unique code for forestwide (FW) air resource (AIR) desired condition (DC) number one (1) is FW-AIR-DC-1

Best Available Scientific Information Applied in Developing the Land Management Plan

The best available scientific information has been used to inform the planning process. The planning record documents how the information was determined to be accurate, reliable, and relevant to issues being considered. Best available scientific information includes relevant ecological, social, and economic scientific information. We documented the use of best available scientific information for the assessment, the plan decision, and the monitoring program. The 2012 Planning Rule does not require that planning develop additional scientific information, but that planning should be based on scientific information that is already available. New studies or the development of new information is not required for planning unless required by other laws or regulation. In the context of the best available scientific information, "available" means that the information currently exists in a form useful for the planning process, without further data collection, modification, or validation. Analysis or interpretation of the best available scientific information may be needed to place it in the appropriate context for planning.

Development of this revised plan was an interactive process using best available scientific information, regional guidance, internal feedback, and collaboration with a wide variety of government agencies, federally recognized tribes, nongovernmental organizations, and the public.

Land Management Plan Implementation

Project-level planning is the mechanism for plan implementation. Project planning translates the desired conditions and objectives in the plan into proposals that identify specific actions, design features, and project-level monitoring. Projects address site-specific needs developed locally with input from experts and stakeholders and consideration of the most current and relevant information. Project decisions are made following public involvement and analysis. Important considerations in project development include consistency with the plan, consistency with higher-level direction, project potential effects on moving toward desired conditions at multiple scales, and feedback from project- and plan-level monitoring regarding the effectiveness of management strategies.

Lincoln National Forest projects and activities are to be consistent with the direction in this plan and compliant with current law, regulation, and policy. This plan does not reiterate higher-level direction; instead, it includes a partial list of applicable laws, regulations, executive orders, and policy for reference in appendix F.

To ensure a project is consistent with the plan, its design and implementation should consider its setting, any designated areas or management areas it overlaps, and plan guidance related to any resources or conditions that may be present in the area (cultural resources, nonnative species, geologic formations, wildlife, etc.). Additionally, project design should consider any potential conflicts with other authorized projects and activities. Project design should be consistent with forestwide plan direction except where superseded by designated area or management area direction, which takes precedence.

Plan-level and project-level monitoring and evaluation are the tools for gathering information on progress toward desired conditions, the effectiveness of plan implementation, and the appropriateness of plan direction. This information is subsequently used to determine management needs and adjust management strategies that, in part, determine the form of future projects and activities. As such,

monitoring and evaluation are key elements of plan implementation, as they guide future management occurring under the plan. The monitoring plan described in chapter 4, in conjunction with project-level monitoring, will provide the framework to support adaptive management on the Lincoln National Forest.

Interrelationships of Land Management Plan Content

This land management plan has resource plan components that, when viewed as a whole, combine to meet the requirements for ecological integrity, diversity of plant and animal communities, multiple-use management, and ecologically sustainable production of goods and services, and contribute to economic and social sustainability. These requirements go hand-in-hand. The plan is not an assemblage of program plans that have unique plan components for every resource.

To effectively manage to the desired conditions of a forest resource, project planners and decisionmakers must ensure use of the entire plan and not just the plan components listed for a single resource. Effective integrated resource management recognizes the interdependency of ecological, social, cultural, and economic resources and acknowledges how management of one resource can influence the management or condition of other resources.

Consistency of Projects with the Land Management Plan

As required by the National Forest Management Act, all projects and activities authorized by the Forest Service, after record of the decision for the revised plan, must be consistent with the land management plan (16 U.S.C. 1604(i) as described at 36 CFR 219.15). This is accomplished by a project or activity being consistent with applicable plan components. If a proposed project or activity is not consistent with the applicable plan components, the responsible official has the following options (subject to valid existing rights):

- Modify the proposed project or activity to make it consistent with the applicable plan components;
- Reject the proposal or terminate the project or activity;
- Amend the plan so that the project or activity will be consistent with the plan as amended; or
- Include a site-specific plan amendment so that the project or activity will be consistent with the plan as amended. This amendment may be limited to apply only to the project or activity. (36 CFR 219.15(c)).

The following criteria should be used in determining if a project or activity is consistent with the land management plan (36 CFR 219.15(d)).

Desired conditions and objectives. A project or activity is consistent with plan desired conditions and objectives when it:

1. Maintains or makes progress toward attaining one or more plan desired condition or objective applicable to the project;
2. Has no effect or only a negligible adverse effect on the maintenance or attainment of applicable desired conditions or objectives;

3. Contributes to the maintenance or attainment of one or more desired conditions or objectives, or does not foreclose the opportunity to maintain or achieve any goals, desired conditions, or objectives, over the long term; or
4. Maintains or makes progress toward attaining one or more of the plan's desired conditions or objectives, even if the project or activity would have an adverse but negligible effect on other desired conditions or objectives.

Many types of projects and activities can occur over the life of the plan; therefore, it is not likely that a project or activity can maintain or contribute to the attainment of all desired conditions. In addition, not all desired conditions would be relevant to every activity. Most projects or activities are developed specifically to maintain or move conditions toward one or more of the desired conditions in the plan. The project decision document should include an explicit finding that the project is consistent with the plan's desired conditions or objectives and briefly explain the basis for that finding. In providing this brief explanation, the project decision document does not need to explicitly address every desired condition or objective set forth in the plan. Rather, a general explanation is all that is needed, so long as the consistency finding is made based on a consideration of one of the four factors noted above. When a categorical exclusion from environmental analysis and documentation applies and there is no project decision document, the finding and explanation should be in the project record.

Standards. A project or activity is consistent with a standard if the project or activity is designed in exact accord with the standard.

The project documentation should confirm that the project or activity is designed in exact accord with all applicable plan standards. The responsible official can make a single finding of consistency with all applicable standards, rather than there needing to be individual findings.

Guidelines. A project or activity must be consistent with all guidelines applicable to the type of project or activity and its location in the plan area. A project or activity can be consistent with a guideline in either of two ways:

- The project or activity is designed exactly in accord with the guideline, or
- The project or activity design varies from the exact words of the guideline but is as effective in meeting the purpose of the guideline to contribute to the maintenance or attainment of relevant desired conditions and objectives.

The project documentation should briefly explain how the project is consistent with the applicable plan guidelines. When the project is designed in exact accord with all applicable guidelines, the project documentation should simply confirm that fact in a single finding of consistency with all applicable guidelines. When the project deviates from the exact guidance of one or more applicable guidelines, the project documentation should explain how the project design is as effective in meeting the purpose and intent of the guideline(s).

Suitability. An area may be identified as suitable or not suitable for certain uses depending on its compatibility with desired conditions and objectives. This plan only addresses suitability for timber. Managing lands with the purpose of sustainable timber production may only occur in an area identified as suitable for timber production (16 U.S.C. 1604(k)).

Amendments

Any substantive changes to plan components require a plan amendment with appropriate analysis as required under the National Environmental Policy Act. Administrative changes can be used to make changes such as updates to data and maps, management approaches, and relevant background information; to fix typographical errors; or to update other required content of a plan (content that is not a plan component). The public will need to be notified of all administrative changes to the land management plan.

Adaptive Planning and Monitoring

Land management planning is a continuous process that includes: (1) assessment; (2) plan development, amendment, and revision; and (3) monitoring. The intent of this land management planning framework is to create an integrated approach to the management of resources and uses, incorporate the landscape-scale context for management, allow the Forest Service to adapt to changing conditions, and improve management based on monitoring and new information.

An adaptive land management plan recognizes that there is always uncertainty about the future of natural systems and the timing and type of disturbances. Social conditions and human values regarding the management of national forests are also likely to change. Given that the setting for land management plan implementation will be changing over time, the plan incorporates an effective monitoring program that can detect change, with an adaptive flexibility to respond to those detected changes. The land management plan monitoring program recognizes key management questions and identifies measurable indicators that can inform the questions. When conditions change beyond what was anticipated in the plan, a responsive process using narrow amendments can be used to adjust the land management plan between revisions.

The planning framework creates a structure within which land managers and partners work together to understand what is happening on the land. It is intended to establish a flexible land management plan that allows the land managers to adapt to changing conditions and improve management based on new information and monitoring.

The land management plan monitoring phase comes after the plan has been revised. The monitoring phase includes:

- Designing management activities proposed to implement the land management plan in a way that will yield specific information and support learning.
- Analyzing monitoring results using scientific methods that reduce uncertainty and improve understanding of system behavior. Well-designed monitoring programs and management activities contribute to better scientific analysis of these results. Monitoring and analysis also evaluate progress to achieving desired conditions and objectives of the land management plan and the assumptions used in developing the plan.
- Learning from the results of the analysis and sharing how the results either confirm or modify the existing assumptions or provide feedback on management effectiveness. Learning is proactively shared with land managers and the public.
- Adapting planning and management activities based on learning from the results of the analysis. This adaptation takes the form of modifying assumptions, models, data, and understanding of the system. This knowledge is then used to inform the planning process that leads to adjustment of the land management plan and projects.

Transition to the Revised Land Management Plan

The land management plan is used as a source of direction for future projects, plans, and assessments. It is not expected that this new direction be used to reevaluate or change decisions that have been made under the previous land management plan. A smooth and gradual transition to the revised land management plan is anticipated, rather than an approach that forces an immediate reexamination or modification of all contracts, projects, permits, or other activities that are already in progress and were enacted under the previous land management plan. As new project decision, contracts, permits, renewals, and other activities are considered, conformance to the new plan direction as described in the previous section is expected.

Chapter 2. Forestwide Management Direction

Introduction

Management of the Lincoln National Forest involves many distinct resources that are also integrated with each other. In this chapter, each resource is presented in an individual section with management direction (plan components) and associated plan content (narratives and management approaches). Ecological resources such as vegetation, soil, water, air, and wildlife are presented first. Socioeconomic resources including timber (forest products), grazing, cultural resources and traditions, and recreation are presented in the second half of this chapter. Despite this resource-by-resource structure, it is important to recognize that resources impact each other and forest uses in complex and integrated ways. Therefore, it is crucial that the land management plan be considered as a whole and not as guidance for a set of individual resources.

The Lincoln National Forest's vision is to improve natural resource resilience—taking into consideration changes in temperature and weather conditions including increased drought—while managing ecosystems in a science-based and flexible manner. Ecosystems have integrity when their composition, structure, function, and connectivity are operating within historical ranges of variation over multiple spatial and temporal scales. However, not every desired condition or acre has to meet the definition of ecological integrity; some specific areas may not meet the definition of ecological integrity because they lack the capacity or because another concern is more important, such as public safety in the wildland-urban interface.

Ecological restoration is an outcome of managing for desired conditions and may be necessary in degraded ecosystems. Restoration is an intentional activity that initiates or accelerates ecosystem recovery with respect to its health (functional process and productivity), integrity (species composition and community structure), and sustainability (resistance and resilience to disturbance) under current and future conditions. Restoration may not necessarily return an ecosystem to its former state, because contemporary constraints and conditions can alter the trajectory of an ecosystem's development.

Ecosystem Services

In light of possible changes in species composition under the effects of changing climate patterns and with a focus on restoration, the plan components of the Lincoln National Forest's land management plan are designed to provide ecological conditions to sustain functional ecosystems based on a future viewpoint. Functional ecosystems are those that sustain critical ecological functions over time to provide ecosystem services including, clean air, fresh water, food, and fuel (provisioning ecosystem services); pollination, soil formation, and nutrient cycling (supporting ecosystem services); carbon storage, climate regulation, water filtration, and flood control (regulation ecosystem services); and educational, aesthetic, spiritual, cultural, and recreational experiences (cultural ecosystem services) (figure 3).

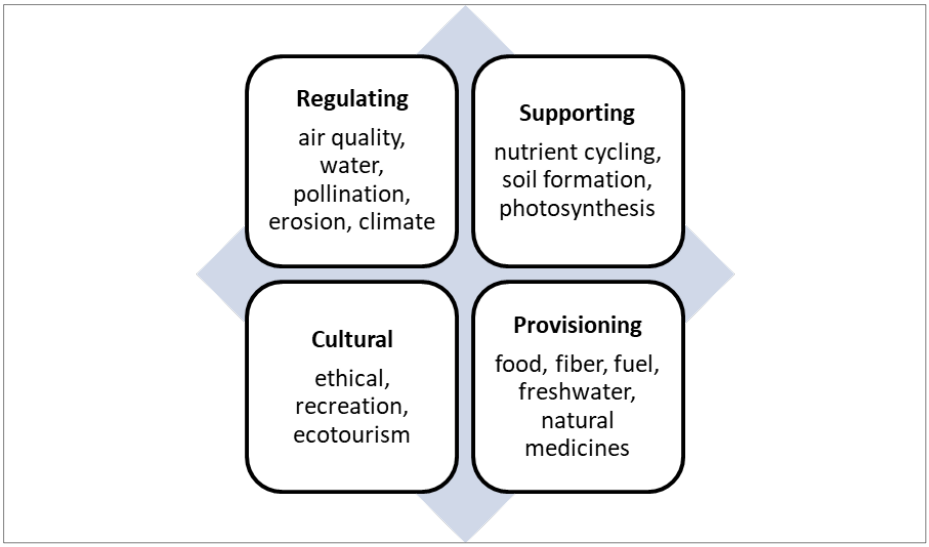

Figure 3. Ecosystem services include regulating, supporting, cultural, and provisioning services

Ecological Resources

Vegetation—Ecological Response Units

In this section, ecological desired conditions for terrestrial ecosystems are grouped by vegetation type (forested, woodland, shrubland, and grassland). The Lincoln National Forest encompasses a broad range of ecosystems that include a diversity of vegetation types, ranging along elevational gradients from desert to subalpine forest. These vegetation types are mapped on the Lincoln National Forest using the ecological response unit framework. Ecological response units are mapped ecosystem types based on biophysical themes that represent the range of conditions (dominant species, vegetation associations, soils, landscape features, or climate) that prevail under natural disturbance regimes (fire, insects, and disease). Each ecological response unit has specific seral stages that describe smaller units of vegetation conditions and succession (such as dominance of post-disturbance species or closed-canopy conditions) that is influenced by both natural processes and management. The seral state proportions given within the desired conditions described for each ecological response unit individually are single values reflecting the seral proportions indicative of reference conditions, adjusted to meet more recent management considerations (for example, Northern goshawk and Mexican spotted owl structural requirements).

Fire exclusion and past management activities have led to the greatest departure from desired conditions for ecological response units on the Lincoln National Forest (see Appendix C: Fire Return Interval). Historically, selective overstory removal logging, overgrazing, fragmentation (caused by roads, trails, railroad systems, etc.), and fire suppression and exclusion have contributed to the highly departed conditions for most ecological response units on the Lincoln. These past activities have produced highly stressed ecosystems, higher densities of small-diameter trees, increased closed-canopy conditions, increased fuel loadings, altered species composition, and have reduced site productivity. These conditions have lowered the resilience of these ecosystems, making them more at risk from stressors (such as climate fluctuations, nonnative invasive species, and prolonged drought) and disturbance (such as increased incidence of insects and disease outbreaks, and more frequent large uncharacteristically severe fires).

Management direction is described for individual ecological response units. Desired conditions for most ecological response units are presented at three spatial scales: landscape scale, mid-scale, and fine-scale (figure 4). The desired conditions are informed by science relative to historical reference conditions and natural range of variation. Descriptions begin with the landscape scale to provide a big picture of the desired conditions across the larger land area (typically composed of variable elevations, aspects, plant associations, slopes, soils, and disturbance processes). Ten or more mid-scale units comprise a landscape area. Descriptions at the mid- and fine-scales provide additional detail necessary for guiding future projects and activities. The mid-scale is composed of assemblages of fine-scale units, which have similar biophysical conditions. The fine-scale is an area in which the species composition, age, structure, and distribution of plants (single, grouped, or aggregates of groups) are described. Vegetation descriptions at these scales provide adequate detail and guidance for designing projects and activities that will help achieve the desired conditions over time. In some cases, not enough science is available to provide descriptions at multiple scales.

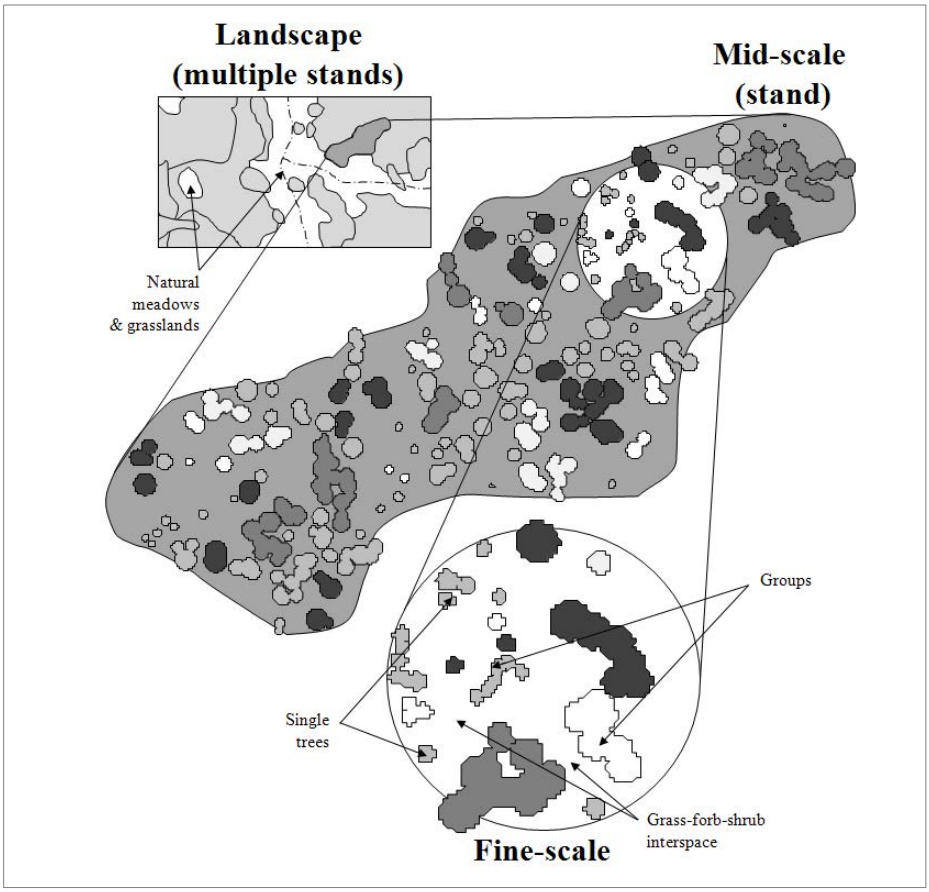

Figure 4. Spatial scales of analysis for vegetation

Desired conditions for each ecological response unit are described as a range of conditions (for example, grass and forb cover ranges from 10 to 25 percent, on average, for a specific seral state). No individual project is anticipated to reach these targets (conditions vary based on site potential), but individual projects should be designed in a manner that helps to drive the ecosystem toward the desired conditions. Moreover, the culmination of multiple projects and averaged conditions across the forest, over time, is anticipated to drive the ecosystems and ecological response units toward the targets or ranges for desired conditions.

Vegetation provides a number of supporting, regulating, provisioning, and cultural ecosystem services. High biodiversity and genetic variation among plant communities supports regulating services and ecosystem resilience. Vegetation cover supports water filtration, clean water, soil function, and nutrient cycling, especially from plant matter and decomposition. Species composition and vegetation structure are also important to wildlife (for example, dead snags for cavity-nesting birds and old growth for spotted owls and bats). Other important ecosystem services include the regulation of climate through carbon sequestration, the production of oxygen through plant respiration, food and wood products, and aesthetic and cultural values.

Plan components for terrestrial ecological response units are presented in the following order: all vegetation types, forested vegetation types, woodland vegetation types, shrubland vegetation types, and grassland vegetation types.

All Vegetation Types

All Vegetation Types Desired Conditions

FW-VEG-DC

01 Ecosystems maintain all of their essential components (plant density, species composition, structure, coarse woody debris, and snags), processes (disturbance and regeneration), and functions (nutrient cycling, water infiltration, and carbon sequestration). Overall plant composition similarity to site potential (FSH 2090.11) averages greater than 66 percent, but can vary considerably at the fine- and mid-scales owing to a diversity of seral conditions.

   a. Ecosystems contain a mosaic of diverse native plants (composition and genetic diversity) with vegetative structural diversity that encourages vigor, connectivity, and persistence at a variety of scales across the landscape, reflecting their natural disturbance regimes.

   b. Native plant communities dominate the landscape, while invasive species are nonexistent or low in abundance (less than 5 percent) and do not disrupt ecological functioning.

   c. Natural ecological cycles (energy, hydrologic, nutrient, etc.) facilitate the shifting of plant communities, structure, and ages over time due to natural ecological processes (such as climate fluctuations and fire) affecting site conditions.

   d. Native insects and diseases affect forest communities within their range of natural variability. Nonnative insects and diseases are nonexistent or low in abundance (less than 5 percent) and do not disrupt ecological functioning.

   e. Vegetation cover and litter are distributed across the soil surface in adequate amounts to limit erosion and contribute to soil deposition and development. Soil cover and herbaceous vegetation protect soil, facilitate moisture infiltration, and contribute to plant and animal diversity and ecosystem function.

02 Ecosystems are resilient or adaptive to the frequency, extent, and severity of disturbances, such as fire in fire-adapted systems, flooding in riparian systems, insects, pathogens, and climate variability.

   a. The composition, structure, and function of vegetation conditions are resilient to the frequency, extent, and severity of disturbances, and to climate variability.

   b. Vegetation communities reflect their natural physical, chemical, and biophysical processes with carefully managed human influence.

c. Non-climate ecosystem stressors (air and water pollution, high road densities, water depletions, etc.) do not negate the resilience and resistance of an ecosystem's ability to adapt to a changing climate.

d. Natural disturbance regimes, including fire, function in their natural ecological role. Uncharacteristic fire (frequency and severity outside historical range for associated vegetation type) is less than 10 percent or absent on the landscape.

e. Native insects and diseases affect forest communities within their range of natural variability. Nonnative insects and diseases are nonexistent or low in abundance (less than 5 percent) and do not disrupt ecological functioning.

f. Landscape vegetation structure and patterns create a mosaic that disrupts large continuous areas of uncharacteristic high-severity fire effects.

g. Healthy, resilient vegetation contribute to the forest's ability to store carbon and function as a sustainable carbon sink.

03 The ecological attributes and processes that provide habitat for native biota and/or historic and cultural values are fully functioning.

a. A diversity of vegetation exists with a mosaic of cover types and stand structures forming a healthy, resilient landscape that provide for genetic exchange, daily and seasonal movements of animals, including inter-specific interaction at all trophic levels (producer-consumer and predator-prey interactions) across multiple spatial scales, and consistent with existing landforms and topography.

b. Vegetation provides a sustainable supply of forest and botanical products, such as timber products, firewood, piñon nuts, and forage, consistent with desired conditions for other resources.

All Vegetation Types Objectives

Objectives for all vegetation types are based on previous Lincoln National Forest accomplishments, anticipated need, and estimated future accomplishment based on capacity.

FW-VEG-O

01 Over a 10-year period, complete the following treatments to move vegetation resources toward desired conditions:

Vegetation Ecological Response Unit	Mechanical Treatment (acres)	Prescribed Fire and Naturally Ignited Wildfire (acres)
Mixed conifer with aspen	1,000–3,000	40,000
Mixed conifer with frequent fire	6,000–8,000	40,000
Ponderosa pine forest	2,000–3,000	40,000
Piñon-juniper woodland	1,000–3000	40,000
Piñon-juniper grass	1,000–2,500	20,000
Piñon-juniper evergreen shrub	Treatments are included in the piñon-juniper woodland acres	20,000

02 Over a 10-year period, complete 400 to 1,000 acres of combined vegetation treatments in highly departed non-forested ecological response units[2] to move vegetation toward desired conditions (such as restoration). Treatments may include mechanical treatments, prescribed fire or naturally ignited wildfires, seeding, or other techniques still to be determined by best available science depending on the specific ecological response unit.

All Vegetation Types Guidelines

FW-VEG-G

01 Management activities should favor the retention of species that naturally occurred in those ecosystems in characteristic proportions.

02 In areas with reasonable assurance of successful regeneration, aspen sprouting should be stimulated in areas that have or previously had aspen, by clearcutting, conifer removal, or fire where desired conditions indicate a need for early seral structures (see individual forested ecological response units).

03 Slash piles should be burned in locations and at times that will facilitate managing forest vegetation towards desired conditions.

04 Lincoln national forest vegetation management projects should not remove large diameter trees, snags, and shrubs.

05 Activities should provide resiliency against potential climate changes by promoting early seral tree species regeneration and identifying and maintaining refugia in cooler moister microsites.

06 Chemical application techniques (such as chemical-free buffers or spot treatments) should be applied to minimize negative effects.

All Vegetation Types Management Approach

Consider the following:

01 Look for management actions that replicate natural disturbances.

Spruce-Fir Forest

Also known as subalpine conifer forests, the spruce-fir forest ecological response unit ranges in elevation from 9,000 to 10,500 feet along a variety of gradients including gentle to very steep mountain slopes. Late successional forests at the lower elevations of this ecological response unit are usually dominated by Engelmann spruce, white fir, and occasionally, blue spruce. Corkbark fir is a subdominant late successional species with quaking aspen, Douglas-fir, white fir, and Southwestern white pine occurring as common early to mid-seral tree species. At the upper elevations, dominant tree species are Engelmann spruce and corkbark fir, with aspen typically being incidental, but may occasionally be co-dominant as an early to mid-seral species. Rocky Mountain maple, currants, whortleberry, snowberry, ferns, sedges, and a variety of other native perennial shrubs and forbs are commonly found in the understory. Lichens and non-vascular plants, such as mosses and liverworts,

2. Highly departed non-forested ecological response units are Gambel oak shrubland, semi-desert grassland, and montane-subalpine grassland. Columbia Plateau-Great Basin grassland is less than 1 percent of plan area and occurs as small inclusions in other piñon-juniper types, and included within their objectives.

are also important components. Natural system drivers and stressors in this ecological response unit include blow-down, insect outbreaks, climate change, and stand-replacing fires.

The Lincoln National Forest contains just over 11,000 acres of spruce-fir forest, with over 6,700 acres in wilderness and all occurring on the Smokey Bear Ranger District, this comprises only 1 percent of the national forest. In the broader landscape, there is even less spruce-fir forest (about 0.05 percent). Thus, the Lincoln National Forest has 65 percent of the spruce-fir forest within the broader landscape, and a substantial contribution to the ecological integrity of the ecological response unit.

Spruce-Fir Forest Desired Conditions

FW-SFF-DC

Landscape Scale (1,000 to 10,000+ acres)

01 The spruce-fir forest vegetation community is a mosaic of structural and seral stages ranging from young trees to old and is composed of multiple species. The landscape arrangement is an assemblage of variably sized and aged groups and patches of trees and other vegetation similar to historical patterns. Tree canopies are generally more closed than in mixed conifer. An understory consisting of native grass, forbs, or shrubs is present.

02 Where old growth is concentrated**,** it occurs over large areas as stands or forests. Old growth includes old trees, dead trees (snags), downed wood (coarse woody debris), and structural diversity. The location of old growth shifts on the landscape over time as a result of succession and disturbance (tree growth and mortality).

03 The spruce-fir forest vegetation community is composed predominantly of vigorous trees, but older declining trees are a component and provide snags, top-killed trees, lightning and fire scarred trees, and coarse woody debris, all well distributed throughout the landscape. The number of snags and amount of downed logs (greater than 12 inches diameter at mid-point and more than 8 feet long) and coarse woody debris (greater than 3 inches diameter) vary by seral stage. Snags equal to or greater than 18 inches diameter at breast height range from 5 to greater than 30 snags per acre, with lower range of snags associated with early seral stages and the upper range associated with late seral stages. Snag density in general (greater than 8 inches diameter at breast height) averages 20 per acre with a range of 13 to 30 snags per acre. Coarse woody debris, including downed logs, averages vary by seral stage, ranging from 5 to 30 tons per acre for early-seral stages; 30 to 40 tons per acre for mid-seral stages; and 40 tons per acre or greater for late-seral stages

04 Vegetation conditions (composition, structure, and function) are broadly resilient to disturbances of varying frequency, extent, and severity. The forest landscape is a functioning ecosystem that contains all its components, processes, and conditions that result from endemic levels of disturbances (diseases, fire, insects, and wind), including old trees, downed logs, and snags. Organic ground cover and herbaceous vegetation provide protection of soil, moisture infiltration, and contribute to plant and animal diversity and to ecosystem function. In the lower spruce-fir type, mixed-severity fires (fire regime III) infrequently occur. Shrub cover is variable and depends on the terrestrial ecological unit inventory unit, determined by the Terrestrial Ecological Unit Inventory (USDA FS 1986b) or the General Ecosystem Survey (USDA FS 1989). At the scale of the plan unit, overall plant composition similarity to site potential

(FSH 2090.11) averages greater than 66 percent, but can vary considerably at the mid- and fine-scales owing to a diversity of seral conditions. In the upper spruce-fir type, high-severity fires (fire regimes IV and V) occur very infrequently. Natural and human-caused disturbances are sufficient to maintain desired overall tree density, age, spatial structure, species composition, coarse woody debris, and nutrient cycling.

Mid-Scale (10 to 1,000 acres)

05 The size and number of tree groups and patches vary depending on disturbance, elevation, soil type, aspect, and site productivity. There may also be small disturbances resulting in groups and patches of trees 10 to 1,000tens of acres or less. Grass, forb, and shrub interspaces created by disturbance may involve single trees or comprise up to 100 percent of the mid-scale area following major disturbances. Aspen is occasionally present in large patches.

06 Density ranges from 20 to 250 or greater square foot basal area per acre based on age and site productivity, and depending on disturbance and seral stages of the groups and patches.

07 Mixed (fire regime III) and high (fire regimes IV and V) severity fires and other disturbances maintain desired overall tree density, structure, species composition, coarse woody debris, and nutrient cycling. Ground cover consists of shrubs, perennial grasses, and forbs with basal vegetation values ranging between about 5 and 20 percent depending on the terrestrial ecological unit inventory unit or general ecosystem survey unit (USDA FS 1986b, 1989). The overall soil conditions meet a rating of “satisfactory” (USDA FS 2019e).

Fine-Scale (fewer than 10 acres)

08 Organic ground cover and herbaceous vegetation provide protection for soil and moisture infiltration, and contribute to plant diversity and ecosystem function. Mid-aged to old trees grow tightly together with interlocking crowns. Trees are generally of the same height and age in early group/patch development but may be multilayered in late development. Small openings (gaps) are present as a result of disturbances.

Spruce-Fir Forest Guidelines

FW-SFF-G

01 Vegetation treatments should be focused on development and maintenance to reflect the desired characteristic structure stage proportions in order to provide continuous representation of old growth and all structure stages on the landscape.

02 Slash from firewood harvest should be managed to a level compatible with the Forest Service’s ability to protect the remaining resources.

03 Surveys for reforestation needs should be completed within the same year following any wildfire or other natural disturbance that reduces forest stocking below desired conditions.

04 Natural regeneration of disturbed areas is preferred unless the following circumstances exist: (1) endangered species habitat needs to be restored, (2) the time period of recovery is deemed excessive due to the large size of deforested area and/or lack of nearby seed sources, (3) there is concern for loss of site capacity from soils loss or extreme competition with early-seral species or other vegetation, or (4) the reforestation need resulted from regeneration harvest, and natural regeneration is not establishing within 5 years.

Wet Mixed Conifer Forest (Mixed Conifer with Aspen Forest)

Wet mixed conifer forest hosts a variety of dominant and co-dominant species spanning mesic environments in the Rocky Mountain and Madrean provinces. Mixed conifer with aspen forest ranges in elevation from approximately 9,000 to 10,500 feet along a variety of gradients, including gentle to very steep mountain slopes situated between ponderosa pine and mixed conifer frequent fire forest below and spruce-fir forest above. Dominant and co-dominant vegetation varies in elevation and moisture availability. Ponderosa pine occurs incidentally or is absent, while Douglas-fir, southwestern white pine, white fir, and Colorado blue spruce occur as dominant and or codominant conifer species. Other species that may be present in sub-dominant proportions include limber pine. Understory vegetation is comprised of a wide variety of shrubs, graminoids, and forbs depending on soil type, aspect, elevation, disturbance history, and other factors.

Aspen stands are a component of the mixed conifer with aspen ecological response unit. This component is dominated by quaking aspen and may or may not have a significant conifer component, depending on successional status. The understory structure may have shrubs and an herbaceous layer or just an herbaceous layer. Common shrubs include oceanspray, thimbleberry, fivepetal cliffbush, and mountain ninebark. The herbaceous layer may be dense or sparse, dominated by graminoids or forbs. Some of the species typically found associated with aspen include Nevada peavine, Fendler's meadow-rue, elkweed, common yarrow, Canadian white violet, Indian paintbrush, and several grasses and sedges. Distribution of aspen within this ecological response unit is limited by several factors, including adequate soil moisture required to meet its high evapotranspiration demand, the length of the growing season or low temperatures, and major disturbances that clear areas of vegetation and stimulate root sprouting and colonization. The impacts from elk are also considered because if elk are present, they may browse aspen until it does not produce ramets within 2 to 5 years.

Wet mixed conifer forest makes up 3.3 percent of the Lincoln National Forest at 35,568 acres, and only 0.23 percent in the broader landscape. The Lincoln National Forest contains 46 percent of the mixed conifer with aspen in the broader landscape, which implies a substantial contribution to the ecological integrity of the ecological response unit. Mixed conifer with aspen is located entirely on the Sacramento Ranger District, and nearly entirely on the Rio Peñasco local unit.

Mixed Conifer with Aspen Forest Desired Conditions

FW-MCW-DC

Landscape Scale (1,000 to 10,000+ acres)

01 The wet mixed conifer forest vegetation community is a mosaic of structural and seral stages ranging from young trees through old. The landscape arrangement is an assemblage of variably sized and aged patches of trees and other vegetation associations similar to historical patterns. Tree patches are comprised of variable species composition depending on forest seral stages. Patch sizes vary but are frequently in the hundreds of acres, with rare disturbances in the thousands of acres. Seral state proportions are applied at the landscape scale, where low overall departure from reference proportions is a positive indicator of ecosystem condition. Canopies are generally more closed than in mixed conifer-frequent fire. An understory consisting of native grass, forbs, and/or shrubs is present. The amount of shrub cover depends on the terrestrial ecological unit inventory or general ecosystem survey unit (USDA FS 1986b, 1989). At the plan unit scale, overall plant composition similarity to site potential averages greater than 66 percent, but can vary considerably at fine- and mid-scales owing to a diversity of seral conditions.

02 Old growth generally occurs over large areas as stands or forests where old growth is concentrated. Old growth includes old trees, dead trees (snags), downed wood (coarse woody debris), and structural diversity. The location of old growth on the landscape shifts over time because of succession and disturbance (tree growth and mortality).

03 Snags equal to or greater than 18 inches diameter at breast height range from 1 to 5 snags per acre, with the lower range of snags of this size associated with early seral stages and the upper range associated with late-seral stages. Snag density in general (greater than 8 inches diameter at breast height) averages 20 snags per acre. Coarse woody debris, including downed logs, vary by seral stage with averages ranging from 5 to 20 tons per acre for early-seral stages, 20 to 40 tons per acre for mid-seral stages, and 35 tons per acre or greater for late-seral stages.

04 The wet mixed conifer forest vegetation community is composed predominantly of vigorous trees, but older declining trees are a component and provide for snags, top-killed, lightning- and fire-scarred trees, and coarse woody debris, all well-distributed throughout the landscape. Number of snags and the amount of downed logs (greater than 12 inches diameter at mid-point and more than 8 feet long) and coarse woody debris (greater than 3 inches diameter) vary by seral stage.

05 Vegetation conditions (composition, structure, and function) are broadly resilient to disturbances of varying frequency, extent, and severity. The forest landscape is a functioning ecosystem that contains all its components, processes, and conditions that result from endemic levels of disturbances (diseases, fire, insects, and wind), including snags, downed logs, and old trees. Organic ground cover and herbaceous vegetation provide protection of soil, moisture infiltration, and contribute to plant and animal diversity and ecosystem function. Mixed-severity fire (fire regime III) is characteristic, especially at lower elevations of this type. High-severity fires (fire regime IV and V) rarely occur and are typically at higher elevations of this type. Natural and anthropogenic disturbances are sufficient to maintain desired overall tree density, structure, species composition, coarse woody debris, and nutrient cycling.

Mid-Scale (10 to 1,000 acres)

06 The size and number of groups and patches vary depending on disturbance, elevation, soil type, aspect, and site productivity. Trees in groups and patches of ten to 1,000 acres are relatively common. A mosaic of groups and patches of trees, primarily even-aged, and variable in size, species composition, and age is present. Openness and prevalence of some species (such as aspen) is dependent on seral stages. Grass, forb, shrub openings created by disturbance, may comprise 10 to 100 percent of the mid-scale area depending on the disturbances and on time since disturbance. Aspen is occasionally present in large patches. Density ranges from 20 to 180 or greater square foot basal area per acre based upon age and site productivity, and depending upon time since disturbance and seral stages of groups and patches.

07 Fire severity is mixed or high, with a fire return interval of 35 to 200 or more years (fire regimes III, IV, and V). Fires and other disturbances maintain desired overall tree density, structure, species composition, coarse woody debris, and nutrient cycling. During moister conditions, fires exhibit smoldering low-intensity surface behavior with single tree and isolated group torching. Under drier conditions, fires exhibit passive to active crown fire behavior with

conifer tree mortality up to 100 percent across mid-scale patches. High-severity fires generally do not exceed 1,000 acre patches of mortality. Other smaller disturbances occur more frequently. Ground cover consists of shrubs, perennial grasses, and forbs with basal vegetation values ranging between about 5 and 20 percent depending on the terrestrial ecological unit inventory unit or general ecosystem survey unit (USDA FS 1986b, 1989, 2006a). The overall soil conditions meet a rating of "satisfactory" (USDA FS 2019e).

Fine-Scale (fewer than 10 acres)

08 In mid-aged and older forests, trees are typically variably spaced with crowns interlocking (grouped and clumped trees) or nearly interlocking. Trees within groups can be of similar or variable species and ages. Small openings (gaps) are present as a result of disturbances.

09 Organic ground cover and herbaceous vegetation provide protection for soil and moisture infiltration, and contribute to plant diversity and ecosystem function. Due to presence of ladder fuels, fires usually burn either with low intensity, smoldering combustion, or transition rapidly in the canopy as passive or active crown fire.

Mixed Conifer with Aspen Forest Guidelines

FW-MCW-G

01 Vegetation treatments should reflect the characteristic structure stage proportions to provide continuous representation of old growth and all structure stages on the landscape.

02 When managing for early seral states, conifers should be removed from aspen stands when needed to increase aspen longevity and increase diversity of aspen age classes.

03 Natural regeneration of disturbed areas should be allowed unless the following circumstances exist: (1) endangered species habitat needs to be restored, (2) the time period of recovery is deemed excessive due to the large size of deforested area and/or lack or nearby seed sources, or (3) there is concern for loss of site capacity from soils loss or extreme competition with early-seral species, (4) the reforestation need resulted from regeneration harvest, and natural regeneration is not establishing within 5 years.

04 Restoration of aspen communities should consider protective measures against ungulate browsing, such as tree shelters or barriers.

Mixed Conifer-Frequent Fire Forest

The mixed conifer-frequent fire ecological response unit may be found at elevations between 6,000 and 10,000 feet, situated between ponderosa pine, pine-oak, or piñon-juniper woodlands below and spruce-fir forests above. Typically, these types were dominated by ponderosa pine in an open forest structure (less than 30 percent tree canopy cover), with minor occurrence of aspen, Rocky Mountain Douglas-fir, white fir, and southwestern white pine. On contemporary landscapes, more shade tolerant conifers, such as Douglas-fir, white fir, and blue spruce, tend to increase in cover in late succession, contrary to conditions under the characteristic fire regime. However, historically, these species could have achieved dominance in localized settings where aspect, soils, and other factors limited the spread of surface fire. Currently, much of this type is dominated by closed structure (greater than 30 percent tree canopy cover) and climax species as a result of fire suppression.

The mixed conifer-frequent fire ecological response unit at 163,674 acres makes up nearly 15 percent of the Lincoln National Forest, compared to just under 1 percent in the broader landscape (328,640 acres). All six local units (and three ranger districts) have some mixed conifer-frequent fire forest. Most occurs on the Sacramento Ranger District (nearly 115,000 acres) in the Rio Peñasco, Salt Basin, and Tularosa local units, while just over 36,000 acres occurs in the Rio Hondo, Arroyo del Macho, and Tularosa units of the Smokey Bear Ranger District. Of those 36,000 acres, 27,000 acres are located in wilderness. Only 1,700 acres of mixed conifer-frequent fire forest occurs in the Upper Pecos unit of the Guadalupe Ranger District at the extreme south of the district. The Lincoln National Forest contains nearly 50 percent of the mixed conifer-frequent fire occurring in the broader landscape, so it has a large contribution to the ecological sustainability of the ecological response unit.

Mixed Conifer-Frequent Fire Forest Desired Conditions

FW-MCD-DC

Landscape Scale (1,000 to 10,000+ acres)

01 The mixed conifer-frequent fire vegetation community is a mosaic of forest conditions composed of structural stages ranging from young to old trees. Forest appearance is variable but generally uneven-aged and open; occasional patches of even-aged structure are present. The forest arrangement is in small clumps and groups of trees interspersed within variably-sized openings of grass/forb/shrub vegetation associations similar to historical patterns. Size, shape, number of trees per group, and number of groups per area are variable across the landscape. Where they naturally occur, groups of aspen and all structural stages of oak are present. Denser tree conditions exist in some locations such as north-facing slopes and canyon bottoms. Seral state proportions, per the Region 3 Seral State Proportions Supplement, are applied at the landscape scale, where low overall departure from reference proportions is a positive indicator of ecosystem condition.

02 Old growth occurs throughout the landscape, generally in small areas as individual old growth components, or as clumps of old growth. Old growth components include old trees, dead trees (snags), downed wood (coarse woody debris) and structural diversity. The location of old growth shifts on the landscape over time as a result of succession and disturbance (tree growth and mortality).

03 The mixed conifer-frequent fire forest vegetation community is composed predominantly of vigorous trees, but declining trees are a component and provide for snags, top-killed, lightning- and fire-scarred trees, and coarse woody debris (greater than 3 inches diameter), all well-distributed throughout the landscape.

04 The composition, structure, and function of vegetation conditions are resilient to the frequency, extent, severity of disturbances, and to climate variability. The landscape is a functioning ecosystem that contains all its components, processes, and conditions that result from endemic levels of disturbances (diseases, fire, insects, and wind), including snags, downed logs, and old trees. Dwarf-mistletoe occurs in less than 15 percent of host trees in uneven-aged forest structures and less than 25 percent in even-aged forest structures. Grasses, forbs, shrubs, needle cast (fine fuels), and small trees maintain the natural fire regime. Organic ground cover (leaf litter, needle cast, etc.) and herbaceous vegetation provide protection of soil, moisture

infiltration, and contribute to plant and animal diversity and to ecosystem function. The amount of shrub cover depends on the terrestrial ecological unit inventory or general ecosystem survey unit (USDA FS 1986b, 1989, 2006a). At the plan unit scale, overall plant composition similarity to site potential (FSH 2090.11) averages greater than 66 percent, but can vary considerably at fine- and mid-scales owing to a diversity of seral conditions. Frequent low-severity fires (fire regime I) are characteristic. Natural and anthropogenic disturbances are sufficient to maintain desired overall tree density, structure, species composition, coarse woody debris, and nutrient cycling.

Mid-Scale (10 to 1,000 acres)

05 The mixed conifer-frequent fire forest vegetation community is characterized by variation in the size and number of tree groups depending on elevation, soil type, aspect, and site productivity. The more biologically productive sites contain more trees per group and more groups per area. Openness typically ranges from 50 percent in more productive sites to 90 percent in the less productive sites. Tree density within forested areas generally ranges from 40 to 125 square foot basal area per acre.

06 The mosaic of tree groups generally comprises an uneven-aged forest with all age classes and structural stages. Occasionally small patches (generally less than 60 acres) of even-aged forest structure are present, based upon disturbance events and regeneration establishment. A small percentage of the landscape may be predisposed to larger even-aged patches, based on physical site conditions that favor mixed-severity and stand replacement fire and other disturbances. Disturbances sustain the overall age and structural distribution. Snags are typically equal to or greater than 18 inches diameter at breast height and average 3 per acre. Smaller snags, equal to or greater than 8 inches diameter at breast height, average 8 snags per acre. Downed logs (greater than 12 inches diameter at mid-point and more than 8 feet long) average 3 per acre within forested areas. Coarse woody debris, including downed logs, ranges from 5 to 15 tons per acre.

07 Ground cover consists primarily of perennial grasses and forbs capable of carrying surface fire, with basal vegetation values ranging between about 5 and 20 percent depending on the terrestrial ecological unit inventory or general ecosystem survey unit (USDA FS 1986b, 1989, 2006a). Fires burn primarily on the forest floor and do not spread between tree groups as crown fire. The overall soil conditions meet a rating of “satisfactory” (USDA FS 2019e).

Fine-Scale (fewer than 10 acres)

08 Organic ground cover and herbaceous vegetation provide protection for soil and moisture infiltration, and contribute to plant diversity and ecosystem function. Trees typically occur in irregularly shaped groups and are variably spaced with some tight clumps. Crowns of trees within the mid-aged to old groups are interlocking or nearly interlocking. Openings surrounding tree groups are variably shaped and composed of a grass, forb, and shrub mix. Some openings contain individual trees or snags. Trees within groups are of similar or variable ages and represent one or more species. Tree groups typically are less than 1 acre in size. Groups at the mid-age to old stages consist of approximately 2 to 50 trees per group.

Mixed Conifer-Frequent Fire Forest Standard

FW-MCD-S

01 Allow natural regeneration of disturbed areas unless the following circumstances exist: (1) endangered species habitat needs to be restored, (2) the time period of recovery is deemed excessive due to the large size of deforested area and/or lack or nearby seed sources, (3) there is concern for loss of site capacity from soils loss or extreme competition with early-seral species, or (4) the reforestation need resulted from regeneration harvest, and natural regeneration is not establishing within 5 years.

Mixed Conifer-Frequent Fire Forest Guidelines

FW-MCD-G

01 Vegetation treatments should reflect the characteristic structure stage proportions in order to provide continuous representation of old growth and all structure stages on the landscape.

02 Where Gambel oak or other native hardwoods exist, they should be retained and treatments should improve vigor and growth and provide for sustainable structure over time.

03 Surveys for reforestation needs should be completed within 1 year following a wildfire or other natural disturbance.

Ponderosa Pine Forest

The ponderosa pine forest ecological response unit generally occurs on loose, well-drained soils derived from igneous, metamorphic, and sedimentary parent material at elevation ranging from 6,000 to 10,000 feet. Ponderosa pine forest is typically bounded at the upper elevation by mixed conifer forest, and at the lower elevation by grasslands or piñon-juniper woodlands, although extensive intergrading of species may occur at ecotone boundaries along gradients of slope, elevation, aspect, and moisture. The dominant species in this system is ponderosa pine. Other trees, such as Gambel oak, Rocky Mountain Douglas-fir, twoneedle piñon pine and junipers may be present. There is typically a shrubby understory, such as currants/gooseberries, and buckbrush, mixed with a variety of grasses and forbs, such as Arizona fescue, mountain muhly, pine dropseed, blue grama, fleabanes, pussytoes, and others. This ecological response unit sometimes occurs as savannah with extensive grasslands interspersed between widely spaced clumps or individual trees. This system is adapted to drought during the growing season, and has evolved several mechanisms to tolerate frequent, low-intensity surface fires.

The Lincoln National Forest is made up of approximately 11.3 percent of ponderosa pine forest (123,156 acres), while the broader landscape contains approximately 1.8 percent. The Lincoln National Forest contains about 21 percent of the ponderosa pine forest in the broader landscape, and so makes a fairly substantial contribution to ecological sustainability.

Ponderosa Pine Forest Desired Conditions

FW-PPF-DC

Landscape Scale (1,000 to 10,000+ acres)

01 The ponderosa pine forest vegetation community is composed of trees from structural stages ranging from young to old. Forest appearance is variable but generally uneven-aged and open; occasional areas of even-aged structure are present. The forest arrangement is in individual trees, small clumps, and groups of trees interspersed within variably-sized openings of grass/forbs/shrubs vegetation associations similar to historical patterns. Size, shape, number of trees per group, and number of groups per area are variable across the landscape. Seral state proportions, per the Region 3 Seral State Proportions Supplement (2019d), are applied at the landscape scale, where low overall departure from reference proportions is a positive indicator of ecosystem condition. In the Gambel oak subtype, all sizes and ages of oak trees are present. Denser tree conditions exist in some locations, such as north-facing slopes and canyon bottoms.

02 Old growth occurs throughout the landscape, generally in small areas as individual old growth components, or as clumps of old growth. Old growth components include old trees, dead trees (snags), downed wood (coarse woody debris) and structural diversity. The location of old growth shifts on the landscape over time as a result of succession and disturbance (tree growth and mortality).

03 The ponderosa pine forest vegetation community is composed predominantly of vigorous trees, but declining trees are a component and provide for snags, top-killed, lightning- and fire-scarred trees, and coarse woody debris (greater than 3 inches diameter), all well-distributed throughout the landscape.

04 The composition, structure, and function of vegetation conditions are resilient to the frequency, extent and severity of disturbances and climate variability. The landscape is a functioning ecosystem that contains all its components, processes, and conditions that result from endemic levels of disturbances (insects, diseases, fire, and wind), including snags, downed logs, and old trees. Dwarf-mistletoe occurs in less than 15 percent of host trees in uneven-aged forest structures and less than 25 percent in even-aged forest structures. Grasses, forbs, shrubs, needle cast (fine fuels), and small trees maintain the natural fire regime. Organic ground cover and herbaceous vegetation provide protection of soil, moisture infiltration, and contribute to plant and animal diversity and to ecosystem function. The amount of shrub cover depends on the terrestrial ecological unit inventory or general ecosystem survey unit (USDA FS 1986b, 1989, 2006a). Overall plant composition is similar to site potential but can vary considerably at fine- and mid-scales owing to a diversity of seral conditions. Frequent, low-severity fires (fire regime I) are characteristic in this type. Natural and anthropogenic disturbances are sufficient to maintain desired overall tree density, structure, species composition, coarse woody debris, and nutrient cycling.

Mid-Scale (10 to 1,000 acres)

05 The ponderosa pine forest vegetation community is characterized by variation in the size and number of tree groups depending on elevation, soil type, aspect, and site productivity. The more biologically productive sites contain more trees per group and more groups per area, resulting in less space between groups. Openness typically ranges from 52 percent in more productive sites to 90 percent in less productive sites. In areas with high fine-scale aggregation of trees into groups, mid-scale openness ranges between 78 to 90 percent. Tree density within forested areas generally ranges from 22 to 89 square foot basal area per acre. Ground cover consists primarily of perennial grasses and forbs capable of carrying surface fire, with basal vegetation values ranging between about 5 and 20 percent depending on the terrestrial ecological unit inventory or general ecosystem survey unit (USDA FS 1986b, 1989, 2006a). The overall soil conditions meet a rating of "satisfactory" (USDA FS 2019e).

06 The mosaic of tree groups generally comprises an uneven-aged forest with all age classes present. Occasionally, patches of even-aged forest structure are present, based upon disturbance events and regeneration establishment. A small percentage of the landscape may be predisposed to larger even-aged patches, based on physical site conditions that favor mixed-severity and stand replacement fire and other disturbances. Disturbances sustain the overall age and structural distribution.

07 Ponderosa pine snags are typically equal to or greater than 18 inches diameter at breast height and average 1 to 2 snags per acre. In the Gambel oak subtype, large oak snags (greater than 10 inches diameter at breast height) are a well-distributed component. Downed logs (greater than 12 inches diameter at mid-point and more than 8 feet long) average 3 logs per acre. Coarse woody debris, including downed logs, ranges from 3 to 10 tons per acre.

08 Fires burn primarily on the forest floor and do not spread between tree groups as crown fire.

09 Where Northern Goshawk is known or suspected to occur, the ponderosa pine forest may have denser forest conditions in nesting areas (Reynolds et al. 1992). Forest conditions in goshawk post-fledging family areas are similar to general forest conditions except these forests contain 10 to 20 percent higher basal area in mid- to old-age tree groups than in goshawk foraging areas and the general forest. Goshawk nest areas have forest conditions that are multi-aged but are dominated by large trees with relatively denser canopies than other areas in the ponderosa pine type.

Fine-Scale (fewer than 10 acres)

10 Organic ground cover and herbaceous vegetation provide protection for soil and moisture infiltration, and contribute to plant diversity and ecosystem function. Trees typically occur in irregularly shaped groups and are variably-spaced with some tight clumps. Crowns of trees within the mid- to old-age groups are interlocking or nearly interlocking. Interspaces surrounding tree groups are variably-shaped and comprised of a grass/forb/shrub mix. Some natural openings contain individual trees. Trees within groups are of similar or variable ages and may contain species other than ponderosa pine. Size of tree groups typically is less than 1 acre, but averages 0.5 acres. Groups at the mid- to old-age stages consist of approximately 2 to 40 trees per group.

Ponderosa Pine Forest Guidelines

FW-PPF-G

01 Vegetation treatments should be designed such that structural stages and age classes are proportionally represented to assure continuous recruitment of old growth characteristics at the appropriate scale over time.

02 The largest and tallest snags (representative of the stand) and downed logs should not be removed along edges of openings and within groups and clumps of trees, to provide necessary habitat components and roost sites for wildlife species (including cavity-nesting birds, small mammals, and tree-dwelling bats).

Ponderosa Pine-Evergreen Oak Forest

Ponderosa pine-evergreen oak is a transition zone between the ponderosa pine and mixed conifer-frequent fire forests and the woodland ecological response units. This ecological type occurs at elevations ranging from 5,500 to 7,200 feet, on sites slightly cooler and moister than the Madrean piñon-oak ecological response unit and with a much greater plurality of ponderosa pine. This system is dominated by ponderosa pine and can be distinguished from the ponderosa pine forest ecological response unit by well-represented evergreen oaks (for example, Emory oak, Arizona white oak, silverleaf oak, and gray oak), alligator juniper, and piñon pine. Though not an indicator in the ponderosa pine life zone, border piñon, along with oneseed juniper can occur as a dominant or codominant component of the ponderosa pine-evergreen oak ecological response unit. In terms of disturbance, the ponderosa pine-evergreen oak averaged greater fire severity than the ponderosa pine forest, and greater patchiness with less horizontal uniformity and more even-aged conditions. Site potential, fire history, and the importance of perennial grasses versus shrubs in the understory vary on a gradient between two provisional subclasses. Understory shrubs include manzanita, Sonoran scrub oak, skunkbush sumac, and mountain mahogany.

Ponderosa pine-evergreen oak, with 8,661 acres, occupies less than 1 percent of the Lincoln National Forest and only 0.12 percent of the broader landscape. Ponderosa pine-evergreen oak on the Lincoln National Forest is 21 percent of the broader landscape. This ecological response unit occurs in only 3 of 6 local units: 4 acres in Rio Peñasco on the Sacramento Ranger District and the remainder in the Salt Basin (412 acres) and Upper Pecos (8,245 acres) local units on the Guadalupe Ranger District. On the Guadalupe district, the ecological response unit is limited to the steep canyons south of Queen Highway. While the ponderosa pine-evergreen oak type is a low percentage of both the Lincoln National Forest and the broader landscape, the Lincoln National Forest contains 21 percent of the ecological response unit in the broader landscape, and thus, has a role in maintaining the ecological integrity of the vegetation type.

Ponderosa Pine-Evergreen Oak Forest Desired Conditions

FW-PPE-DC

Landscape Scale (1,000 to 10,000+ acres)

01 The ponderosa pine-evergreen oak is composed of trees from structural stages ranging from young to old. Forest appearance is variable but generally uneven-aged and open at landscape scales (though can appear even-aged within tree groups); occasional larger areas of even-aged structure are present. The forest arrangement is in individual trees, small clumps and groups of trees interspersed within variably-sized openings of grass/forbs/shrub vegetation associations

similar to historical patterns. Shrubs occur in low densities which do not inhibit ponderosa pine regeneration. Size, shape, number of trees per group, and number of groups per area are variable across the landscape. All structural stages of oak are present, with old trees occurring as dominant individuals, and small groups occurring typically within openings. Denser overall tree conditions exist in some locations such as north-facing slopes and canyon bottoms. Seral state proportions are applied at the landscape scale, where low overall departure from reference proportions is a positive indicator of ecosystem condition.

02 Old growth occurs throughout the landscape, generally in small areas as individual old growth components, or as clumps of old growth. Old growth components include old trees, dead trees (snags), downed wood (coarse woody debris) and structural diversity. The location of old growth shifts on the landscape over time as a result of succession and disturbance (tree growth and mortality).

03 The ponderosa pine-evergreen oak perennial grasses subtype is composed predominantly of vigorous trees, but declining trees are a component and provide for snags, top-killed, lightning- and fire-scarred trees, and coarse woody debris (greater than 3 inches diameter), all well-distributed throughout the landscape.

04 The composition, structure, and function of vegetation conditions are resilient to the frequency, extent, and severity of disturbances, and climate variability. The landscape is a functioning ecosystem that contains all its components, processes, and conditions that result from natural disturbances (diseases, fire, insects, and wind), including old growth. Dwarf-mistletoe occurs in less than 15 percent of host trees in uneven-aged forest structures and less than 25 percent in even-aged forest structures. Grasses, forbs, shrubs, and needle cast (fine fuels), and small trees maintain the natural fire regime. Organic ground cover and herbaceous vegetation provide protection of soil, moisture infiltration, and contribute to plant and animal diversity and to ecosystem function. Shrubs average less than 30 percent cover. Overall plant composition is similar to site potential but can vary considerably at fine- and mid-scales owing to a diversity of seral conditions. Frequent, primarily low-severity fires (fire regimes I and III) are. Natural and anthropogenic disturbances are sufficient to maintain desired overall tree density, structure, species composition, coarse woody debris, and nutrient cycling.

Mid-Scale (10 to 1,000 acres)

05 The ponderosa pine-evergreen oak perennial grasses subtype is characterized by variation in the size and number of tree groups depending on elevation, soil type, aspect, and site productivity. The more biologically productive sites contain more trees per group and more groups per area. Openness typically ranges from 10 percent in more productive sites to 70 percent in the less productive sites. Tree density within forested areas generally ranges from 20 to 80 square foot basal area per acre.

06 The mosaic of tree groups generally comprises an uneven-aged forest with all age classes and structural stages present, though tree groups and patches may be relatively even-aged. Occasionally, patches of even-aged forest structure are present, based upon disturbance events and regeneration establishment. A small percentage of the landscape may be predisposed to larger even-aged patches, based on physical site conditions that favor mixed-severity and stand

replacement fire and other disturbances. The mix of natural disturbances sustains the overall age and structural distribution. Patch sizes range from less than 1 acre to 10s of acres.

07 Ponderosa pine snags are typically equal to or greater than 18 inches diameter at breast height and average 1 to 2 snags per acre. In the Gambel oak subtype, large oak snags (greater than 10 inches diameter at breast height) are a well-distributed component. Downed logs (greater than 12 inches diameter at mid-point and more than 8 feet long) average 3 logs per acre. Coarse woody debris, including downed logs, ranges from 3 to 10 tons per acre.

08 Ground cover consists of shrubs, perennial grasses, and forbs with basal vegetation values ranging between about 5 and 15 percent depending on the terrestrial ecological unit inventory or general ecosystem survey unit (USDA FS 1986b, 1989). The overall soil conditions meet a rating of "satisfactory" (USDA FS 2019e). Fires burn primarily on the forest floor and do not typically spread between tree groups as crown fire. Mixed-severity fires occur at less frequency and over smaller spatial extents than low-severity fires occur.

Fine-Scale (fewer than 10 acres)

09 Organic ground cover and herbaceous vegetation provide protection for soil and moisture infiltration, and contribute to plant diversity and ecosystem function. At the fine-scale, trees typically occur in small groups in which they are variably-spaced with some tight clumps. Crowns of trees within the mid- to old-age groups are interlocking or nearly interlocking. Interspaces between tree groups are variably-shaped and comprised of a grass/forb/shrub mix. Some natural openings contain individual trees, including large open-grown oaks. Trees within groups are of similar or variable ages and may contain species other than ponderosa pine. Size of tree groups typically is less than 1 acre. Groups at the mid-to old-age stages consist of approximately 2 to 40 trees.

Piñon-Juniper Evergreen Shrub Woodland

The piñon-juniper evergreen shrub ecological response unit is typically found on lower slopes in transition zones, often between interior chaparral and montane forests, and is most extensive in geographic areas dominated by mild climate gradients and bi-modal precipitation regimes. The piñon-juniper evergreen shrub ecological response unit is a broad grouping of different plant associations for descriptive purposes, with variable species composition. Historically, this ecological response unit had greater than 10 percent tree canopy cover in later successional stages, expressed by twoneedle piñon, single leaf piñon, Utah juniper, oneseed juniper, or alligator juniper. Piñon is occasionally absent, but one or more juniper species are always present. Oak trees (such as Arizona white oak, gray oak, and Emory oak) are subordinate, but have high constancy in mild climate zones between central Arizona and southwestern New Mexico. Trees occur as individuals or in smaller groups and range from young to old, but typically small stands or clumps are even-aged in structure as a consequence of mixed-severity fire (at least historically). The understory is dominated by low-to-moderate density shrubs, with herbaceous plants in the interspaces. Shrub species include species of manzanita, mountain mahogany, antelope bitterbrush, silktassles, Stansbury cliffrose, Sonoran scrub oak, and sumacs.

The Lincoln National Forest contains just under 5 percent piñon-juniper evergreen shrub (53,976 acres), compared to the broader landscape's 0.26 percent. However, this represents 63 percent of the piñon-juniper evergreen shrub in the broader landscape, so the Lincoln National Forest has a large contribution to the ecological sustainability of the piñon-juniper evergreen shrub ecological response unit.

Piñon-Juniper Evergreen Shrub Woodland Desired Conditions

FW-PJC-DC

Landscape Scale (1,000 to 10,000+ acres)

01 The composition, structure, and function of vegetation conditions are resilient to the frequency, extent and severity of disturbances (insects, diseases, and fire) and climate variability. Fires are typically mixed-severity with a moderate frequency (fire regime III). Some evergreen shrub types exhibit occasional high severity fires (fire regime IV). Seral state proportions are applied at the landscape scale where low overall departure from reference proportions is a positive indicator of ecosystem condition.

02 Old growth occurs throughout the landscape, generally in small areas as individual old growth components, or as clumps of old growth. Old growth components include old trees, dead trees (snags), downed wood (coarse woody debris) and structural diversity. The location of old growth shifts on the landscape over time as a result of succession and disturbance (tree growth and mortality). Overall plant composition is similar to site potential but can vary considerably at the fine- and mid-scales owing to a diversity of seral conditions.

Mid-Scale (10 to 1,000 acres)

03 Snags are scattered, with snags equal to or greater than 8 inches diameter at root collar averaging 5 snags per acre, while snags equal to or greater than 18 inches diameter at root collar average 1 snag per acre. Coarse woody debris increases with succession and averages 1 to 3 tons per acre.

04 The understory is dominated by low to moderate density shrubs depending on successional stage, overall averaging greater than 30 percent canopy cover. The shrub component consists of one or a mix of evergreen oak, manzanita, mountain mahogany, sumac and other shrub species, which are well-distributed. Native perennial grasses and annual and perennial forbs are present in the interspaces. Ground cover consists of shrubs, perennial grasses, and forbs with basal vegetation values ranging between about 5 and 15 percent depending on the terrestrial ecological unit inventory or general ecosystem survey unit (USDA FS 1986b, 1989, 2000a). The overall soil conditions meet a rating of "satisfactory" (USDA FS 2019e).

Fine-Scale (fewer than 10 acres)

05 Organic ground cover and herbaceous vegetation provide protection for soil and moisture infiltration and contribute to plant diversity and ecosystem function. Trees occur as individuals or in smaller groups ranging from young to old. Typically, groups are even-aged in structure with all ages represented across the landscape for an overall uneven-aged grouped appearance. The patch size of woodlands ranges from 1 to 10s of acres, and can include patches of even-aged woodland structure, based upon disturbance events and regeneration establishment.

Piñon-Juniper Woodland

The piñon-juniper woodland ecological response unit serves as a broad grouping of different plant associations for descriptive purposes. Trees may occur as individuals or in smaller groups and range from young to old, but more typically as large even-aged structured patches. The site is characteristically dominated by moderate to high density tree canopy, and understory herbaceous plants/shrubs are limited or scarce. It is mostly found on lower slopes of mountains and in upland rolling hills at approximately 4,500 to 7,500 feet in elevation.

Woodland development occurs in distinctive phases; ranging from open grass-forbs, to mid-aged open canopy to mature closed canopy woodland. Where fire is very infrequent, the fire regime is usually attributed to local edaphically-influenced fire affects such as rocky scarps, etc. On these sites, factors such as insects and diseases may be the only disturbance agents that affect woodland development. Tree and shrub species composition varies throughout the Southwest and common trees include twoneedle piñon, singleleaf piñon, Utah juniper, one-seed juniper, and alligator juniper. Typically, sparse native understory grasses are perennial species, such as several species of grama, common wolftail, and three-awns, while forbs consist of both annuals and perennials. Shrubs are characteristically sparse to moderately distributed. This type is typically found on sites with rocky soil characteristics.

The piñon-juniper woodland ecological response unit as mapped, makes up nearly 30 percent of the Lincoln National Forest at 319,105 acres, comprising just over 3 percent of the total broader landscape. Forest resource specialists estimate that the piñon-juniper woodland ecological response unit comprises a much smaller proportion of the Lincoln National Forest. On-the-ground evidence should be used to determine the appropriate ecological response unit and desired conditions that apply.

Piñon-Juniper Woodland Desired Conditions

FW-PJO-DC

Landscape Scale (1,000 to 10,000+ acres)

01 Piñon-juniper woodland (persistent) is characterized by even-aged patches of piñons and junipers that at the landscape level form multi-aged woodlands. The composition, structure, and function of vegetation conditions are resilient to the frequency, extent and severity of disturbances (insects, diseases, and fire), and climate variability. Insects and disease occur at endemic levels. Fire as a disturbance is less frequent and variable due to differences in ground cover, though some sites are capable of carrying surface fire. The fires that do occur are mixed to high severity (fire regimes III, IV, and V). Seral state proportions, per the Region 3 Seral State Proportions Supplement, are applied at the landscape scale, where low overall departure from reference proportions is a positive indicator of ecosystem condition.

02 Old growth includes old trees, dead trees (snags), downed wood (coarse woody debris) and structural diversity, and is often concentrated in mid- and fine-scale units as patches of old growth. The location of old growth shifts on the landscape over time as a result of succession and disturbance (tree growth and mortality). Very old trees (greater than 300 years old) are present, while snags and older trees with dead limbs and/or tops are scattered across the landscape. Snags equal to or greater than 8 inches diameter at root collar average 5 snags per acre, while snags equal to or greater than 18 inches diameter at root collar average 1 snag per acre. Coarse woody debris increases with succession and averages 2 to 5 tons per acre. Overall

plant composition is similar to site potential but can vary considerably at fine- and mid-scales owing to a diversity of seral conditions.

Mid-Scale (10 to 1,000 acres)

03 Tree density and canopy cover are high, shrubs are sparse to moderate, and herbaceous cover is low and discontinuous. The amount of shrub cover depends on the terrestrial ecological unit inventory or general ecosystem survey unit (USDA FS 1986b, 1989, 1993, 2000b, 2006a). Ground cover consists of shrubs, perennial grasses, and forbs with basal vegetation values ranging between about 5 and 15 percent depending on the terrestrial ecological unit inventory or general ecosystem survey unit. The overall soil conditions meet a rating of "satisfactory" (USDA FS 2019e). Trees occur in even-aged patches ranging from young to old, where patch size of these woodlands ranges from 10 to 100s of acres (Muldavin et al. 2003).

Piñon-Juniper Woodland Guidelines

FW-PJO-G

01 Large accumulations of green material (such as slash, wind-thrown trees) should be managed to reduce the risk of uncharacteristic bark beetle outbreaks.

02 Slash whether scattered or piled should be retained across the landscape for several years, rather than immediately being burned to provide microhabitat for wildlife habitat and regeneration of understory herbaceous vegetation. The number and distribution of retained slash piles should be balanced with potential threats from bark beetles and fire and fuels concerns.

03 Treatments in the piñon-juniper woodland vegetation community should avoid creating a sharp, well-defined edge between dense woodlands and recovered shrublands, to provide foraging habitat of at-risk species.

04 Treatments in the piñon-juniper woodland vegetation community should leave key habitat features (such as roosting trees, snags, partially dead or dying trees, large trees, or downed logs) and single or small groups of medium to large native trees that are widely spaced, with expanses of herbaceous vegetation and coarse woody debris, to provide for soil productivity, traditional uses (for example, piñon nut gathering), and wildlife needs (such as foraging habitat for at-risk species, migratory birds, and other piñon-juniper obligate species).

05 Favor retention of piñon over juniper during vegetation treatments.

Piñon-Juniper Grass and Juniper Grass Woodland

The piñon-juniper grass ecological response unit occurs in what were historically more open woodlands with grassy understories. The piñon-juniper grass type is typically found on sites with well-developed, loamy soil characteristics, including gentle upland and transitional valley locations where soil conditions favor grasses (or other grass-like plants) but can support at least some tree cover. Tree species include one seed juniper, Utah juniper, Rocky Mountain juniper, alligator juniper and two-needle piñon. Native understories were made up of perennial grasses, with both annual and perennial forbs, and shrubs that were absent or scattered. Historically, herbaceous understories of native grasses and forbs provided fine fuel sources for fire, aiding in the maintenance of an uneven-aged open canopy condition.

Juniper grass is typically on warmer and drier settings beyond the environmental limits of piñon pine, and just below, and often intergrading with, the piñon-juniper zone. However, juniper grass tends to be restricted to warmer and drier settings that limit piñon. This type is typically found on sites with well-developed, loamy soil characteristics, generally at the drier edge of the woodland climatic zone. Mollisol soils are common for this ecological response unit and support a dense herbaceous matrix of native grasses (mostly perennials) and forbs. Typical disturbances (fire, insects, and disease) are of low-severity and high frequency with a historical average fire return interval of 0 to 35 years from low to moderate severity fires. These disturbance patterns create and maintain the uneven-aged, open-canopy nature of this type. Typically, native understory grasses are perennial species, while forbs consist of both annuals and perennials. Shrubs are characteristically absent or scattered. Generally, these types are most extensive in geographic areas dominated by warm (summer) season or bi-modal precipitation regimes. Overall these sites are less productive for tree growth than the piñon-juniper woodland type.

The piñon-juniper grass ecological response unit makes up less than 2 percent of the broader landscape, but more than 15 percent of the Lincoln National Forest at 165,432 acres. It represents nearly 30 percent of piñon-juniper grass in the broader landscape. This ecological response unit occurs in all six local units. Thus, piñon-juniper grass is relatively common on the national forest, but is rare within the broader landscape, making the management of this ecological response unit important to ecological integrity and sustainability.

The juniper grass ecological response unit represents 8.5 percent of the broader landscape but less than 1 percent of the Lincoln National Forest. The Lincoln's 9,755 acres in juniper grass are only 0.35 percent of juniper grass in the broader landscape. The Lincoln National Forest has a relatively low contribution to ecological sustainability for this ecological response unit. Thus, while the structural state of the national forest is moderately departed at 64 percent, it has little effect on the broader landscape, which has low departure of 16 percent.

Piñon-Juniper Grass and Juniper Grass Woodland Desired Conditions

FW-JUG-DC

Landscape Scale (1,000 to 10,000+ acres)

01 Piñon-juniper grass and juniper grass are generally uneven-aged and open in appearance. They are dominated by one or more species of juniper and/or piñon pine and occur with a grass/forb dominated understory. At the landscape scale, the majority of piñon-juniper grass and juniper grass (more than 50 percent) is dominated by trees over 10 inches diameter at breast height. Trees up to 9.9 inches diameter at breast height occur as individuals or small groups scattered throughout the landscape, intermixed with the larger trees and occupy 12 to 30 percent of the landscape.

02 Old growth occurs throughout the landscape, generally in small areas as individual old growth components or as clumps of old growth. Old growth components include old trees, dead trees (snags), downed wood (coarse woody debris), and structural diversity. The location of old growth shifts on the landscape over time as a result of succession and disturbance (tree growth and mortality). Overall plant composition similarity to site potential (FSH 2090.11) averages greater than 66 percent, but can vary considerably at the fine- and mid-scales owing to a diversity of seral conditions.

03 In piñon-juniper grass and juniper grass, snags and older trees with dead limbs are scattered across the landscape. At the landscape scale, snags equal to or greater than 8 inches diameter at root collar average 5 snags per acre, while snags equal to or greater than 18 inches diameter at root collar average 1 snag per acre. Coarse woody debris increases with succession and averages 1 to 3 tons per acre.

04 The composition, structure, and function of vegetation conditions are resilient to the frequency, extent, and severity of disturbances (insects, diseases, and fire) and climate variability. Fires are typically frequent and low severity (fire regime I). Seral state proportions, per the Region 3 Seral State Proportions Supplement, are applied at the landscape scale where low overall departure from reference proportions is a positive indicator of ecosystem condition.

05 Ground cover consists primarily of perennial grasses and forbs capable of carrying surface fire and averages between 10 and 30 percent. Shrubs average less than 30 percent canopy cover.

06 Overall plant composition is similar to site potential but can vary considerably at the fine- and mid-scales owing to a diversity of seral conditions.

Mid-Scale (10 to 1,000 acres)

07 Seral state proportions are applied at the landscape scale, where low overall departure from reference proportions is a positive indicator of ecosystem condition.

08 Overall plant composition is similar to site potential but can vary considerably at the fine- and mid-scales owing to a diversity of seral conditions.

09 Scattered shrubs and a dense herbaceous understory including native grasses, forbs, and annuals are present to support frequent surface fires. Ground cover consists primarily of perennial grasses and forbs capable of carrying surface fire, with basal vegetation values averaging between about 10 and 30 percent depending on the terrestrial ecological unit inventory or general ecosystem survey unit (USDA FS 1986b, 1989, 2006a). Shrubs average less than 30 percent canopy cover. The overall soil conditions meet a rating of “satisfactory” (USDA FS 2019e).

Fine-Scale (fewer than 10 acres)

10 Piñon-juniper grass and juniper grass are generally uneven-aged and open in appearance. Organic ground cover and herbaceous vegetation provide protection for soil and moisture infiltration, and contribute to plant diversity and ecosystem function. Trees occur as individuals, but occasionally in smaller groups, and range from young to old. Patch sizes of woodlands range from individual trees and clumps that are less than one-tenth acre to tree groups of approximately one acre (Muldavin et al. 2003).

Piñon-Juniper Grass and Juniper Grass Woodland Guideline

FW-JUG-G

01 Project planning should favor retention of piñon over juniper during vegetation treatments.

Gambel Oak Shrubland

Gambel oak shrubland is dominated by long-lived Gambel oak clones that form largely mono-typic overstories. It occurs between 6,500 to 9,500 feet on all aspects, and at higher elevations occurs more predominantly on southern exposures. Gambel oak occurs as the dominant species ranging from dense thickets to clumps associated with other shrub species such as serviceberry or sagebrush. Older, more developed Gambel oak can have a well-developed understory comprised of snowberry, elk sedge, letterman's needlegrass, *Poa ampla*, yarrow, lupine, and goldenrod. Depending on site potential, ponderosa pine, juniper, and piñon can encroach older plant communities. The primary disturbance mechanism is mixed-severity to stand replacement fire resulting in top-kill and rare mortality. Gambel oak responds to fire with vigorous sprouting from the root crown. Larger forms may survive low-intensity surface fire.

A first look at much of the Lincoln National Forest's landscape, particularly in burned areas on the Smokey Bear and Sacramento districts, would lead one to think there is a great deal of the Gambel oak shrubland ecological response unit on the Lincoln National Forest, but much of that is really a persistent shrub phase of the mixed conifer-frequent fire or ponderosa pine forest ecological response units. The Gambel oak shrubland ecological response unit makes up 0.33 percent of the Lincoln National Forest, occurring in only two local units. The Gambel oak shrubland ecological response unit occurring on the Lincoln National Forest makes up 0.067 percent of the broader landscape, but is 16 percent of all that occurs in the broader landscape, so the Lincoln has a small role in the sustainability of the ecological response unit.

Gambel Oak Shrubland Desired Conditions

FW-GAMB-DC

01 The system is dominated by native tall shrubs and hardwood trees. Some areas contain many trees with relatively large hollow boles or limbs. Coniferous trees are widely scattered and are frequently mature or old. Young Gambel oak thickets and sometimes other species comprise a patchy shrub layer.

02 Ground cover is mostly comprised of oak litter, with grasses and forbs present.

03 Low-intensity fire occurs regularly in intervals of less than 25 years.

04 Old stands contain habitat for birds and arboreal nesting or roosting mammals. A variety of oak growth forms, sizes, and densities that benefit wildlife species can be found across the landscape.

Mountain Mahogany Mixed Shrubland

The mountain mahogany mixed shrubland ecological response unit occurs in the foothills, canyon slopes, and lower slopes of the Rocky Mountains and on outcrops and canyon slopes in the western Great Plains. It ranges from southern New Mexico extending north into Colorado. These shrublands are often associated with exposed sites, rocky substrates, dry conditions, and recurrent historical fire that limited tree growth. Scattered trees or inclusions of grassland patches or steppe may be present, but the vegetation is typically dominated by a variety of shrubs, including mountain mahogany and skunkbush sumac. Historically, this ecological response unit had less than 30 percent tree canopy cover.

The mountain mahogany mixed shrubland ecological response unit makes up only 0.52 percent of the broader landscape, but 5 percent of the Lincoln National Forest (52,528 acres). Mountain mahogany mixed shrubland on the Lincoln National Forest contains 30 percent of the ecological response unit occurring in the broader landscape, and thus contributes substantially to the ecological sustainability to the ecological response unit. This ecological response unit is found at the mid-elevations of the western scarp of the Sacramento Mountains on the Sacramento Ranger District and around the base of the Guadalupe Mountains on the Guadalupe Ranger District.

Mountain Mahogany Mixed Shrubland Desired Conditions

FW-MMS-DC

Landscape Scale (1,000 to 10,000+ acres)

01 The mountain mahogany mixed shrubland vegetation community is a mosaic of structural and seral states ranging from young trees through old and is composed of multiple species.

02 Tree cover is less than 10 percent, except in dissimilar inclusions driven by local topography, microclimate and soil properties.

03 Stand replacement fire (fire regime groups II and IV) is characteristic of this vegetation type.

Mid-Scale (10 to 1,000 acres)

04 Shrub cover is greater than 10 percent and may exceed 30 percent in late-seral states depending on disturbance history, elevation, aspect, topography, and soil properties. Shrub basal area values typically range from between 5 to 15 percent or more.

Chihuahuan Desert Scrub Shrubland

The Chihuahuan desert scrub ecological response unit ranges from the edges of basin floors, up alluvial fan piedmonts to foothills of desert, mountains, and mesas. The major dominant is creosote bush, often mixed with tarbush. Other sites may be dominated by whitethorn acacia, viscid acacia, Rio Grande saddlebush, and ocotillo. Sub-shrubs are also abundant and often codominants. These include lechugiulla, cactus apple, Wright's beebrush, and mariola. Other typical sub-shrub associates are broom snakeweed, pricklyleaf dogweed, plumed crinklemat, and mat rockspirea. Herbaceous cover can by sparse or grassy with fluffgrass, and bush muhly key indicators. Black grama, tobosagrass, and burrograss may also occur.

There are 19,256 acres (less than 2 percent) of Chihuahuan desert scrub on the Lincoln National Forest, while that ecological response unit makes up 19 percent of the broader landscape. This ecological response unit is found at the lower elevations of the western scarp of the Sacramento Mountains on the Sacramento Ranger District and around the base of the Guadalupe Mountains on the Guadalupe Ranger District.

Chihuahuan Desert Scrub Shrubland Desired Conditions

FW-CDS-DC

Mid-Scale (10 to 1,000 acres)

01 Average ground cover of bare soil is 60 percent and average ground cover of plant basal area (where plant comes out of the ground) is 5 percent.

02 Coarse woody debris varies by seral stage, ranging from 0.03 tons per acre for early-seral stages and 1.1 tons per acre for mid- and late-seral stages.

03 The Chihuahuan desert scrub vegetation type is characterized by fire regime group III, with an average fire-return interval of 200-plus years from mixed-severity fire. The sparse nature of this vegetation type indicates that fires likely would have been limited in size to small areas of continuous fuels.

All Grasslands

Montane Subalpine Grassland

Also referred to as montane grasslands, this system occurs at elevations ranging from 8,000 to 10,900 feet. Size of montane subalpine grasslands range from small park-like openings to extensive landscapes covering several thousand acres. This ecological response unit contains a mix of dominant and co-dominant species in both dry and moister environments and often harbors several plant associations with varying prominent grasses and herbaceous species. Such dominant species may include Parry's oatgrass, Arizona fescue, Thurber's fescue, pine dropseed, nonnative bluegrasses, mountain muhly, various sedges, shooting star, fowl mannagrass, Sierra rush, Rocky Mountain iris, Parry's bellflower, California false hellebore, and species of bulrush. Historically, the montane subalpine grassland ecological response unit had less than 10 percent tree canopy cover and less than 10 percent shrub cover. However, tree encroachment may occur along the periphery of the grasslands, trees may include Engelmann and blue spruce, Rocky Mountain Douglas-fir, white and subalpine fir, ponderosa, and limber pine, depending on elevation and adjacent forest ecological response units. Some shrubs may also be present.

The Lincoln National Forest contains 11,230 acres of the montane subalpine grassland ecological response unit, for 1 percent of the forest, while it makes up just 0.12 percent of the broader landscape. This means the Lincoln National Forest has a higher relative proportion of this ecological response unit than the broader landscape. Lincoln National Forest contains 27 percent of the montane subalpine grassland in the broader landscape; thus, the Lincoln has a substantial role in the ecological sustainability of this ecological response unit.

Semi-Desert Grassland

The semi-desert grassland ecological response unit occurs at elevations ranging from 3,000 to 4,500 feet. These grasslands are bounded by Sonoran or Chihuahuan desert at the lowest elevations and woodlands or chaparral at the higher elevations. Species composition and dominance varies across the broad range of soils and topography that occur within the two states. Dominant grassland associations/types are black grama grassland, blue grama grassland, curly mesquite grassland, tobosagrass grassland, big sacaton grassland, mixed native perennial grassland, and nonnative perennial grassland. Shrubs, catclaw acacia, and catclaw mimosa also occupy these grasslands and their abundance and species composition also varies. As described, this ecological response unit may have had over 10 percent shrub cover historically, but had less than 10 percent tree cover.

The Lincoln contains about 65,888 acres of semi-desert grasslands, comprising 6 percent of the national forest mostly around the edges, while semi-desert grasslands makes up 45 percent of the broader landscape. Thus, the Lincoln National Forest has a relatively smaller proportion of semi-desert grasslands and a relatively smaller role in the ecological sustainability of the ecological response unit.

All Grasslands Desired Conditions

FW-MSG-DC and FW-SDG-DC

Landscape Scale (1,000 to 10,000+ acres)

01 Vegetation is dominated by native herbaceous plants. Tree and shrub cover are each less than 10 percent except in the Colorado Plateau-Great Basin grassland and semi-desert grassland where shrub cover, but not tree cover, may occasionally exceed 10 percent. There are inclusions of tree and/or shrub cover and variability within the landscape as well as ecotones on the fringes.

02 Old growth components may exist but are limited to some savanna settings with sparse tree cover, where there are scattered large trees and occasional snags. The location of these components shifts over time as a result of natural growth/mortality, drought, and fire.

03 Fire plays its natural role on the landscape. Vegetation height and density carry frequent low-severity fire, thereby limiting conifer encroachment.

04 There is regeneration, seed head production, and balance of native perennial grasses and forb species, including warm and cool season species in most years, reflecting the capability of soils, weather patterns, and the range of natural variability.

Mid-Scale (10 to 1,000 acres)

05 The composition, structure, and distribution of native vegetation reflect a mix of early, middle, and late-seral states. Early seral states will typically contain more forbs, with older states being dominated by native perennial grasses and fewer forbs. Native plant species are present in all age classes and are healthy, vigorous, and reproducing.

06 Biological diversity is high. In mid-to-late seral states, species composition is similar to site potential.

07 Vegetation conditions provide hiding, nesting, and thermal cover in contiguous blocks for wildlife, including small mammals and songbird nesting.

Fine-Scale (fewer than 10 acres)

08 Biological diversity is high, consisting predominantly of native vegetation. Within site capability, a mosaic of vegetation density exists across the landscape, ranging from densely vegetated areas to small bare areas that result from natural processes such as freeze-thaw action or burrowing by small mammals.

Montane Subalpine Grassland Guideline

FW-MSG-G

01 Woody plant encroachment should be reduced on the margins of grasslands.

Riparian Areas

Riparian areas are where ecosystems develop from the influence of water, along streams, lakes, springs, and other waterbodies. Riparian ecosystems are transitional between aquatic and adjacent upland ecosystems. These riparian ecosystems also vary depending on the geology, soils, vegetation, topography, climate and weather patterns, and level of disturbance. Riparian areas include soils and plant communities contiguous to and affected by surface and subsurface hydrologic features of perennial or intermittent lotic and lentic waterbodies. Riparian areas have distinctively different vegetation species than upland areas. Where indicator plants may not be present, riparian areas are identified by signs of fluvial processes and/or fluvial features created under the current flow and climatic regimes. Riparian ecosystems can have a large influence overall ecosystem sustainability in spite of their small size relative to the more broadly distributed upland ecosystems. On the Lincoln National Forest, riparian areas are generally very small with little transition to upland ecosystems. The Lincoln contains 15 riparian ecological response units in five groups that make up approximately 0.3 percent of the national forest. Much of the riparian vegetation within the Lincoln National Forest boundary is in headwater systems and many of the main watercourses are on private land. Human habitation, roads, and use are often centered around or along riparian areas. Reactions of riparian areas to disturbance, such as flooding, fire, or human use may be different than how these events affect adjacent upland areas. When riparian areas are functioning properly, desired conditions are being met and the riparian ecosystem characteristics are being sustained.

Achieving the riparian desired conditions described below includes restoring proper hydrologic function to stream channels and adjacent riparian areas. This maintains and enhances water quality and capacity leading to increased base flow in the streams, soil water quantity available for vegetation, and water available for downstream use. Proper functioning stream channels also mitigate flood events by dissipating waters' energy. Proper functioning riparian areas have the vegetation to support wildlife habitat, livestock use, and provide for many human uses.

Riparian areas offer their own ecosystem services (supporting, regulating, provisioning, and cultural) distinct from the adjacent upland ecosystems. Riparian areas provide for overall water quality including groundwater storage and filtration for private and municipal water sources, and surface water for wildlife, livestock, and human use. Riparian areas provide habitat for aquatic and terrestrial wildlife, cover and forage for livestock, as well as providing for cultural, recreational, aesthetic, and spiritual values of humans.

The standards and guidelines below are not directed toward any specific ecosystem service, but to ensure that the forest is moving toward meeting the desired conditions and functioning properly in the riparian areas. Implementation of standards and guidelines protects and moves riparian areas towards desired conditions. Meeting desired conditions imply that ecosystem services continue to be provided.

Riparian Area Desired Conditions Watershed Scale

FW-RIPAR-DC-WS

Watershed and Subwatershed Scale

01 Riparian and aquatic ecosystems support the distribution, diversity, and complexity of watershed and watershed-scale features that in turn support species, populations, and communities. The system's ability to support unique physical and biological attributes and the diversity of associated riparian species is sustained by necessary soil, hydrologic regime, vegetation, and water characteristics.

02 Riparian areas provide for multiple uses (grazing, recreation, timber, wildlife, etc.) while maintaining their proper functioning condition and contributing to healthy watersheds.

a. Riparian areas provide sufficient water quality, water quantity, and high-quality forage for domestic and wild ungulate grazing without compromising the integrity of the riparian areas.

03 Riparian ecosystems are intact and properly functioning. Within their type and capability, riparian ecosystems have adequate vegetation, landform, coarse woody debris, litter, and root masses to filter and capture sediment, filter contaminants, and dissipate stream energy from stream flows and from overland flow from uplands, to protect and enrich soils, stabilize banks and shorelines, maintain channel characteristics, and improve water quality. The associated water table supports riparian vegetation.

a. Water table elevations are maintained at levels that sustain native riparian and aquatic vegetation, high productivity, and soil moisture characteristics.

b. Erosion and deposition are within the historical range of variation.

c. Riparian soil condition and erosion hazard ratings are not departed from or above threshold/potential as provided in terrestrial ecological unit inventory or other soil reference.

d. Stream channel morphology and streambank stability are in proper functioning condition.

e. The soil infiltration rating averages satisfactory (USDA FS 2020).

f. Gullies and headcuts are rare or absent in perennial and intermittent stream channels. High water flows easily access the adjacent floodplain. Ephemeral stream channels are not down cut beyond the natural range of variation.

04 Riparian areas are resilient to a variety of disturbances including fire, flooding, and animal and human use. Compared to surrounding uplands, riparian corridors may have reduced fire frequency and severity (fire regime V (III); Dwire et al. 2016, Everett et al. 2003, Skinner 2003) owing to characteristics such as surface water and saturated soils (Crane 1989, Pavek 1993, Tesky 1992, Uchytal 1989) and high vegetative moisture content.

a. Fire is infrequent and patchy, and riparian corridors are resilient and able to recover following fire where hydrologic processes have not been compromised. Regeneration, growth, and persistence of obligate vegetation is ensured by natural variation in depth to groundwater, volume of surface water, and timing and the magnitude of their fluctuations (Auchincloss et al. 2013, Horton et al. 2001, Smith et al. 2018, Stromberg et al. 1997).

b. Compared to surrounding uplands, riparian corridors have conditions (moist soils and surface water) that reduce the frequency and severity of fire. Infrequent fires of high severity and occasionally mixed severity are characteristic of this ecosystem.

c. Desired condition is low departure from historical fire regime (such as 0 to 33 percent similarity to reference condition, fire regime V (III); LANDFIRE departure formula).

d. Flooding is assessed at the watershed scale and occurs at a frequency and magnitude characteristic of the watershed. Reference conditions for a given watershed can be determined using equations from table 2 in U.S. Geological Survey Scientific Investigations Report 2008-5119 (Waltemeyer 2008). The natural disturbance regime of a riparian ecosystem promotes a diverse plant structure consisting of herbaceous, shrub and tree species of all ages and size classes necessary for the recruitment of riparian-dependent species.

e. Flooding and scour occur at a frequency and magnitude that at least supports the regeneration of riparian dependent vegetation that is common to each ecological response unit (Glenn et al. 2017).

05 Wetland and riparian areas consist of a diversity of riparian plant communities and native species consistent with site potential relative to wetland and riparian ecological response units.

a. Riparian vegetation consists of native and subordinate nonnative species that support a wide range of vertebrate and invertebrate animals and are free of invasive exotic or state defined noxious weeds.

b. Overall plant composition similarity to site potential (FSH 2090.11) is greater than 66 percent at the watershed scale, with the calculation for similarity based on the Region 3 Rangeland Analysis and Management Training Guide (USDA FS 1997) and an area weighted summary for ecological units within an analysis area.

c. Shrub cover is variable and depends on site potential for given terrestrial ecological unit inventory units or as determined through field reconnaissance of reference sites (USDA FS 1986b).

d. In aquatic and riparian systems that evolved with wood near the streams, woody species are present and thriving in multiple age classes. Large woody material is present and continues to be recruited into the system at near natural rates.

e. Riparian woody regeneration is sustainable, approximating reference conditions according to the overall percentage of early-mid seral states (low departure). Less than 1 percent total canopy cover is in exotic woody vegetation (Muldavin et al. 2011).

f. There is a diversity of seral conditions with low departure from desired conditions, with all seral states considered collectively (see Region 3 Seral State Proportions Supplement) using LANDFIRE departure formula (Barrett et al. 2010).

06 Riparian ecosystems exhibit connectivity between and within aquatic, riparian, and upland components that reflect their natural linkages and range of variability. Stream courses and links between riparian and upland components provide habitat and movement that maintain and disperse populations of riparian-dependent species (beaver and other wildlife).

a. Spatial connectivity is provided within or between watersheds and, where appropriate, riparian ecosystems provide connectivity important for dispersal, access to new habitats, perpetuation of genetic diversity as well as nesting and foraging for special status species. Within riparian ecosystems connectivity is exhibited between and within aquatic, riparian, and upland components that reflect their natural linkages and range of variability within jurisdictions of this plan. Less than 15 percent of riparian corridors are fragmented by roads or other human disturbances (Muldavin et al. 2011) at the watershed scale, with exceptions for fish barriers and water rights diversions. Cooperation from adjacent landowners is sought to reduce fragmentation and increase functionality at the watershed scale.

Riparian Area Desired Conditions Fine Scale

FW-RIPAR-DC-FS

Fine Scale-Groundwater Dependent Ecosystems and Wetlands

01 Groundwater dependent ecosystems are in satisfactory condition and provide benefits to dependent species. These systems are recognized and supported by ensuring surface water and groundwater interactions are considered in management decisions.

02 Natural processes of groundwater recharge and discharge support the long-term sustainability of aquifers through climatic variations.

03 Lentic riparian areas (such as herbaceous wetlands, wet meadows, and fens) have vegetation and landform present to dissipate wind action, wave action, and overland flow from uplands.

04 Wetlands, seeps, springs, wet meadows, and associated riparian systems develop and support stable herbaceous and woody vegetation communities with root masses that stabilize streambanks, stream channels, floodplains, and soil surfaces.

05 Overall wetland condition reflects excellent or good condition for native vegetation community, degree of disturbance and consistency with historical size or an equivalent rating for proper functioning condition (USDI BLM 2015, Faber-Langendoen et al. 2012, Muldavin et al. 2017, Prichard et al. 2003). Obligate species within wet meadows, around springs and seeps, along stream banks, and active floodplains provide sufficient vegetative ground cover (herbaceous vegetation, litter, and woody riparian species) to protect and enrich soils, trap sediment, mitigate flood energy, stabilize stream banks, and provide for wildlife and plant needs.

a. Native riparian vegetation dominates areas adjacent to seeps, springs, perennial streams and wetlands with less than 1 percent total canopy cover of exotic woody vegetation (Muldavin et al. 2011).

b. Ground cover comprising shrubs, perennial grasses, and forbs with basal vegetation values ranging between about 5 to 30 percent at the subwatershed scale, depending on site potential for a given terrestrial ecological unit inventory unit or as determined through field reconnaissance of reference sites (USDA FS 1986b), while the amount of bare ground likewise reflects site potential (low departure).

c. Riparian vegetation density and structure provides site-appropriate shade to regulate water temperature in streams and maintain soil moisture in the riparian zone.

d. In aquatic and riparian systems that evolved with wood near the streams, woody species are present and thriving in multiple age classes. Large woody material is present and continues to be recruited into the system at near natural rates.

e. The amount of coarse woody debris (large woody debris) is similar to the reference condition of the given ecological response unit (low departure) and is adequately recruited to sustain replacement (applies only to cottonwood, montane conifer-willow, and walnut-evergreen tree vegetation types). In lieu of more precise information, the desired condition for coarse woody debris over 12 inches in diameter and 35 feet in length is 30 or more pieces per mile; and the desired condition for coarse woody debris over 6 inches in diameter and 3 feet in length is 48 or more pieces per mile for proper functioning condition (Stacey et al. 2006, USDA FS 2003).

Riparian Area Objectives

FW-RIPAR-O

01 Maintain and enhance existing riparian areas exhibiting properly functioning condition within the next 10 years.

02 Restore to properly functioning condition a minimum of 25 percent of stream reaches considered to be functioning at-risk over a 10-year period.

03 Restore or enhance to a functioning at-risk or properly functioning condition a minimum of 25 percent of non-functioning stream reaches over the next 10 years.

Riparian Area Standards

FW-RIPAR-S

01 Riparian management zones will be determined on a project-by-project basis. The exact width of the riparian management zones may vary, but the following should be considered in developing the appropriate riparian management zone:

a. Ecological or geomorphic factors or water body type, but includes those areas which provide riparian and aquatic ecosystem functions and connectivity.

b. Width and slope of the riparian zone, soil type, or hydrologic soil group.

c. Presence of free and unbounded water.

02 To protect water quality and aquatic species, refueling, maintaining equipment, and on-site storage of fuels or other toxins must not occur in riparian management zones.

Riparian Area Guidelines

FW-RIPAR-G

01 Riparian areas should be managed to promote a diverse native plant structure consisting of emergent herbaceous, shrub, and tree species representative of the site potential and natural range of variation.

02 For all management activities, applicable best management practices should be identified and planned for site-specific conditions at the project level.

03 Management activities, permitted uses, and structural developments should occur at levels or scales that allow moving towards desired conditions for water quality, soils, and vegetation as a whole.

04 The use of motorized vehicles should be limited to designated routes in riparian areas, except when there is an established stream crossing or when short-term uses are required to improve resource conditions or maintain infrastructure. Short-term uses for riparian management shall be defined at the project level.

05 Firewood cutting or wood removal within riparian management zones should be managed to improve habitat for understory species, tree density, tree growth, and to promote channel stability.

06 Vegetation and fuels projects in riparian management zones should re-establish riparian vegetation species and habitat.

07 Forested riparian ecological response units, should be managed to retain large diameter trees and snags near stream channels and riparian areas, in a quantity that provide for recruitment of large woody material to stream channels.

08 Riparian areas should be managed to reduce gullies and headcuts, reconnecting riparian functions to the adjacent floodplain.

09 Riparian habitats should be managed to be relatively free from alterations and promote connectivity for species movement, re-connect fragmented populations and support genetic exchange.

10 Riparian habitat alterations, such as water gaps or road crossings, should not exclude riparian species from their historical habitat or restrict seasonal and opportunistic movements.

11 Modifications, mitigations, or other measures should be incorporated to reduce negative impacts to riparian habitats to help provide for riparian obligate species needs.

12 Project activities and special uses should be designed and implemented to maintain riparian refugia and critical life cycle needs of riparian obligate species, particularly for at-risk species.

13 Modifications, mitigations, or other measures should be incorporated to reduce negative impacts to riparian habitats to help provide for species needs. Project activities and special uses must be designed and implemented to maintain riparian refugia and critical life cycle needs of species, particularly for at-risk species.

Riparian Area Management Approaches

Consider the following:

01 Consider underlying causes for degradation at the watershed scale when planning or implementing restoration activities.

02 Follow regional strategies using collaboration and partnerships to develop forest and riparian restoration activities that provide for increased water quality and capacity and related resource resiliency.

Soil Resources

Soil is a critical watershed and ecosystem component, as well as being a complex and dynamic ecosystem in and of itself. It consists of a mineral component, organic matter, air, water, and living soil organisms. It is formed over time by interactions between climate, parent material, topography, and organisms, both above and below ground. It provides air, water, nutrients, and physical support to plants, and is where many plant seeds accumulate and are stored until conditions are right for their germination and establishment. The topsoil layer is of crucial importance as this is where the majority of plant and animal organic matter accumulate, decompose, and eventually become soil nutrients. It is the zone of maximum biological activity and nutrient release and is largely responsible for long-term site productivity (USDA FS 2020a).

Soil provides multiple ecosystem services on which plants and animals, including humans, depend. Ecosystem services are supplied to the extent that desired conditions are met. Supporting ecosystem services include physical, hydrologic, and biochemical support to plants and provide diverse habitats for invertebrates, fungi, and microorganisms. Satisfactory soil condition ratings indicate that water can infiltrate the soil and mitigate large overland flows or floods downstream, as well as recharge groundwater. Provisioning ecosystem services include wildlife habitat (burrows, dens), plant-growth media (nurseries), and fill (construction). The protection of soils in satisfactory conditions and improvement of soils in unsatisfactory conditions will positively impact the ecosystems within the Lincoln National Forest, and will ensure that ecosystem services continue to be provided into the future.

Soil standards and guidelines are needed to ensure that soils are moving towards a desired condition. Soils that are impaired or unsatisfactory become further departed from desired condition. Best management practices will be followed to limit soil loss and compaction. In order to decrease short- and long-term impacts, soil guidelines are established to guide activities impacting vegetative canopy cover, groundcover, and soil stability.

Within the 14 upland and 15 riparian ecological response units present on the Lincoln National Forest, five of the 12 soil orders are represented: Alfisols, Aridisols, Entisols, Inceptisols, and Mollisols.

Alfisols are inherently fertile with soil horizon development and are normally formed under forested vegetation. These soils form in a wide range of parent materials and occur under a large range of environmental conditions. In general, Alfisols are productive soils high in native fertility. They occur in ecological response units of mixed conifer with aspen, mixed conifer with frequent fire, ponderosa pine forest, ponderosa pine-evergreen oak, semi-desert grassland, and mountain mahogany mixed. Alfisols account for 12 percent of the Lincoln National Forest.

Aridisols are characterized by an ochric epipedon that is generally light in color and low in organic matter. Water deficiency is a major limiting characteristic of these soils. The soil moisture level is sufficiently high enough to support plant growth for no longer than 90 consecutive days. These soils mainly consist of scattered desert shrubs and short bunchgrasses. They occur in ecological response units of piñon-juniper grass and semi-desert grassland areas. Aridisols account for 6 percent of the Lincoln National Forest.

Entisols are very young soils with little to no subsurface soil development. These soils formed in landscape positions where the soil material has not been in place long enough for soil-forming processes to create distinctive soil horizons; areas with recent deposition such as floodplains, alluvial fans, or stream terraces are examples. In general, these soils exist in settings where erosion or deposition is happening at rates faster than those needed for soil formation. Soil productivity ranges from very high for certain Entisols formed in recent alluvium (where topography is nearly level, close proximity to water, and periodic nutrient replenishment occurs from floodwater sediments) to very low for those forming in shifting sand or on steep rocky slopes. Entisols on the Lincoln National Forest mostly occur on active steep scarp, mountain, and hill slopes although some of these soils occur on flat valley plains formed in alluvium. They occur in ecological response units of mixed conifer-frequent fire, semi-desert grassland, and Chihuahuan desert scrub. Entisols account for 2 percent of the Lincoln National Forest.

Inceptisols have moderate degrees of soil weathering and soil horizon development, but typically lack significant clay accumulation in the subsoil. These soils generally occur on relatively young geomorphic surfaces (landforms) that are stable enough to allow some profile development. The natural productivity of Inceptisols varies widely and is dependent upon clay and organic matter content, and other plant-related factors. They occur in ecological response units of juniper grass, piñon-juniper woodland, piñon-juniper grass, semi-desert grassland, and Chihuahuan desert scrub. Inceptisols account for 2 percent of the Lincoln National Forest.

Mollisols have a dark-colored surface horizon, are relatively high in organic matter, and are highly fertile. These soils formed as a result of deep inputs of organic matter and nutrients from decaying roots and litter. Microbes, earthworms, ants, and other organisms contributed to the inputs and nutrient cycling of these soils. Mollisols are among the world's most productive soils because of high native fertility. This soil order is probably the most economically important soil order because of its high use in agriculture. Mollisols are the dominate soils found on the Lincoln National Forest, accounting for approximately 78 percent. These soils are distributed widely, mostly occurring on relatively flat to moderately sloping landform and can be found in all 14 ecological response units on the Lincoln.

Soils on the Lincoln National Forest have predominantly dry moisture regimes and mild temperature regimes at the lower elevations and humid to sub-humid moisture regimes and cold temperature regimes at the higher elevations. Soils range from fine (greater than 35 percent clay) to loamy, and skeletal (greater than 35 percent rock fragments) to non-skeletal in nature. They occur on slopes ranging from 0 to 80 percent, with flat and vertical rock outcrops present in some areas. Soil texture and mineralogy varies with parent material.

Soil Resources Desired Conditions

FW-SOIL-DC

01 The ability of the soil to perform essential functions, sustain biological productivity and overall ecosystem and watershed health, and contribute to resilience. The ability of the soil to sustain ecosystem services (such as water purification, soil formation, and nutrient cycling) within its natural capability is high.

02 Soil functions are broadly resilient to the impacts of human activities and natural disturbances, including long-term climatic variability and extreme weather events. Naturally unstable and other high-risk soils are influenced primarily by natural processes.

03 Overstory and understory plant species composition support soil functions and are similar to site potential, but can vary considerably at fine- and mid-scales owing to a diversity of seral conditions.

04 Organic ground cover (leaf litter, needle cast, coarse woody debris, nonvascular plants and biological crusts, and basal area) and vegetative canopy cover contribute to soil functions and maintain soil loss rates at near natural rates, thereby contributing to high water quality, watershed, and ecosystem function.

05 No new gullies or headcuts are forming and existing ones are stabilizing or have stabilized.

06 Soil organic carbon represents reference conditions for a given ecological response unit, but are transitory and adaptive with site potential, characteristic disturbances, and long-term trends in climate.

07 Soil productivity is not inhibited by nonnative invasive plant species.

08 Regulating ecosystem services provided by healthy soils include water capture and release, flood mitigation and maintenance of water quality, and carbon sequestration.

Soil Resources Objectives

FW-SOIL-O

01 Improve impaired and unsatisfactory soil condition scores in the Watershed Condition Framework in priority watersheds over 5-year periods.

Soil Resources Guidelines

FW-SOIL-G

01 Projects and activities should incorporate the applicable management capabilities, limitations, and/or relevant interpretations for each terrestrial ecological unit inventory into design and implementation.

02 Best management practices should be identified and planned for to limit soil loss and compaction (National Core Technical Guide for Best Management Practices, FS-990A; FSH 2509.22 – Soil and Water Conservation Practices Handbook).

03 New activities that encourage concentrated use (for example, recreation sites, landings, construction, stock tanks, mineral supplements, and corrals) on soils that are poorly drained or saturated, or in impaired, or unsatisfactory soil condition, should be avoided or mitigated.

04 Activities impacting groundcover and soil stability should be avoided or mitigated on soils with impaired or unsatisfactory soil condition as determined by terrestrial ecological unit inventories or similar methods at the project level.

05 Ground-disturbing management activities should be designed to minimize short- and long-term impacts (for example, soil compaction and soil loss). Where disturbance cannot be avoided, project-specific soil and water conservation practices should be developed. Short-term and long-term impacts should be defined at the project level.

Soil Resources Management Approach

Consider the following:

01 Work collaboratively with other agencies and groups that facilitate soil conservation, watershed improvement, and research projects.

Water Resources

Water resources of the Lincoln National Forest include waterbodies, stream ecosystems, and groundwater dependent ecosystems. Waterbodies serves as a catchall term for lentic systems, which are non-flowing water features. Non-flowing waterbodies are also quite limited in scale, including

few lakes or ponds. Groundwater and groundwater dependent ecosystems include springs, seeps, wetlands, fens, riparian areas, groundwater-fed streams and lakes, and aquifers. These are present throughout the national forest and vary in size and timing of flow and connections to surface waters. Stream ecosystems have flowing water and include streambeds, streambanks, associated riparian vegetation zones, and floodplains. Stream types differ in the timing and duration of surface flow and corresponding vegetation. Ephemeral streams flow for short duration in response to storm events or snowmelt. Intermittent streams flow seasonally, usually in response to snowmelt or summer monsoonal rains, and may contain perennially wet areas. The Lincoln National Forest has 174 miles of perennial streams, a lesser number of intermittent streams, and hundreds of miles of ephemeral stream channels.

Past management activities and resource use caused degradation of water resources in many parts of the national forest. Demand for the waters of the Lincoln National Forest will continue to increase in the coming decades, challenging forest managers to protect existing high-quality water resources and restore degraded areas. Metrics of impairment used to evaluate current condition and trends of water resources vary, but in general, the Forest Service assesses impacts to water resources in three categories: water quality, water yield, and watershed condition.

Water Quality: Surface water quality reflects the surrounding natural physical, biological, and chemical variables, such as elements present in soils and rock substrates, and concentrations of biological and chemical contaminants that originate either from a single point source such as a discharge pipe or from nonpoint sources such as stormwater runoff that carries contaminants that accumulate over a landscape. The State of New Mexico, through the New Mexico Environment Department, designates uses for waterbodies and establishes quantifiable standards to ensure that water quality supports these established uses (categories include supporting aquatic life, municipal use, recreation, etc.). Approximately 61 percent of the Lincoln National Forest’s streams are listed as impaired by the New Mexico Environment Department. Common sources of water quality impairment are high water temperature as a result of lack of shading or reduced stream flows from drought or water diversion. High turbidity and sedimentation are also common sources of water quality impairment on the national forest. New Mexico provided additional water quality protection to some waters on the Lincoln National Forest by applying the Outstanding National Resource Waters designation; this designation includes all named waters in wilderness areas. Outstanding National Resource Waters receive the highest level of protection under the New Mexico's water quality standards.

Water Yield: Natural and human disturbances have altered and will continue to alter the quantity and timing for the streamflow on the Lincoln National Forest. General trends for the region show an increase of drought and drier winters coupled with a trend toward warmer winter temperatures. The earlier runoff season combined with drought means less water will be available during the late summer and fall. Decreased stream flow will have cascading impacts for both the natural systems and humans that rely on water from the national forest. Functioning watersheds show increased resilience to drought and changing precipitation regimes and may replenish streamflow.

Watershed Condition: As watersheds integrate all ecosystem components, assessing watershed condition requires evaluating a suite of metrics. The Lincoln National Forest follows the U.S. Forest Service’s Watershed Condition Framework to assess watershed condition and identify priority watersheds. The Watershed Condition Framework classifies watersheds using a comprehensive set of twelve watershed condition indicators chosen to represent ecological, hydrological, and geomorphic

functions and processes affecting watershed condition. These features help identify priority watersheds based on (1) broad scale restoration strategies; (2) the importance of water and watersheds; (3) the urgency and ability of management action to address threats; (4) alignment with other objectives and priorities of the Forest Service and other agencies and organizations; (5) ecological values; and (6) impaired ecosystems including those where improvement or restoration are necessary to meet regulatory requirements. Condition assessments include three categories: Properly functioning, functioning at risk, and impaired. Projects within priority watersheds are designed, implemented, and monitored for restoration and maintenance of watershed conditions. Every 5 years, a reevaluation will take place in order to be consistent with the land management plan objectives and the current watershed conditions. Current watersheds and conditions are described in the Forest Plan Assessment Report, Lincoln National Forest, Volume I: Ecological Resources (2019a).

Water from the Lincoln National Forest supports many uses and provides ecosystem services to the people and animals that inhabit and use these lands. Areas with water are centers of high biological diversity in arid landscapes, and their ecological health is important for forest ecosystem sustainability. Collectively, surface waters contribute to connectivity for fish and wildlife across the landscape, local and urban potable water supplies, agricultural uses such as livestock watering and irrigation, and recreation-providing support services, provisions, and cultural benefits. Water in arid New Mexico has important traditional cultural significance which will only become more vital in the future with additional pressures from predicted climate change and continually increasing demands from growing urban populations. Plan and management direction for water resources is integrated throughout many of the different resource areas.

The plan components described below contribute to ecosystem services provided by water resources. As the Lincoln National Forest works towards moving water resources towards desired conditions, all four categories of ecosystem services (supporting, regulating, provisioning, and cultural) will more fully be realized. Achieving water resources desired conditions includes having properly functioning watersheds in both riparian and upland areas. This ultimately contributes to proper hydrologic function in the watersheds' streams, riparian areas, springs, seeps, and underlying aquifers. Some of these upland components include obtaining conditions that are resilient to wildfire and climatic fluctuations and that provide for multiple uses, such as timber, recreation, and grazing. Other desired conditions are similar to the riparian area desired conditions, with ecosystem services being provided similar to those in the riparian area desired conditions. Floodplain connectivity, flow regime, stream channel morphology, and aquatic habitats all provide the same ecosystem services that are described in the "Riparian Area" section. These plan components result in more efficient nutrient cycling and soil stabilization, increased water filtration and higher water quality, increased forage for livestock and wild ungulates, healthier forest stand structure, greater timber production, and a wildfire regime that approaches desired conditions. Aesthetic and recreation opportunities are also enhanced.

Water resources objectives include improving watershed scores per the Watershed Condition Framework and restoring or enhancing wetlands. Improving watershed scores improves the entire landscape to proper functioning condition, which in turn increases the ecosystem services which may include provisional ecosystem services such as timber for wood products, forage for grazing, and water for domestic and municipal uses. Restoring wetlands provides habitat for wildlife, increased water for recreational, domestic, and industrial uses, increased herbaceous forage for livestock, and greater opportunities for aesthetics and recreation.

Implementation of standards and guidelines mandate best management practices be adhered to during project implementation. Emphasis is placed on all water resources including groundwater, stream channels, impacts of invasive species in riparian areas and wetlands, and all other water resources. Erosion control measures are incorporated into project planning. All these activities provide for increased ecosystem services that benefit wildlife, domestic livestock, and humans. In one way or another, all four components of ecosystem services are improved by implementing these standards and guidelines and have been described above as well as in the riparian vegetation section.

Water Resources Desired Conditions

FW-WATER-DC

01 Watersheds are functioning properly and:

a. Provide for high biotic integrity (habitats that support adaptive plant and animal communities);

b. Are resilient to natural and human-caused disturbances such as wildfire and climate fluctuations;

c. Exhibits connectivity;

d. Maintain long-term soil productivity; and

e. Provide a wide range of sustainable ecosystem (for example, provisioning service such as clean water and cultural services like recreation).

02 Most watersheds support multiple uses (such as timber, recreation, grazing) with no long-term decline in ecological conditions, although some watersheds are set aside to preserve ecological function and may support more limited uses (for example, municipal watersheds).

03 Water quality across the Lincoln National Forest meets or exceeds State of New Mexico water quality standards.

04 There is continuous exchange of water between the stream channel, the adjacent riparian management zone, and the underlying groundwater. Through these processes, sediment and organic debris is efficiently filtered, transported, and stored. Additionally, floodplains are developed and maintained to withstand high-flow events, improve floodwater retention, and provide efficient water holding capacity for stream base flow and groundwater recharge.

05 The flow regime (magnitude, timing, duration, frequency, and rate of change) of streams is sustained at levels that maintain or enhance essential ecological functions including channel and floodplain morphology, groundwater recharge, water quality, nutrient cycling, and stream temperature regulation.

06 Channel type (width/depth ratio, sinuosity, gradient, etc.) is appropriate for the landscape setting (landform, geology, bioclimatic region, etc.). Stream channels are vertically and laterally stable and resist headcutting and gullying.

07 Aquatic habitats are connected and free from alterations (such as temperature regime changes, lack of adequate streamflow, or barriers to aquatic organism passage) to allow for species migration, connectivity of fragmented populations, and genetic exchange. Barriers to movement are located where necessary to protect native fish from nonnative species. Stream

alterations (such as culverts and water crossings) do not exclude aquatic species from their historical habitat or restrict seasonal and opportunistic movements. Barriers to movement may exist to protect native aquatic species from nonnative aquatic species.

Water Resources Objectives

FW-WATER-O

01 Improve the Watershed Condition Framework score for two watersheds over the life of the plan.

02 Restore or enhance 20 acres of wetlands over 10 years.

Water Resources Standards

FW-WATER-S

01 Project planning documents must include best management practices to minimize management impacts to maintain water quality or prevent degradation of water resources (for example, National Core Technical Guide for Best Management Practices, FS-990A; FSH 2509.22 – Soil and Water Conservation Practices Handbook; Best Management Practices for Water Quality Management on National Forest System Lands; Volume 1: National Core BMP Technical Guide; USDA Forest Service, April 2012; or other best management practices guidance).

Water Resources Guidelines

FW-WATER-G

01 New and reauthorized (permits, environmental analyses including Section 18 reviews, etc.) management activities should not cause departure from desired conditions.

02 To encourage natural channel morphology on perennial and intermittent streams, new or redesigned stream crossings (such as bridges and culverts) should be wide enough to successfully pass water, sediment, wood, and aquatic organisms.

03 Measures should be taken to eliminate the risk of introducing new or spreading existing invasive species and pathogens to streams, riparian areas, or wetland ecosystem.

04 Where known, groundwater recharge areas should be protected or restored to maintain water quality and quantity (discharge).

Water Resources Management Approaches

Consider the following:

01 Work with local, state, and tribal governments, nongovernmental organizations, and other stakeholders to identify improvement projects and priorities for protection and management of watersheds especially in priority watersheds (Watershed Condition Class Framework).

02 Consider developing watershed-specific plans that prioritize specific roads for decommissioning or maintenance to result in improved water quality and a smaller road system (administrative or public).

Wildlife, Fish, and Plants

Plant and animal species are highly dependent on the function of ecosystems with specific conditions, which create areas favorable for particular species. Important drivers of biodiversity loss and ecosystem service changes are habitat change, long-term trends in climate, invasive species, overexploitation, and pollution. This plan addresses species viability and persistence by providing guidance to maintain and/or enhance habitat elements that are important for species found on the Lincoln National Forest, in addition to addressing threats specific to habitat and providing guidance for species-specific threats.

This will be done by adopting a complementary ecosystem and species- specific approach to maintaining species diversity, also known as coarse-filter/fine-filter. The premise behind this approach is that native species evolved and adapted within limits established by natural landforms, vegetation, and disturbance patterns prior to human alterations. Therefore, maintaining or restoring ecological conditions and functions similar to those under which native species evolved (that is, coarse filter approach), offers the best assurance against losses of biological diversity and maintains habitats for the majority of species in an area. However, for some species, the coarse-filter approach may not be adequate, and a fine-filter approach may be necessary.

The fine-filter approach recognizes that for some species, ecological condition or additional specific habitat features (key ecosystem characteristics) may be required, the reference condition is not achievable, or there are non-habitat risks to species viability, and these factors may not be addressed by the coarse-filter approach. Species of conservation concern are species native to, and known to occur in, the plan area; and for which there is substantial concern about the species ability to persist in the plan area. The Lincoln National Forest has identified federally listed threatened, endangered, proposed, and candidate species and developed a list of potential species of conservation concern may need the fine-filter approach (see volume 2 of the draft environmental impact statement, Appendix A: Documentation of the Analyses of At-Risk Species). Maintaining species that are vulnerable will preserve diversity on the Lincoln National Forest and thus comply with the National Forest Management Act diversity requirement.

The Forest Service has the ultimate responsibility for managing habitat within National Forest System lands, but the New Mexico Department of Game and Fish and the U.S. Fish and Wildlife Service are the lead agencies responsible for managing wildlife populations in New Mexico. The U.S. Fish and Wildlife Service is responsible for managing federally endangered and threatened species, as well as migratory birds, while the New Mexico Department of Game and Fish is responsible for managing game species, furbearers, some migratory birds and raptors, reptiles, amphibians, and species listed as threatened or endangered under the New Mexico Wildlife Conservation Act. Species and habitats are managed in conjunction with other resources according to the Multiple-Use Sustained-Yield Act of 1960 (Public Law 86-517). For federally endangered and threatened species on the Lincoln National Forest, habitat management and compatible multiple uses are determined in accordance with Section 7 of the Endangered Species Act as amended (Public Law 93-205). For species of conservation concern, habitat management and compatible multiple uses will be accomplished in such a way that ensures those species' persistence on the Lincoln, per the 2012 Planning Rule.

Wildlife, fish, and plants on the Lincoln National Forest contribute to social wellbeing and quality of life by promoting recreational and educational opportunities. The opportunity to hunt, fish, or just commune with nature is an important tradition for families and communities living around the national forest. Many families have been here for generations and these activities have become part of the social fabric upon which family and community relationships are built. Local tribes also rely on resources within the plan area for cultural and traditional uses such as gathering medicinal plants or piñon nuts for consumption.

The plant and animal species found in the Lincoln National Forest provide ecosystem services that in turn benefit society. These include ecosystem supporting services such as nutrient cycling (by plants, animals, and invertebrates), soil formation and manipulation (by burrowing insects and mammals), primary production (plants), and seed dispersal (by animals). By maintaining a diversity of habitat components, including biotic and abiotic features, this will provide opportunity for breeding, feeding, nesting, and other critical life history needs of species, which in turn contribute to supporting services.

Ecosystem services for wildlife, fish, and plants also include regulating services such as carbon sequestration (plants), pollination (both forest plants and adjacent croplands by vertebrates and invertebrates), and erosion control and water storage (plants). Meeting desired conditions provides or restores diverse habitats across the planning area, which in turn maintain and promote interspecific relationships at all trophic levels (producer-consumer and predator-prey relationships), and further contributes to these ecosystem services.

Diverse animal species—including bats, bees, flies, moths, beetles, birds, and butterflies—provide free pollination services. Pollinators are responsible for pollination of about 30 percent of the world's food production. Plant community composition, structure, and patterns across the Lincoln National Forest, as described in the desired condition for vegetation, would promote foraging habitat for native pollinator species.

Some animal and plant species form the basis of cultural ecosystem services including recreation (hunting, fishing, birdwatching, etc.) and provisioning ecosystem services such as food (forage, game, and wild foods), fiber, medicine, and forest products. Local tribes make use of the cultural ecosystem services present on the Lincoln National Forest in their use of native plants and animals. Desired conditions aimed at maintaining species and their habitat will support opportunities for hunting, plant gathering, and other species-based recreation and traditional use.

Aesthetic beauty is another example of an ecosystem service provided on the Lincoln National Forest. The forest provides aesthetic beauty in many forms including wildlife viewing of a diversity of species such as hawks, squirrels, mule deer, elk, and desert bighorn sheep. The forest contains hundreds of species of wildflowers and wildlife that provide viewing enjoyment of our public; opportunities for scientific discovery and education; and cultural, intellectual, or spiritual inspiration.

This section is grouped into four main categories: Terrestrial Species and Habitats, Aquatic Species and Habitats, At-Risk Species, and Nonnative Invasive Species. The first three groupings (terrestrial, aquatic, and at-risk) are managed for the species persistence on the Lincoln National Forest, while the last grouping (nonnative invasive) is managed for the species eradication or control since they are not native flora and fauna of the forest.

Terrestrial Species and Habitats

Terrestrial plant and animal species include commonly found species that spend all or the majority of their time on dry land and are usually represented by mammals (deer, rabbits, etc.), birds (eagles, jays, etc.), reptiles (lizards, snakes, etc.), land-based plants (grasses, trees, etc.), and macro-invertebrates (beetles, snails, etc.). These animals and plants are native to the Lincoln National Forest and are not considered invasive, nor is there concern regarding their persistence on the national forest.

Terrestrial Species and Habitats Desired Conditions

FW-TERSPH-DC

01 Terrestrial ecosystems are composed of assemblages of sustainable populations of plant and animal species that are supported by healthy ecosystems.

02 A diversity of habitat components, including biotic and abiotic features, are available at the spatial, temporal, compositional, and structural levels to provide opportunity for breeding, feeding, nesting, and other critical life history needs of wildlife.

03 Undesired nonnative and invasive terrestrial species as well as introduced pathogens are rare or absent.

04 Terrestrial habitats allow for the maintenance and promotion of interspecific relationships at all trophic levels (producer-consumer and predator-prey relationships) across multiple scales, consistent with existing landforms and topography.

05 Habitat configuration, connectivity, and availability allow wildlife and plant populations to adjust their movements in response to major disturbances (climate change and uncharacteristic wildfire) and promote genetic flow between populations.

06 Wildlife populations are free from harassment and human disturbance at a scale that impacts vital functions (breeding, feeding, and rearing young) and that affects persistence of the species.

07 Plant populations are maintained within their natural or historical range of variation.

08 Sparsely-vegetated habitat features (such as cliffs, caves, and cavities) required for some species exhibit limited disturbance. Vegetative habitat features (such as snags, large down woody material, herbaceous cover, and shrubs) provide forage, cover, fawning, and nesting sites for species with these requirements.

09 Foraging habitat for native pollinator species is provided by plant community composition, structure and pattern across the forest as described in the desired conditions of each ecological response unit.

10 Plant communities across the forest are a mix of native grass, wildflowers, forb, shrub, and tree species, with a diverse structure (including snags and large down woody material), and diverse communities of multiple seral stages and patterns as described in vegetation and watershed desired conditions.

11 Hunting and plant gathering and other species-based recreation and traditional use opportunities exist, while maintaining species, populations, and habitat.

12 Risk of disease transmission from permitted domestic sheep or goats to bighorn sheep is not present.

13 Habitat configuration, connectivity, and availability allow wildlife populations to adjust their movements and allow plant populations to adjust and spread in response to major disturbances (climate change or uncharacteristic fire) and promote genetic flow.

14 Research authorized on the Lincoln National Forest results in improved understanding of the science of natural and social resources and uses without negatively impacting long-term ecological conditions.

Terrestrial Species and Habitats Objectives

FW-TERSPH-O

01 Restore or enhance 50,000 acres of terrestrial wildlife habitat during each 10-year period following plan approval.

02 Reconstruct or maintain 20 existing water developments for wildlife during each 10-year period following plan approval.

03 Restore or improve 50,000 acres of pollinator habitat during each 10-year period following plan approval.

04 Establish or maintain five pollinator gardens during each 10-year period following plan approval.

05 Improve wildlife connectivity by removing unneeded structures (fences, roads, cattleguards, water improvements, spring developments, etc.) or completing improvement projects (such as removing barriers and connecting fragmented habitat) in 10 locations during each 10-year period following plan approval.

06 Complete five projects to improve habitat connectivity for riparian species (remove barriers, relocate and decommission roads, restore dewatered stream segments, connect fragmented habitat, construct wildlife passage friendly fences, etc.) during a 10-year period.

Terrestrial Species and Habitats Standards

FW-TERSPH-S

01 On the western escarpment, where bighorn sheep and their habitat occur, special use permits pertaining to domestic sheep and goats must not be issued, and management of vegetation with the use of domestic sheep and goats must not be authorized to prevent transfer of disease to bighorn sheep.

Terrestrial Species and Habitats Guidelines

FW-TERSPH-G

01 Constructed features (water tanks, cattle guards, fences) should provide safe access and escape for wildlife, such as ramps or other climbing features.

02 Human-made structures (fences, steel posts, and vent pipes) should be constructed and maintained to prevent wildlife mortality (for example, capped fence posts) and removed when no longer needed.

03 Infrastructure (fences and roads) should be designed, modified, or removed to prevent impacts on wildlife movement and improve habitat connectivity.

04 When found, new populations of at-risk as well as rare and endemic species should be documented and factored into project design.

05 Species habitat should be considered at the project level to identify these habitat needs are being met to retain species persistence in the planning area.

06 Management activities that inhibit the reproduction of an individual raptor pair (disturbing same nest site) should be avoided in successive years (for example, timing restrictions during breeding season). Known active raptor nests, including those on cliff faces, should be protected from management activities and disturbance during the nesting season to maintain the persistence of or contribute to the recovery of at-risk species. Project design features can include timing restrictions, adaptive percent utilizations, distance buffers, or other means of avoiding disturbance based on best available information and site-specific factors, such as topography, available habitat, and location.

07 Modifications, mitigations, or other measures should be incorporated into project design to reduce negative impacts to plants, animals, and their habitats and to help provide for species needs. Project activities and special use authorizations should be designed and implemented to maintain refugia and critical life cycle needs of species, particularly for at-risk species.

08 Management activities should avoid disturbance to desert bighorn sheep during birthing season and on winter range during the winter period, to maintain the persistence of desert bighorn sheep. Timing restrictions, adaptive percent utilizations, distance buffers, or other means of avoiding disturbance should be based on the best available information, as well as site-specific factors (available habitat, topography, etc.).

09 Natural ecosystems should be conserved to sustain a diversity of pollinators. Where practicable, seed mixes and reclamation projects should include native forbs and wildflowers that benefit pollinator species.

10 Authorization of permits for botanical plant species or plant parts collection should consider whether: 1) available information indicates that it will not be detrimental to species persistence, 2) it is necessary for species conservation, 3) important for tribal collection, or is a research request that will aid in the management of that species.

11 Management activities that have the potential to impact microclimates in caves should not be authorized. Caves are important nurseries or hibernacula for sensitive bat species, including known bat day and night roosts. All caves should be protected as potential habitat and their microclimates must be maintained during management activities (such as timber harvest, prescribed fire activities, road construction, or recreation uses).

12 Where known bat uses and concentrations of bats occur (maternity colonies, hibernacula, or seasonal roosts), measures to maintain habitat and reduce disturbance by human activities through use of seasonal or permanent access restrictions should be used.

13 Project planning should include design features to protect endemic and habitat-specific ecological conditions and habitat needed by groups of plants or animals, especially for those that require cliff, talus slopes, cave, gypsum outcrops, springs, and for those species that only occur under specific habitat requirements. Examples of these include gypsophiles, species with an affinity to specific geographic areas, and montane subalpine grasslands should be protected and managed for the species.

Terrestrial Species and Habitats Management Approaches

Consider the following:

01 During project planning, consider mitigations to wildlife and plant habitat resulting from the effects of long-term and short-term climate fluctuations (drought, El Niño Southern Oscillation, global climate change, etc.), and subsequent effects of management activities.

02 Work with the New Mexico Department of Game and Fish and other partners to develop projects that improve terrestrial habitat conditions and enhance hunting and wildlife viewing opportunities.

03 Work collaboratively with the New Mexico Department of Game and Fish and other organizations, individuals, and groups to plan and implement projects for the management and research of terrestrial wildlife and plant species and their habitats.

04 Prioritize restoration projects based on factors such as watershed conditions, at-risk species, and restoration after disturbances (fire, flood, etc.), partner interest, and other immediate needs.

05 Prioritize mapping of rare and endemic species and habitats and work on maintaining or restoring intact, functioning habitat sufficient for species persistence.

06 Prioritize restoration projects based on factors such as watershed conditions, at-risk species, and restoration after disturbances (fire, flood, etc.), partner interest, and other immediate needs.

Aquatic Species and Habitats

Aquatic plant and animal species include commonly found species that spend all or the majority of their lives in water features in the forest (streams, springs, and pools) and are usually represented by fish (trout, chubs, etc.), amphibians (frogs, salamanders, etc.), and water dependent plants (cattails, lily-pads, etc.) and macro-invertebrates (aquatic insects, clams, etc.). These animals and plants are native to the Lincoln National Forest and are not considered invasive, nor is there concern regarding their persistence on the national forest.

Aquatic Species and Habitats Desired Conditions Watershed Scale

FW-AQSPH-DC-WS

Watershed and Subwatershed Scales

01 Aquatic habitats provide for the distribution of conditions (such as bank stability, substrate size, pool depths and frequencies, channel morphology, large woody debris size, and frequency) similar to reference condition watersheds or to other ecologically relevant benchmarks.

a. Riparian-aquatic systems have a rating of proper functioning condition (USDI BLM 2015; Prichard et al. 1998, 2003) but can vary at the fine scale. There are no state-listed impaired or threatened waterbodies (EPA 1996).

b. Microtopographic complexity within streams represents the potential of the watershed to support habitat function. Diversity in physical features (such as backwater channels, depositional surfaces, pool-riffle complexes, and additional features outside the main channel) foster biological diversity characteristic of a properly functioning riparian system (New Mexico Rapid Assessment Method rating 4; Muldavin et al. 2011).

02 Aquatic ecosystems are functioning with all their components, processes, and conditions that result from endemic levels of disturbances (fluvial, fire, and herbivory) to support the distribution, diversity, and complexity of watershed features that in turn support species, populations, and communities.

a. Fluvial processes provide for structural complexity of aquatic habitats involving the main channel, side channels, floodplain scour pools, and other floodplain features (Muldavin et al. 2011). Perennial and intermittent streams are in equilibrium, with stretches of fast-moving and relatively shallow water (riffles) alternating with deeper and slower moving (pools) sections (Stacey et al. 2006).

b. Aquatic and riparian habitats are hydrologically functioning and have sufficient emergent vegetation as described in riparian area (including watersheds) and water resources desired conditions or otherwise described site potential, as well as macroinvertebrate populations to support resident and migratory species.

c. There are no state-listed impaired or threatened waterbodies (EPA 1996)

d. Instream cover habitat made up of trees and shrubs provide shade and overhanging structure. The desired amount of stream cover may be inferred by reference conditions for mid- and late-seral states for a given riparian ecological response unit. Boulders, cobbles, fallen trees and logs, and exposed roots also offer instream cover, with the type and amounts of cover varying by ecological response unit.

e. Overall deposition and erosion of sediment is in balance (as determined by assessment of the same stream types over time using repeat monitoring).

f. Aquatic habitats are distributed across the forest in sufficient quantity (redundancy and size) and with appropriate habitat components to support self-sustaining populations of native fish and other aquatic species.

g. Aquatic habitats (springs, streams, and wetlands,) support a complete assemblage of historically present native aquatic species and are resilient to natural and human disturbances, including projected warmer and drier climatic conditions.

h. Undesired and invasive aquatic species as well as introduced pathogens are rare or absent.

i. Aquatic habitats are connected and free from alterations (barriers to aquatic organism passage, lack of adequate streamflow, and temperature regime changes) to allow for species migration, connectivity of fragmented populations and genetic exchange. Stream alterations (such as culverts and water crossings) do not exclude aquatic species from their historical habitat or restrict seasonal and opportunistic movements.

j. Riparian areas are connected vertically and laterally with surface and subsurface flows as reflected in an average entrenchment ratio of more than 2:2 in montane systems, while trends in incision average stable-recovering or no incision evident (Muldavin et al. 2011, Prichard et al. 1998, Schumm et al. 1984) at the subwatershed scale.

k. Road networks pose a limited risk to riparian and aquatic resources, with less than 10 percent of watersheds having more than 0.25 road-stream intersections per square mile (Cederholm and Scarlett 1982, Rieman et al. 1997, Smith and Friggens 2017). Riparian corridors are longitudinally connected with less than 15 percent disruption (Muldavin et al. 2011) with exceptions for fish barriers and water rights diversions.

l. Barriers to movement may exist to protect native species and prevent movement of nonnative species (for example, fish barrier structures to protect Rio Grande cutthroat trout populations from nonnative fish).

03 Fishing and other aquatic species-based recreation and traditional use opportunities exist, while maintaining species, populations, and habitat.

Aquatic Species and Habitats Desired Conditions Fine Scale

FW-AQSPH-DC-FS

Fine-Scale—Cold, Upper Elevation Ecological Response Units

01 Stream banks are vegetated or stabilized by natural materials such as rock or woody debris, ensuring their integrity and stability for the protection and function of associated aquatic and riparian habitats (Muldavin et al. 2011). At least 80 percent of the stream bank surfaces are vegetated or stabilized by natural materials. A characteristic abundance and diversity of vegetation is present to provide bank stability and reduce erosion, particularly during high flows when vegetation offers a roughness function (Geyer et al. 2000, Hickin 1984). Woody vegetation, at amounts reflecting low departure from site potential (USDA FS 1986b), is present to absorb energy from moving water to reduce erosion. Within a given reach, all characteristic instream mesohabitat types are present.

Aquatic Species and Habitats Objectives

FW-AQSPH-O

01 Restore or protect 5 miles of aquatic habitat over a 10-year period.

02 Implement a project to establish a Rio Grande cutthroat trout reintroduction and management zone into the upper reaches of the Rio Bonito Watershed to assist in management and recovery of the species within 10 years of plan approval.

03 Reduce nonnative fish within native fish populations in four stream reaches during each 10-year period following plan approval.

04 Complete five projects to improve habitat connectivity for aquatic and riparian species (remove barriers, road relocation and decommissions, restore dewatered stream segments, connect fragmented habitat, wildlife passage friendly fences, etc.) during the 10 years following plan approval.

Aquatic Species and Habitats Standards

FW-AQSPH-S

01 Equipment must not be refueled (including hydraulic fluid and oil) within the riparian management zone as defined in project planning document.

02 Preparation of pesticides (mixing and refilling) must not occur within the riparian management zone as defined in project planning document.

Aquatic Species and Habitats Guidelines

FW-AQSPH-G

01 Fragmentation of aquatic habitats and isolation of aquatic species should be avoided and passage for aquatic organisms should be maintained, except where barriers are beneficial and necessary to achieve conservation goals for aquatic species or are legally required diversions.

02 Human-made structures (such as instream structures and fencing) should be maintained to support the purposes for which they were built or removed when no longer needed.

03 Projects and management activities within aquatic and riparian systems should be designed or managed to maintain high-quality aquatic habitats.

04 Management of streams should include adequate vegetation cover and width-to-depth ratio to move toward New Mexico standards for stream water temperatures for the appropriate designation.

05 Management activities negatively impacting vital functions of native aquatic species (including reproduction and migration) should be avoided except when short-term impacts are required to improve resource conditions and maintain infrastructure.

06 Project design features should be incorporated at a fine scale detail to maintain habitat for endemic species.

07 Habitat should be suitable to native species re-introduction and management.

08 In the forested riparian ecological response units, large diameter trees and snags near stream channels and riparian areas should exist in a quantity that provide for recruitment of large woody material to stream channels.

09 Seep and spring function should be restored as the opportunity arises.

Aquatic Species and Habitat Management Approaches

Consider the following:

01 Work collaboratively with the New Mexico Department of Game and Fish and other organizations, individuals, and groups to plan and implement projects for the management and research of fish and other aquatic species and their habitats.

02 Work with partners to develop and implement conservation strategies beneficial to aquatic habitats (such as the Rio Grande Cutthroat Conservation Strategy).

03 During project planning, consider management actions to mitigate the effects of long-term and short-term climate fluctuations on aquatic species (climate change, drought, El Niño Southern Oscillation, etc.).

04 Prioritize restoration projects based on factors such as watershed conditions, at-risk species, and restoration after disturbances (such as fire and flood), partner interest, and other immediate needs.

At-Risk Species

The Lincoln National Forest provides for ecological conditions necessary to maintain the persistence or contribute to the recovery of native species within the plan area, including at-risk species. Ecological conditions consist of 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.

At-risk species consist of federally recognized threatened, endangered, proposed, and candidate species, as well as species of conservation concern. Federal listing under the Endangered Species Act of 1973 falls under the purview of the U.S. Fish and Wildlife Service. Section 7 of the Act requires federal agencies to use their authorities to carry out programs for the conservation of endangered and threatened species and to ensure that any action authorized, funded, or carried out by them is not likely to jeopardize the continued existence of listed species or modify their critical habitat. Species of conservation concern are species native to, and known to occur in, the plan area and for which there is substantial concern about the species' ability to persist in the plan area (see volume 2 of the draft environmental impact statement, Appendix A: Documentation of the Analyses of At-Risk Species).

At present, a total of 79 at-risk species have been identified, 20 federally recognized and 59 species of conservation concern; however, if any employee receives new scientific information that indicates a species should be added to or removed from the list of species of conservation concern, the information should be sent to the forest supervisor to be evaluated and documented, and any subsequent recommendation for change should be sent to the regional forester for consideration.

At-Risk Species Desired Conditions

FW-ATRISK-DC

01 Ecological conditions (such as desired conditions for vegetation and water resources) provide habitat that contribute to the survival and recovery of federally listed, proposed, and candidate species. Meeting desired conditions would provide habitat to aid in the persistence of the species.

02 Habitat for species of conservation concern sustains both common and uncommon native species. Habitats and refugia for species of conservation concern are intact, functioning, and sufficient for species persistence and recovery.

03 At-risk plant community habitats (gypseous outcrops, margins of springs and wetlands, travertine seeps, canyons, cliffs, ledges, etc.) are present, to maintain self-sustaining populations of soil-specific associated at-risk plant species.

04 The structure and function of the vegetation and associated microclimate and special features (cavities, interlocking canopy, logs, snags, specific soil types, talus slopes, and wetlands) exist in adequate quantities within the capability of the plan area to provide habitat and refugia for at-risk species with restricted distributions.

At-Risk Species Standards

FW-ATRISK-S

01 Project activities and special uses occurring within federally designated critical habitat must integrate habitat management objectives and species protection measures from the most recent approved U.S. Fish and Wildlife Service recovery plan.

02 Where the Forest Service has entered into signed conservation agreements that provide guidance on activities or actions to be carried out by Lincoln National Forest staff, those activities or actions must be undertaken consistent with the guidance found within those conservation agreements.

At-Risk Species Guidelines

FW-ATRISK-G

01 All authorized activities should be designed and implemented to address and mitigate threats to at-risk species and their habitats, including, but not limited to:

a. Timing restrictions to encourage reproductive success.

b. Prevention of introduction of invasive, competing, or predatory species (species directly and negatively impacting at-risk species populations).

c. Prevention or introduction of pathogens leading to population impacts.

d. Creation or removal of obstructions that may alter natural migration or directly cause mortality to wildlife.

e. Creation or removal of obstructions that may alter habitat function or fragment populations of plant species.

f. Avoiding or protecting small or isolated populations during management activities.

02 Within critical habitat for threatened and endangered species, footprints of emergency ground-disturbing fire suppression activities should be as small as possible or located where ground disturbance has previously occurred.

03 Heavy equipment should be kept out of streams during spawning, incubation, and emergence periods of aquatic at-risk species (spring to early summer for fish species) except when short-term uses are required to protect or improve resource conditions and maintain infrastructure.

04 Means to reduce the threat to at-risk species should be implemented in areas where concentrated recreational shooting may cause harm.

05 At-risk species habitat should be considered at the project level to identify that habitat needs are being met to retain species persistence in the planning area.

06 Seep and spring function should be restored as necessary to maintain habitat for at-risk species (such as Sacramento Mountains thistle and Wright's marsh thistle).

07 Project level analyses where Northern goshawk (Accipiter gentilis) is known or suspected to occur should plan for forest conditions and management recommendations as provided in GTR-RM-217 (Reynolds and others, 1992).

At-Risk Species Management Approaches

Consider the following:

01 Periodically assess at-risk species and habitat and review if information indicates concern about a species' capability to persist over the long term in the plan area.

02 Strengthen and develop programs to survey, monitor, and collect data on at-risk species, especially when basic distribution and species status information is lacking on the Lincoln National Forest. Identify, document, and correct any management conflicts to the species or their habitat.

03 Coordinate and collaborate with state and federal agencies, nonprofit organizations, and other specialists as well as other interested stakeholders in support of gathering information on at-risk species for which little information is known or available.

04 Collaborate with universities, state and federal agencies, and other organizations to obtain, manage, and disseminate data and encourage research on at-risk species.

05 Work with partners to promote public education and valuing of at-risk species on the Lincoln National Forest.

06 Ensure that in project-level planning, at-risk species should reference the appropriate species-specific documentation and the species of conservation concern analysis to identify the disturbance mechanisms necessary to maintain and enhance species and their habitat.

07 Prioritize areas for at-risk plant and animal habitat surveys by focusing on rare soil types, geological features, or biodiversity hotspots.

08 Collaborate on avoiding or mitigating management actions that may reduce long-term reproductive success or directly harm populations of at-risk species in subalpine and alpine habitats.

09 Collaborate on management activities along cliff faces, rock features, and other known at-risk species sites to avoid or mitigate impacts during reproduction season.

10 Prioritize mapping at-risk species and habitats and maintain or restore to an intact, functioning condition sufficient for species persistence.

Nonnative Invasive Species

A species is considered invasive if it is 1) nonnative to the ecosystem under consideration and 2) its introduction causes or is likely to cause economic or environmental harm or harm to human health (Executive Order 13112). Across the Nation's forests, invasive species have caused disruptions in ecosystem function, reducing biodiversity, and degrading ecosystem health. Historically, the Lincoln National Forest has suffered from a number of introduced, nonnative species that have threatened native plant and animal communities through direct competition and predation or by altering the frequency and intensity of fire regimes and other ecosystem functions. Riparian and aquatic communities have been especially impacted over time, and many other ecosystems and native species remain at risk of further invasion of harmful nonnative species.

Another category of undesirable species includes nonnative and invasive plants, which is defined as any species of plant that is detrimental, destructive, or difficult to control or eradicate. This includes plants found injurious to any domesticated, cultivated, native, or wild plant. Most weeds are pioneer plant species that have evolved various traits that adapt them to thrive and reproduce successfully in different habitats. While eradicating nonnative invasive plants is not always possible or needed, aggressive control of existing populations may be important to ensure that native ecosystems functionality is protected.

Many invasive nonnative plant species are so common they have effectively become naturalized and are essentially a new component in the ecosystem. For instance, Kentucky bluegrass (*Poa pratensis*) and dandelion (*Taraxicum officinale*) are very common and in some cases, have replaced native species as a dominant component in grass plant communities. Kentucky bluegrass is a sod-forming species that reproduces through seed and vegetatively through rhizomes and thrives under heavy grazing pressure. Throughout the forest, Kentucky bluegrass is common on more developed soils and often dominates riparian zones to the exclusion of native species.

Invasive species are frequently adapted to a wide range of climates and tend to thrive as early colonizers after disturbances and have reproductive strategies that allow it to outcompete or overwhelm native plant and animal assemblages. Changing conditions due to climate change and increased human impacts on many systems may favor the spread and establishment of invasive species on the forest.

In recent decades, invasive plant species progressively increased in abundance on the Lincoln National Forest and adjacent lands, which led to increased public concern about the effects of invasive plants (principally musk thistle and teasel) and greater demand for treatment. Lincoln National Forest staff initiated two extensive invasive plant surveys in the early 1990s to help assess the extent of the infestation. These surveys revealed the presence of 11 invasive plant species across 4,200 acres. However, most of the surveys were conducted along roads and trails on the Smokey

Bear and Sacramento ranger districts. They reflect only major infestations and only the observed portions of infestations. Exotic terrestrial animals of prominent concern on the Lincoln are the feral hoofed mammals: pig (*Sus scrofa*), horse (*Equus asinus*), and Barbary sheep (*Ammotragus lervia*).

Nonnative Invasive Species Desired Conditions

FW-INVASIVE-DC

01 Plant and animal communities are dominated by native species. Nonnative invasive species are absent or exist at levels that do not cause economic harm or negatively impact human health, disrupt ecological processes, alter hydrologic or sediment regimes, reduce biodiversity or affect the sustainability of native and desirable nonnative species.

02 Collaborative information and education programs build awareness of nonnative invasive species and the threats they pose at all levels and across all jurisdictions.

03 Research authorized on the Lincoln National Forest is encouraged and results in improved understanding of management of invasive nonnative species impacting long-term ecological conditions.

Nonnative Invasive Species Objective

FW-INVASIVE-O

01 Treat or remove invasive species in 1,000 acres of habitat during each 10-year period following plan approval.

Nonnative Invasive Species Standards

FW-INVASIVE-S

01 Domestic goats and sheep must not be used to control invasive plants in bighorn sheep occupied range.

02 Appropriate decontamination procedures must be used for white nose syndrome before entering any caves on the forest, between cave visits, and after caving.

03 Decontamination of boots, waders, or other aquatic equipment shall be done if coming from areas that are known to have parasites or disease (for example, chytrid fungus, didymo, and whirling disease).

Nonnative Invasive Species Guidelines

FW-INVASIVE-G

01 Integrated pest management should be coordinated with other partners, such as county weed management associations and soil and water conservation districts, adjacent landowners, federal and state agencies, and tribes.

02 Measures should be incorporated into authorized activities, contracts, project planning, and implementation to include appropriate decontamination procedures to prevent the establishment and spread of invasive species and apply best management practices and guidance from the current Forest Service Southwestern Region Guidance for Invasive Species Management.

03 Measures should be incorporated into authorized activities, contracts, project planning, and implementation to control, contain, and/or eradicate priority established infestations of nonnative invasive species to maintain or recover ecosystem and habitat functionality.

04 Projects and authorized activities should use native plant species. Exceptions apply to the use of sterile cereal grains for emergency watershed stabilization.

05 Techniques for nonnative management activities within sensitive habitat (such as at-risk plants or riparian areas) should be applied to prevent negative effects to at-risk species.

06 Chemical application techniques should be applied to minimize negative effects (such as chemical-free buffers and spot treatments).

07 When drafting water from streams or other waterbodies, measures should be taken to prevent entrapment of fish and aquatic organisms and prevent the spread of parasites or disease (for example, chytrid fungus, Didymo, and whirling disease).

08 To prevent spread of nonnative invasive plants, project planning should include mitigations as part of implementation to properly clean off-road vehicles, including all-terrain vehicles, prior to entering or reentering National Forest System lands.

09 Nonnative invasive species should be treated using methods, and in a manner, consistent with various designated area characteristics to allow natural processes to predominate in designated areas, including wilderness.

10 Ground-disturbing activities should be assessed for risk of nonnative invasive plant invasion or establishment and incorporate measures that minimize the potential for the spread of nonnative and invasive species.

Nonnative Invasive Species Management Approaches

Consider the following:

01 Focus on reducing nonnative fish to protect and promote the recovery of native species or existing multiple uses.

02 Habitat improvement and aquatic restoration projects should identify sites of occurrence and provisions to remove nonnative invasive plants and animals.

03 Make efforts to eradicate feral hogs in coordination and cooperation with the New Mexico Department of Agriculture, USDA Animal and Plant Health Inspection Service, and other stakeholders consistent with the National Feral Swine Damage Management Program.

Air

Air resources on national forests are an important resource to be protected. Not only does the public value the fresh air and sweeping views that national forests can provide, but forest health, water quality, and fisheries can also be affected by poor air quality. The goal of air quality management is to meet regulatory standards that protect both human health, the environment and visibility, as well as addressing and responding to other air quality concerns, such as atmospheric deposition of pollutants on the forest.

Human health and environmental standards are defined in the National Ambient Air Quality Standards set by the Environmental Protection Agency for seven pollutants considered harmful to public health and the environment: carbon monoxide, lead, nitrogen dioxide, particulate matter 10 microns in size or smaller (PM_{10}), particulate matter 2.5 microns in size or smaller ($PM_{2.5}$), ozone, and sulfur dioxide.

To protect visibility in national parks and congressionally designated wilderness areas, in 1977 Congress designated all wilderness areas over 5,000 acres and all national parks over 6,000 acres as mandatory federal Class I areas subject to visibility protection requirements in the Clean Air Act. The White Mountain Wilderness (47,219 acres) on the Lincoln National Forest is a Class I area. Class II areas are also designated by the Clean Air Act but are not as restrictive in relation to air quality protection. The Capitan Mountain Wilderness (36,034 acres) is a Class II area.

Air quality and the values dependent on air quality on the Lincoln National Forest are generally in good condition or are improving as most pollutants are decreasing; however, visibility and ambient air quality conditions associated with particulate matter are expected to have episodic periods of very high levels resulting from wildfires and increases in fugitive dust owing to the effects of climate change. Also, impacts from emissions along the U.S.-Mexico border are a significant concern and an area of significant uncertainty in terms of the magnitude and subsequent impacts.

Air provides a wide variety of ecosystem services across the entire national forest. This includes regulating services such as air quality, respiration in plants, exchange of biological byproducts, climate control, and carbon and nitrogen cycling. Supporting services include protection of wilderness and greater biodiversity throughout. Managing for quality air across the forest also facilitates cultural services like recreation and scenery. When air quality is higher overall, visitors are drawn to a broader range of services and features the Lincoln National Forest provides.

Air Desired Conditions

FW-AIR-DC

01 Air quality meets or surpasses New Mexico and federal ambient air quality standards.

02 Visibility in designated wilderness areas (Class I areas) is free of anthropogenic (human-caused) impacts.

03 Good air quality contributes ecosystem services through carbon and nitrogen cycling, visibility, human health, quality of life, economic opportunities, quality recreation, and wilderness values.

Air Guidelines

FW-AIR-G

01 Dust abatement should occur during construction and road projects where dust is a potential effect.

02 During wildfire incidents, techniques to minimize smoke impacts (public notification, timing of ignitions, mass ignitions, limiting fire spread, etc.) should be used, including the identification of smoke management objectives in the wildfire decision document.

03 Project design for prescribed burns and strategies for wildfires should incorporate emission reduction techniques (such as those listed in New Mexico Administrative Code Title 20, Chapter 2, Part 65) to reduce negative impacts to air quality, subject to economic constraints, technical feasibility, safety criteria, and land management objectives.

04 Relevant and timely information should be provided to the public whenever an air quality hazard associated with Lincoln National Forest activities, projects, or wildfire is known or predicted.

Air Management Approaches

Consider the following:

01 Work with agencies, organizations, federally recognized tribes, and other entities to actively pursue actions designed to reduce the impacts of pollutants from sources within and outside the Lincoln National Forest. These measures may include:

- Continuing to comply with local, New Mexico, and federal air quality regulations.
- Implementing air pollution mitigations where appropriate.
- Monitoring ambient air quality.

02 Consider deploying smoke monitors when there is potential for significant impacts to the public.

Fire and Fuels

Wildland fire includes both wildfire (unplanned ignitions) and prescribed fire (planned ignitions). Fire management includes the strategies and actions used both before and during wildland fire. Management of wildland fire influences whether fire effects create beneficial or negative impacts to values such as vegetation, water quality, air quality, habitat, recreation areas, or communities. Wildfire management includes a spectrum of responses, from protection objectives (suppression) to resource objectives (managing fire to play an ecological disturbance role on the landscape). Fire behavior and effects are predicated on fuels, topography, and weather. Suppression refers to management strategies used to extinguish or confine wildfires for the protection of values at risk.

Manipulation of vegetation for the purpose of changing the fire characteristics when it burns is called fuels management. Fuels reduction treatments result in a change in the amount, configuration, and spacing of live and dead vegetation (fuels), with the purpose of creating conditions that result in more manageable and ecologically characteristic fire behavior during wildfires. Uncharacteristic fire behavior and effects result from uncharacteristic fuel loads (overly dense forests) often combined with uncharacteristic climate conditions (extended drought).

Fire and Fuels Desired Conditions

FW-FIRE-DC

01 Wildland fires do not result in the loss of life, property, or cultural resources, or create irreparable harm to ecological resources. Firefighter and public safety is the first priority in every fire management activity.

02 Fire management uses an all lands, landscape approach which is risk-based, consistent with current national policy guidance and strategy, responsive to the latest fire and social sciences, and adaptable to rapidly changing conditions. The full range of fire management activities and tactics are recognized and used by forest administrators as an integral part of achieving sustainability and ensuring firefighter and public safety.

03 Naturally caused wildfires predominate; human-caused wildfires (such as those from abandoned campfires or downed powerlines) are rare.

04 Wildland fire functions in its natural ecological role on a landscape scale and across administrative boundaries under conditions where safety and values at risk can be protected. In frequent, low-severity fire systems, regular occurrence of wildland fire mitigates high-severity disturbances and protects social, economic, and ecological values at risk.

a. Wildland fires burn within the historical fire regime of the vegetation communities affected. High-severity fires occur where this is part of the historical fire regime and do not burn at the landscape scale.

b. Wildland fire is managed to play a natural ecological role in designated areas such as wilderness or research natural areas.

c. Restoration and fuel treatments result in ecological resources that are adaptable to the effects of changing climate conditions.

05 Lincoln National Forest staff, in coordination with other agencies and stakeholders, provides information and opportunities to learn about wildfire protection of homes and property, including providing for defensible space. Education and information programs are utilized to discuss the roll of wildland fire as a necessary disturbance process integral to the function and sustainability of ecosystems.

Fire and Fuels Standards

FW-FIRE-S

01 Wildfire risk assessments will be used to provide a means to assess the potential risk posed by wildfire to specific highly valued resources and assets across large landscapes actions needed to protect those values.

02 Human safety shall be the highest priority in all fire response actions. Firefighters will not be ordered into situations likely to cause fatalities or serious injury.

03 When suppression is an objective, the agency administrator must prioritize firefighter exposure, risk, values, cost, and likelihood of success before trying to limit the size of wildfires.

04 Managers must use a decision support process to guide and document wildfire management decisions. The process will provide situational assessment, analyze hazards and risk, define implementation actions, and document decisions and rationale for those decisions (quantitative wildfire risk assessment).

05 All wildfire response will occur in accordance with the Interagency Standards for Fire and Fire Aviation Operations.

06 Aerial application of retardant to water, riparian, wetland, and aquatic ecosystems must be avoided unless it is necessary to protect human safety or prevent property loss, per the Record of Decision for Nationwide Aerial Application of Fire Retardant on National Forest System Land (USDA FS 2011b) or similar document.

Fire and Fuels Guidelines

FW-FIRE-G

01 When wildland fires occur, appropriate response strategies should be developed based on the risk considerations of life, safety, and potential resource impacts and with the participation of other responsible agencies, authorities, and jurisdictions as appropriate.

02 The response to wildland fire must remain spatially and temporally dynamic based on a risk management approach while accomplishing integrated resource objectives.

03 Wildfires should be managed to meet multiple resource management objectives where and when conditions permit and risk to identify values are within acceptable limits.

04 Wildland fire activities should be used to move ecosystems towards vegetation desired conditions, including more natural fire regimes.

05 Response to wildland fire should mitigate fire effects to non-fire adapted ecosystem (such as Chihuahuan desert scrub).

06 Fire suppression activities should be conducted in a manner that avoids disturbance to fire sensitive resources including at-risk species, cultural resources, and other highly valued or at-risk resources, while keeping human safety a top priority.

07 In designated and recommended wilderness areas, prescribed fire should be considered to reduce the risks and consequences of uncharacteristic wildfire, if necessary, to meet fire management objectives. Naturally occurring fires should be allowed to perform, as much as possible, their natural ecological role.

08 Naturally ignited wildfire should only be suppressed when behavior and effects are outside the natural range of variation or where necessary to protect life, investments, and valuable resources.

09 Minimum impact suppression techniques should be used in wilderness areas and when impacts to sensitive resources (including wilderness and known rare or sensitive plants) could result during fire suppression activities.

10 Lincoln National Forest personnel should follow the operational guidelines for invasive species and aquatic invasive species provided in the most current Interagency Standards for Fire and Fire Aviation Operation (see also Nonnative Invasive Species standards and guidelines).

11 Measures should be taken to prevent the spread of invasive plant species by equipment, personnel, or rehabilitation operations.

12 Post-fire restoration and recovery should be provided where critical resource concerns merit rehabilitation for controlling the spread of invasive species and protection of areas of cultural concern, critical or endangered species habitat, or other highly valued resources.

13 Project and activities should retain coarse woody debris sufficient to meet wildlife needs, maintain site productivity, and support natural fire regimes (see individual ecological response unit mid-scale desired conditions), except when necessary in the wildland-urban interface.

14 Vegetation conditions around all structures on administrative and permitted sites should be maintained to provide defensible space and assist with protection.

Fire and Fuels Management Approaches

Consider the following:

01 Collaborate with stakeholders and partnering agencies early and often to successfully meet resource objectives through the use of fire. Educate internally and externally the potential challenges and tradeoffs of wildland fire.

02 Coordinate management of wildland fire across jurisdictional boundaries whenever there is potential for managing a wildfire or a prescribed fire on more than one jurisdiction (federal, state, county, local, tribal governments, land grants, etc.). This includes water sources, access, and land use agreements. This is done with the understanding that fire-adapted ecosystems and communities transcend jurisdictional boundaries.

03 When planning and implementing fuels projects and all hazard response, work collaboratively with federal, state, local governments, and private landowners; consider promoting public safety and reducing the risk of wildfire on lands of other ownership by supporting the development and implementation of community wildfire protection plans or similar assessments and management plans to mitigate negative impacts of wildfire. Community wildfire protection plans are also important tools for mitigation efforts such as wildfire preparedness, evacuation planning, and other mitigations that will aid in wildfire response.

04 Consider an interdisciplinary assessment of site-specific values to develop wildfire objectives (for example, desired conditions, existing fuel conditions, current and expected weather, fire location, resource availability, and social and economic conditions) to enhance or protect those values.

05 In areas departed or trending away from desired conditions, combine the use of wildland fire with mechanical treatments, as this is often the most effective approach to restoring forest structure and function.

06 In areas highly vulnerable to climate change, increase resiliency by using a diversity of treatments to facilitate natural adaptation to changing conditions such as managing in favor of early- to mid-seral species over late-seral species in ecotones, as species characteristic of lower life zones are adapted for warmer and drier conditions. Managing tree basal area at the low end of the range of desired conditions to mitigate water stress.

07 Develop practices and protocols to reduce non-prescribed human ignitions by providing timely and disseminating widely fire danger and fire restriction information. Educate the public on their responsibility to help reduce human-caused wildfires by providing information in the form of signage, public contacts, and fire restrictions in locations such as trailheads and designated recreation areas.

08 Take into account the scenic effects from prescribed fire during project planning and implementation to provide for related cultural ecosystem services. Blackened and scorched vegetation may be visible in project areas in the short-term following treatments, but take into consideration the long-term scenic integrity objectives. Short term is defined as 10 years or less and long term is greater than 10 years.

09 In wildland fire areas that are not expected to reseed naturally, use seeding with native vegetation and implement other site rehabilitation practices as necessary. Consider that fire suppression support activities and facilities (including constructed firelines, fuelbreaks and safety areas, fire camps, staging areas, helibases, and helispots) follow the same site rehabilitation practices.

10 Collaborate with scientists (from universities, Forest Service Research and Development, U.S. Geological Survey, or Ecological Restoration Institute, etc.) to conduct research on areas impacted by uncharacteristic wildfire to understand how fire has altered the ecological conditions outside the natural range of variation and develop strategies to better manage these areas.

11 Use the wildfire strategic response zones to facilitate informed and transparent decisionmaking that will allow beneficial fires to burn under the right conditions and inform aggressive strategies when fires need to be suppressed. Five strategic zones were developed for the Lincoln National Forest: (1) maintain, (2) restore, (3) protect, (4) exclusion, and (5) high complexity. These zones are dynamic over time and space, and will change as conditions change, affecting management opportunities. For example, an area currently identified as a "restore" zone could become a "maintain" zone after treatment (mechanical or prescribed fire). Conversely, a "restore" zone could become a "protect" zone if changing fuel conditions change expected fire behavior and effect such that fire would not meet land management plan desired conditions.

12 In areas, highly vulnerable to climate change, increase resiliency by using a diversity of treatments to facilitate natural adaptation to changing conditions such as managing in favor of early- to mid-seral species over late-seral species in ecotones, as species characteristic of lower life zones are adapted for warmer and drier conditions. Consider managing tree basal area at the low end of the range of desired conditions to mitigate water stress.

Socioeconomic Resources

Significant Caves

The Lincoln National Forest is known worldwide for its cave resources. Once a living reef on the edge of an inland sea, the national forest is home to over 500 known limestone caves ranging from a few feet long to those that are hundreds of feet long or deep. More than 120 significant limestone caves are found within lands managed by the Lincoln. Many of these caves occur in in the rough canyons flanking the north and south sides of the Guadalupe Ridge Anticline on the south end of the Guadalupe Ranger District. Caves on the southern end of the Guadalupe district range in size and shape—from very large, simple chambers to complex mazes of interconnecting passages. The Lincoln National Forest has additional documented smaller caves with simple chambers and interconnecting passages.

Due to their unique sulfuric acid speleogenesis, the limestone caves of the Guadalupe and Sacramento mountains have been and continue to be intensely studied by speleologists, hydrologists, and geologists. The caves offer scientists the opportunity to clearly study the Capitan Reef from the inside out.

The Lincoln National Forest began taking an active role in the protection and management of caves on the Guadalupe Ranger District in the early 1970s. Prior to that, many of the caves were discovered, explored, surveyed, and studied by various caving enthusiasts belonging to a variety of grottos, or caving clubs, organized under the National Speleological Society. Several caves have been visited by Euro-Americans since the late 1800s and a few were utilized for commercial tours during a dude ranch operation in the early 1900s. Due to these activities, several major caves had sustained minor vandalism prior to the creation of the Federal Cave Resources Protection Act of 1988.

Caves provide a number of ecosystem services. Provisioning services come from clean water, as some of the caves on the Lincoln National Forest are associated with surface and groundwater processes. Cultural services are provided through research and educational opportunities. In addition, caves on the national forest hold cultural heritage values for the Mescalero Apache.

Significant Caves Desired Conditions

FW-CAVE-DC

01 Features, characteristics, values, or opportunities for which caves have been designated or nominated as “significant” are maintained or improved.

02 Caves provide habitat for species that require specialized conditions for roosting and overwintering, such as bats. Caves maintain moisture and temperature levels consistent with historical conditions. They do not contain bat diseases, such as white-nose syndrome.

03 Until otherwise designated, caves are managed as significant.

Significant Caves Objectives

FW-CAVE-O

01 Twenty-five percent of caves known to contain sensitive or special status biological species, cultural, or paleontological resources will be monitored annually.

02 Inspect all infrastructure at the entrance or interior of caves twice per year. This includes, but is not limited to, gates, ladders, fixed ropes, bolts, etc.

03 Survey and map a minimum of 5,000 linear feet per year in caves on the Lincoln National Forest.

04 Strategically survey a minimum of 250 acres of surface area for cave and karst features annually.

05 Provide for volunteer opportunities to conduct cave resource restoration quarterly.

06 As caves are discovered, they should be evaluated for significance under the Federal Cave Resources Protection Act of 1988.

Significant Caves Standards

FW-CAVE-S

01 Management of significant caves on the forest shall follow the current Lincoln National Forest Cave Management Plan.

02 Permits are required for entry into any cave.

03 Public information concerning location and access to non-recreational caves must be restricted to permit holders. Information concerning location and access to these caves will be limited to individuals holding valid permits.

04 Recreational activities inside caves must only be permitted for designated recreational caves.

05 Resources in caves (for example, prehistoric and historic habitation sites, sacred sites, traditional cultural properties, and paleontological vertebrate) must be protected and in compliance with federal regulations. Removal, relocation or mitigation will only occur when significant resource damage or loss is occurring. Any changes to cultural resources, prehistoric and historic habitation sites, sacred sites, and traditional cultural properties would occur only after consultation with affiliated tribes and the state historic preservation office.

06 Authorized activities must not use cave entrances as general disposal sites for slash, spoils, or other refuse.

07 Confidentiality on the location of cultural resources, sacred sites, traditional cultural properties, and paleontological vertebrate in all caves must be maintained unless authorized through a permit.

Significant Caves Guidelines

FW-CAVE-G

01 Project design should include design features (for soil, vegetation cover, and drainage) to maintain cave microclimates during management activities.

02 Measures or mitigation for protecting caves should be incorporated into project plans for road construction, timber harvest, tree planting, blasting near caves, and any activity that could change cave temperatures and drainage patterns.

03 Vegetation and other natural characteristics in the vicinity of a cave should be retained to protect the cave’s microenvironment.

04 Monitoring protocol should be done in accordance with sensitivities of each species.

05 Management activities that increase sedimentation, decrease soil productivity, or change the cave’s natural hydrology should be limited.

06 Prescribed burn plans should be developed to avoid or minimize smoke influences at or around caves.

07 Logging, road construction, and other uses of heavy equipment should be avoided above or in the vicinity of a cave if there is potential for damage.

Significant Caves Management Approaches

Consider the following:

01 Collaborate with state and federal agencies, nongovernmental organizations, and universities as well as local, regional, and national speleological societies to identify significant caves, obtain data, encourage research on karst environments and karst-dependent species, and develop conservation strategies for protecting karst-dependent species and their habitats.

02 If timber harvesting is permitted near a cave, consider directionally felling trees away from a cave and its course.

03 Identify and document cave and karst features when they are found to occur across the landscape; these features include springs, sinkholes, and losing streams.

Collaboration, Partnerships, Education, and Relationships

In recent years, the Forest Service has placed a higher priority on strengthening relationships between national forest staff and surrounding communities. Lincoln National Forest partners and users have valuable ideas and knowledge that can expand the Lincoln's capacity to "Care for the Land and Serve People." Public engagement during the development of this plan has provided collective insight from the people who use, benefit from, and are sustained by the Lincoln National Forest.

The Forest Service will continue to actively engage its many public stakeholders through conservation education, working agreements, partnerships and volunteerism, with a particular emphasis on growing the capacity for partnership collaboration around public services and ecological restoration on National Forest System lands. Partners will continue to build and maintain trails, restore forested and riparian areas, and ensure continued traditional and cultural uses.

Successful implementation of the land management plan will require collaborative partnerships with federal, state, and local governments, federally recognized tribes and pueblos, rural traditional communities, nonprofit organizations, private landowners, youth, and the public. Collaborative partnerships may include identifying, planning, funding, and implementing projects and activities together. Partnerships will improve trust and contribute to projects that best provide for cultural, social, and economic needs while also increasing the capacity to do quality restoration work and to develop and provide improved recreation opportunities.

Additional guidelines and management approaches for working with partners and volunteers are found under individual resources.

Collaboration, Partnerships, Education, and Relationships Desired Conditions

FW-COLPART-DC

01 Strengthen existing relationships, promote new relationships, and incorporate shared strategies and interests. Partnerships, stakeholder support, and leveraging resources are key considerations in prioritizing projects.

02 Emphasize working with partners and volunteers to manage resources, monitor activities, and promote citizen stewardship.

03 The Lincoln National Forest and the diverse communities and partners it serves are engaged and able to create a shared understanding of resource issues; successfully implement programs and projects; and promote the social, economic and ecological benefits that the national forest provides.

04 The uniqueness and values of communities and the traditional uses important for maintaining cultures are recognized and valued as important, supporting provisioning and cultural ecosystem services.

05 Public education opportunities are used to explain natural ecological and hydrologic processes, their contributions to water quality and quantity for beneficial use, benefits of stream restoration, proper recreation practices, proper grazing techniques, and the disadvantages of degraded conditions.

Collaboration, Partnerships, Education, and Relationships Objectives

FW-COLPART-O

01 Complete 30 products or activities that educate the public, particularly youth, about wildlife, fish, and plant resources during each 10-year period following plan approval. Examples of products include educational signs and brochures, website pages, species checklists, presentations, and field trips.

02 Complete 30 products or activities that educate the public, particularly youth, about fish and aquatic resources during each 10-year period following plan approval. Examples of products include educational signs and brochures, website pages, species checklists, presentations, and field trips.

03 Complete 30 products or activities that educate the public, particularly youth, about species at-risk and species of conservation concern during each 10-year period following plan approval. Examples of products include educational signs and brochures, website pages, species checklists, presentations, and field trips.

04 Complete 30 products or activities that educate the public, particularly youth, about nonnative invasive species impacts during each 10-year period following plan approval. Examples of products include educational signs and brochures, website pages, species checklists, presentations, and field trips.

Collaboration, Partnerships, Education, and Relationships Management Approaches

Consider the following:

01 Forest managers utilize collaboration, partnerships, youth, diverse communities, volunteerism, citizen stewardship, and conservation education to support work across program areas, connect people with public lands, and foster a sense of stewardship.

02 Use a collaborative approach when developing and implement projects by engaging representative stakeholders and communities of place and interest to develop relationships and inform decisions.

03 Form partnerships with stakeholders where common interests and leveraging respective resources can bring synergy, support and broader accomplishments to fruition.

04 Develop and implement consistent methods to recruit, train, and coordinate volunteers across the Lincoln National Forest.

05 Work with partners and stakeholders involved in community wildfire protection plans to meet the broad intent and goals of those plans.

06 Work with partners to promote public education on the value of the terrestrial and aquatic wildlife on the Lincoln National Forest.

07 Work with partners to promote public education on the value of rare and endemic species on the forest.

08 Lincoln National Forest personnel use collaborative information and education programs to build awareness of nonnative invasive species and the threats they pose at all levels and across all jurisdictions.

09 Consider developing and promoting programs that educate the public on the importance of staying on trails and not disturbing natural plant communities, including biological soil crusts.

10 Use heritage programs, interpretive presentations, publications, and interactive learning opportunities to provide the public with opportunities to learn about, understand, and experience the forest's cultural resources (prehistory and history).

11 Promote established programs and develop conservation education programs at schools, youth activities, fairs, and volunteer events that help connect people to nature, reach underserved populations, and encourage responsible use of natural resources.

12 Develop conservation education, visitor information, and interpretation materials to inform and engage visitors and local communities. These resources are readily available and encourage increased forest stewardship, ecological awareness, visitor orientation, and knowledge of recreation opportunities.

13 Develop public education opportunities and information about the importance of scenery.

14 Use interpretation and education to encourage visitors to adopt techniques, equipment, and ethics specific to wilderness values.

Tribal Uses

The Lincoln National Forest has been the setting of considerable human activity for thousands of years. The Mescalero Apache, Hopi, and Zuni tribes consider the lands in the plan area to be their traditional lands. These lands are important for maintaining tribal cultural practices through the use of forest resources and places. Sacred sites, values, spirituality, and ties to places and resource uses are still important today. For example, entire mountain ranges are commonly regarded as sacred and viewed as an integral part of a tribe's cultural landscape. Sierra Blanca, the Guadalupe Mountains, Three Sisters Mountain, and Oscura Mountain Peak represent the cultural landscape of the Mescalero Apache people. The Capitan Mountains also have associated stories important to Apache culture. For more distant tribes, such as the Hopi and Zuni that are currently based in Arizona and western New Mexico, some of these mountain ranges served as a distinctive landmark or waypoint to aid in travel.

The Mescalero Apache rely on the Lincoln National Forest for its ecosystem services. The ecosystem services provided by cultural resources and traditional uses of the plan area by tribal members are by definition "cultural services," because these resources and uses provide social, psychological, spiritual, and emotional connections between Native people and the land. Forest provisioning products are used for personal, subsistence, and ceremonial use. Plants are used for food, medicine, and items like cradle boards or brush structures. Piñon nuts are one example of a forest product commonly gathered for personal use and marketable to local populations. The collection and sale of piñon nuts is important because tribal members may partially rely on the nuts for income. Firewood is another forest product that is widely collected by tribal members for personal and ceremonial use. This includes juniper, piñon, oak, and ponderosa pine. There is a heavy reliance on forest products for traditional and cultural purposes.

Tribal Uses Desired Conditions

FW-TRIBE-DC

01 The uniqueness and values of Native cultures in the Southwest and the traditional uses important for maintaining these cultures in the Lincoln National Forest are recognized and valued by Forest Service personnel.

02 Traditional cultural properties, sacred sites, and other locations of traditional and cultural use which are identified as important by the tribes are not degraded from vandalism, looting, and other human impacts or natural processes such as erosion.

03 Forest resources that are important for cultural and traditional needs, as well as for subsistence practices and economic support of tribal communities, are available and sustainable.

04 Tribes and tribal members have access to sacred sites, traditional cultural properties, and collection areas for traditional and ceremonial use supporting cultural ecosystem service.

05 The Lincoln National Forest provides a setting for educating tribal youth in culture, history, and land stewardship.

06 Traditionally used products on the forest are available to rural historic communities and tribes, except in areas with resource concerns or in designated areas where such uses are not allowed or otherwise restricted by standards or guidelines set forth in other sections of this plan.

Tribal Uses Standards

FW-TRIBE-S

01 Confidentiality of tribal information and resources collected during consultation must be maintained unless permission to share information is given.

Tribal Uses Guidelines

FW-TRIBE-G

01 Consultation with federally recognized tribes should occur at the early stages of project planning and design. Tribal perspectives, needs, and concerns, as well as traditional knowledge, should be incorporated into project design and decisions.

02 To honor tribal privacy, requests for temporary closure orders for cultural and traditional purposes should be accommodated.

03 Lincoln National Forest staff should facilitate access by tribes for the gathering of special forest products and forest botanical products.

Tribal Uses Management Approaches

Consider the following:

01 Collaborate with American Indian Tribes to manage historic sites and other traditional areas of importance.

02 Develop collaborative proposals and partnerships with American Indian Tribes to implement projects of mutual benefit and economic development.

03 Collaborate with American Indian Tribes to identify mitigation measures for historic properties, traditional cultural properties, and cultural landscapes during management activities.

04 Work with partners such as the American Indian Tribes, New Mexico Historic Preservation Division SiteWatch program, Archaeological Society of New Mexico, the National Park Service, and local museums to identify, study, protect, and monitor sites and artifact collections.

05 Improve relationships with American Indian Tribes.

06 Draft new and update existing agreements with American Indian Tribes as needed.

Cultural Resources

Cultural resources include prehistoric, historic, sacred sites and traditional cultural properties. The description of and values provided by cultural resources, along with their protection is found in law, regulation, or policy.

Cultural resources provide cultural services such as educational, aesthetic, and heritage values; they are not necessarily linked to provisioning, regulating, and supporting services. These links vary depending on the communities that engage in forest use. For non-tribal groups, cultural resources and their use serve as a driver of economic sustainability in the vicinity of the plan area by fueling cultural tourism. Historic properties are a major attraction for cultural tourism. In the plan area, there are a few historic properties that are interpreted and readily available for public visitation. There are interpretive displays in the forest supervisor's office and district offices and at Sacramento Peak Observatory. Historic properties open to the public include the Mexican Canyon Trestle, associated with 19th and 20th century railroads and logging in the Sacramento Mountains, Monjeau Fire Lookout on Smokey Bear Ranger District, Camp Baca, a Civilian Conservation Corps camp, National Youth Administration women's education camp, and Japanese internment camp, and Sitting Bull Falls built by the Civilian Conservation Corps on the Guadalupe Ranger District. Although not offered for interpretation, cultural resources in the backcountry are also an attraction for visitors, as has been observed by district personnel and cooperating volunteer groups, such as New Mexico Rails-to-Trails. Tourists are also attracted to the traditional communities that rely on the resources and uses of the plan area to maintain their traditional identity. Fine art, handicrafts, foods, religious events, festivals and as well as other cultural events, products, and activities that attract tourists to these communities rely on

cultural resources and uses within the plan area. Lincoln National Forest heritage staff oversee Passport-in-Time projects that consistently expose volunteers to the prehistory and history of the area.

Scientific information generated from the study of cultural resource properties has generated a wealth of information germane to the ecological sustainability of the plan area. Places of past human settlement and use contain faunal remains, macro-botanical materials, soils, pollen, and other remains relevant to the reconstruction of patterns of ecological and ecological change over the past 12,000 years and have been vital for reconstructing patterns of environmental change within the plan area and the region. Scientific investigation of cultural resources can also provide an understanding of how humans have successfully adapted to a changing environment, or when they have failed to do so. Understanding past patterns of human land use also informs on the forces that have contributed to current ecological conditions, as practices such as farming, ranching, and logging can affect the subsequent health of ecosystems for hundreds of years. As such, information about past environmental change and human land use is critical for making decisions about maintaining ecological sustainability in future land management. The interpretation of cultural resources also creates opportunities to educate the public about environmental change and human adaptation in the past, and ecological sustainability in the future.

Cultural Resources Desired Conditions

FW-ARCH-DC

01 The integrity of cultural resources (buildings, sites, districts, structures, and objects) meeting National Register of Historic Places criteria (having scientific, cultural, or social values) is intact. They are not degraded from vandalism, looting, and other human impacts or natural processes such as erosion.

02 The public has opportunities for learning about cultural ecosystem services, appreciating, and understanding cultural resources and the ecosystem services they provide (such as education, recreation, and cultural heritage values).

03 Historic buildings and infrastructure maintain their historic integrity while also serving as administrative and recreational facilities and other infrastructure functions through adaptive reuse**.**

04 Heritage-based interpretive sites are managed to enhance the public's understanding of the resource, protect and preserve the resource, and protect the cultural setting of the site and visitor experiences.

Cultural Resources Standards

FW-ARCH-S

01 Contracts, permits, agreements, authorizations, or leases that have the potential to effect cultural resources must include appropriate clauses specifying site protection responsibilities and liabilities for damage.

Cultural Resources Guidelines

FW-ARCH-G

01 Buildings and infrastructure listed (or eligible for listing) in the National Register of Historic Places should be maintained to preserve their historic integrity when practicable or adaptively reused if possible.

02 When undertakings have the potential to adversely affect cultural resources, known communities to whom the resources are important should be involved in the resolution of the adverse effects.

03 Historic documents (photographs, maps, etc.) should be properly preserved, and made available for research and interpretation by Forest Service, contractors, other agencies, universities, federally recognized tribes, historic Spanish and Mexican rural communities, and the public.

04 Cultural artifacts should be preserved in situ, except when endangered, then they shall be curated following current policy and regulations.

05 Access to cultural resources may be temporarily restricted for such things as adverse resource damage, safety concerns, or tribal use.

06 Rappelling, rock climbing or similar activities should not be authorized in rock shelters eligible for listing or listed in the National Register of Historic Places.

Cultural Resources Management Approaches

Consider the following:

01 Maximize opportunities for partnerships and volunteerism with the heritage program. Cooperate with local, state, and federal agencies, as well as institutions and tribes in accomplishing program goals and objectives.

02 Collaborate with traditional communities to manage historic sites and other traditional areas of importance.

03 Work with partners such as the American Indian Tribes, New Mexico Historic Preservation Division SiteWatch program, Archaeological Society of New Mexico, the National Park Service, and local museums to identify, study, protect, and monitor sites and artifact collections.

04 Collaborate with traditional communities to identify mitigation measures for cultural resource properties and cultural landscapes during management activities.

05 Use programs (such as site stewards, volunteers, and Passport in Time) that engage the public to assist in protecting, managing, and documenting cultural resources.

06 Update the Forest Overview and Cultural Resources Planning Assessment into a comprehensive document to include a synthesis of known cultural data as well as lists of priorities for non-project survey, National Register of Historic Places nominations, site stabilization, interpretation, and public involvement.

07 Restore select historic structures for appropriate recreation or interpretive use.

08 When mitigating resource deterioration, implement the following protective measures:

- Vegetation treatment in and adjacent to site boundaries (provided appropriate protection measures are in place)
- Signing
- Fencing
- Administrative closure
- Patrols
- Interpretive signs
- Stabilization
- Data recovery

09 Consider prioritizing non-project-related surveys in the following areas:

- Areas where historic properties 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 understanding of the prehistory or history.

Forest Products

National Forest System lands were established with the intent of providing goods and services to satisfy public needs over the long term, which includes provisioning ecosystem services through the production of a sustainable supply of timber, forest, and botanical products. Timber products include but are not limited to: firewood, sawtimber, pulpwood, and non-sawlog materials removed in log form and biomass for electricity. Forest products include but are not limited to: Christmas trees, posts, poles, and vigas. Botanical non-forest products include but are not limited to: piñon nuts, bark, berries, boughs, cones, herbs, wildlings (plant transplants), mushrooms, pine needles, and wildflowers.

The production of timber, forest, and botanical products are provisioning ecosystem services provided by ecosystems of the Lincoln National Forest. Periodic removal of forest products to meet the desired conditions of the ecosystems is one tool used to provide the benefits of ecosystem services. These benefits are sustainable when the removal of these products maintains or improves ecosystem and watershed function, and/or does not detract from it. There are areas of the national forest where the removal of wood products provides socio-economic value, improves wildlife habitat and forest health, reduces fuel loading, and meets other project specific objectives. Similarly, there are areas where the removal of wood products can reduce the risk of uncharacteristic levels of insect or disease activity.

Focus has shifted toward ecological restoration to improve ecosystem resilience and resistance to stressors such as drought and climate change, and reduction of wildfire hazard to communities by creating and maintaining more open uneven-aged forest conditions as well as managing for desired species composition. An increasing level of forest production is necessary to achieve restoration of

desired conditions in forested vegetation communities at the plan scale. To facilitate achieving desired conditions, markets that will make use of forest products resulting from restoration treatments will need to be further developed and supported. The Forest Service is encouraging the expansion of wood product industries to use these products.

The total volume of wood products sold by the Lincoln National Forest has fluctuated over time, with an overall downward trend since the 1990s. There is less availability of sawlogs due to historic logging practices and industries, lagging industrial demand for highly available low-quality small diameter material (biomass), and increased regulation due to threatened and endangered species habitat loss. Currently, there is an emphasis on reducing the impacts of wildfires on communities and restoring fire-adapted ecosystems. Landscape-scale restoration projects may increase the volume of wood products in the near future as land managers work toward meeting desired conditions of the forest resource. The Lincoln National Forest seeks to integrate a timber and forest products program that supports industry and the general public, ecosystem health, watershed restoration, wildlife habitat improvements, and hazardous fuels reduction. In southern New Mexico, access to wood products continues to be an important component of the local social and economic fabric. Fuelwood harvest in particular is regarded as a traditional family activity and the national forest is a major source of fuelwood for the many local residents who still rely on wood to heat their homes during the cold winter months (provisioning and cultural ecosystem services.

On the Lincoln National Forest, forest products include but are not limited to sawtimber, posts, poles, fuelwood, and biomass. This material contributes to local subsistence and the livelihood of rural communities, with small quantities sold across state lines with some going to mills in Mexico. Forest products provide many ecosystem services on which other life forms (including people) depend. For example, forest products provide supporting ecosystem services by converting sunlight and carbon dioxide into oxygen and carbohydrates (primary production); provide regulating ecosystem services through soil formation and stability; provide provisioning ecosystem services in the form of wildlife habitat (cover and nest sites), food (piñon nuts for people and other animal species and browse for wildlife), and fiber (lumber, paper, and fuel); and provide cultural ecosystem services to society (Christmas trees, botanical remedies, and aesthetics).

Nonetheless, a backlog of supply, especially for small diameter and biomass markets, presently exceeds demand. While Forest Service planning capacity remains limited, many watershed and habitat restoration projects across the forest will be based on controlling the density of small diameter woody growth. Fire suppression costs can also be reduced at the same time, and smoke emissions from forest fires would decrease with less woody fuel. Recreation opportunities would be more sustainable, with less fire-caused interruptions and facility destruction. By releasing remaining vegetation, carbon sequestration could increase as larger trees store more carbon.

Timber Suitability

The National Forest Management Act of 1976 requires that National Forest System lands be classified as to their suitability for timber production. National Forest System lands were reserved with the intent of providing goods and services to satisfy public needs over the long term; among them is a sustainable supply of forest products. The 2012 Planning Rule provisions require the responsible official to identify lands not suitable for timber production within the area governed by the land management plan (36 CFR 219.11).

Forest Service Manual 1900 defines “forest land” as that which has at least 10 percent tree cover, or which had such tree cover in the past [indicating potential capability to produce at least 10 percent tree cover in the future], and which is not currently developed for non-forest uses, such as agriculture, providing improved pasture, residential or administrative areas, improved roads of any width, and adjoining road clearing and powerline clearing of any width. It defines timber production as “the purposeful growing, tending, harvesting, and regeneration of regulated crops of trees for cutting into logs, bolts, or other round sections for industrial or consumer use.”

Forest land may be considered as unsuited for timber production if any of the following apply:

a) Congress, the Secretary, or the Chief has withdrawn it from the public domain;

b) it is not producing or capable of producing crops of industrial wood;

c) there is no technology available to prevent irreversible damage to soil productivity and/or watershed conditions;

d) there is no reasonable assurance, based on existing technology and knowledge, that it is possible to restock lands within 5 years after final harvest as reflected in current research and experience;

e) there is currently a lack of adequate information about responses to timber management activities; and/or

f) timber management is inconsistent with, or not cost-efficient in meeting, the management requirements, and multiple-use objectives specified in the land management plan.

The Lincoln National Forest boundary encompasses 1,260,900 acres in south-central New Mexico, which includes 1,095,600 acres of National Forest System land, intermixed with State of New Mexico land, Bureau of Land Management administered land, and private land. Table 1 shows the results of a timber suitability analysis for the Lincoln National Forest; various categories of forest land are described and the acres suitable for timber production are reported (USDA FS 2020b).

Table 1. Timber suitability acres for the Lincoln National Forest

Land Classification Category	Acres
A. Total National Forest System lands in the plan area	1,095,604
B. Lands not suited for timber production due to legal or technical reasons	841,613
B1. Lands on which timber production is prohibited or lands withdrawn from timber production	259,437
B2. Lands on which technology to harvest timber is not currently available without causing irreversible damage	2,189
B3. Lands on which there is no reasonable assurance that lands can be adequately restocked within 5 years of final regeneration harvest.	3,809
B4. Land that is not forest land (non-forest)	576,178
C. Lands that may be suited for timber production (A minus B)	253,991
D. Total lands suited for timber production because timber production is compatible with the desired conditions and objectives established by the plan	179,726
E. Lands not suited for timber production because timber production is not compatible with the desired conditions and objectives established by the plan (C minus D)	74,265
F. Total lands not suited for timber production (B plus E)	915,878

The timber suitability analysis created the foundation to determine the amounts of timber and forest products anticipated to be harvested from the Lincoln National Forest over the lifetime of the land management plan. These quantitative measures include sustained-yield limit, which is the quantity of wood products that could be removed from the forest in perpetuity under a defined management system; projected wood sale quantity, which is all woody material likely to be sold from forest harvests whether or not the woody material meets utilization standards; and projected timber sale quantity, which is a subset of the projected wood sale quantity, and is an estimate of the quantity of timber expected to be sold during the plan period.

The process for determining timber suitability, sustained-yield limit, projected timber sale quantity, and projected wood sale quantity is described in volume 2 of the draft environmental impact statement, Appendix C: Timber Production Suitability, Estimated Vegetation Practices, and Projected Harvest Levels Analysis Methodology. Maps of suitable timber lands are also located in the draft environmental impact statement.

Forest Products Desired Conditions

FW-FORESTRY-DC

01 Forest products and associated provisioning ecosystem services (timber products, Christmas trees, herbs, fuelwood, medicinal plants, piñon nuts, teepee poles, etc.) are available to businesses and individuals in a sustainable manner (allowing forest products to recover between collections) that also effectively contributes to watershed health and the restoration and maintenance of desired vegetation conditions.

02 Forest products are available and contribute to the long-term socioeconomic diversity and stability of local communities with provisioning, regulating and cultural ecosystem services.

03 Forest products for personal or commercial use are available for gathering, while not adversely affect ecological status of landscape (species richness and abundance), create undue soil disturbance or encourage recruitment of nonnative invasive plants.

04 Forest products (such as fuelwood) that are a byproduct of management activities are available for personal use by the public.

05 Private and commercial timber harvest supplements other restoration and maintenance treatments at a scale that moves toward landscape desired conditions and contributes to watershed restoration, function, and resilience; enhances wildlife habitat; creates opportunities for small and large businesses and employment; and provides wood products.

06 Harvest of dead and dying trees for economic value is consistent with the desired conditions of wildlife habitat, soil productivity, and ecosystem functions.

07 Native seed stock is available to supply reforestation needs.

Forest Products Standards

FW-FORESTRY-S

01 Regulated timber harvest (tree harvest for the purpose of timber production) shall occur only on lands classified as suitable for timber production.[3]

02 Timber harvest shall only occur where soil, slope, and watersheds will not be irreversibly damaged, and protection must be provided for streams, streambanks, wetlands, fish, wildlife, recreation (including trails), and aesthetic resources.

03 Regeneration timber harvest shall only occur where there is reasonable assurance of adequate restocking within 5 years of harvest. Documentation of appropriate stocking level will be provided in project planning.

04 Even-aged timber harvest methods shall be used only where a completed interdisciplinary team review determines them to be appropriate, and clearcutting will only be used where it is determined to be the optimum method for regeneration and restoration, such as for aspen.

05 Even-aged regeneration cuts will be shaped and blended with the natural terrain.

06 Except for harvests that are the result of a large-scale disturbance event (such as stand-replacing wildfire, windstorm, or insect or disease outbreak), any even-aged regeneration timber harvest unit (clearcutting, seed tree cutting, or shelterwood cutting) will not exceed 40 acres without 60 days public notice and review by the regional forester.

07 The annual, forestwide sale of timber shall not exceed the quantity which can be removed annually in perpetuity on a sustained-yield basis (sustained-yield limit), except as defined in the 1976 National Forest Management Act.[4]

08 Harvesting systems shall primarily be selected for their ability to move toward ecological desired conditions for the site and not for their ability to provide the greatest dollar return or unit output of timber.

09 Permits, contracts and agreements that authorize removal and/or use of forest and botanical products must include provisions to protect, maintain, or enhance relevant resource values.

10 Personal use gathering (small quantities to be used within the household) of botanical products shall be allowed without permits as specified by product plans approved by the Forest Supervisor. Specifications shall include a common measurable amount at one time and any other limitations that support sustainability.

3. Management activities to meet resource objectives other than timber production (such as fuelwood harvest, thinning, and habitat enhancement) are permitted on all lands—"suitable" and "not suitable." For example, timber harvest for purposes other than timber production may be necessary to enhance habitat for threatened and endangered species or to improve conditions within a wildland-urban interface or in recreation sites.

4. 16 U.S. Code section 1611(a)(b).

Forest Products Guidelines

FW-FORESTRY-G

01 On lands classified as suitable for timber production, even-aged stands should have reached or surpassed 95 percent of the culmination of mean annual increment prior to having a regeneration harvest, unless it is needed to (1) contribute toward achieving the desired uneven-aged vegetation conditions over the long term; or (2) treat unsustainable stand conditions resulting from insects, disease, or other damage agents.

02 Surveys for reforestation needs should be completed within 1 year following a wildfire or other natural disturbance greater than 1,000 acres.

03 In areas identified as having high vulnerability to changing climate patterns, project planning should consider alternatives to mitigate potential climate change effects.

04 In project areas treating ponderosa or piñon pine, the potential for *Ips* beetle outbreaks should be minimized through the timing and treatment of green slash.

05 Treatments should be designed for controlling dwarf mistletoe to maintain infection levels that allow for development of a diversity of age classes across the landscape by applying mistletoe reduction methods such as thinning when stand level dwarf mistletoe rating is 3 or greater, or project (landscape of interest) dwarf mistletoe rating is 2 or greater. Treatments should not eliminate this naturally occurring disturbance agent.

06 Where severe dwarf mistletoe affects sustainability of the stand or development of desired uneven-aged characteristics, regeneration harvest or deferral from management are options that should be considered for local project planning.

07 Planning and design for vegetation management projects should incorporate input from specialists in multiple resource areas to include opportunities and consideration for multiple objective management.

08 Where current forests are lacking proportional representation of late-seral states and species composition on a landscape scale, old-growth components should be retained or developed through project design and silvicultural prescription within the scope of meeting other desired conditions (for example, reduce impacts from insects and disease, reduce the threat of uncharacteristic wildfire).

09 Projects and activities should promote movement toward plan level desired conditions for habitat connectivity, seral state diversity, species composition, size class distribution, old growth and patch size (see ecological response unit desired conditions).

10 Natural regeneration should be the preferred method for reestablishing vegetation unless there is inadequate recruitment.

11 Permits, contracts, and agreements should not allow for collection of plant species or plant parts unless Lincoln National Forest staff has information that indicates it will not be detrimental to species persistence, it is necessary for species conservation, is important for tribal collection, or is a research request that will aid in the management of that species.

12 Personal use gathering (small quantities to be used within the household) of forest products shall be allowed without permits as specified by current product plans approved by the forest supervisor. Specifications shall include a common measurable amount at one time and any other limitations that support sustainability.

13 Projects and activities should support long-term retention of plant and animal diversity.

14 Projects and activities should implement guidelines and recovery objectives in the most current recovery plans and conservation agreements for all federally listed species and species of conservation concern (see Wildlife, Fish, and Plants plan components).

15 Projects and activities should promote recruitment and development of healthy southwestern white pine and aspen.

16 Projects and activities should manage for sustaining spruce and/or corkbark fir on the areas where they occur, consistent with the ecology of the site.

17 Projects and activities should retain coarse woody debris sufficient to meet wildlife needs, maintain site productivity, and support natural fire regimes (see individual ecological response unit mid-scale desired conditions), except when necessary in the wildland-urban interface.

Forest Products Management Approaches

Consider the following:

01 In areas highly vulnerable to climate change, increase resiliency by using a diversity of treatments to facilitate natural adaptation to changing conditions such as managing in favor of early- to mid-seral species over late-seral species in ecotones, as species characteristic of lower life zones are adapted for warmer and drier conditions. Retain refugia of vegetation types in draws and cold drainages. Manage tree basal area at the low end of the range of desired conditions to mitigate water stress.

02 Prepare pest control plans with forest health specialists that contain appropriate mitigation measures (such as use of resistant tree species, maintenance of species diversity, removal of damaged trees, or use of pesticides) and monitoring procedures.

Range

Livestock grazing of the forage production from range and forested lands are an economic driver and a prominent provisioning ecosystem service for local communities in the four counties (Otero, Lincoln, Eddy, and Chaves) that encompass the Lincoln National Forest. The livestock grazing program on the national forest contributes jobs, labor income, and economic outputs to the four-county area. Indirect economic impacts and provisioning services include businesses that support the logistical needs of ranching operations. Most ranching operations in New Mexico are family-owned businesses. Livestock are a very important part of the culture of the small communities surrounding the forest. Historically, livestock grazing has been the primary economic driver for settlement of the west and still is the primary industry in some rural communities. Many of the Lincoln's livestock producers and their families have grazed these lands for generations and for many producers, grazing on national forest lands is important not only as a source of income, but as a part of their heritage, cultural identity, and family history.

The land that comprises the Lincoln National Forest has been grazed by domestic livestock much longer than the national forest has existed as an administrative entity. The Lincoln National Forest and surrounding lands have been grazed by domestic livestock since the Spanish first settled the area around 1700. Initially, small numbers of cattle, sheep, swine, horses, and goats grazed under common use systems and understandings across the landscape where forage was abundant relative to the demand. Subsistence was a primary objective. Over time, more livestock where moved in as a commercial venture, which created competition and over exploitation of limited resources and the eventual decline of forage resources and watershed functionality. The advent of the Organic Act and Forest Reserves (now known as national forests) began the regulation of the kind and amount of livestock grazing to promote sustainability. With this regulation of grazing, the amounts and types of livestock grazing on federally administered lands has dramatically decreased once the establishment of the grazing permit system was invoked. Currently, the Lincoln National Forest is grazed primarily by domestic cattle, with limited grazing by horses typically associated with the cattle grazing operation. Currently, no domestic sheep grazing permits are in use on the Lincoln National Forest.

As part of the agency's mission, the Lincoln National Forest authorizes domestic livestock grazing under a permit system. The permit system administers livestock grazing to be compatible with other multiple-use objectives and promotes desired economic and cultural benefits to communities.

The types of livestock operations permitted on the national forest are primarily cow-calf ranches—operations where a permanent herd of mother cows and bulls are kept by a rancher to produce weaned calves for later sale. Some permits have yearling carryover (meaning additional forage is authorized once a calf has reached 6 months old but has not been sold yet) and/or yearling stocker options (meaning when additional forage is available, the rancher may purchase additional young cattle to graze and fatten). Some permits also include small numbers of ranch horses or mules used for the management operations of the allotment. All grazing permits are tied to privately-owned "base property" commensurate with the use of the national forest, which the Lincoln National Forest has defined as a minimum 80 acres of fenced land with livestock handling facilities and available water.

Livestock grazing is permitted on all vegetation types found on the Lincoln National Forest. Rangeland managers and permitted livestock producers work cooperatively to resolve management issues. This usually involves a combination of structural and non-structural range improvements and adjustment in grazing season and pasture rotations. These determinations are made through the allotment management planning process and annual adjustments related to water and forage availability and condition and maintenance of rangeland infrastructure such as fencing, water developments, and corrals.

Range Desired Conditions

FW-RANGE-DC

01 Sustainable rangelands provide forage for livestock grazing opportunities that contribute to provisioning and cultural ecosystem services (such as agricultural businesses, livelihoods, and generational ties to the land).

02 Rangelands are resilient to disturbances and variations in the natural environment (fire, flood, climate variability, etc.).

03 Livestock grazing is compatible with ecological functions and processes (water infiltration, wildlife habitat, soil stability, and natural fire regimes).

04 Native plant communities support diverse age classes of shrubs, and vigorous, diverse, self-sustaining understories of grasses and forbs relative to site potential (per terrestrial ecosystem units), while providing allowable forage use if in excess of ecological or social requirements.

05 Rangeland management infrastructure functions to maintain or improve livestock grazing practices, management systems, and the condition of forest ecological and cultural resources.

06 Stocking rates are compatible with available forage.

Range Objectives

FW-RANGE-O

01 Maintain, improve, or install five water features per 5-year increment to improve water availability for wildlife or livestock where natural water sources are limited. These water features can serve dual purposes for both wildlife and livestock and can be done in conjunction with objective for water features in the wildlife section.

02 Evaluate vacant allotments every 5 years to determine availability to livestock grazing at appropriate stocking levels and compatibility with other multiple use values.

Range Standards

FW-RANGE-S

01 New domestic sheep and goat allotments will not be established or authorized where there is the potential transfer of disease from domestic sheep to bighorn sheep, wherever bighorn sheep occur.

02 The appropriate timing, duration, and intensity of livestock grazing will be evaluated and established within allotment management plans in order to maintain ecological function and processes or other multiple-use objectives.

03 Utilization or residual forage thresholds will be established during planning cycles (including annual operating instructions, allotment management plans, and coordinated resource management plans; and permit renewal), in accordance with best available science or applicable threatened and endangered species recovery plans to sustain livestock grazing, while maintaining ecological function and processes or other multiple-use objectives.

Range Guidelines

FW-RANGE-G

01 Allowable forage use should consider all grazing ungulates and be based on maintaining or enhancing desired ecological conditions.

02 Livestock grazing distribution and forage use within riparian management zones (along streams and around seeps, springs, lakes, and wetlands) should be managed to sustain desired hydrologic functions and vegetation communities, while considering water availability for established beneficial uses and water quality under New Mexico water laws.

03 Where possible, range infrastructure and livestock management practices that may contribute to concentrations of livestock such as salting, livestock troughs, tanks, corrals, and holding facilities should be located out of riparian management zones (along streams and around seeps, springs, lakes, and wetlands) to protect riparian ecological resources.

04 New or replaced water developments should be designed, constructed, and maintained to allow use by livestock and wildlife.

05 New range infrastructure (troughs, tanks, etc.) should be designed to avoid or mitigate long-term negative impacts to soil resources (unsatisfactory soil condition), to maintain hydrological function outside the structure's footprint. Long-term will be defined on a project-by-project basis.

06 New or reconstructed fencing, cattle guards, and watering infrastructures should allow for wildlife passage and escape, except where specifically intended to exclude wildlife (such as elk exclosure fence).

07 Salting or mineral supplementation should not occur on or adjacent to areas with known at-risk species habitat, riparian areas, wetlands, or archeological sites.

08 Restocking and management of grazing allotments following a major disturbance (such as fire and flood) should occur on a case-by-case basis after consideration of site-specific resource conditions concerning adequate vegetation establishment, cover, and soil stability.

09 Vacant or understocked allotments may be made available to permitted livestock grazing where compatible with other multiple-use objectives to provide pasture during times or events when other active allotments are unavailable and require ecosystem recovery as a result of natural disturbances (such as wildfire) or management activities (such as vegetation restoration treatments).

Range Management Approaches

Consider the following:

01 Lincoln National Forest managers cooperate, collaborate, and coordinate with livestock producers and stakeholders to respond to changing resource conditions. Cooperation, collaboration, and coordination with stakeholders is key to improving rangeland and forest conditions for multiple uses, moving towards desired conditions, and contributing to the socio-economic wellbeing of local communities.

02 Develop partnerships with livestock grazing permit holders, agencies, and other groups and individuals to develop collaborative proposals and implement projects that benefit multiple use on the Lincoln National Forest.

03 Coordination with livestock producers holding national forest grazing permits should occur at the early stages of planning and project design to include local perspectives, needs, concerns, and traditional knowledge.

04 Acknowledge the economic, traditional, and cultural importance of livestock grazing to southern New Mexico families.

05 Consider emphasizing large-scale landscape approaches and treatments for restoring rangelands and the use and perpetuation of a diversity of native plant species, with an emphasis on grass, forb, and shrub communities.

06 Consider an adaptive management strategy to manage livestock grazing in a manner that promotes ecosystem resiliency, sustainability, and species diversity based on changes in range conditions, climate, and other resource conditions. The adaptive management strategy is to provide more flexibility to grazing management while improving or maintaining the health of rangelands.

07 Facilitate dialogue between the New Mexico Department of Game and Fish and livestock producers about ungulates (elk, deer, and livestock) and the cumulative impacts on forest resources.

08 Where an allotment fence intersects a designated trail, consider a pass-through section (for example, easy-to-use gate, walk-through gate, horseback accessible) to provide access for recreation users unless it interferes with range management and resource protection.

Recreation

The Lincoln National Forest provides a diverse range of recreation settings and cultural ecosystem services across nearly 1.2 million acres ranging from the Chihuahuan desert to subalpine forested mountains. Outstanding recreational opportunities range from the most primitive and wild to the highly developed and are available throughout the year. During hot summer months, visitors enjoy the cooler temperatures in higher elevation forested areas; during winter, they seek both the lower elevation desert activities in the multi-hued canyons and Chihuahuan desert environments and higher elevation snow activities in the peaks and valleys of the Sacramento Mountains (USDA FS 2014). The Lincoln National Forest consists of “sky islands,” isolated mountain ranges surrounded by desert. One of the smaller national forests in the West, the Lincoln has three distinct districts, each with its distinguishing characteristics and constituents.

Around the tourist town of Ruidoso, the Smokey Bear Ranger District consists of the White, Capitan, Jicarilla, and Carrizo mountains and the hills above Highway 70 east of Ruidoso Downs. Both of the Lincoln National Forest’s wilderness areas, comprising about 82,924 acres, are located within this district and a large amount of equestrian use and outfitting and guiding for hunting occurs here. Mountain biking is popular and walking and biking trails close to town have been developed in partnership with local agencies and organizations. Ski Apache—the southernmost major ski area in the United States offering snow-based activities in the winter—straddles the Lincoln National Forest and Mescalero Apache Reservation.

The Sacramento Ranger District has the majority of the developed campgrounds on the Lincoln National Forest and is a destination for motorized trail riders. Encompassing about one-half of the national forest, this district is the largest contiguous area of forest and also provides special use permits to outfitters and guides for hunting in this area. Locals are proud of their railroad logging history, which they highlight with their railroad grades converted to trails. The clear skies of the Sacramento Mountains make this area popular for astronomers, both professional and amateur. The western, lower elevation boundary of the Sacramento district abuts the eastern edge of Alamogordo.

Adjacent to Carlsbad Caverns and Guadalupe Mountains national parks, the Guadalupe Ranger District's cave and karst geology draws cavers from all over the world to explore undeveloped caves. Fall brings hunters to the steep ridges and canyons of this district and its oasis in the desert, Sitting Bull Falls Recreation Area can be busy year-round.

The Lincoln National Forest offers interpretive information at the district offices and sites throughout the forest, including at popular recreation sites such as Sitting Bull Falls and the Mexican Canyon Trestle Vista, at overlooks such as Five Points Vista, Haynes Canyon Vista, and the West Capitan Vista, and at more remote sites like Nelson Canyon and sites along various rail trails. Visitors appreciate having access to information; therefore, the Lincoln National Forest has the opportunity to improve visitor satisfaction by making more information available whether on signs at the site, through guided hikes, or through electronic means. However, signs have high upfront costs and ongoing costs, and may be damaged inadvertently or by vandals. Guided hikes have ongoing costs as they require employees, partners, or volunteers for implementation. Use of technology and social media may allow for cost effective communication with users.

In 2008, the Lincoln National Forest developed a recreation niche statement and setting map through the recreation facility analysis process. The niche statement describes the unique characteristics, opportunities, settings, and activities of the Lincoln's recreation program. The recreation niche settings (USDA FS 2006b) are spatial representations of the potential opportunities and activities available across the national forest.

The four principle settings, special places, and values detailed in the 2008 Recreation Facility Analysis (USDA FS 2008a) include climatic relief zones, dispersed use, scenic corridors, and recreational site nodes. Visitors experience a diversity of life zones, from desert canyons and mesas to pinion-juniper woodlands and subalpine forests. Sitting Bull Falls Recreation Area presents a unique opportunity for water play during the spring and summer months and the Permian Reef entices visitors nationally and from abroad to explore the geology and biology of this Karst topography. Steep and narrow canyons and other lower elevation areas offer warmth during colder months. Heritage attractions such as Civilian Conservation Corps sites, the Trestle and lookout towers showcase the history of the forest. Partnerships like the Sunspot Observatory and the rails-to-trails program have enhanced the Lincoln National Forest's recreation offerings. Families and retirees appreciate the diversity of day use recreation opportunities.

The Lincoln National Forest uses the desired recreation opportunity spectrum (Hill 2016) to identify various development levels of recreation activities available to visitors. The recreation opportunity spectrum is a continuum used for managing recreation opportunities based on a combination of physical, biological, social, and managerial settings, ranging from the paved to the primeval. The recreation opportunity spectrum uses the following descriptors for recreation settings, ranging from least to most developed: primitive, semi-primitive non-motorized, semi-primitive motorized, roaded natural, rural, and urban. These recreation opportunity spectrum classifications are used as a measure in project planning to measure the degree of variation from the existing classification to a new classification (see maps in appendix A).

General Recreation

General Recreation Desired Conditions

FW-REC-DC

01 The unique cultural, historical, and ecological resources of the Lincoln National Forest are featured through recreation opportunities, education, and interpretation. Visitors have opportunities to connect to the importance of the past, present, and future of the forest.

02 Recreation opportunities are commensurate with the recreation setting per the desired recreation opportunity spectrum, enhance the economic, cultural, and social vitality and well-being of surrounding communities.

03 Lincoln National Forest staff are engaged with local communities, stakeholders, and volunteers to foster partnerships and facilitate the management of sustainable recreation and cultural ecosystem services.

04 Use conflicts are infrequent.

05 Recreation experiences are not diminished by human disturbances (such as vandalism, theft, and overuse).

06 Sustainable recreation opportunities are variable (recreation settings, activities, and seasonality), adaptable to changing uses and trends, available commensurate with public interest, resource capacity, and other natural and cultural resource values.

07 Forest resources are not degraded by recreational activities (trails, developed and dispersed recreation sites).

General Recreation Objective

FW-REC-O

01 Recreation opportunity spectrum classes are kept to within 15 percent of those identified for 15 years or the life of the plan in order to support the continued spectrum of recreation opportunities.

General Recreation Standard

FW-REC-S

01 The maximum allowable overnight occupancy within the Lincoln National Forest is 14 days (consecutive or not) within a 30-day period, except as authorized by permit.

General Recreation Guidelines

FW-REC-G

01 All project-level decisions and implementation activities should be maintaining or moving toward desired recreation opportunity spectrum mapped classes and setting descriptions to sustain recreation settings and opportunities.

02 Recreation opportunity spectrum classes should be kept to within 15 percent of those identified for 15 years or the life of the plan in order to support the continued spectrum of recreation opportunities.

03 Disruptive projects activities (including special use authorizations and restoration work) should not be scheduled on weekends or holidays during the major recreation season (between Memorial Day and Labor Day) so to not affect recreation experiences including the scenic setting, except in cases of wildland fire management or when doing so would otherwise not achieve project goals.

General Recreation Management Approaches

Consider the following:

01 Develop or enhance partnerships and collaborate with agencies, groups, communities, volunteers, permit holders, and other individuals to increase forest stewardship, ecological awareness, volunteerism, and user satisfaction, promote a sustainable recreation program, support local recreation-based economic development, and cultural ecosystem services.

02 Convene and encourage multi-stakeholder groups to address recreation maintenance concerns in specific areas.

03 Collaborate with permitted livestock producers and recreationists to resolve conflicts.

04 Multilingual interpretation in recreation areas popular with non-English speaking visitors.

05 Incorporate information technology (such as scannable QR codes, web addresses, and interactive maps) into signs and interpretive materials to direct public to additional information.

06 Manage excessive recreation use resource impacts by using techniques that change habitual behaviors and promote citizen stewardship and education. Issue closure orders to maintain public safety or where short-term measures are adequate to reduce resource impacts.

07 Use sustainable operations (recycling receptacles, electric maintenance vehicles, etc.) at developed recreation sites.

Developed Recreation

Developed Recreation Desired Conditions

FW-DEVREC-DC

01 Developed recreation sites meet the expectations of the public and are sustainable (for example, developed sites generate enough fees to pay for the cost of operation, maintenance, and enhancement).

02 Recreation facilities are safe, well-maintained, and function as intended. New facilities are appropriate within the recreation opportunity spectrum setting and complement private opportunities while not being redundant.

03 Developed recreation sites complement the forest's scenery resources and scenic character.

04 Developed recreation sites include opportunities to reduce solid waste (such as recycling) and utilize renewable resources to the extent possible.

05 Recreational users have the opportunity to learn about stewardship of natural and cultural resources associated with ecosystem services.

Developed Recreation Objective

FW-DEVREC-O

06 Ninety-five percent of recreation facilities are maintained in a fair to good condition within 15 years.

Developed Recreation Guidelines

FW-DEVREC-G

01 Recreation developments and improvements should be planned, designed, and managed for activities and capacities that allow for sustainable use and resource protection.

02 Design, construction, and maintenance of signage (trail markings, kiosks, and interpretive signs) and facilities should be consistent with the scenic and cultural character of the surrounding landscape and the development scale appropriate to the recreation opportunity spectrum class.

03 Recreation facilities and improvements should be designed to prevent human and wildlife conflicts. For example, improvements should use animal-resistant trash cans and cap or screen pipes on gates, vault toilets vents, and interpretive sign bases.

04 Wildlife-resistant trash and food boxes should be used when installing new or replacing existing models.

05 Constructed features should be maintained to support the function(s) for which they were built. When no longer utilized as intended, they should be repurposed to accommodate the new use or decommissioned in order to reduce maintenance backlog and infrastructure deterioration and to protect public safety and health.

06 The use of new recreation technologies and trends (such as drones and slacklining), at developed recreation sites, should be considered on a case-by-case basis for the protection of public safety, other resource, and quality recreation opportunities.

07 To sustain recreation settings and opportunities, all project-level decisions and implementation activities should be consistent with the recreation opportunity spectrum classes and setting descriptions in the recreation opportunity spectrum.

08 Over-the-snow vehicle travel should be allowed where snow depth is adequate—except in wilderness areas or areas closed to over-snow vehicles—in order to protect other resources such as administrative sites, reforestation, and sensitive plant and wildlife areas.

09 Constructed features, facilities, and management activities should be planned and designed to blend with the natural appearing landscape, closely following the form, line, color, texture, and pattern common to the desired scenic character. Apply design guidelines found in USDA Handbook, National Forest Landscape Management Series.

10 Lincoln National Forest staff should emphasize “low impact” or “no trace” recreation use concepts in presentations, public messages, and conservation education services.

Developed Recreation Management Approaches

01 Consider the financial sustainability of the developed recreation program and prioritize sites for decommissioning, closing, repurposing the facilities, increasing revenue, decreasing costs, and/or leveraging partnerships.

02 Consider the volume of use, resource protection needs, and opportunities for public-private partnerships, geographic distribution, and operating costs and revenues to determine the operation or closure of a site.

03 Build relationships, identify common interests, and leverage resources that support tourism and support sustainable operations.

04 Consider adaptively managing recreation facilities and shifting limited program resources to prioritized sites.

05 Consider repurposing closed or unused facilities (such as fire towers, cabins, and recreation residences) as possible recreation rentals.

06 Consider posting public safety and stewardship information at developed recreation sites that includes a welcome to the site as well as rules and regulations on recreational activities.

Dispersed Recreation

Dispersed Recreation Desired Conditions

FW-DISREC-DC

01 Dispersed recreation opportunities range from remote backcountry solitude to roadside campsites along popular corridors. Dispersed recreation is consistent with management tools (motor vehicle use map and recreation opportunity spectrum classes) and does not adversely affect ecological resources.

02 Hunting and fishing opportunities are available.

03 The Lincoln National Forest trail system is sustainable (using design, construction, and maintenance) and supports cultural ecosystem services through recreation opportunities.

04 Trail and dispersed recreation use conflicts are rare and easily resolved (for example, signs display designated uses and uses are separated with a schedule).

05 Unauthorized access (roads and trails) and non-system routes are not present on the landscape.

06 A system of motorized and non-motorized trails is available in a variety of settings that provide differing levels of challenge, types of experiences, and linkages to local neighborhoods, communities, and other public lands.

07 Loop trails exist for easy to arduous trail users.

08 Trail use, construction, and maintenance is consistent with desired conditions for natural and cultural resources.

09 Natural and cultural resources are not adversely impacted by trails.

10 The location and design of roads and trails does not impede wildlife and fish movement.

Dispersed Recreation Objectives

FW-DISREC-O

01 Twenty percent of trails are maintained to meet national quality standards within 10 years.

02 Verify and correct signage for 100 percent of system trails within 15 years.

Dispersed Recreation Standards

FW-DISREC-S

01 Motorized uses are prohibited in primitive recreation opportunity spectrum settings and in semi-primitive non-motorized recreation opportunity spectrum settings, except for administrative activities, authorized activities under permit, and emergency access.

02 In semi-primitive non-motorized recreation opportunity spectrum settings, no new permanent motorized routes or areas shall be constructed or designated. Temporary motorized routes or road construction in semi-primitive non-motorized settings must be decommissioned and rehabilitated within two years of project completion.

Dispersed Recreation Guidelines

FW-DISREC-G

01 National Forest System trails should not be used for management activities (such as administrative motorized use) that have negative impacts trail conditions (rutting and damaging vegetation outside of the trail prism) or the user experience unless alternatives entail greater resource damage or the trail is needed for wildland fire suppression.

02 Trails should be sustainably designed, constructed, rerouted, or maintained using current best management practices.

03 Trails (motorized and non-motorized) that adversely impact cultural resources, at-risk species, or riparian areas should be relocated where possible.

04 When closing or mitigating adverse effects of dispersed recreation areas, native vegetation and natural materials should be used when practicable.

05 Dispersed camping sites should be rehabilitated or otherwise mitigated when:

a. site conditions are no longer consistent with the area's scenic integrity objective;

b. there are persistent user conflicts;

c. environmental damage is occurring (for example, eroded streambanks, large areas of denuded vegetation, piles of campfire ash, and human waste impacting natural water features);

d. when cultural or tribal resource are being damaged; or

e. there are conflicts with permitted special uses.

Dispersed Recreation Management Approaches

Consider the following:

01 Work with volunteer groups, partners, local governments, and adjacent landowners to maintain trail corridors, maintain the condition and character of the surrounding landscape, and facilitate trail use that promotes "Leave No Trace" principles and reduces conflict.

02 Implement programs and educational techniques (such as brochures, signs, websites, and social media) that promote visitor knowledge of:

- Proper non-motorized and motorized trail use etiquette
- "Leave no Trace" principles
- Fire prevention (especially, how to properly extinguish campfires)
- At-risk species habitat

03 Discourage the creation and use of non-motorized user-created routes (for example, redirect recreation use to National Forest System trails).

04 Construct barriers to control unauthorized use in areas with a high potential for illegal cross-country motorized vehicle use.

05 Post information to redirect use and encourage public compliance in site rehabilitation efforts.

06 Promote clean camping practices (such as "Leave No Trace" and "Pack-It-In, Pack-It-Out") at dispersed sites.

Recreation Special Uses

Recreation special use authorizations allow the use and occupancy of National Forest System lands when the proposed activity supports the Forest Service mission, meets demonstrated public needs, and aligns with the desired conditions for the use area. Tourism, nature-based outdoor recreation, and other special recreational uses encourage responsible use by visitors and local communities. Recreational special uses may include ski areas, outfitters and guides (for hunting, backpacking, etc.), recreation residences, and recreation events. Many recreational special uses provide cultural ecosystem services with economic opportunities and sustainability to local communities. The quality of life is supported when there are recreational and educational opportunities provided through special use permits.

Recreation Special Uses Desired Conditions

FW-RECSU-DC

01 Recreation special use authorizations provide unique opportunities, services, and experiences for the recreating public and address a demonstrated demand for a specific recreation opportunity.

02 Recreation special use authorizations are timely, efficient, user-friendly, and consistent across similar locations and uses.

03 Recreation special use authorizations balance public demand with desired conditions for ecological resources and multiple uses.

04 Recreation special uses contribute provisioning ecosystem services to the local economy by providing small business opportunities.

Recreation Special Uses Standards

FW-RECSU-S

01 Organized group events (non-motorized or motorized) must not be authorized under special uses where resource impacts are determined to be adverse (USDA FS 2016a) unless mitigated.

Recreation Special Uses Guidelines

FW-RECSU-G

01 Special use authorizations for recreation events and outfitting and guiding services should be analyzed relevant to resource impacts.

Recreation Special Uses Management Approaches

Consider the following:

01 Collaborate with New Mexico Game and Fish, New Mexico Council of Outfitters and Guides, and other New Mexico national forests to coordinate special use permitting consistency for outfitters and guides. Consider convening an annual meeting between the Lincoln National Forest, the New Mexico Council of Outfitters and Guides, and State of New Mexico representatives to discuss issues and management strategies.

02 Consider directing applicants desiring special use authorizations in heavily used areas to alternative areas that can better support the desired activities.

03 Consider using tools that assist in efficiencies to the program and expand administrative capacity (such as Lincoln National Forest's categorical exclusion week, special use modernization efforts, proposed statewide outfitter and guide permits, and regional billing team).

Scenery Resources

The Lincoln National Forest offers a wide diversity of settings, from conifer covered mountains and piñon-juniper woodlands rising from high desert plains to spectacular canyons. People are drawn to the Lincoln National Forest area for its stunning views, cool mountain escape from desert climates,

and outstanding recreation opportunities. The forest offers dark night skies and provides the backdrop to many communities and homes. The Lincoln area has a variety of scenic settings with mesas, canyons, and peaks rising from deserts, meadows, and grasslands. Scenery provides cultural ecosystem services through aesthetics, recreation, and tourism.

The natural and natural-appearing scenic character of the Lincoln National Forest stands out, making it a major local, regional, and national recreation and living destination. The mountain landscapes are a focal point viewed from Alamogordo, New Mexico, and the backdrop to communities in the area. When managing for scenic resources, concern levels are used to measure the public importance placed on landscapes viewed from travel ways and use areas. Roads surrounding the forest and most roads, trails, and recreation sites on the Lincoln National Forest have high public concern for viewing scenery, especially those areas along the Sunspot and Billy the Kid scenic byways, designated wilderness areas, and the wilderness study area. The forest also has many prehistoric and historic sites adding richness of character and culture. A high concern for viewing scenery means that users expect to see a natural-appearing landscape.

Perennial streams and springs throughout the landscape, unique waterfalls, diverse vegetation, higher elevation tree-covered mountains, and steep, vibrant-colored cliffs and canyons combine to provide for distinctive landscapes over much of the forest. The water, landform, and vegetation attributes provide for unique and outstanding scenic quality with a variety, unity, vividness, intactness, order, uniqueness, pattern, and balance.

The Lincoln National Forest is managed per scenic integrity objective maps. There are five levels of scenic integrity: very high, high, moderate, low, and very low. These scenic integrity objectives determine how much alteration of the landscape's character is permissible, according to USDA Handbook 701 "Landscape Aesthetics: A Handbook for Scenery Management" (USDA FS 1995). See table 2 for a description of scenic integrity objectives and how they relate to public perceptions of scenery.

Table 2. Scenic integrity objectives and how they relate to public perceptions of scenery

Scenic Integrity Objective	Public Perceptions of Scenery
Very high	Unaltered; scenic character is intact; naturally evolving
High	Appears unaltered; alterations to scenic character may be present but are not evident; naturally appearing
Moderate	Slightly altered; alterations are subordinate to scenic character being viewed (scenic character is dominant, not the alteration); relatively naturally appearing
Low	Moderately altered; alterations begin to dominate the valued scenic character being viewed.
Very low	Heavily altered; alterations may strongly dominate the valued scenic character.

Aesthetic and scenic values of the Lincoln National Forest contribute to the attractiveness of the forest and the general quality of life for residents. Residents and visitors experience a particular "sense of place," a cultural ecosystem service that partially depends on the scenic backdrop the forest provides for many communities in southern New Mexico.

Scenery Resources Desired Conditions

FW-SCENIC-DC

01 The forest contains a variety of ecologically sound, resilient, and scenically appealing landscapes that sustain scenic character in ways that contribute to visitors' sense of place and connection with nature.

02 Naturally appearing landscapes are interconnected throughout the forest and connected to natural landscapes outside the national forest boundary.

03 Landscapes possess vegetation patterns and compositions that are naturally variable in appearance and contribute to scenic values. The natural and cultural features that provide a "sense of place" are intact.

04 Users have opportunities to experience important scenic elements (fall colors, high mountain meadows, picturesque vistas, rugged canyons and escarpments, etc.).

05 The forest appears predominantly natural and human activities do not dominate the landscape.

06 High-quality scenery dominates the landscape in areas the public values highly for scenery (such as developed recreation sites, major roads and trails, scenic byways) and high scenic integrity areas (such as wilderness areas, wilderness study area, and inventoried roadless areas).

07 Scenery supports cultural ecosystem services by reflecting ecosystem diversity, enhances recreation settings, and contributes to the quality of life for local residents and communities, as well as forest users from outside the area.

08 Interpretive or informational signs are displayed at sites with impacts to scenery to inform the public about the nature and consequences of such projects or events.

Scenery Resources Guidelines

FW-SCENIC-G

01 Constructed features, facilities, and other infrastructure activities should blend with the natural appearing landscape and complement the natural setting.

02 Scenery management, scenic integrity objectives, scenic character, and scenery values should be integrated into the design, planning, and implementation of all resource management decisions, according to the process described in U.S. Department of Agriculture's National Forest Landscape Management Series (FSM 2380.6).

03 Management activities should minimize scenery disturbances (for example, avoid clear cuts if possible, mimic natural vegetation states, collocate constructed features, and design manmade features with scale and color that blends with surroundings) and should be consistent with or move the area toward achieving scenic integrity objectives:

a. In areas with very high scenic integrity objectives, the scenic character should have only minor, if any, deviations. The areas should appear unaltered, with the majority of the area dominated by ecological processes. Range facilities are allowed, but mitigation measures (such as compatible color or size) should be used to minimize impacts to scenic quality.

b. In areas with high scenic integrity objectives, the scenic character should appear intact, but may include deviations that are not evident (for example, repeat the scenic attributes of size, shape, form, line, color, texture, or patterns common to the scenic character).

c. In areas with moderate scenic integrity objectives, the scenic character may appear slightly altered. Management activities including manmade structures and facilities should not dominate the scenic character, but should use scenic attributes to blend into the landscape (for example, repeat the scenic attributes of size, shape, form, line, color, texture, or patterns common to the scenic character).

d. In areas with low scenic integrity objectives, the scenic character may appear moderately altered. Management activities including manmade structures and facilities may begin to dominate the scenic character, but should use scenic attributes to blend into the landscape (for example, repeat the scenic attributes of size, shape, form, line, color, texture, or patterns common to the scenic character).

04 Management activities that result in short-term impacts inconsistent with scenic integrity objectives should achieve the scenic integrity objectives over the long term. Short-term and long-term timeframes should be defined during site-specific project planning.

05 Effects to scenery from prescribed fire should be considered during project planning and implementation. Efforts should be made to minimize uncharacteristic wildfire along areas valued highly by the public for scenery (as defined in the Scenery Management System), unless actions (such as thinning ladder fuels) are necessary to meet management objectives or ensure public safety.

Scenery Resources Management Approaches

Consider the following:

01 Cooperate with other entities, such as the New Mexico Department of Transportation, tribal and local governments, and commercial and private entities to protect scenic integrity on and adjacent to the national forest, including along scenic byways.

02 Use best environmental design practices to advance environmentally sustainable design solutions (such as the Forest Service Sustainable Recreation Site Design Guide).

03 Use the Forest Service Built Environment Image Guide in construction or reconstruction of Forest Service facilities to ensure consistency with the scenic character of the Southwestern Region.

04 When setting priorities for scenic integrity rehabilitation consider the following:

- foreground (within one-half mile) of high public use areas is highest priority;
- amount of deviation from the scenic integrity objectives;
- length of time it would take natural processes to reduce scenic impacts so that they meet the scenic integrity objectives;
- length of time it will take rehabilitation measures to meet the scenic integrity objectives;
- benefits to other resource management objectives to accomplish rehabilitation; and

- as a component of project work or as funds are available, coordinate restoration of scenic integrity in areas where it has been negatively impacted, and where existing scenic integrity is lower than the scenic integrity objectives.

05 Prior to vegetation work in developed recreation sites or administrative facilities, develop vegetation management plans that outline activities to sustain the desired scenic character.

06 Use of native planting and key scenery elements over time.

07 Consider the following types of activities to enhance scenic resources: restore grasslands and aspen, decommission or rehabilitate unneeded and unauthorized roads and routes, remove unnecessary fences, and paint facilities along scenic byways in colors that blend with the landscape.

Roads

National Forest System roads are used for management, recreational activities, and commercial uses by various entities and as such have substantial social and economic impacts to the Lincoln National Forest and areas surrounding the forest. Forest Service staff use National Forest System roads for a variety of administrative purposes including fire management, law enforcement, and resource and facilities management. Ranching, utility, telecommunication, and mining permittees and operators depend on National Forest System roads to maintain their permitted operations. By providing access to forest resources, roads provide provisioning ecosystem services to forest users. Many National Forest System roads are also used by permittees as part of special use authorizations for activities such as hunting guide access, outfitter provided off-highway vehicle opportunities, and special use recreation events such as bicycle races.

National Forest System roads are vital to the public as they are the primary means for access to the national forest. The public uses National Forest System roads to access recreation interests such as camping, fishing, hunting, hiking, backpacking, mountain biking, rock climbing, sightseeing, driving off-highway with off-highway vehicles, and visiting historic and natural interest areas. National Forest System roads also provide cultural ecosystem services since they are used by the public for personal and commercial fuel wood gathering, mining, pine nut gathering, and traditional Native American uses.

There are approximately 2,686 miles of currently existing National Forest System roads under Forest Service jurisdiction on the Lincoln National Forest. The roads are managed and maintained to various road standards, or maintenance levels, depending on management objectives (USDA FS 2008b). The roads range from paved roads regularly maintained to rough high-clearance roads with little to no regular maintenance, depending on the type of access necessary. About 1,131 of these miles are currently closed to motorized vehicle use. These closed roads have been put in storage for administrative purposes.

In addition to National Forest System roads, unauthorized routes exist that are not part of the Lincoln National Forest transportation system; however, a current inventory of unauthorized routes has not been completed. Some of these roads were constructed for the purpose of permitted resource extraction, such as mining or timber harvest, and were considered temporary roads that would not be needed after the permitted use ceased. Many roads remain on the landscape and offer a tempting opportunity for unauthorized use of motorized vehicles such as all-terrain vehicles and motorcycles.

These roads are not part of the Lincoln National Forest transportation system and are not analyzed in the infrastructure assessment.

Roads Desired Conditions

FW-ROADS-DC

01 A safe transportation system and infrastructure accommodates needs for public access, land and resource management, and permitted activities while contributing to social and economic sustainability along with cultural and provisioning ecosystem services.

02 National Forest System roads and bridges provide safe, legal, and reasonable access for a wide variety of uses.

03 National Forest System roads are well-marked and provide for traveler safety and information.

04 The transportation system provides a variety of recreation opportunities with varying degrees of difficulty, from dirt roads to paved scenic byways, while limiting resource and use conflicts.

05 National Forest System and non-system routes do not cause adverse impacts to environmental resources (such as watercourses or sensitive riparian areas) or cultural resources.

06 Use of National Forest System roads does not hinder wildlife movement or interrupt critical life cycle needs (for example, calving, nesting, and mating).

07 Impacts to ecological resources (such as watersheds, wildlife, and soils) are reduced and habitat connectivity improved though the decommissioning of unauthorized routes.

Roads Objectives

FW-ROADS-O

01 Maintain 100 miles of maintenance level 3 passenger car roads and 60 miles of maintenance level 2 high clearance roads yearly for the life of the plan.

02 Decommission 75 miles of road within 15 years.

Roads Standards

FW-ROADS-S

01 Motor vehicle use by the public is only authorized where designated by the motor vehicle use map (except where motor vehicle use is authorized by law, permit, valid right, or order).

02 New motorized routes must not be constructed in areas where the desired recreation opportunity spectrum is designated as primitive.

Roads Guidelines

FW-ROADS-G

01 Road construction and maintenance should incorporate best management practices (such as Soil and Water Conservation Practices in FSH 2509.22).

02 Bridges and transportation infrastructure, such as culverts that serve as important habitat for at-risk wildlife, should not be demolished unless demolition is necessary for safety along the travel route.

03 New roads should be designed and constructed to minimize the delivery of sediment and pollutants to waterbodies.

04 Road management objectives and functional classification should not be changed if significant resources (for example, cultural resources, sacred sites, and species of conservation concern) may be adversely affected.

05 When a practical alternative does not exist, the footprint of new roads constructed in riparian management zones should be designed to mitigate or eliminate resource damage to ecological resources. Stream crossings and the footprint of new roads constructed should avoid impacts to ecological resources.

06 Project-level decommissioning of roads should follow recommendations in the current Travel Analysis Plan.

07 After management activities occur in areas with high potential for unauthorized motorized vehicle use, methods should be used to prevent unauthorized motor vehicle use (such as barriers, signs, and law enforcement).

08 Reconstruction and rehabilitation of existing roads should be emphasized over new road construction.

09 Temporary administrative roads that support ecosystem restoration activities, fuels management, or other short-term projects should be decommissioned to more natural vegetation conditions upon project completion to protect watershed condition, prevent wildlife disturbance, and prevent illegal motorized use.

10 Construction of new roads and trails or reconstruction and maintenance of existing roads intersecting fish-bearing streams should accommodate aquatic organism passage.

11 Road maintenance activities should avoid or minimize noise and habitat disturbance where at-risk species are present, depending on species needs (for example, seasonal scheduling).

12 To encourage natural channel morphology on perennial and intermittent streams, new or redesigned stream crossings (bridges and culverts) should be wide enough to successfully pass water, sediment, wood, and aquatic organisms.

Roads Management Approaches

Consider the following:

01 Within project areas, prioritize decommissioning of roads and routes that are redundant, adversely impact flow regimes, or cause resource damage.

02 Mitigate or decommission roads that may be susceptible to erosion, landslides, rock falls, or other landslide movements and hazard trees.

03 Maintain relationships and communications with internal and external customers as well as partners. Notify local governments, partners, adjacent landowners, permit holders, etc., of changes in road status and significant deviations in traffic patterns.

04 Prioritize road system maintenance to provide for safe travel on all roads as well as to prevent or mitigate resource damage. Continue current maintenance agreements and entering into new agreements with other entities including federal, state, tribal, and local government agencies, as well as private organizations and individuals.

Facilities

The Lincoln National Forest manages buildings and infrastructure for a variety of purposes. These include administrative facilities (offices, warehouses, employee housing, and fire facilities), the public recreational facilities (visor centers, campgrounds or picnic areas, restrooms, and storage buildings), and associated water and wastewater treatment systems, dams, and electronic and communication towers.

The Lincoln National Forest has both administrative and recreation sites and facilities that must be maintained as safe and functional for employee and public use. Facilities and infrastructure include the site (driveways, parking, landscaping), buildings, and the utilities (electric, water, wastewater) that service the site and building. Administrative facilities are the support facilities for Forest Service personnel. Some of the administrative facilities are accessible to the general public for getting information and buying permits. The Lincoln National Forest manages recreation facilities and sites; these include campsites, trail heads, scenic vistas, vault toilets, and other structures that support recreation on the forest. Dams on the national forest are also considered part of facilities and infrastructure. Other infrastructure such as communication sites, utility corridors, and range infrastructure are addressed elsewhere in the land management plan.

Properly designed and maintained facilities such as septic systems and roads help people use the forest while minimizing ecological impacts. Facilities help support communities economically and socially by providing access to and enjoyment of recreational resources and experiences. Facility condition and maintenance needs are variable and depend on factors such as age, original construction, past maintenance, and location. The facility condition index is used as a standardized agency method to monitor facility condition. It rates buildings as good, fair, or poor by using a calculation based on deferred maintenance costs and replacement value.

Facilities and infrastructure support cultural ecosystem services through campgrounds, fishing areas, trailheads, scenic vistas, toilets, and other infrastructure that supports recreation. Provisioning ecosystem services are provided by dams that hold drinking water for communities surrounding the Lincoln National Forest. Since administrative facilities sell permits for forest products, like fuelwood, they provide provisioning and cultural ecosystem services.

Facilities Desired Conditions

FW-FAC-DC

01 Infrastructure is safe and functions as intended or is adapted to accommodate the current and/or anticipated demands; the facilities provide an environment free from recognized hazards for people, while avoiding or minimizing negative impacts to natural, cultural, and social resources.

02 Surrounding vegetation conditions and building materials aid in the protection of infrastructure from wildfire and do not consist of nonnative invasive plants.

03 Facilities are energy-efficient, promote resource sustainability, and effectively serve their intended purpose.

04 Facilities are broadly accessible to Lincoln National Forest visitors, including persons with disabilities.

Facilities Guidelines

FW-FAC-G

01 New structures (such as buildings, campgrounds, and water systems) or other above-ground facilities should adhere to scenic integrity objectives and should not be located in areas of very high or high scenic integrity unless they are designed to blend in with the general landscape.

02 Construction of new facilities in floodplains, wetlands, and other environmentally sensitive areas should be avoided. When a practical alternative does not exist, the amount and area of disturbance should be the smallest size possible to protect these sensitive areas.

03 Infrastructure design, construction, reconstruction, and maintenance should prevent or mitigate impacts to terrestrial and aquatic species and decrease species mortality (for example, no reflective surfaces that would cause confusion and collision by birds; and features to accommodate appropriate movement for fish and other aquatic organisms).

04 Facilities should utilize native plants in the design of landscape features.

05 Exterior lighting for new and reconstructed facilities should be designed to reduce light pollution to the greatest extent while still providing for public safety and accessibility.

06 Facilities no longer utilized as intended should be repurposed to accommodate a new use or be decommissioned in order to reduce maintenance backlog and infrastructure deterioration, and to protect public safety and health.

07 Adaptive reuse of historic properties should be pursued when appropriate; maintenance and renovations should respect and maintain historic design.

Facilities Management Approaches

Consider the following:

01 Follow a comprehensive preventive maintenance program for buildings and infrastructure to minimize major unplanned repairs or replacements.

02 Prioritize infrastructure needs and investments for current need and long-term planning goals as described in facilities master plan, sustainable recreation plan, recreation facility analysis, and other resource planning documents, and health and safety requirements for employees and visiting public. All infrastructure with employee occupancy is subject to the Occupational Safety and Health Administration standards and will be evaluated regularly to protect the health and safety of forest employees, volunteers, and the visiting public.

03 Decommission potable water systems that no longer serve the current needs.

04 When work is being planned for administrative facilities and infrastructure that are historic resources, work with the heritage program and partnerships to administer and maintain facilities according to the facility master plan and any developed preservation maintenance plans (historic property plans).

05 Partner with local, state, federal, and tribal agencies, nongovernmental and academic organizations, and special interest groups to conduct maintenance or to repurpose excess infrastructure as outlined in facilities master plans, sustainable recreation plans, recreational facility analysis, and other resource planning documents, while following applicable standards and guidelines.

06 Consider using photovoltaic systems for administrative facilities, range improvements, resource monitoring, public safety, and recreation projects.

Lands and Access

Land ownership is the basic pattern of public and private ownership of both surface and subsurface estates. Land status is defined as the ownership record of title to lands, including withdrawals, rights, and privileges affecting or influencing the use and management of National Forest System lands. Land status refers to the use or specific designations of a geographic area that provide general guidance and policy for the management of a defined geographic area. This guidance can take the form of use restrictions (such as withdrawals or dedication) and encumbrances (such as rights-of-way acquired or granted, reservations, outstanding rights, partial interests, or easements). Land status differs from land ownership. Land use is the current use of land, such as residential, commercial, industrial, or agricultural use, and access is transportation access to or through the Lincoln National Forest.

About 14 million acres of land in four counties (Otero, Lincoln, Eddy, and Chaves) encompass the Lincoln National Forest. Within this expanse, there are distinct patterns of land ownership and use, each of which carries important implications for current and future forest management. The total acreage of the Lincoln National Forest—the plan area—is 1,095,470 acres of National Forest System land (USDA FS 2015b), with 166,425 acres in other ownership within the forest boundaries.

The planning area consists primarily of large tracts of National Forest System land interspersed with private land, state land, and Bureau of Land Management land. The Lincoln National Forest's three ranger districts are not contiguous, with more than 30 miles separating each district. The Smokey Bear Ranger District is bordered to the north, west, and east primarily by private land and some state land and Bureau of Land Management land. To the south, the district is bound by the Mescalero Apache Indian Reservation and the Village of Ruidoso. The Sacramento Ranger District is bordered to the north by the Mescalero Apache Indian Reservation, to the south by the Fort Bliss Military Reservation, and to the west by the City of Alamogordo. In addition, the district is bordered to the west, south, and east by private land, state land, and Bureau of Land Management land. The Guadalupe Ranger District is bordered predominately by Bureau of Land Management land on all sides with some state land and private land interspersed. To the south, the district is additionally bound by National Park Service land.

In addition, private inholdings of various sizes are scattered throughout the planning area. For the most part, these private inholdings were created when homestead entries were patented to private individuals. These scattered private inholdings create additional miles of irregular property boundary.

Lands and Access Desired Conditions

FW-LANDS-DC

01 National Forest System lands provide for ecosystem services and contribute to long-term socioeconomic diversity and stability of local communities, management of vegetation and watershed health, wildlife habitat and diversity, and recreation and scenic opportunity.

02 Right of ways to private property do not impede public access to National Forest System lands.

03 Forest boundaries are identified and correctly marked.

04 Legal access to National Forest System lands exist across private property (for administration, hunting, fishing, and recreation access).

05 Land connectivity through acquiring private inholdings support wildlife habitat and corridors, increases public access to the forest, and enhances more recreation opportunities.

Lands and Access Guidelines

FW-LANDS-G

01 Rights-of-way for roads, utilities, and communications sites should maximize use of existing infrastructure or collocated before new disturbance is allowed or authorized to minimize natural resource impacts (for example, new towers are not authorized until existing towers are fully utilized and existing distribution lines are used to carry both power and fiber optics).

02 Suitable and/or occupied threatened and endangered species habitat on private lands within Lincoln National Forest boundary should be recommended for acquisition.

03 Rights-of-way should be acquired by purchase, donation or condemnation. Rights-of-ways should be acquired for the following purposes:

a. Forest Service administration.

b. Public access.

04 Land exchanges should be recommended under the following conditions:

a. Opportunities to acquire private land within wilderness or with access to wilderness.

b. Community expansion needs.

c. Isolated tracts or tracts surrounded by private land should be considered for disposal.

d. Acquire private land in areas where there is a needed to block up National Forest System ownership for resource management (for example, habitat connectivity).

e. Dispose of Forest Service land with substantial improvements under special use permit to local governments or private organizations.

05 Acquired easements should include administrative access in addition to public access.

06 Special use authorizations for access to inholdings with multiple owners should be conveyed to a road users association or to a subdivision of local government to ensure the equitable (all owners have the same level of access and contribute to maintenance) and adequate maintenance (maintenance level and objectives are identified in the authorization) of the road and minimize the needs (one authorization versus multiple) associated with permit administration.

07 Special use authorizations for access to private property through National Forest System lands should not be granted unless the applicant has proven there is no other means of access.

Lands and Access Management Approach

Consider the following:

01 Consider encouraging the protection of existing public access rights and the acquisition of new public access opportunities to National Forest System lands.

02 Work with interested stakeholders to identify suitable parcels for acquisition and explore funding opportunities that leverage the Land and Water Conservation Fund, grant opportunities, and third-party financing.

03 Consider updating the existing landownership adjustment plan, which will identify lands desirable for acquisition, as well as identify parcels or areas as suitable for exchange or sale.

04 On easements acquired from private landowners, consider prioritizing public access interests over road closures.

05 Consider using the following criteria to prioritize boundary management surveys:

- Where known litigation is pending, a title claim has been asserted, encroachments are suspected, or the probability of encroachment can be reduced.
- Where significant resource values exist and use or manipulation of resources is planned (this includes the location, by survey, of right-of-way easements necessary for resource management).
- To ensure that any conveyance of land, resource, or restoration project that occurs near or adjacent to any Lincoln National Forest boundary does not proceed until the legal national forest boundary lines are properly located and physically marked in the field prior to any management action.
- To provide an accurate delineation and location of national forest boundary lines will help prevent boundary disputes and/or loss of valued National Forest System land and its resources.
- When all remaining property boundary lines have not been previously surveyed.

Lands Special Uses

Lands special use authorizations are issued for infrastructure related uses such as communication sites, utilities (electrical, communication, and internet lines), pipelines (natural gas and water), road access, sanitation, and alternative energy development that cannot be reasonably accommodated on private lands. Activities, such as research and monitoring and commercial filming are also permitted uses. Communication sites are critical to ensuring public and private user communications are

operational across New Mexico and contributing to national infrastructure systems. Utility and energy transmission rights-of-way, along with communication sites, are generally long-term commitments of National Forest System lands. Requests to use National Forest System lands for communication and electronic sites have increased over the past few years and will likely continue to increase. More demand for utility lines, renewable energy sources, community infrastructure, and private land access on National Forest System lands is also expected. Lands special use authorizations provide for provisioning ecosystem services through infrastructure related uses such as communication sites, electrical utilities, and pipelines (for example, natural gas and water).

Transmission Corridors

There are numerous sub-transmission, distribution, and unground transmission lines across the Lincoln National Forest serving local communities and neighboring counties. There are currently no high voltage transmission lines (greater than 229 kilovolts) crossing the national forest. Within Lincoln County, the SunZia Southwest Transmission Line, two 500 kilovolt overhead parallel lines and substations serve southwest New Mexico and southern Arizona. Another major transmission line, a 345-kilovolt line, crosses Otero, Chaves, and Eddy Counties serving western Texas and southern New Mexico.

Lands Special Uses Desired Conditions

FW-LANDSU-DC

01 Special use authorizations serve the demand for multiple use of National Forest System lands and protect sensitive ecological resources.

02 The special use authorization process is timely, efficient, user-friendly, and consistent across similar landscapes and uses to support provisioning ecosystem service.

03 Authorized roads, utilities, and communications sites are an integrated part of the landscape with little to no effect on natural, cultural, and tribal resources.

04 Environmental, scenic, and sound impacts of emerging technology, communication sites, utility corridors, and other authorized infrastructure are non-intrusive as a result of coordination and co-location among users.

05 Research authorized on the Lincoln National Forest results in improved understanding of the science of natural and social resources and uses without negatively impacting long-term ecological conditions.

Lands Special Uses Standards

FW-LANDSU-S

01 Permits for utilities that require use of roads not listed on the motor vehicle use map must incorporate requirements (for slope and drainage, etc.) for road construction, reconstruction, or maintenance.

02 Needed rights-of-way must be reserved in land exchanges and sales before leaving federal ownership.

Lands Special Uses Guidelines

FW-LANDSU-G

01 New authorized power or other utility distribution or service lines should be buried if site conditions permit to reduce fire hazard.

02 Special use authorizations for roads, utilities, and communications sites should maximize use of existing infrastructure and utility corridors before new uses are authorized, with the intent to reduce ground disturbance.

03 To reduce disturbance to other Lincoln National Forest resources, special-use authorizations for communication sites should be authorized only at existing locations. New authorizations will be allowed after a comprehensive environmental analysis indicates such occupancy will not compromise other national forest management objectives, that a valid demand exists for the requested use, and that the demand cannot be met outside of National Forest System lands.

04 Commercial or local government communication antennal should not be authorized on historic fire lookout towers that are eligible for listing or listed in the National Register of Historic Places. These towers may have radio antenna for fire lookout purposes.

05 Power pole installation or replacement under special use authorization should include raptor protection devices. As permits are renewed raptor protection devices should be installed on existing poles.

06 Electronic sites should be fully developed before authorizing new sites.

07 Existing energy corridors should be used to their capacity with compatible upgraded power lines before evaluating new routes.

08 Environmental disturbance should be minimized by collocating pipelines, power lines, fiber optic lines, and communications facilities.

09 Permits should include a results and performance monitoring requirement of submitting data within 2 years of project completion or at milestones identified in the authorization.

10 New transmission corridors should be located outside of inventory roadless areas.

11 Lands authorizations should maintain the roadless character of the inventoried roadless area.

Lands Special Uses Management Approaches

Consider the following:

01 Add stipulations to authorizations to install raptor protection devices on all existing poles.

02 Consider including in the operation and maintenance plan of recreation residence special uses authorizations to us the most recent edition of “A Guide to maintaining the Historic Character of Your Forest Service Recreation Residence” for guidance on any improvement or maintenance to eligible historic or unevaluated recreation residences.

03 Explore cost recovery measures that balance commercial viability with program sustainability.

04 Limit diesel-powered generators at facilities operating under a lands special-use permit.

Energy, Minerals, and Mining

This group of resources provide provisioning ecosystem services and includes a discussion on the leasable, locatable, and salable minerals that may be found within the Lincoln National Forest. The leasable minerals include oil and natural gas as nonrenewable energy. Locatable minerals are things such as gold, silver, copper, and uranium. Salable minerals are products such as sand, gravel, and landscaping rock. These resources are divided into three broad categories in this plan: leasable minerals, locatable minerals, and salable minerals. Renewable energy production—from sources such as wind, solar, and biomass—is also included in this section.

Mining and mineral resources provide provisioning and cultural ecosystem services important to communities and people around the forest. Provisioning ecosystem services are provided through potential natural gas and oil deposits, mineral resources, and renewable energy generation potential.

Leasable Energy Minerals

Leasable minerals are subdivided into two classes: fluid and solid. The most common fluid leasable minerals include oil and gas resources, geothermal resources, oil shale, and tar sands. Solid leasable minerals include coal, sodium, potassium, and phosphate. There are no oil or gas leases within the plan area and there are no leases for solid resources, as these resources are not found on the Lincoln National Forest. The geologic environment that hosts these resources is located in deep sedimentary basins, which are not present in the plan area.

Current Type, Extent, and General Area for Leasable Mineral Activity

Leasable minerals are disposed of through leases issued by the Bureau of Land Management after the Forest Service consents to leasing and provides the appropriate stipulations for each lease. Development of the leases may only occur after site-specific environmental analysis for each proposed development is prepared by the Forest Service and the Bureau of Land Management.

Smokey Bear Ranger District

Coal mining in the White Oaks district was once a prosperous industry in Lincoln County, New Mexico. Extensive coal deposits were discovered near Capitan, New Mexico in the late 1800s, and from the late 1800s to the early 1900s Lincoln County was the third-ranking producer of coal in New Mexico. Coal beds were found to be interrupted by numerous faults and dikes, making them difficult to mine, and that led to the closing of most the coal mines in the early 1900s. Until 1939, mines in the White Oaks district continued to produce coal for local use including generating electric power for the town of Carrizozo, New Mexico. It is unlikely any future coal mining will occur due to economic costs and value of the resource. Coal is a leasable mineral.

Sacramento Ranger District

There currently are no leases for minerals of the Sacramento Ranger District and the potential for future leases is undetermined. Natural gas wells have been located on land managed by the Bureau of Land Management in the area near Bent ,New Mexico, on the northwest end of the ranger district. The geology of the district would not support natural gas.

Guadalupe Ranger District

Although there is oil and gas exploration adjacent to the Guadalupe Ranger District, there are currently are no leases for fluid or solid leasable minerals on land managed by the Lincoln National Forest. The geology of the district would not support natural gas.

Leasable Energy Minerals Desired Conditions

FW-LEASEMIN-DC

01 Surface resource impacts resulting from energy mineral development are mitigated and do not have adverse long-term effects on ecosystem health or watershed conditions.

02 Reclaimed energy mineral extraction areas exhibit restored resource damage and are free of public safety hazards.

03 Mining activities are not visually evident along major highways.

Leasable Energy Minerals Standards

FW-LEASEMIN-S

01 Surface uses in extractive mineral energy operations shall be controlled through plans of operation and permits that provide for the long-term protection and sustainability of all affected resources.

02 Structures or occupancy for mining purposes shall be limited to only those that are necessary and incidental to mining operations.

Leasable Energy Minerals Guidelines

FW-LEASEMIN-G

01 Special stipulations for oil and gas leases should be included where needed for special resource protection (such as scenery, campgrounds, facilities, recreation residence, caves, and natural and culturally sensitive areas).

02 Oil and gas operations should not adversely impact significant caves.

03 To reduce ecological impacts, reclamation should be carried out concurrently with mining. Restoration of the environment takes place at the earliest opportunity for each area on a mine site.

04 To reduce erosion, restoration and reclamation of surface disturbance associated with mineral activities should be implemented to achieve 70 percent of groundcover (as compared to nearby undisturbed areas) with permanent native vegetation within three growing seasons.

Locatable Minerals

The discretion of the Forest Service to allow locatable mining operations is governed by the U.S. mining laws, which includes the 1872 Mining Law, as amended, and supporting case law. In United States versus Weiss, 642 F.2d 296 (9th Cir. 1981), it was ruled that the Forest Service cannot categorically deny an otherwise reasonable plan of operation for locatable minerals. Reasonable means it conforms to known industry practices and minimizes surface disturbance to the extent possible while still allowing mining to occur. The Forest Service does have the authority to return an unreasonable plan of operations or a plan otherwise prohibited by law. In such cases, the Forest Service would return the plan to the claimant and request submission of a new plan.

The General Mining Act of 1872 (30 U.S.C. 22-42) grants U.S. citizens the right to prospect and explore for minerals on lands open to mineral entry. The right of reasonable access for exploration and development of locatable mineral is guaranteed. The Forest Service can require reasonable protection of surface resources and compliance with other federal laws (for instance, Clean Water Act, Endangered Species Act, National Historic Preservation Act, Archeological Resources Protection Act, etc.), but cannot deny a request to explore and develop the minerals on National Forest System lands.

The Lincoln National Forest has a long history of mining. Minerals located on the Lincoln have historically contributed provisioning ecosystem services and these benefits continue today. The following sections describe the mineral activity of each ranger district and the potential for future activity.

Current Type, Extent, and General Area for Locatable Mineral Activity

Smokey Bear Ranger District

There were selected areas within the Smokey Bear Ranger District that were historically mined, including in the White Oaks, Nogal, and Gallinas mining districts, which produced significant amounts of precious and heavy metals (such as gold, silver, lead, and copper) in the early 1900s. Lesser mining districts such as Oscuro, Jicarilla, and Schelerville produced metals intermittently in the late 1800s to early 1900s. World War II caused a revival of mining for a limited time in these districts, but economic conditions limited production following the war. The known deposits of the area do not favor economic exploitation and the sporadic production and irregular prospecting history likely preclude the development of major mines in the area. Mineral activity now consists of individual prospecting, primarily in the Jicarilla district.

Sacramento Ranger District

Copper and lead mining near High Rolls on the Sacramento Ranger District historically contributed to the economy. This largely occurred from 1900 through 1945 and has declined since World War II. There are currently no active mines on the Sacramento Ranger District.

Guadalupe Ranger District

There is no history of mining for locatable minerals on the Guadalupe Ranger District and no active mining.

Salable Minerals

Salable mineral resources include locatable mineral deposits (gold, silver, copper, uranium, some non-metallic minerals, and rare earth elements) and salable materials (sand, gravel, cinders, common building stone, and flagstone). Minerals located on the Lincoln National Forest have historically contributed provisioning ecosystem services and these benefits continue today.

Current Type, Extent, and General Area for Salable Mineral Activity

Mineral materials, such as sand, gravel, and other common variety materials, fall under the category of “salable” mineral resources. Forest Service policy is to make mineral materials on National Forest System lands available to the public and to local, state, and federal government agencies where reasonable mitigation of effects on other resources is assured and where disposal of these commodities is allowed by land management plans. In general, mineral materials are disposed

through a sales contract, personal use permit, or a free use permit. Unlike locatable minerals, disposal of mineral materials on National Forest System lands is discretionary.

Smokey Bear Ranger District

Interest from the public regarding mineral material sales contracts on the Smokey Bear Ranger District is limited to small personal use permits issued for minimal tonnage, generally less than one-half ton or what could fit in a pickup bed. Although the reasons for the lack of interest in larger volumes of material disposal is unknown, speculation points to the abundance of these types of minerals found on adjacent federal and state lands where topography is more conducive to larger scale developments and located in more accessible areas.

Sacramento Ranger District

There is one active commercial salable minerals pit on the Lincoln National Forest and it is located on the Sacramento Ranger District. The Apache Pit gravel site covers approximately 18 acres and has operated for more than 20 years. In 2011, a pit expansion plan was developed for future use based on the available material (approximately 1.5 million cubic yards) for an estimated 30 years of additional operation (USDA FS 2011a).

This commercial pit is easily accessible and provides a commodity that is beneficial to the local economy. This allows the operator to keep costs down by reducing the distance it takes to transport the material from pit site to destination site. It is anticipated that this pit will remain open for the additional operating period, but that no new mineral material pits will be opened. This is based on the location of the current pit and the ability of the operator to provide materials at a lower cost than operators from lower elevations.

Guadalupe Ranger District

Interest from the public regarding mineral material sales contracts on the Guadalupe Ranger District is limited to small personal use permits issued for 8 tons but actual collection is for minimal tonnage, generally less than one-half ton or what could fit in a pickup bed. The reasons for the lack of interest in larger volumes of material is the abundance of these types of minerals found on adjacent federal and state lands where topography is more conducive to larger scale developments and located in more accessible areas.

Noncommercial Mineral Collection Activity

The Lincoln National Forest has multiple non-commercial mineral collecting activities. They are as follows:

Panning for gold is allowed in most streambeds on the Lincoln National Forest. To protect surface resources such as scenic values, riparian vegetation and biota, and recreational opportunities, the use of hand tools is recommended and work must remain in the streambed. If there is no likelihood of significant surface disturbance, then notice to the Forest Service is not required.

Insignificant amounts of rock collecting do not require a permit or fee collected from the Lincoln National Forest as long as the specimens are for personal use, non-commercial gain, and significant surface disturbance does not occur. In addition, no mechanical equipment may be used, and any collection must not conflict with existing mineral permits, leases, claims, or sales. The collection and removal of quartz crystals from the White Mountain Wilderness area of the Lincoln National Forest is strictly prohibited. A closure order is in effect for this activity (USDA FS Southwestern Region).

Locatable and Salable Minerals Desired Conditions

FW-LOCMIN/SALMIN-DC

01 Mining activities meet the legal mandates to facilitate the development of minerals in a manner that minimizes adverse impacts (for example, soil erosion, turbidity and contamination impacting water quality and quantity, noise and disturbance to wildlife, and changes in vegetation structure and distribution) to surface and groundwater resources, watershed and forest ecosystem health, wildlife and wildlife habitat, scenic character, and other desired conditions applicable to the area.

02 Mining activities are not visually evident along major highways.

03 Reclamation of energy mining and mineral activity sites provides for public safety and the protection of forest resources and is conducted to return sites to as natural condition as possible (for example, soil, hydrology, vegetation, and habitat similar to pre-disturbance).

04 Hazards in abandoned mining areas are inventoried and historical information collected.

05 Remediated abandoned mines are available for roosting bats and other species inhabiting or using caves, reducing the potential for displacement, abandonment of young, and possible mortality.

06 Caves maintain their features, characteristics, and values and are unavailable for mineral extraction.

Locatable and Salable Minerals Objectives

FW-LOCMIN/SALMIN-O

01 To reduce erosion, restoration and reclamation of surface disturbance associated with locatable mineral activities achieve 70 percent of groundcover (as compared to nearby undisturbed areas) with permanent native vegetation within three growing seasons.

Locatable and Salable Minerals Standards

FW-LOCMIN/SALMIN-S

01 Structures and/or occupancy for mining purposes must be limited to only those necessary and incidental to approved mining operations.

02 Surface uses in mineral operations must be controlled through plans of operation and permits that provide for the long-term protection and sustainability of all affected resources.

03 In locatable mineral sites exceeding 5 acres, mined-out areas must be stabilized or reclaimed as new mine areas are opened.

04 All locatable mineral activities must include reclamation of surface resource impacts, whether a plan of operation is required.

05 Approval of mining activities must include the use of reclamation bonds to protect and restore surface resources.

06 Locatable plans of operation must include contingencies to address stabilization and interim reclamation of mineral sites during periods of unforeseen shutdown (as in 36 CFR 228.10). This contingency plan would apply any time mine activity ceases during development and production, and before planned closure.

07 Prior to the destruction of access to adits, shafts, and other mine workings, a biological inventory and assessment must be conducted to determine use by bats and other wildlife species. If determined to be used by wildlife, closures must be designed and implemented to address the needs of resident or historically occurring wildlife within the constraints of meeting public safety concerns.

08 Talus slopes will not be used as a common variety mineral materials source where disturbance would destabilize the talus slopes and alter any endemic or rare species habitat or presence.

09 Mineral materials such as gravel will not be removed within water resource features (riparian areas, streams, stream banks, etc.).

10 Bonds will be collected for commercial mineral materials operating plans to ensure appropriate closure for operations.

11 Salable minerals shall not be extracted from within designated areas (such as designated wilderness or national scenic trails), areas of high scenic integrity, or administratively recommended areas (such as recommended wilderness areas and eligible wild and scenic river corridors).

Locatable and Salable Minerals Guidelines

FW-LOCMIN/SALMIN-G

01 To reduce ecological impacts, reclamation should be carried out concurrently with locatable mining. Restoration of the environment should take place at the earliest opportunity for each area on a mine site.

02 Common variety mineral materials should be available for local, county, state and National Forest System roads located on or providing access to the Lincoln National Forest. Material should be made available for other roads only upon adequate documentation that other sources are not available.

03 The potential to use sites for salable mineral collection areas or future exploration and development should be included when a reclamation plan is being developed.

04 Solid mineral extraction and development should avoid impacting locations like campgrounds, communication sites, observatories, administrative facilities, and sites listed in the National Register of Historic Places.

05 Mining activities should incorporate mitigation and reclamation measures that reduce scenery contrasts with the surrounding landscapes (for example, mimic slope, and vegetation).

06 Areas and landforms where past locatable mineral development or exploration has occurred should be stable and vegetated where possible.

07 Post-mining restoration areas should be designed to allow the sustainability of other forest resources.

08 Native seed and certified weed-free plant materials should be applied immediately when revegetating disturbed sites, replacing soils, or roughening surface media to increase revegetation success.

09 Plans of operation should address avoiding or minimizing the alteration of natural features that provide habitat for wildlife or at-risk plants.

10 Streambed and floodplain alteration or removal of material should not prevent attainment of riparian, channel morphology, or streambank desired conditions.

11 Mining and mineral activities of all sizes should minimize the disturbance footprint of the operations site.

12 Mining and mineral operations should be logically planned, opened, and operated in order to optimize resource values and to meet final reclamation objectives.

13 Soil disturbance should be kept to a minimum. Where removal of soil is necessary, topsoil will be stockpiled and stabilized for use in post mining reclamation.

14 Suitable interim and post-project surface water and groundwater monitoring should be implemented by locatable mining operators where needed to detect adverse changes at the earliest practicable time.

15 Where possible, talus slopes should not be altered or material removed from them. In areas that harbor talus snails, reclamation and revegetation treatments should be designed to retain microhabitat characteristics for endemic snails and other talus-dependent species unless as needed to meet statutory requirements (mining law or as needed to protect public health and safety).

16 Locatable mineral operations should accommodate desired conditions of other resources where possible.

17 Minerals materials will be made available to the public for landscape rock, soil, and other uses by permits if compatible through clearances with other resource concerns.

18 Piled materials from roadsides, previously cleared areas (for other projects), and other suitable materials left over from construction or maintenance for rock sales should be used if the disposal of these salable materials is desirable.

Locatable and Salable Minerals Management Approaches

Consider the following:

01 Prior to the destruction of access to adits, shafts, and other mine workings, provide an opportunity to record mineral resource information when safe.

02 Inspect commercial use mineral material sites to identify and mitigate resource damage due to overuse.

Renewable Energy

This section covers renewable energy sources including wind, solar, and biomass. These resources are considered to be provisioning ecosystem services. Starting with the Lincoln National Forest 1986 land management plan, there has been a push toward renewable energy development on public lands. The State of New Mexico requires investor-owned electric utilities and rural electric cooperatives to acquire percentages of power from renewable energy sources. Additional development of renewable energy risks exceeding the capacity of existing transmission corridors and any additional development in the next 20 years might prompt a need for new transmission lines over National Forest System lands.

Renewable energy are resources that are naturally replenishing but flow-limited. They are virtually inexhaustible in duration but limited in the amount of energy that is available per unit of time. Renewable energy may include wind, hydropower, solar, biomass, and geothermal resources (USDOE 2016).

Current Type and Potential for Renewable Energy Activity

Solar and Wind

The U.S. Department of Energy and the National Renewable Energy Laboratory have published wind and solar resource maps for New Mexico, depicting wind resources for potential future industry development. The National Renewable Energy Laboratory identified the Lincoln National Forest as a national forest unit with a high potential for the development of two or more solar and wind energy sources. Potential for wind energy is highest on the Guadalupe Ranger District and fair-to-moderate on the rest of the forest (National Renewable Energy Laboratory 2005, TrueWind Solutions 2007).

Potential for solar power and wind development is moderate-to-high in all four counties (Otero, Lincoln, Eddy, and Chaves) that encompass the Lincoln National Forest, which shows a trend to potential future development.

Hydroelectric and Geothermal

There are currently no hydroelectric or geothermal facilities on the Lincoln National Forest or within the four-county area of interest, with none predicted in the near future. Potential for hydroelectric development within the plan area is extremely low owing to the lack of water resources on the national forest. Potential for geothermal development on the Lincoln is unknown at this time due to lack of exploration.

Biomass

There are currently no biomass facilities on the Lincoln National Forest. Since 1986, interest has grown and technology has improved related to developing this renewable resource as a byproduct of harvesting timber from the forest. In the past 10 years, Otero and Lincoln counties have investigated the feasibility of woody biomass facilities, but as of 2020 there are still no active projects.

Wood Products

Small diameter wood products produced by the Lincoln National Forest could potentially have great social value by creating another local economic sector while meeting and enhancing restoration efforts. The Lincoln National Forest currently has a strong local infrastructure that is vital to meeting the needs of small diameter wood products markets. Potential markets may include biochar and pellets products.

Renewable Energy Desired Condition

FW-RENEWENRGY-DC

01 Exploration, development, production, and transmission of renewable energy resources contribute provisioning ecosystem service through social and economic benefits to local communities and do not adversely impact forest resources and uses, ecosystem health, and watershed conditions over the long term.

02 Energy developments and other special uses are not major features on the landscape and do not attract attention (moderate scenic integrity).

Renewable Energy Standards

FW-RENEWENRGY-S

01 Nonnative invasive species monitoring and control shall be included in contracts, permits, and agreements (see FW-INVASIVE-G).

02 New energy developments shall not be authorized on traditional cultural properties, in wetlands, critical habitat and other areas that would limit species' ability to persist and thrive.

Renewable Energy Guidelines

FW-RENEWENRGY-G

01 Special use authorizations should include provisions that limit encumbrances of National Forest System lands.

02 New energy developments and energy corridors should be located to minimize impacts to scenery, special areas, and species (collocate, mitigate with material and color, or design mitigation to protect species).

03 Installation or replacement of renewable energy structures under special use authorization should include raptor protection devices in open habitat such as large meadows and grasslands. Raptor protection devices should be installed where raptors have been killed.

04 Constructed features should be maintained to support the purpose(s) for which they were built. Constructed features should be removed when no longer needed.

05 Authorizations for renewable energy operations and structures should incorporate current best management practices measures (such as site location and design) to reduce potential impacts to wildlife and avoid rare and unique habitats (USDI FWS 2012).

Chapter 3. Area-Specific Management Direction

Designated area and management area plan direction contains the plan components applicable to specific areas that call for management that is in addition to or different than forestwide management. A designated area or management area represents a management emphasis for an area or several similar areas on the landscape. Plan components for a management area may differ from forestwide guidance by:

- Constraining an activity where forestwide direction does not;
- Constraining an activity to a greater degree than forestwide direction; or
- Providing for an exception to forestwide direction, when forestwide direction is in conflict with the management emphasis of the management area.

Forestwide plan components are applied unless there is management direction specific to the designated area or management area. All designated area or management area plan components are based on applicable authorities and the specific purposes for which the area was created, recommended, or designated. Where designated areas and management areas overlap, the most restrictive protection measures should be followed. Maps for the designated areas and management areas are located in appendix A.

Designated Areas

Designated areas are a specific type of management area that are either statutorily or administratively designated.

The Lincoln National Forest has areas that contain special, exceptional, or unique values that provide important ecosystem services. Through natural process, they provide provisioning services like clean water, supporting services like nutrient cycling, and cultural services like aesthetic, recreation, and cultural heritage values. Some of these areas meet the criteria to be considered special places and become designated areas:

- An area or feature identified and managed to maintain its unique special character or purpose.

Designated areas may be statutorily designated by Congress or administratively designated by authorities such as a regional forester, Secretary of Agriculture, or Forest Service Chief. Once established, the designation continues until a subsequent decision by the appropriate authority removes the designation.

Designated areas are not only managed to land management plan standards, but also must be managed to additional standards contingent as part of their designation. Depending on the type of designation, these areas may be managed primarily for human recreation interests, to provide for unhindered ecosystem processes with only low-technology recreation, or managed for the long-term unfolding of ecological changes, providing a critical education benefit as system baselines.

Overall, designated areas can contribute to the cumulative value of the various ecosystem services the Lincoln National Forest provides. Designated areas contribute to cultural ecosystem services by providing recreation opportunities and connecting people to their natural and cultural heritage. They can be attractions for visitors, and as a result, provide supporting ecosystem services through

economic benefits such as increased employment opportunities and supporting small businesses to surrounding communities. Undeveloped areas with protections associated with their designation provide important supporting and regulatory ecosystem services for conservation of habitats and connectivity, biodiversity, and climate change adaptation. Finally, designated areas provide regulating ecosystem services by preserving intact natural systems and their individual components.

The designated areas within the Lincoln National Forest include:

- Two wilderness areas
- Eleven individually named inventoried roadless areas
- Three national recreation trails
- Three designated scenic byways

All Designated Areas

Designated Area Desired Conditions

DA-DC

01 Designated areas on the Lincoln National Forest retain the unique or special character and purpose for which they were designated.

Wilderness Areas

In 1964, Congress acknowledged the immediate and lasting benefits of wild places by passing legislation that permanently protected some of America's most natural and undisturbed lands. The Wilderness Act established the National Wilderness Preservation System ". . . to secure for the American people of present and future generations the benefits of an enduring resource of wilderness."

The Wilderness Act sets forth guidelines for the management of wilderness areas by maintaining four attributes used to describe wilderness character:

- untrammeled;
- naturalness;
- undeveloped; and
- outstanding opportunities for solitude or primitive and unconfined recreation.

As such, designated wilderness areas provide places where natural processes dominate and the impacts of people are minimized. Motorized and mechanized uses, such as motorized vehicles, heavy machinery (such as feller bunchers or excavators), chainsaws, mountain bikes, wheelbarrows, and drones, are not allowed in wilderness areas to protect these values. Wilderness areas are typically large, offering people the opportunity to escape from civilization and experience rugged and unaltered natural elements that can sometimes involve a high level of unregulated risk.

The Wilderness Stewardship Performance was introduced in 2015 to manage wilderness attributes using seven categories that can be selected for each wilderness area: natural quality of wilderness character; undeveloped quality of wilderness character; untrammeled quality of wilderness character;

outstanding opportunities for solitude or primitive and unconfirmed recreation quality of wilderness character; other features of value quality of wilderness character; special provisions; and administration.

Designated wilderness areas offer abundant ecosystem services. Their often-pristine condition and minimal human impacts provide for excellent supporting ecosystem services, such as nutrient and water cycling; biodiversity; and regulating ecosystem services, such as water filtration, air quality protection, and climate change adaptation. Hunting and foraging can occur in a designated wilderness, allowing for provisioning ecosystem services such as food. Wilderness areas house many headwaters and provide high-quality water to the natural systems and communities below, another provisioning ecosystem service. Designated wilderness areas also provide abundant cultural ecosystem services in the form of recreation, opportunities to connect with nature, baselines on unhindered ecosystem processes for ecological research, and the preservation of cultural traditions and historical features.

The Lincoln National Forest manages two congressionally designated wilderness areas totaling approximately 83,252 acres (8 percent of the national forest), including the White Mountain and Capitan Mountains. Most of the White Mountain was designated under the 1964 Wilderness Act, with additional acres and the Capitan Mountains designated under the 1980 New Mexico Wilderness Act. The 20,913-acre Guadalupe Escarpment Wilderness Study Area was reviewed by Congress as part of the New Mexico Wilderness Act of 1980. The Lincoln National Forest's 1986 land management plan includes the complete acreage of each designated wilderness, including the additional acreage designated by the 1980 New Mexico Wilderness Act. In 2014, of the approximately 767,000 visitors to the Lincoln National Forest, over 21,000 enjoyed visiting the White Mountain and Capitan Mountains wilderness There are also two congressionally designated National Park Service wilderness areas—Carlsbad Caverns and Guadalupe Mountains—adjacent to the south end of Lincoln National Forest.

White Mountain Wilderness

The White Mountain Wilderness was originally made up of 30,359 acres. In 1980, the New Mexico Wilderness Act added an additional 16,860 acres, bringing its total acreage to 47,219. The White Mountain Wilderness is located on the Smokey Bear Ranger District near the Village of Ruidoso. Sierra Blanca, the highest peak in the White Mountains, is visible for many miles, and is one of the most widely recognized landmarks in southern New Mexico. Elevations range from 6,400 feet near Three Rivers Campground to 11,300 feet near Lookout Mountain, resulting in diverse plant and animal communities.

Capitan Mountains Wilderness

Capitan Mountains Wilderness was designated in 1980 and contains 36,034 acres on the Smokey Bear Ranger District. It is the birthplace of the world-famous Smokey Bear, having been found as a cub in a tree near Capitan Pass by local firefighters in 1950.

The Capitan Mountains Wilderness straddles much of the Capitan Mountains, which have a unique geologic structure. Most basin and range type of mountains orient themselves north to south, but the Capitan Mountains are oriented perfectly east to west. Numerous canyons cut into the north side of the rocky range, while rocky outcroppings distinguish the region to the south. The Wilderness

measures approximately 12 miles wide (east to west) and 2 to 6 miles high (north to south), with elevations varying from about 5,500 feet near the eastern boundary to 10,083 feet on Capitan Peak.

Wilderness Area Desired Conditions

DA-WILD-DC

01 Wilderness character and values are enhanced and maintained.

02 Wilderness provides opportunities to preserve and protect natural ecosystems and wild areas and also provides opportunities for solitude and retrospective or primitive recreation. Social encounters are infrequent and occur only with individuals or small groups in order to provide opportunities for solitude and primitive, unconfined recreation. Self-reliance is required.

03 Wilderness is valued by the public for the variety of ecosystems services and values it provides, including clean air and water, enhancing wildlife and plant habitat, primitive recreation opportunities, and other values of wilderness character.

04 Wilderness represents an environment that is essentially an unmodified and natural landscape. Constructed features are rare and provided primarily for resource protection. When present, they reflect the historic and cultural landscape and utilize natural or complementary materials.

05 Natural processes are maintained within wilderness. Wildland fires function or mimic their natural ecological role within wilderness.

06 Naturally occurring wildfires may be allowed to perform their natural ecological role.

07 Wilderness areas have minimal to no nonnative invasive species.

08 Wilderness boundaries are defined through signage at official entry points and needed locations (such as informal access points), with features such as trail maps, boundary markers, and consistent signage.

Wilderness Area Objectives

DA-WILD-O

01 Within 10 years of plan approval, wilderness areas continue to meet baseline measures of wilderness character as annually reported in Wilderness Stewardship Performance.

Wilderness Area Standards

DA-WILD-S

01 Outfitter-and guide permits shall require appropriate wilderness practices, such as “Leave no Trace” principles, and incorporate awareness for wilderness values in their interaction with clients and others.

Wilderness Area Guidelines

DA-WILD-G

01 Management activities should use methods consistent with maintaining or improving wilderness character in designated wilderness.

02 Management activities for the intervention in natural processes (such as fire, insects, and disease) should only occur where this would improve, preserve, or maintain wilderness character, protect public health and safety within and adjacent to wilderness, or uphold other federal laws and regulations.

03 Group size should be limited to numbers identified in current wilderness management plans, except as determined under special use authorization, emergency services, formal agreements, and management activities for maintaining wilderness character.

04 Management activities should be consistent with the scenic integrity objective of very high as defined in the Scenery Management System in designated wilderness.

05 Trails in wilderness or leading into wilderness areas should be designed, constructed or reconstructed to control or limit resource degradation in a sustainable manner (trail class 1 or 2).

06 Signage should be limited to those essential for resource protection and user safety to retain the wilderness character of self-reliance and challenging recreation opportunities.

07 Prescribed fire ignitions should be used to reduce the risks and consequences of uncharacteristic wildfire within wilderness.

08 Fire operations and associated activities within designated wilderness areas should minimize effects to wilderness character by locating fire camps, helispots, and temporary facilities outside the area (see the “Fire and Fuels” section).

09 Nonnative invasive species shall be treated using methods, and in a manner, consistent with wilderness character in order to allow natural processes to predominate in designated wilderness.

Wilderness Area Management Approaches

Consider the following:

01 Work with local partners, volunteers, Adopt-a-Trail organizations, and other entities to maintain wilderness, including trails maintenance and construction.

02 Coordinate with the New Mexico Department of Game and Fish on management of wildlife within wilderness using techniques consistent with wilderness character.

03 Wilderness management is guided by the elements outlined in the Forest Service’s Wilderness Stewardship Performance or other current guidance. This framework tracks how well the wilderness character is being preserved through measuring progress in 10 elements selected by managers for each wilderness from a suite of possible options (such as management of fire, range, and cultural resources).

04 When revising allotment management plans, consider encouraging non-motorized or non-mechanized practices (range riders) and minimizing structural development in wilderness.

05 Consider adaptive management and corrective measures if overuse causes unacceptable resource damage or unacceptable loss of opportunities for solitude. Use proactive approaches

in identifying and addressing visitor use management challenges before effects to resources become unacceptable.

06 Prioritize the decommissioning, realignment, or reconstruction of trails in designated wilderness areas based on need, the amount of use it receives, and potential impacts on wilderness character and recreation opportunities.

07 Consider using methods to prevent unauthorized use in wilderness such as education, law enforcement, barriers, road closures, and trail design.

08 When fire threatens a wilderness area, dispatch a resource advisor-fireline qualified (REAF) or resource advisor (READ) with a specialized knowledge of wilderness, or dispatch a wilderness program specialist in the absence of a wilderness REAF or READ.

09 Use news releases, postings, permit issuance, and individual visitor contacts to inform visitors of areas of concentrated resource damage and use restrictions.

10 Consider rehabilitating human-caused disturbed areas (such as compacted sites) that do not complement wilderness character to a natural appearance.

11 Reintroduce extirpated (locally extinct) or restoring populations of native species when consistent with ecological conditions and social values.

12 Treat nonnative invasive species using methods, and in a manner, consistent with wilderness character in order to allow natural processes to predominate in designated wilderness except where nonnative invasive species unacceptably threaten (large infestations) wilderness characteristics.

Inventoried Roadless Areas

Inventoried roadless areas were authorized by the 2001 Special Areas-Roadless Area Conservation Rule, 36 Code of Federal Regulations Part 294. The “inventoried” part of the name comes from the Roadless Area Review and Evaluation the Forest Service conducted in the 1970s. The 2001 Roadless Rule establishes prohibitions on road construction, road reconstruction, and timber harvesting on 58.5 million acres of inventoried roadless areas on National Forest System lands. The intent of the 2001 Roadless Rule (36 CFR Part 294) is to provide lasting protection for inventoried roadless areas within the National Forest System in the context of multiple-use management.

In a May, 2011 memorandum, the Chief of the Forest Service was re-delegated authority by the Secretary of the Department of Agriculture to approve the cutting, sale, or removal of generally small diameter timber in inventoried roadless areas when needed for one of the following purposes: 1) to improve threatened, endangered, proposed, or sensitive species habitat; 2) to maintain or restore the characteristics of ecosystem composition and structure, such as to reduce the risk of uncharacteristic wildfire effects within the range of variability that would be expected to occur under natural disturbance regimes of the current climatic period; or 3) for administrative and personal use, as provided for in 36 CFR 223, where personal use includes activities such as Christmas tree and firewood cutting and where administrative use includes providing materials for activities such as construction of trails, footbridges, and fences.

Per the Chief's Review Process for activities in an inventoried roadless area, as outlined in May 31, 2012 direction, regional foresters shall review inventoried roadless area activities that involve "the cutting, sale, or removal of generally small diameter timber when [such removal is] needed . . . to maintain or restore the characteristics of ecosystem composition and structure, such as to reduce the risk of uncharacteristic wildfire effects within the range of variability that would be expected to occur under natural disturbance regimes of the current climatic period."

Each inventoried roadless area often includes and is characterized by the roadless area characteristics outlined in the Roadless Area Conservation Rule of 2001. The following nine characteristics are:

1. High-quality or undisturbed soil, water, and air resources
2. Sources of public drinking water
3. Diversity of plant and animal communities
4. Habitat for threatened, endangered, proposed, candidate, and sensitive species and species dependent on large undisturbed areas of land
5. Primitive and semi-primitive classes of recreation
6. Reference landscapes for research study and interpretation
7. Natural appearing landscapes with high scenic quality
8. Traditional cultural properties and sacred sites
9. Other locally unique characteristics

For the review process, the regional forester conducting the review must determine if the purpose and need of a project fits within this allowed purpose and that the activities that would be authorized by the project decision would be consistent with the 2001 Roadless Rule to ensure that project activities would not alter these roadless characteristics.

Inventoried roadless areas contribute to ecological sustainability by providing clean drinking water and other ecosystem services and serve as biological strongholds for wildlife. They provide large, relatively undisturbed landscapes that are important to biological diversity and the long-term survival of many at-risk species. They also serve as barriers against the spread of nonnative invasive plant species and provide reference areas for study and research. Inventoried roadless areas also contribute to social sustainability by providing opportunities for dispersed outdoor recreation, opportunities that diminish as open space and natural settings are developed elsewhere. Although the boundaries of the roadless areas are not reconsidered during plan revision, these areas will be evaluated for potential suitability as wilderness areas.

The Lincoln National Forest has eleven roadless areas in addition to the two existing wilderness areas and one wilderness study area. Roadless areas include: Capitan Mountains, Carrizo Mountain, Tucson Mountain, Ortega Peak, West Face Sacramento Mountains, Grapevine, Culp, Jefferies Canyon, Little Dog and Pup Canyon, North Rocky Canyon, Last Chance Canyon, and the South Guadalupe Mountains.

The roadless areas on the Lincoln National Forest are located in places that generally do not receive a high amount of use by the visiting public. All but one of these inventoried roadless areas allow for

road maintenance. Some of the roadless areas contain minor infrastructure such as trick tanks and drinkers and have had some minor vegetation treatments.

Inventoried Roadless Area Desired Conditions

DA-IRA-DC

01 The roadless character of inventoried roadless areas is protected and conserved.

02 Inventoried roadless areas serve as safeguards against the spread of invasive plant species and provide reference areas for study and research. Biological diversity and the long-term survival of at-risk species is supported.

03 In inventoried roadless areas, ecosystems are intact and function to provide a full range of ecosystem services (provisioning services like clean water, regulating services like pollination, support services like soil formation, and cultural services like education and recreation).

04 Inventoried roadless areas appear natural, have high scenic quality, and provide opportunities for dispersed recreation.

Inventoried Roadless Area Guidelines

DA-IRA-G

01 Inventoried roadless areas should be managed for semi-primitive nonmotorized and semi-primitive motorized recreation settings as defined in the desired recreation opportunity spectrum.

02 Management activities should be consistent with the scenic integrity objective of high in inventoried roadless areas as defined in the Scenery Management System.

03 Renewable energy development of solar or wind should be located outside of inventoried roadless areas.

Inventoried Roadless Area Management Approaches

Consider the following:

01 Prioritize roads in inventoried roadless areas for decommissioning.

National Recreation Trails

Congress passed the National Trails System Act in 1968. The Act authorized creation of a national trail system comprised of national scenic trails, national historic trails, and national recreation trails. National scenic and historic trails can only be designated by Congress, but the regional forester can designate national recreation trails to recognize exemplary trails of local and regional significance. They provide day-use or extended trail experience for a variety of recreation opportunities accessible from urban areas (FSM 2350). There are over 1,000 national recreation trails across all 50 states. These trails offer spectacular views and high-quality recreation opportunities.

National recreation trails are cooperatively managed among a number of agencies, including the Forest Service, for the primary purpose of outdoor recreation. Regional foresters may establish national recreation trails (FSM 2353.04) as provided in section 4 of the National Trails System Act (16 U.S.C. 1243).

Ecosystem services supported by national recreation trails are largely cultural in nature. The trails provide exemplary outdoor recreation opportunities, which encourage connection with the landscape and promote physical and mental health.

Dog Canyon Recreation Trail

The Dog Canyon National Recreation Trail has been used for thousands of years by Native Americans as an access route from the desert environment of the Tularosa Basin to the Sacramento Mountains. It even served as an Apache stronghold during the Indian War period. The trail was designated as a national recreation trail in 1981. The Dog Canyon Trail is a steep trail that passes through multiple vegetation zones as it rises some 3,000 feet in 5.2 miles. It provides views of Alamogordo and the Tularosa Basin. The lower trailhead is located at Oliver Lee Memorial State Park. The trailhead at the top is on Joplin Ridge.

The Dog Canyon National Recreation Trail is a popular trail primarily in the spring and fall months when temperatures are cooler. The trail is open to hikers and equestrian users, but equestrian use is low due to the steepness and narrowness of the trail and the lack of water within the canyon. Hikers generally enjoy the trail for day trips only.

Rim National Recreation Trail

The Rim National Recreation Trail, designated in 1978, was the first Forest Service trail in New Mexico to be designated as a national recreation trail under the National Trail System Act of 1968. The trail itself is a combination of old Indian paths, railroad grades, and homestead trails all linked together by new sections of trails built from the 1960s to 1980s. The trail passes through mixed conifer (Douglas-fir, white fir, southwestern white pine), quaking aspen and meadows. It runs north to south along the top of the Sacramento Mountains, offering beautiful glimpses of the Tularosa Basin. Currently, the Rim Trail is 31.2 miles long. Sections have been added to the trail over the years, the latest addition being in 2000. Originally, 14 miles of the trail were designated as a national recreation trail. When a new addition was added to the beginning of the trail in 2000, the designated section became mile marker 1.1–15.1. Except for the first 1.1 miles, this trail is designated for hikers, horses, mountain bikes, and motorcycles.

Rim Trail 105 is very popular, and its use is increasing. It has been highlighted on numerous trail websites, and is popular with hikers, equestrian users, mountain bikers, motorcyclists, and skiers. Use is heaviest in the summer months, but it is also popular in the fall when tree colors change. Skiers and snowshoers enjoy the trail in the winter months for quiet adventures in the forest.

Guadalupe Ridge National Recreation Trail

The Guadalupe Ridge National Recreation Trail, designated in 2018, is an interagency national recreation trail. Winding through two national parks—Guadalupe Mountain and Carlsbad Caverns—the Lincoln National Forest and the desert landscape of Bureau of Land Management, the trail encompasses over 100 miles of hiking and camping scenic wonders. Travel on the Guadalupe Ridge Trail can include equestrian and stock, motorized vehicles, and bikes based on agency jurisdiction.

The trail traverses the rocky peaks of the highest point in Texas, Guadalupe Peak (8,751 feet), to the challenging mountainous landscape of the New Mexico Chihuahuan desert.

The trail starts in Guadalupe Mountains National Park, at the highest point in Texas which is Guadalupe Peak (8,751 feet). Some sections of the trail in the Guadalupe Mountains climb and dip over a 60 percent solid rock grade and are very rugged terrain. Almost 40 percent of the main trail is double-track; 60 percent is single-track when including the Sitting Bull Falls segment of the trail. The trail travels through Chihuahuan desert, mixed coniferous forest, and riparian woodlands before exiting the national park to the Lincoln National Forest. The national forest has mixed coniferous forest along with spectacular rocky canyons. An optional loop will take trekkers through Last Chance Canyon and Sitting Bull Falls, a desert oasis with a series of small waterfalls and pools. The trail continues through Carlsbad Caverns National Park and Bureau of Land Management property with stunning views of the rugged and unforgiving Guadalupe Ridge.

National Recreation Trail Desired Conditions

DA-NRT-DC

01 National recreation trails provide a variety of opportunities for recreation as well as a diversity of experiences with different components of solitude, remoteness, and development.

02 Visitor access, use, and management activities are consistent with the recreational, scenic, ecological, cultural, traditional, and wildlife resource values for which the trail is designated.

03 Recreation opportunities on the national trails support the needs and expectations of the diverse populations in the surrounding areas.

   a. Visitors are aware of the nature and purpose of the national trail designation.

   b. National trails are well maintained, signed, and passable. Alternate routes are available in the case of temporary closures (resulting from natural events including fire or flooding) or land management activities.

National Recreation Trail Guidelines

DA-NRT-G

01 Management activities within foreground views (up to one-half mile) from the trail should at least meet the high scenic integrity objective.

02 Management activities in the middle ground (up to 4 miles) and background (from middle ground to horizon) should at least meet or exceed the moderate scenic integrity objective.

03 Special-use authorizations that affect national recreation trails should include scenery management considerations.

04 National trails should not be used for timber pile landings.

05 New temporary and/or permanent roads and motorized trails should not be constructed across or adjacent to national trails unless necessary for resource protection, access to private lands, or to protect public health and safety.

06 Management activities should maintain safe public access to national recreation trails.

07 National recreation trails should be maintained to the standards for trail class and use.

National Recreation Trail Management Approaches

Consider the following:

01 Work with volunteer groups, partners, local governments, and adjacent landowners to maintain trail corridors, maintain the condition and character of the surrounding landscape, and facilitate trail use that promotes “Leave No Trace” principles and reduces conflict.

02 Ensure that incident management teams are aware of all national trails as a resource to be protected during wildland fire management activities. Clearly identify fire-related rehabilitation and long-term recovery of the national trail corridor(s) as high priorities for fire managers, incident management teams, burned area emergency response teams, and post-fire rehabilitation interdisciplinary teams.

Scenic Byways

The National Scenic Byways Program is administered by the U.S. Department of Transportation, Federal Highway Administration. It was established to help recognize, preserve, and enhance selected roads throughout the Nation. The U.S. Secretary of Transportation recognizes these designated roads based on one or more intrinsic qualities—archaeological, cultural, historic, natural, recreational, or scenic. Complementing the U.S. Department of Transportation program is the USDA Forest Service National Forest Scenic Byways Program that was established in 1988 to showcase driving routes located on National Forest System lands that provide access to outstanding scenic corridors and important natural, recreational and historic features.

There is one National Scenic Byway, one National Forest Scenic Byway, and one Bureau of Land Management Scenic Byway associated with the Lincoln National Forest. Ecosystem services supported by scenic byways are largely economic and cultural in nature. The byways provide exemplary tourism and outdoor recreation opportunities which encourage connection with the landscape and promote physical and mental health.

Billy the Kid National Scenic Byway

The Billy the Kid Trail National Scenic Byway, designated in 1998, is an 84-mile loop in the heart of Lincoln County. The byway is associated with Wild West lore of gunfights, Buffalo Soldiers, and Smokey Bear. From Lincoln, one of the best-preserved historic Western towns in the country, to Ft. Stanton, an historic frontier fort, to Ruidoso, a town known for tourism, the byway offers a view of the legendary West, both past and present.

A Corridor Management Plan for the Billy the Kid Scenic Byway was developed in 1997 in partnership with the byway communities. The plan included management direction and projects for a 5-year period. In 2000, the Billy the Kid Scenic Byway received a grant to revise its management plan. The Corridor Management Plan Phase II was completed in 2001, highlighting new projects and additional needs for the following 5 years. No additional management plans have been prepared for the scenic byway since 2001.

Only a small portion of this byway falls on Lincoln National Forest lands along New Mexico State Highway 48, however the forest serves as a scenic backdrop for much of the route. Continued collaboration and management of this small area needs to be done in partnership the local communities to ensure that the essence of this area is maintained. Scenic conditions were affected

along New Mexico State Highway 48 and along U.S. Highway 82 by both the Little Bear Fire in 2012 and the White Fire in 2011, but conditions are recovering as vegetation returns.

Sunspot Highway National Forest Scenic Byway

The first ten national forest scenic byways were designated in 1989. New Mexico State Highway 6563, known as Sunspot Highway, was among this first group of national forest scenic byways. Sunspot Highway is a 13.6-mile two-lane highway traversing the front rim of the Sacramento Mountains, providing travelers with a variety of scenic opportunities and panoramic views. This byway is known for its views of the Tularosa Basin as well as for stands of golden aspen in the fall. At the end of the scenic byway, travelers will find the Sunspot Observatory, the Apache Point Observatory, and the Sunspot Visitor Center and Museum. A management plan has not been created for this scenic byway.

Guadalupe Backcountry Byway

This Bureau of Land Management designated byway along Route 137 starts north of Carlsbad, New Mexico, and runs southwest for about 30 miles. The byway runs through Chihuahuan desert lands and into the rugged Guadalupe Mountains of the Lincoln National Forest. Those visitors prepared for off-road travel can follow the unpaved continuation of Highway 137 toward Texas and Guadalupe Peak. As one ascends the Guadalupe Mountains, Chihuahuan desert plant life mixes with piñon, juniper, and ponderosa pine woodlands. Located off the byway's main route, Sitting Bull Falls is an oasis in the desert where water cascades down a 100-plus foot rock wall in a dead-end canyon. Sitting Bull Falls provides a developed picnic area and trailhead.

Scenic Byway Desired Conditions

DA-SB-DC

01 View sheds from scenic byways are consistent with desired conditions for scenery. The immediate foreground (300 feet on either side) of these travel ways is natural appearing and generally unaltered by human activities.

Scenic Byway Guidelines

DA-SB-G

01 To maintain and protect the scenic quality of scenic byways, management activities planned and implemented within the foreground (up to one-half mile on either side) should be consistent with the scenic integrity objective of high as defined in the Scenery Management System.

Scenic Byway Management Approaches

Consider the following:

01 Work with the New Mexico Department of Transportation and county highway departments to manage hazard trees within the immediate foreground of scenic byways (up to 300 feet on either side).

02 Work with the New Mexico Department of Transportation, the Federal Highway Administration, and local communities to improve services and interpretive opportunities on byways.

03 Consider using signs, kiosks, exhibits, and other educational tools (such as brochures, auto tours, websites, and social media) to provide interpretive, educational, and safety information along scenic byways, in adjacent recreation sites, and at visitor contact points (including ranger stations).

Management Areas

The Lincoln National Forest has several areas requiring different management that cannot be met through forestwide plan components and are not designated areas. These areas are identified as management areas. Management areas are similar to designated areas but differ in that they are defined as part of the land management plan and not designated by Congress or administratively. Management areas can include proposed designated areas, such as research natural areas and wilderness areas (see maps in appendix A), or wild and scenic rivers that are managed as management areas until they are designated. A management area represents a management emphasis for an area or several similar areas across the landscape.

Overall, management areas can contribute to the cumulative value of the various ecosystem services the Lincoln National Forest provides. Management areas contribute to cultural ecosystem services by providing recreation opportunities and connecting people to their natural and cultural heritage. They can be attractions for visitors, and as a result, provide supporting ecosystem services through economic benefits such as increased employment opportunities and supporting small businesses to surrounding communities. Undeveloped areas provide important supporting and regulatory ecosystem services for conservation of habitats and connectivity, biodiversity, and climate change adaptation. Finally, management areas provide regulating ecosystem services by preserving intact natural systems and their individual components.

Management areas identified in this plan for the Lincoln National Forest include:

- One wilderness study area
- 19 recommended wilderness areas
- 54 eligible wild and scenic rivers
- One proposed research natural area
- Two cave management areas—the Guadalupe Caves Resource Protection Area and the Snowy River Cave Resource Protection Area

Recommended Wilderness and Wilderness Study Area

The Lincoln National Forest has one wilderness study area and additional areas of recommended wilderness. The plan components below apply to both.

Guadalupe Escarpment Wilderness Study Area

The 20,913-acre[5] Guadalupe Escarpment Wilderness Study Area was reviewed by Congress as part of the New Mexico Wilderness Act of 1980. The New Mexico Wilderness Act of 1980 stated "the Secretary of Agriculture shall review the Guadalupe Escarpment Wilderness Study Area as to its suitability or non-suitability for preservation as wilderness, and report the findings to Congress. Subject to valid existing rights, the Guadalupe Escarpment Wilderness Study Area designated by this section shall, until Congress determines otherwise, be administered by the Secretary of Agriculture so as to maintain its presently existing wilderness character and potential for inclusion in the National Wilderness Preservation System provided, that within the area, current levels of motorized and other uses and improvements shall be permitted to continue subject to such reasonable rules and regulations as the Secretary of Agriculture shall prescribe."

In 2001, approximately 27,300 acres of National Forest System lands were withdrawn from location and entry under the Unites States mining and mineral leasing laws for a period of 20 years in order to protect the Guadalupe Cave Resource Protection Area. The withdrawal area includes the Guadalupe Escarpment Wilderness Study Area's 20,913 acres along with 6,387 acres adjacent to the north.

Recommended Wilderness and Wilderness Study Area Desired Conditions

MA-RECWILD-DC

01 Recommended wilderness management areas maintain the wilderness characteristics they were evaluated to possess at the time of recommendation until their designation as wilderness or other use is determined by Congress.

02 Recommended wilderness management areas are valued by the public for the ecosystem services they provide, including contributing to clean air and water, enhancing wildlife habitat, providing primitive recreation and solitude opportunities, and other wilderness characteristics.

03 Recommended wilderness management areas represent environments that are essentially unmodified and natural landscapes. Constructed features exist when they are necessary for administration of the area as a recommended wilderness management area or for the protection of resources.

04 Natural processes (insects, disease, blowdown, wildfires) function within their natural ecological role or are mimicked (using prescribed fire).

05 Recommended wilderness management areas provide recreation opportunities where social encounters are infrequent and occur only with individuals or small groups so that there are opportunities for solitude. Visitors experience self-reliance, challenge, and risk while enjoying freedom to pursue nonmotorized and nonmechanized activities.

5. Acreage differs from the 1980 New Mexico Wilderness Act designation due to the use of GIS-generated acres and rounding for consistency in this document. The use of GIS-generated acres does not change the approximate 21,000 acres identified in the New Mexico Wilderness Act.

06 Livestock grazing management continues to contribute to the long-term socioeconomic diversity and stability of local communities and cultural identity tied to a recommended wilderness management area.

07 Wildland fires function or mimic their natural ecological role.

Recommended Wilderness and Wilderness Study Area Standards

MA-RECWILD-S

01 Insect and disease infestations shall be allowed to run their natural course except where they unacceptably threaten wilderness characteristics.

02 Nonnative invasive species shall be treated using methods, and in a manner, consistent with wilderness characteristics. Exceptions would include situations where nonnative invasive species unacceptably threaten wilderness characteristics (for example, feral hog control or control of large nonnative invasive plant infestations).

03 The following activities are not allowed in recommended wilderness management areas:

a. No new permanent roads, motorized trails, or mechanized (mountain bike) trails for public access shall be constructed in or designated in recommended wilderness management areas.

b. Mechanical vegetation management (such as mastication) is prohibited in recommended wilderness management areas unless treatment is needed to protect wilderness character.

c. New energy developments, authorizations, or leases shall not be permitted.

d. Sales or extraction of common variety minerals shall not be authorized.

Recommended Wilderness and Wilderness Study Area Guidelines

MA-RECWILD-G

01 Activities in recommended wilderness management areas should maintain the wilderness characteristics until Congress acts on the recommended area, either designating it as wilderness or releasing it for other management.

02 Intervention in natural processes through management activities should only occur where this would move the area towards desired conditions, enhance or preserve wilderness characteristics, protect public health and safety within and adjacent to the recommended wilderness management area, or uphold other federal laws and regulations.

03 Unplanned and planned wildland fire ignitions should be allowed to reduce the risks and consequences of uncharacteristic wildfire and to increase apparent naturalness or to enhance ecosystem function.

04 Mechanized uses for management activities (including chainsaws and wheelbarrows) should be allowed in recommended wilderness areas if they are needed to preserve, protect, or enhance wilderness characteristics of the area.

05 Recommended wilderness areas should be managed to preserve a very high scenic integrity objective as defined in the Scenery Management System.

06 Recommended wilderness areas should be managed for primitive recreation opportunity spectrum classes.

07 Existing structures necessary for administration of the area should be maintained but not expanded to protect the area's wilderness characteristics. Maintenance of existing structures should be carried out in a manner that does not expand the evidence of installations, motor vehicle use, and mechanized equipment use beyond current conditions.

08 Competitive events should not be permitted in recommended wilderness areas to maintain wilderness characteristics of solitude and primitive and unconfined recreation.

09 Motorized access should be allowed for administrative purposes on existing roads and trails including for search and rescue operations, livestock management, State of New Mexico game and fish operations, and Lincoln National Forest administration (such as wildland fire management).

Eligible Wild and Scenic Rivers

Eligible wild and scenic rivers meet the basic criteria for inclusion in the National Wild and Scenic Rivers System. They are free-flowing and possess at least one outstandingly remarkable value. Preliminary classifications of eligible river segments as wild, scenic, or recreation follow the same characteristics as designated wild and scenic rivers, and are based on the condition and development level in and around the river at the time it was deemed eligible. Forest Service Handbook 1909.12, chapter 82.2, states: The planning rule requires 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 section 219.7(c)(2)(vi))."

The current handbook indicates that "… if a river segment has been studied in the past and a determination was made of its eligibility, it does not need to be studied again for eligibility during any subsequent land management planning, unless changed circumstances warrant additional review of eligibility" (section 82.4).

In 2002, all rivers in the Lincoln National Forest were evaluated to determine their eligibility. This evaluation resulted in 55 river segments that have been identified as eligible to be included in the National Wild and Scenic Rivers System (see Appendix D: Eligible Wild and Scenic Rivers). There are no designated wild and scenic rivers on the Lincoln National Forest. In 2019, the rivers evaluated as eligible in the 2002 analysis were reviewed by the Forest Service for change in circumstance; 54 river segments were determined eligible, totaling approximately 139 miles, and the potential outstandingly remarkable values were updated. A detailed explanation of the eligible wild and scenic rivers evaluation process is located in volume 2 of the draft environmental impact statement, Appendix F: Wild and Scenic River Evaluation Process.

Eligible wild and scenic rivers must be managed to maintain the free flow and outstandingly remarkable values they possess at the time of eligibility unless a determination of ineligibility or

non-suitability is made. If an eligible river is determined through a suitability study to be not suitable, it shall no longer be considered eligible and plan direction in this management area will no longer apply. If an eligible river is determined to be suitable and is designated by Congress as a wild and scenic river, the designation would not affect existing water rights or the existing jurisdiction of states and the federal government, as determined by established laws.

The free-flowing character of eligible wild and scenic rivers is a regulating ecosystem service providing water to downstream sources. Free-flowing water can also be a supporting ecosystem service in the form of water cycling and a provisioning ecosystem service in terms of fresh water. The specific outstandingly remarkable values of each wild and scenic river can have different ecosystem services: Scenic, recreational, historic, and cultural outstandingly remarkable values are cultural ecosystem services, while the fish outstandingly remarkable value contributes to supporting ecosystem services.

Eligible Wild and Scenic River Desired Conditions

MA-ELIGWSR-DC

01 The outstandingly remarkable values, free-flowing condition, and classifications of eligible wild and scenic river corridors are protected or enhanced until rivers are designated or released from consideration.

02 Eligible wild and scenic river corridors are valued by the public for the ecosystem services they provide, including contributions to clean water, enhancing wildlife habitat, and recreation opportunities.

Eligible Wild and Scenic River Standards

MA-ELIGWSR-S

01 When management activities are proposed that may compromise the outstandingly remarkable values, potential classification, or free-flowing character of an eligible wild and scenic river segment or corridor, a suitability study shall be completed for that eligible river segment prior to initiating activities.

02 Rivers found unsuitable through a suitability study, for inclusion in the National Wild and Scenic River System shall be released from further consideration and the direction in this section.

03 Where eligible wild and scenic river corridors occur within other management areas, the most restrictive management direction shall apply.

Eligible Wild and Scenic River Guidelines

MA-ELIGWSR-G

01 Recreation and other activities near eligible rivers and associated corridors should be managed to occur at appropriate locations and intensities to protect and enhance the free-flowing condition and the outstandingly remarkable values, while remaining consistent with the classification.

02 Activities in eligible wild and scenic river corridors should comply with interim protective measures.

03 New roads or motorized trails should not be constructed within one-quarter mile of a wild eligible river segment.

04 Management activities should be consistent with the scenic integrity objectives as found in the Scenery Management System:

a. Very high within eligible river corridors classified as wild
b. High within eligible river corridors classified as scenic
c. Moderate to high within eligible river corridors classified as recreational

05 Management activities should be consistent with the recreation opportunity spectrum classes:

a. Primitive to semi-primitive non-motorized within eligible river corridors classified as wild
b. Semi-primitive non-motorized to semi-primitive motorized within eligible river corridors classified as scenic
c. Roaded natural to rural within eligible river corridors classified as recreational

06 Management activities (such as vegetation treatments) should be prohibited within eligible river corridors unless treatment is needed to protect eligibility, classification, or values**.**

Eligible Wild and Scenic Rivers Management Approach

Consider the following:

01 Seek opportunities for enhancing outstandingly remarkable values in all project management activities within an eligible wild and scenic river corridor.

Proposed Research Natural Areas

Research natural areas are part of a national network of ecological areas designated in perpetuity for research and education and to maintain biological diversity on National Forest System lands. Research natural areas are principally for non-manipulative research, observation, and study (Forest Service Manual 4063). The Lincoln National Forest's 1986 land management plan includes the following definition for research natural areas: "An area set aside by the Forest Service to preserve a representative sample of an ecological community primarily for scientific and educational purposes" (USDA FS 1986a). Research natural areas contribute to ecological sustainability by providing minimally disturbed areas for study, an ecological baseline, and comparison for forest management techniques on adjacent lands.

One proposed research natural area is recommended to be brought forward in the revised plan: Upper McKittrick Research Natural Area.

Upper McKittrick Proposed Research Natural Area

The Upper McKittrick Research Natural Area comprises approximately 787 acres in the Guadalupe Mountains at the southern border of New Mexico, adjacent to Texas. It encompasses an extensive stand of mountain mahogany and associated chaparral shrubs, which are yet to be represented in the Southwestern Region Research Natural Area system. Many areas in the Forest Service Southwestern

Region have mountain mahogany cover, but most have been heavily grazed in the past and are currently grazed. However, Upper McKittrick is far enough from water that it does not receive livestock use. The high floral abundance and diversity, together with geographic position and considerable variability in topographic relief and aspect, provide a rich array of factors for study.

Upper McKittrick is surrounded by steep, shrub-covered limestone cliffs. Most of the area is dominated by mountain mahogany together with wavy leaf oak and other associated chaparral shrubs, grasses, and a variety of forbs. Piñon-juniper woodland is found above the research natural area to the northeast, and pockets of ponderosa pine occur on north-facing slopes in the canyon. Vegetation along the narrow canyon bottoms includes large trees and abundant and varied herbs and grasses.

The Upper McKittrick Research Natural Area falls within the Guadalupe Escarpment Wilderness Study Area. It was proposed as an example of relatively untouched chaparral (currently mapped as mountain mahogany ecological response unit) as influenced by the adjacent Chihuahuan desert. Mountain mahogany makes up about 91 percent of the research natural area. Additional ecological response units include the mixed conifer-frequent fire ecological response unit and the little walnut-ponderosa pine riparian ecological response unit (5 percent and 3 percent, respectively). Topography and lack of water have limited historical grazing, and none is permitted there now. The condition of this area at its initial proposal date was within the historical range of variation for the ecosystems in the research natural area (USDA FS 2019g). Current conditions have changed little since proposal with no history of wildfire or insect and disease disturbance. The ecological response units are currently within the historical range of variation and could function as reference sites for those ecological response units. This proposed research natural area will be reevaluated during the plan revision to determine whether it should be carried forward in the planning process and formally designated as a research natural area.

Proposed Research Natural Area Desired Conditions

MA-RNA-DC

01 Research natural areas are natural appearing and ecological processes (plant succession, insects and diseases, and wildfire) function with limited human interference.

02 Research natural areas remain a baseline for ecological processes, including succession. They serve as a baseline for actively studied ecosystems, measuring ecological change from disturbances or stressors like climate change.

Proposed Research Natural Area Standards

MA-RNA-S

01 Research natural areas will be recommended for withdrawal from minerals, geothermal, or oil and gas development.

02 Vegetation manipulation or removal of forest products for commercial purposes and personal use (including firewood) will not be permitted or authorized unless it is necessary to maintain the ecological process or the natural characteristics for which the research natural area was designated.

03 New trail construction will not be permitted.

04 Special-use permits will not be issued, except for research that would not lead to long-term effects on the characteristics specific to the research natural area.

05 Only non-motorized day use recreational activities are allowed.

06 Campfires are prohibited.

07 New utility corridors will not be authorized.

Proposed Research Natural Area Guidelines

MA-RNA-G

01 Management activities should be consistent with the scenic integrity objective of the research natural area.

02 Unauthorized roads should be removed and the route restored (soil, slope, and vegetation).

Proposed Research Natural Area Management Approaches

Consider the following:

01 Collaborate with appropriate agencies and universities regarding scientific opportunities of research natural areas.

02 Encourage partnerships and volunteers to provide onsite interpretation and monitoring for the research natural areas.

03 Mark the boundary of the research natural area and use signs to educate the public about the research natural area purpose, including permitted and prohibited activities.

Cave Management Areas

On the Lincoln National Forest, the southern end of the Guadalupe Mountains contains many significant caves. These caves pre-date the large canyons and well-defined surface features we see today. Since the development of the caves is much older than the surrounding landscape, there are very few typical karst features found. Several caves have been mapped to lengths of over 3 miles with a few approaching 10 miles. Guadalupe caves are generally deep, but not long. The caves tend to descend via a series of drops of about 100–150 feet each. The deepest known single drop in a Guadalupe cave is over 200 feet. Other caves inventoried in this area are relatively level. Travertine deposits are profuse (Hill 1987). Geological features inside Guadalupe caves include stalactites, stalagmites, flow stone, and crystals. These caves have the well-earned reputation of being among the most beautiful in the world. The boundary of the management area corresponds to a previous Bureau of Land Management withdrawal for mining and mineral leasing (USDI BLM 2001). This withdrawal protected the Lincoln National Forest's significant cave resources (geological, ecological, cultural, and tribal).

The Snowy River Cave is the third longest cave in New Mexico. The majority of the documented cave is under the jurisdiction of the Bureau of Land Management as the Fort Stanton-Snowy River Cave National Conservation Area. Currently at 15 miles, Snowy River is the world's longest calcite formation. Snowy River cave passages continue on Smokey Bear Ranger District, where Lincoln

National Forest management applies. The boundaries of the Snowy River Management Area in this plan were recommended based on hydrologic, subsurface exploration, and surface surveys.

Cave Management Area Desired Conditions

MA-CAVEMA-DC

01 The unique and nationally important historic, cultural, scientific, archaeological, natural, and educational subterranean cave resources found in the Guadalupe Cave Management Area are conserved and enhanced.

02 The Snowy River Cave's unique and nationally important historic, cultural, scientific, archaeological, natural, and educational subterranean cave resources are conserved and enhanced.

Cave Management Area Standards

MA-CAVEMA-S

01 The Cave Resource Protection Areas will be recommended for withdrawal from minerals, geothermal, or oil and gas development.

02 In the Cave Resource Protection Areas, special use authorizations for recreation events that involve motorized use will not be permitted.

03 In the Cave Resource Protection Areas, new rights-of-way for major infrastructure will not be issued (including commercial use communication or energy sites, pipelines 10 inches in diameter or larger, and transmission lines).

04 In the Cave Resource Protection Area, new construction of facilities (structures) or roads must not introduce pollution (such as chemicals or sewage), in order to protect cave biotic values.

Cave Management Area Guidelines

MA-CAVEMA-G

01 The portion of the Guadalupe Cave Management Area located in the Guadalupe Escarpment Wilderness Study Area should be managed to preserve a very high scenic integrity objective as defined in the Scenery Management System.

02 The portion of the Guadalupe Cave Management area located outside the Guadalupe Escarpment Wilderness Study Area should be managed for high scenic integrity objective as defined in the Scenery Management System.

03 In the Snowy River Cave Management Area, changes to hydrologic function from Lincoln National Forest activities (such as vegetation thinning) should be mitigated if uncharacteristic flooding or changes in groundwater recharge and flow may result.

04 The Snowy River Cave Management Area should be managed for at least the moderate scenic integrity objective as defined in the Scenery Management System.

05 In the Snowy River Cave Management Area, entrances and features should be located (using surface inspection pedestrian survey) and avoided prior to mechanical vegetation treatment that cause ground disturbance (for example, bulldozer pushes).

Cave Management Area Management Approaches

Consider the following:

01 Work with the Bureau of Land Management and National Park Service in the management of the Guadalupe Caves Management Area.

02 Work with the Bureau of Land Management in the management of Snowy River Cave.

03 Work with the Fort Stanton Cave Study Project for survey, exploration, and research of Snowy River Cave.

Chapter 4. Land Management Plan Monitoring

Introduction

Under the 2012 Planning Rule, monitoring consists of two elements: the plan monitoring program and broader-scale monitoring strategies. Together, these elements support adaptive management by demonstrating if a change may be needed in plan components or other plan content that guide management of resources in the plan area. Broader-scale monitoring strategies are developed by the regional forester and are not completed at this time.

Monitoring is continuous and provides feedback for the planning cycle by testing assumptions, tracking relevant conditions over time, and measuring management effectiveness. Monitoring uses the best available scientific information while remaining within the financial and technical capabilities of the agency.

The plan-level monitoring program is informed by the assessment report (USDA FS 2019a, 2019b) developed concurrently with plan development, and implemented after plan adoption. Biennial monitoring evaluation reports document whether a change to the plan or change to the monitoring program is warranted based on new information, whether a new assessment may be needed, or whether there is no need for change at that time. The monitoring strategy provides a framework for subsequent monitoring and evaluation designed to inform adaptive management (table 3). The 2012 Planning Rule requires that the plan monitoring program contain at least one monitoring question and associated indicator to address each of the following nine topics (36 CFR 219.12(a)(5)):

1. The status of select watershed conditions.
2. The status of select ecological conditions (including key characteristics of terrestrial and aquatic ecosystems).
3. The status of focal species to assess how ecological conditions provide for the diversity of plant and animal communities, within the Forest Service authority and consistent with the inherent capability of the planning area.
4. The status of select ecological conditions that contribute to the recovery of threatened and endangered species, conserve proposed and candidate species, and maintain a viable population of each species of conservation concern.
5. The status of visitor use, visitor satisfaction, and progress toward meeting recreation objectives.
6. Measurable changes on the plan area related to climate change and other stressors.
7. Progress toward meeting desired conditions and objectives in the plan, including for providing multiple use opportunities.
8. The effects of management systems to determine that they do not substantially and permanently impair the productivity of the land.
9. Changes in social, cultural, and economic conditions that are influenced by the plan and contributions of plan area management toward meeting social, cultural, and economic attributes of desired conditions to provide feedback for adaptive management toward expected and potential contributions to social and economic sustainability.

Monitoring is the part of the adaptive management strategy used to determine the degree to which on-the-ground management is maintaining or making progress toward desired conditions. The monitoring strategy includes questions and performance measures designed to evaluate implementation and effectiveness and inform adaptive management (table 3).

Monitoring questions focus on providing the information necessary to evaluate whether plan components are effective and appropriate and whether management is effectively maintaining or achieving progress toward the desired conditions and objectives in the plan area. Indicators are quantitative or qualitative variables that can be measured or described and that, when observed periodically, show trends in conditions that are relevant to the associated monitoring questions.

Table 3. Monitoring strategy

Resource/ Characteristic	Plan Component	Component Code	Question	Indicator	Topic	Focal Species
Ecosystem/Mixed Conifer with Aspen						
Seral State/ Structure	Aspen proportion and patch size on the landscape in historical range of variation; disturbance regimes function as historically to maintain aspen communities.	FW-VEG-DC-1, 3 FW-VEG-O-1 FW-VEG-G-1, 2 FW-MCW-DC-MS-1 FW-MCW-G-1, 2	Are management activities maintaining or moving structure toward desired (historical range of variation) conditions?	Proportion of seral state, patch size; every 5 years, remote sensing	ii, iii	aspen (*Populus tremuloides*)
Coarse Woody Debris	Adequate coarse woody material and stumps exist providing quality habitat for ground dwelling species.	FW-VEG-DC-1, 3 FW-MCW-DC-LS-2, 3, 4, 5 FW-TERSPH-DC-2 FW-TERSPH-g-7, 8 FW-ATRISK-DC-1, 4 FW-ATRISK-S-2 FW-ATRISK-G-1, 5	Are management activities maintaining or moving structure toward desired (historical range of variation) conditions that support the needs of endemic/rare historically occurring species?	Presence/absence, distribution; every year, after implementation, on rotation for biological opinion compliance	ii, iii, iv	Sacramento Mountains salamander (*Aneides hardii*)
Seral State/ Structure	Seral state structure, proportion, and patch size resembles more closed canopy portion of historical range of variation, with multi-storied canopies.	FW-VEG-DC-1, 3 FW-VEG-O-1 FW-MCW-LS-1, 2, 3, 4 FW-MCW-G-1 FW-TERSPH-DC-1, 2, 5, 6, 8 FW-TERSPH-O-1 FW-TERSPH-G-4, 5, 6, 7	Do management activities and resulting structural changes affect Mexican spotted owl use of occupied habitat.	Presence/absence, reproductive success, distribution; every year, after implementation, on rotation for biological opinion compliance	ii, iii, iv	Mexican spotted owl (*Strix occidentalis lucida*)
Ecosystem/Mixed Conifer-Frequent Fire						
Seral State/ Structure	Seral state structure, proportion, and patch size resembles more closed canopy portion of historical range of variation, with multi-storied canopies.	FW-VEG-DC-1, 3 FW-VEG-O-1 FW-MCD-LS-1, 2, 3 FW-MCD-G-1, 4 FW-TERSPH-DC-1, 2, 5, 6 FW-TERSPH-O-1 FW-TERSPH-G-4, 5, 6, 7	Do management activities and resulting structural changes affect Mexican spotted owl use of occupied habitat.	Presence/absence, reproductive success, distribution; every year, after implementation, on rotation for biological opinion compliance	ii, iii, iv	Mexican spotted owl (*Strix occidentalis lucida*)

Resource/ Characteristic	Plan Component	Component Code	Question	Indicator	Topic	Focal Species
Seral State/ Structure	Seral state structure, proportion, and patch size resembles more closed canopy portion of historical range of variation, with multi-storied canopies.	FW-VEG-DC-1, 3 FW-VEG-O-1 FW-MCD-DC-LS-1, 2, 4 FW-MC-MS-1, 2 FW-MCD-G-1	Are management activities maintaining or moving structure toward desired (historical range of variation) conditions?	Proportion seral state measured every 5 years through remote sensing and Forest Service Activity Tracking System records.	ii, iv	not applicable
Ecosystem/Ponderosa Pine Forest						
Seral State/ Structure	Seral state structure, proportion, and patch size are within historical range of variation, providing habitat for a suite of historically occurring species.	FW-VEG-DC-1, 3 FW-VEG-O-1 FW-PPF-DC-LS-1, 2, 3, 4 FW-PPF-DC-MS-1, 2, 3 FW-PPF-G-1, 2	Are management activities maintaining or moving systems toward desired condition of providing adequate quality habitat for the range of locally historically occurring species?	Presence/absence, distribution; every 1 to 2 years, on rotation	ii, iii	pigmy nuthatch, Williamson's sapsucker, mountain bluebird, Grace's warbler, western bluebird (end of summer)
Seral State/ Structure	Seral state structure proportion, and patch size resembles more closed canopy portion of historical range of variation, with multi-storied canopies.	FW-VEG-DC-1, 3 FW-VEG-O-1 FW-PPF-DC-LS-1, 4 FW-PPF-MS-2 FW-PPF-G-1	Are management activities maintaining or moving structure toward desired (historical range of variation) conditions?	Change in proportion seral state measured every 5 years through remote sensing and Forest Service Activity Tracking System records.	ii	not applicable
Ecosystem/Piñon-Juniper						
Seral State/Structure	Seral state structure, proportion, and patch size are within historical range of variation, providing habitat for a suite of historically occurring species.	FW-VEG-DC-1, 3 FW-VEG-G-1 FW-PJC-DC-MS-1, 2 FW-PJO-DC-LS-1 FW-PJO-MS-1 FW-PJO-O-1 FW-PJO-G-2, 3, 4 FW-PJG-DC-FS-1 FW-TEERSPH-DC-1, 2, 5, 13 FW-TERSPH-S-7, 8	Are management activities maintaining or moving systems toward desired condition of providing adequate quality habitat for the range of locally historically occurring species?	Presence/absence, distribution; every 1 to 2 years, on rotation	ii, iii	grey vireo, pinyon jay, black-throated gray warbler, juniper titmouse, western bluebird, Virginia's warbler

Resource/ Characteristic	Plan Component	Component Code	Question	Indicator	Topic	Focal Species
Ecological Status (Composition)	Species dominated by one or another of suite, not exotics or nonnative forage.	FW-VEG-DC-1, 3 FW-VEG-G-1 FW--PJC-DC-MS-2 FW-INVASIVE-DC-1 FW-INVASIVE-S-8, 9 FW-INVASIVE-G-4	Are nonnative invasive plants displacing native vegetation/rangelands?	Presence/absence, distribution; every 1 to 2 years, on rotation	ii, iv	yellow bluestem, Caucasian bluestem, King Ranch bluestem
Seral State/Structure	Seral state structure, proportion, and patch size are within historical range of variation, capable of providing habitat for the suite of historically occurring species.	FW-VEG-DC-1, 3 FW-VEG-O-1 FW-PJC-DC-LS-1 FW-PJC-DC-MS-2 FW-PJO-DC-LS-1 FW-PJO-DC-MS-1 FW-PJG-DC-LS-4, 6	Are management activities maintaining or moving structure toward desired (historical range of variation) conditions?	Proportion seral state; every 5 years, remote sensing, Forest Service Activity Tracking System extraction	ii	not applicable
Seral State/Structure	Seral state structure, proportion, and patch size are within historical range of variation, providing habitat for a suite of historically occurring species.	FW-VEG-DC-1, 3 FW-VEG-O-1 FW-PJC-DC-LS-1 FW-PJC-DC-MS-1, 2 FW-PJO-DC-LS-1 FW-PJO-MS-1 FW-PJO-G-2, 3, 4 FW-PJG-DC-FS-1 FW-TERSPH-DC-1, 2, 5 FW-TERSPH-G-5	Are management activities maintaining or moving systems toward desired condition of providing adequate quality habitat for the range of locally historically occurring species?	Presence/absence, distribution; every 1 to 2 years, on rotation	ii, iii	Bell's vireo, Scott's Oriole, Black hawk
Ecosystem/Montane Subalpine Grassland						
Ecological Status (Composition) (Ridge/Slope)	Species dominated by one or another of suite, not exotics or nonnative forage.	FW-VEG-DC-1, 3 FW-VEG-G-1; FW-MSG-DC-LS-4 FW-MSG-DC-MS-1, 2	Are management or use activities maintaining or improving native plant composition in herbaceous plant vegetation types?	Suite of grasses - presence/absence, composition; every 1 to 2 years, on rotation	ii, iii	Arizona fescue (*Festuca arizonica*), Thurber fescue (*Festuca thurberi*), Parry's oatgrass (*Danthonia parryi*), bluebunch wheatgrass (*Pseudoroegneria spicata*), pine dropseed (*Blepharoneuron tricholepis*)

Resource/ Characteristic	Plan Component	Component Code	Question	Indicator	Topic	Focal Species
Seral State/Structure	Lack of conifer encroachment.	FW-VEG-DC-1, 3; FW-VEG-O-2 FW-VEG-G-1 FW-MSG-G-1	Are conifers encroaching into grasslands, altering disturbance and successional regimes?	Proportion grass/conifer; every 5 years, remote sensing, Forest Service Activity Tracking System extraction	ii	not applicable
Ecological Status (Composition)	Herbaceous vegetation dominated by native graminoids and forbs, with nonnative exotics rare or not spreading where they occur.	FW-VEG-DC-1, 3 FW-VEG-G-1 FW-MSG-DC-LS-1 FW-MSG-DC-FS-1 FW-INVASIVE-DC-1 FW-INVASIVE-G-1, 3, 5	Are nonnative invasive plants displacing native vegetation?	Presence/absence, distribution; every 1 to 2 years, on rotation	ii, iv	musk thistle
Seral State/Structure	Vegetation dominated by native or naturalized plant species with structural characteristics (height) that supports a suite of animal species, particularly rare or listed species.	FW-VEG-DC-1, 3 FW-VEG-G-1 FW-MSG-DC-MS-3	Do management activities support historical herbaceous vegetation structure identified as quality New Mexico meadow jumping mouse habitat	Vegetation height (New Mexico meadow jumping mouse); every 1 to 2 years, on rotation	ii	not applicable
Ecosystem/Herbaceous Wetland						
Ecological Status (Composition)	Species dominated by one or another of suite, not exotics or nonnative forage.	FW-VEG-DC-1, 3 FW-VEG-G-1 FW-RIPAR-DC-WS-1 FW-RIPAR-O-1, 2, 3	Are management or use activities maintaining or improving native plant composition in herbaceous plant vegetation types?	Regional approved assessment (possibly proper functioning condition lotic)	ii, iii	not applicable
Ecological Status (Composition)	Species dominated by one or another of suite, not exotics or nonnative forage.	FW-VEG-DC-1, 3 FW-VEG-G-1 FW-RIPAR-DC-WS-1, 5 FW-RIPAR-DC-FS-4, 5	Are management or use activities maintaining or improving native plant composition in herbaceous plant vegetation types?	Presence/absence, distribution, every 2 years	ii, iii	coneflower (*Rudbeckia laciniata*)

Resource/ Characteristic	Plan Component	Component Code	Question	Indicator	Topic	Focal Species
Seral State/Structure	Vegetation dominated by native or naturalized plant species with structural characteristics (height) that supports a suite of animal species, particularly rare or listed species.	FW-VEG-DC-1, 3 FW-VEG-G-1 FW-RIPAR-DC-WS-1, 5 FW-RIPAR-DC-FS-4, 5	Do management activities support historical herbaceous vegetation structure identified as quality New Mexico meadow jumping mouse habitat	Veg height (New Mexico meadow jumping mouse) annually	ii	cutleaf coneflower (*Rudbeckia laciniata*)
Ecosystem/Semi-Desert Grassland						
Ecological Status (Composition)	Species dominated by native vegetation (including one or another of suite), not exotics or nonnative forage.	FW-VEG-DC-1, 3 FW-VEG-G-1 FW-SDG-DC-MS-1, 2	Are management or use activities maintaining or improving native plant composition in herbaceous plant vegetation types?	Suite of grasses; every 1 to 2 years, on rotation	ii, iii	blue grama (*Bouteloua gracilis),* sideoats grama (*Bouteloua curtipendula*), hairy grama (*Bouteloua hirsuta*), black grama (*Bouteloua eriopod*), little bluestem (*Schizachyrium scoparium*), tobosa grass (*Pleuraphis mutica*), giant sacaton (*Sporobolus wrightii*)
Ecosystem/Selected Riparian						
Ecological Status (Composition)(D 3)	Endemic Riparian Systems capable of supporting endemic and rare plant and animal species.	FW-VEG-DC-1, 3 FW-VEG-G-1 FW-RIPAR-DC-WS-1, 5, 6 FW-RIPAR-DC-FS-5 FW-RIPAR-G-9, 11, 12	Are conditions in little walnut riparian ecological response units able to continue supporting viable populations of leopard frog, and little walnut as the dominant tree?	Presence/absence, distribution; every 1 to 2 years, on rotation	ii, iii	little walnut, leopard frog

Resource/ Characteristic	Plan Component	Component Code	Question	Indicator	Topic	Focal Species
Ecological Status (Composition)/ Structure (D1, D3)	Riparian systems contain historical range of composition and structure to provide habitat for the historically naturally occurring suite of plants, animals, and aquatic species.	FW-VEG-DC-1, 3 FW-VEG-G-1 FW-RIPAR-DC-WS-1, 5, 6 FW-RIPAR-DC-FS-5 FW-RIPAR-G-1, 6	Are management or use activities maintaining or improving native plant composition and structure to provide quality habitat for the historically naturally occurring suite of plants, animals, and aquatic species.	Presence/absence, cover, distribution; every 1 to 2 years, on rotation, remote sensing	ii, iii	Salix spp.
Ecological Status (Cover, Structure, Erosion)	Riparian systems contain historical range of composition and structure to provide habitat for the historically naturally occurring suite of plants, animals, and aquatic species. Threatened and endangered species (New Mexico meadow jumping mouse and Sacramento Mountains thistle).	FW-VEG-DC-1, 3 FW-VEG-G-1 FW-RIPAR-DC-WS-1, 5, 6 FW-RIPAR-DC-FS-5 FW-RIPAR-G-1, 3, 6, 11, 12	Are management or use activities maintaining or improving native plant composition and structure, and desired riparian geomorphologic conditions to provide quality habitat for the historically naturally occurring suite of plants, animals, and aquatic species. Threatened and endangered species (New Mexico meadow jumping mouse and Sacramento Mountains thistle).	Presence/absence, cover, distribution; every 5 to 10 years, remote sensing (including but not limited to NAIP, EarthSense, REV, LiDar, etc.)	ii, iv	riparian vegetation, exposed soils (New Mexico meadow jumping mouse)
Ecosystem/Cave Systems						
Ecological Status (Composition)	Endemic Cave and Karst Systems capable of supporting historically occurring endemic and rare plant and animal species.	FW-VEG-DC-1, 3 FW-VEG-G-1	Are Cave and Karst Systems continuing to support historically occurring endemic and rare plant and animal species?	Presence/absence, reproductive success, distribution; every year, after implementation, on rotation for biological opinion compliance	ii, iii, iv	Mexican spotted owl

Resource/ Characteristic	Plan Component	Component Code	Question	Indicator	Topic	Focal Species
Ecological Status (Composition)	Caves provide habitat for species that require specialized conditions for roosting and overwintering, such as bats. Caves maintain moisture and temperature levels consistent with historical conditions. They do not contain bat diseases, such as white-nose syndrome.	FW-CAVE-DC-2	Are Cave and Karst Systems continuing to support historically occurring endemic and rare plant and animal species?	Presence/absence, distribution; every year, after implementation	ii, iii	bats
Ecological Status (Composition)	Measures or mitigation for protecting caves should be incorporate into project plans for road construction, timber harvest, tree planting, blasting near caves, and any activity that could change cave temperatures and drainage patterns.	FW-CAVE-G-2	Are Cave and Karst Systems continuing to support historically occurring native plant and animal species?	Presence/absence, cover distribution; every 1 to 2 years, on rotation (depend on species)	ii, iii	other
Ecosystem/Ecological Response Unit						
Wildland Fire	Wildland fires are burning within desired condition fire regime intensity and frequency.	FW-FIRE-DC-3, 5, 6 FW-FIRE-O-1 FW-FIRE-S-1, 2, 3, 4 FW-FIRE-2, 3, 4	Are wildfires burning under the appropriate fire intensity and frequency aiding natural ecosystem processes?	Percent of ecological response unit burned under each intensity class; annually	ii, iii	not applicable

Resource/ Characteristic	Plan Component	Component Code	Question	Indicator	Topic	Focal Species
Watershed/Soils						
Road Densities	Watersheds function properly with hydrology unaffected by roads or obstructions.	FW-WATER-DC-1, 2; FW-WATER-O-1 FW-WATER-S-1 FW-ROADS-DC-7	Are forest roads negatively impacting hydrologic function and watershed condition?	Watershed condition framework scores	i, ii, vii, viii	not applicable
Road and Trail Maintenance – Erosion Hazard	Hydrologic systems function properly with no adverse effects from roads.	FW-WATER-DC-1, 2 FW-WATER-O-1 FW-WATER-S-1 FW-ROADS-DC-7 FW-ROADS-O-2	Are designed drainage features adequately draining water from roads, trails, and stream crossings?	Number of water bars/culverts maintained, or number road miles with drainage maintained every year	i, ii, vii, viii	not applicable
Roads and Trails	Watersheds function properly with hydrologic resources unaffected by roads or trails.	FW-WATER-DC-1, 2 FW-WATER-O-1 FW-WATER-S-1 FW-ROADS-DC-7 FW-ROADS-O-1, 2	Are forest roads and trails negatively impacting stream water quality, stream bank stability, stream channel geomorphology, or sensitive riparian/wetland areas? Are new roads created for extraction (timber, etc.) designed to avoid degradation of hydrologic resources (streams, riparian areas, etc.) and to mitigate accelerated hillslope erosion?	Miles of road decommissioned per year. Miles of road "properly" maintained per year. Replacement or mitigation of improperly placed culverts. Every 5 years	i, ii, vii, viii	not applicable

Resource/ Characteristic	Plan Component	Component Code	Question	Indicator	Topic	Focal Species
Watershed/Hydrology						
Water Quality	Streams and waterbodies are free from management introduced sedimentation and toxic elements.	FW-WATER-DC-1, 2 FW-WATER-O-1 FW-WATER-S-1 FW-ROADS-DC-7 FW-ROADS-O-1, 2	Are roads and trails contributing to excess sedimentation and degraded water quality conditions in streams?	Watershed Condition Framework scores	i, ii, vii, viii	not applicable
Recreation						
Developed Recreation Economic contribution	Developed recreation sites meet the expectations of the public and are sustainable (for example, developed sites generate enough fees to pay for the cost of operation, maintenance, and enhancement).	FW-DEVREC-DC-1	Are developed recreation sites meeting the needs, desires, and expectations of visitors?	National visitor satisfaction surveys.	v	not applicable
Developed Recreation Sustainability	Developed recreation sites include opportunities to reduce solid waste (for example, recycling) and utilize renewable resources to the extent possible.	FW-DEVREC-DC-1, 4	Are developed recreation sites sustainable?	Percent of recreation facilities in good or fair condition every 5 years.	v	not applicable
Dispersed Recreation Trail Sustainability	The Lincoln trail system is sustainable (using design, construction, and maintenance) and supports cultural ecosystem services through recreation opportunities.	FW-DISREC-DC-3	Are system trails maintained to prevent resource degradation and to support allowable uses?	Miles of trails maintained every 5 years.	v	not applicable

Resource/ Characteristic	Plan Component	Component Code	Question	Indicator	Topic	Focal Species
Economic Contribution Trails	A system of motorized and non-motorized trails is available in a variety of settings that provide differing levels of challenge, types of experiences, and linkages to local neighborhoods, communities, and other public lands.	FW-DISREC-DC-6	Are visitors satisfied with the opportunities for recreation on the forest?	National visitor satisfaction surveys.	v	not applicable
Roads Sustainability	A safe transportation system and infrastructure accommodate needs for public access, land and resource management, and permitted activities while contributing to social and economic sustainability along with cultural and provisioning ecosystem services.	FW-ROADS-DC-1	Are visitors satisfied with the opportunities for recreation on the forest?	Percent of roads maintained every 5 years.	v	not applicable
Designated Areas						
Wilderness	Wilderness character and values are maintained.	DA-WILD-O-1	Are management activities maintaining wilderness character in our designated wilderness areas?	Score in Wilderness Stewardship Performance	v	not applicable

Resource/ Characteristic	Plan Component	Component Code	Question	Indicator	Topic	Focal Species
Climate Change						
Ecological Status (Composition)	*Ecosystems are Resistant and Resilient to the Effects of Climate Change	FW-VEG-DC-2 FW-VEG-O-1, 2 FW-VEG-G-5	Are vegetation conditions resilient to a changing climate?	Acres of vegetation treatments and planting success related to Climate Change Vulnerability Assessment (USDA FS 2016b), annually; vegetation structure and composition departure, every 5 years; acres of canopy loss in ponderosa pine forest vegetation community due to fire, insects, or disease, annually;	v	not applicable
Ecological Status (Composition)	Plant and animal communities are dominated by native species. Nonnative invasive species are absent or exist at levels that do not affect the sustainability of native and desirable nonnative species.	FW-INVASIVE-DC-1	Are insect and disease populations within reference conditions?	Acres of invasive species treatments. every 10 years	v	not applicable

Resource/ Characteristic	Plan Component	Component Code	Question	Indicator	Topic	Focal Species
Multiple Uses/Grazing						
Ecological Status (Composition)	*Forest resources are sufficient to provide for ecological sustainability as well as provide for traditional economic opportunity and land use.	FW-RANGE-DC-1, 2, 4, 6 FW-RANGE-S-2, 3 FW-RANGE-G-1, 2, 3	Are rangelands providing adequate forage resources to sustain agricultural businesses, socioeconomic diversity, and cultural identity of local communities?	Number of livestock permittees authorized (head months); Daubenmire plots or similar protocol	vii	not applicable
Ecological Status (Composition)	Livestock grazing is compatible with ecological functions and processes (for example, water infiltration, wildlife habitat, soil stability, and natural fire regimes).	FW-RANGE-DC-3, 6 FW-RANGE-S-2, 3 FW-RANGE-G-1, 2, 3	Is rangeland condition moving towards identified vegetation desired conditions and/or ecological site potential?	Allotment condition ratings; every 10 years	vii	not applicable
Tribal Uses						
Traditional Uses	Tribes and tribal members have access to sacred sites, traditional cultural properties, and collection areas for traditional and ceremonial use supporting cultural ecosystem service.	FW-TRIBE-DC-3, 4, 6	Do tribes have adequate solitude and privacy for traditional and cultural activities?	Feedback from annual tribal meetings; report every 3 years.	vi	not applicable

Resource/ Characteristic	Plan Component	Component Code	Question	Indicator	Topic	Focal Species
Cultural Resources						
Education	The public has opportunities for learning about cultural ecosystem services, appreciating, and understanding cultural resources and the ecosystem services they provide (for example, education, recreation, and cultural heritage values).	FW-ARCH-DC-2, 4	Is the Lincoln providing interpretative and educational opportunities to the public about cultural and historic resources?	Number of youth participating in educational programs, events, activities, and employment on the Lincoln National Forest; every 2 years.	vi	not applicable
Preservation	The integrity of cultural resources (buildings, sites, districts, structures, and objects) meeting National Register of Historic Places criteria (for example, having scientific, cultural, or social values) is intact. They are not degraded from vandalism, looting, and other human impacts or natural processes such as erosion.	FW-ARCH-DC-1	Are cultural and historical resources being located and protected to provide a legacy for the Lincoln and its visitors?	Number of sites updated in the INFRA database. Every 2 years.	vi	not applicable

Glossary

adaptation: Adjustment in natural or human systems to a new or changing environment. Adaptation includes, but is not limited to, maintaining primary productivity and basic ecological functions, such as energy flow; nutrient cycling and retention; soil development and retention; predation and herbivory; and natural disturbances. Adaptation occurs primarily by organisms altering their interactions with the physical environment and other organisms.

adaptive capacity: The ability of ecosystems to respond, cope, or adapt to disturbances and stressors, including environmental change, to maintain options for future generations. As applied to ecological systems, adaptive capacity is determined by:

- Genetic diversity within species in ecosystems, allowing for selection of individuals with traits adapted to changing environmental conditions.
- Biodiversity within the ecosystem, both in terms of species richness and relative abundance, which contributes to functional redundancies.
- The heterogeneity and integrity of ecosystems occurring as mosaics within broader-scaled landscapes or biomes, making it more likely that some areas will escape disturbance and serve as source areas for re-colonization.

adaptive management: Adaptive management is the general framework encompassing the three phases of planning: assessment, plan development, and monitoring (36 CFR 219.5). This framework supports decisionmaking that meets management objectives while simultaneously accruing information to improve future management by adjusting the plan or plan implementation. Adaptive management is a structured, cyclical process for planning and decisionmaking in the face of uncertainty and changing conditions with feedback from monitoring, which includes using the planning process to actively test assumptions, track relevant conditions over time, and measure management effectiveness.

all lands: The concept that ecosystems transcend land ownership boundaries, thus, effective land and resource management requires cooperation and collaboration among the Forest Service, other land managing agencies, federally recognized tribes, and private landowners. This plan was developed using an approach that considers the greater landscape and the Lincoln National Forest's ecological, social, and economic role in that landscape.

airshed: A geographic area that, because of topography, meteorology, and/or climate is frequently affected by the same air mass.

assessment: For the purposes of the land management planning regulation at 36 CFR part 219, an assessment is the identification and evaluation of existing information to support land management planning. Assessments are not decisionmaking documents but provide current information on select topics relevant to the plan area in the context of the broader landscape (36 CFR 219.19).

at-risk species: Species federally recognized as endangered, threatened, proposed, or candidate species, or species of conservation concern. Species of conservation concern are species other than federally recognized threatened, endangered, proposed, or candidate species known to occur on the Lincoln National Forest and for which the regional forester has determined that the best available

scientific information indicates substantial concern about the species' capability to persist over the long term on the forest. For species of conservation concern, habitat management and compatible multiple uses will be accomplished in a way that ensures species' persistence on the Lincoln National Forest, in accordance with the 2012 Planning Rule (36 CFR § 219.9(b)). For many at-risk species, essential ecological conditions can be provided through "coarse filter" plan components, such as desired conditions and standards and guidelines, for specific vegetation communities (for example, alpine and tundra, mixed conifer-frequent fire, piñon-juniper woodland). These may be adequate to ensure persistence of at-risk species and maintain viable populations on the Lincoln National Forest. For other at-risk species, fine-filter plan components that are species-specific (timing restrictions, etc.) may be required to ensure persistence. In this land management plan, at-risk species associated with a vegetation community (see ecological response units) are listed after plan components, but are not in a text box, since their identification is not a land management plan decision, as are plan components. At-risk species can be changed based on new scientific information throughout the life of the land management plan, without an amendment (FSH 1909.12, 21.22b).

authorized livestock numbers: Year to year actual stocking of livestock on a grazing allotment, based on forage and water availability, condition of range improvements, climatic conditions, personal convenience for the permittee, or resource protection. Authorized numbers are not necessarily the number on the permit.

basal area: The cross-sectional area at breast height (4.5 feet above the ground) of trees measured in square feet. Basal area is a way to measure how much of a site is occupied by trees.

best management practices (BMPs): Methods, measures, or practices selected by an agency to meet its nonpoint source control needs. BMPs include but are not limited to structural and nonstructural controls and operation and maintenance procedures. BMPs can be applied before, during, and after pollution-producing activities to reduce or eliminate the introduction of pollutants into receiving waters (36 CFR 219.19).

biological soil crusts: Crusts of soil particles formed by living organisms (such as algae, mosses, lichens) in arid areas. They hold soil in place, help retain moisture, and improve soil nutrients by fixing atmospheric nitrogen.

broader landscape: For land management planning pursuant to 36 CFR 219, the plan area and the lands surrounding the plan area. The spatial scale of the broader landscape varies depending upon the social, economic, and ecological issues under consideration.

candidate species (36 CFR 219.19):

1. For species under the purview of the U.S. Fish and Wildlife Service: a species for which the U.S. Fish and Wildlife Service possesses sufficient information on vulnerability and threats to support a proposal to list as endangered or threatened, but for which no proposed rule has yet been published by the U.S. Fish and Wildlife Service.
2. For species under the purview of the National Marine Fisheries Service, a species that is:
    a) The subject of a petition to list as a threatened or endangered species and for which the National Marine Fisheries Service has determined that listing may be warranted, pursuant to section 4(b)(3)(A) of the Endangered Species Act (16 U.S.C. 1533(b)(3)(A)), or

b) Not the subject of a petition but for which the National Marine Fisheries Service has announced in the Federal Register the initiation of a status review.

climate change: A change in global or regional climate patterns, in particular a change apparent from the mid to late 20th century onward and attributed largely to the increased levels of atmospheric carbon dioxide produced by the use of fossil fuels. Climate change is addressed throughout this plan, indirectly through desired conditions in the form of functional ecosystems and resilient landscapes, and directly through management approaches and the monitoring plan where appropriate. This plan is designed around strategies that are responsive to an uncertain and changing climate, including maintaining and restoring resilient native ecosystems; adaptive management; anticipating increased disturbance; increasing water conservation and planning for reduced supply; and anticipating increased recreational use (increased number of summer visitors and extended summer season of use).

coarse woody debris: Fallen dead trees and the remains of large branches on the ground in forests and in rivers or wetlands.

collaboration or collaborative process: A structured manner in which a collection of people with diverse interests share knowledge, ideas, and resources, while working together in an inclusive and cooperative manner toward a common purpose. Collaboration, in the context of the land management planning regulation at 36 CFR part 219, falls within the full spectrum of public engagement described in the Council on Environmental Quality's publication of October 2007: Collaboration in NEPA—A Handbook for NEPA Practitioners (36 CFR 219.19).

community wildfire protection plan: A comprehensive community-based planning and prioritization approach for protection of life, property, and critical infrastructure in the wildland-urban interface. Protection plans may take a variety of forms based on the needs of the community, but must be collaboratively developed, identify and prioritize areas for hazardous fuel reduction treatments, recommend treatment types and methods, and recommend measures that homeowners and communities can take to reduce the ignitability of structures. The planning process may also identify management options and implications in the surrounding landscape. The Healthy Forests Restoration Act of 2003 instructed the U.S. Forest Service to give consideration of community priorities as outlined in a community wildfire protection plan during planning and implementation of hazardous fuel reduction projects.

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 climate change (36 CFR 219.19).

conservation: The protection, preservation, management, or restoration of natural environments, ecological communities, and species (36 CFR 219.19).

conserve: For the purpose of meeting the requirements of 36 CFR 219.9, to protect, preserve, manage, or restore natural environments and ecological communities to potentially avoid federally listing of proposed and candidate species (36 CFR 219.19).

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 in accordance with the provisions of section 4 of the Endangered Species Act (16 U.S.C. 1533), on which are found those physical or biological features (a) essential to the conservation of the species, and (b) which may require special management considerations or protection; and (2) specific areas outside the geographical area occupied by the species at the time it is listed in accordance with the provisions of section 4 of the Endangered Species Act (16 U.S.C. 1533), upon a determination by the Secretary that such areas are essential for the conservation of the species. Endangered Species Act, section 3 (5)(A), (16 U.S.C. 1532 (3)(5)(A)). Critical habitat is designated through rulemaking by the Secretary of the Interior or Commerce. Endangered Species Act, section 4 (a)(3) and (b)(2) (16 U.S.C. 1533 (a)(3) and (b)(2)).

cumulative effects or impacts: The impact on the environment that results from the incremental impact of the action when added to other past, present, and reasonably foreseeable future actions, regardless of what agency (federal or non-federal) or person undertakes such actions. Cumulative impacts can result from individually minor, but collectively significant actions, taken place over a period of time.

decommission: Treated in such a manner so as to no longer function as intended. Usually in reference to decommissioning of a road so that it no longer is apparent on the landscape.

defensible space: An area either natural or manmade where material capable of allowing a fire to spread has been treated, cleared, reduced, or changed to act as a barrier between an advancing wildland fire and property or resources. In practice, “defensible space” is defined as an area a minimum of 30 feet around a structure that is cleared of flammable brush or vegetation.

departure: The degree to which the current condition of a key ecosystem characteristic is unlike the reference condition.

designated area: An area or feature identified and managed to maintain its unique special character or purpose. Some categories of designated areas may be designated only by statute and some categories may be established administratively in the land management planning process or by other administrative processes of the federal executive branch. Examples of statutorily designated areas are national heritage areas, national recreational areas, national scenic trails, wild and scenic rivers, wilderness areas, and wilderness study areas. Examples of administratively designated areas are experimental forests, research natural areas, scenic byways, botanical areas, and significant caves (36 CFR 219.19).

decision document: A record of decision, decision notice, or decision memo (36 CFR 220.3).

designated road, trail, or area: A National Forest System road, a National Forest System trail, or an area on National Forest System lands that is designated for motor vehicle use pursuant to 36 CFR 212.51 on a motor vehicle use map (36 CFR 212.1).

desirable nonnative: Nonnative species that were intentionally released into the wild to establish self-sustaining populations of wildlife that meet public demands for recreation or other purposes (for example, sport fishes). These desirable nonnative species are not likely to cause ecosystem disruption.

desired conditions: Reflects either natural or desired variation in the composition and structure within a community or resource area. Desired conditions may or may not be the same as historical conditions and may have wide ranges of values due to spatial variability in soils, elevation, aspect, or social values. For the purposes of the land management planning regulation at 36 CFR 219, desired conditions give 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. Desired conditions must be described in terms that are specific enough to allow progress toward their achievement to be quantified, but do not include completion dates (36 CFR 219.7(e)(1)(i)). Desired conditions are achievable, and may reflect social, economic, or ecological attributes, including ecosystem processes and functions.

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 (36 CFR 219.19).

disturbance regime: A description of the characteristic types of disturbance on a given landscape; the frequency, severity, and size distribution of these characteristic disturbance types; and their interactions (36 CFR 219.19).

diversity: An expression of community structure; high if there are many equally abundant species; low if there are only a few equally abundant species. The distribution and abundance of different plant and animal communities and species within the area covered by a land and resource management plan.

easement: A type of special use authorization (usually granted for linear rights-of-way) that is utilized in those situations where a conveyance of a limited and transferable interest in National Forest System land is necessary or desirable to serve or facilitate authorized long-term uses, and that may be compensable according to its terms (36 CFR 251.51).

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 (36 CFR 219.19).

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 influence (36 CFR 219.19).

ecological process: The physical, chemical, and biological actions or events that link organisms and their environment including decomposition, production (of plant matter), nutrient cycling, and fluxes of nutrients and energy.

ecological response unit (ERU): A classification of a unit of land that groups sites by similar plant species composition, succession patterns, and disturbance regimes, such that similar units will respond in a similar way to disturbance, biological processes, or manipulation. Each ecological

response unit characterizes sites with similar composition, structure, function, and connectivity, and defines their spatial distribution on the landscape.

ecological sustainability: See sustainability.

ecological system: See ecosystem.

economic sustainability: See sustainability.

ecosystem: A spatially explicit, relatively homogeneous unit of the Earth that includes all interacting organisms and elements of the abiotic environment within its boundaries (36 CFR 219.19). An ecosystem is commonly described in terms of its:

- **composition**: The biological elements within the different levels of biological organization, from genes and species to communities and ecosystems.
- **structure**: The organization and physical arrangement of biological elements, such as snags and down woody debris, vertical and horizontal distribution of vegetation, stream habitat complexity, landscape pattern, and connectivity.
- **function**: Ecological processes that sustain composition and structure, such as energy flow, nutrient cycling and retention, soil development and retention, predation and herbivory, and natural disturbances, such as wind, fire, and floods.
- **connectivity**: See connectivity above.

ecosystem diversity: The variety and relative extent of ecosystems (36 CFR 219.19).

ecosystem integrity: See ecological integrity.

ecosystem services: Those products and processes in functional ecosystems that people enjoy or from which they benefit. The description of each resource in the plan includes a discussion of the ecosystem services that it provides. Benefits that people obtain from ecosystems may be grouped into four broad categories:

- **supporting** ecosystem services are those that are necessary for the production of other ecosystem services, such as pollination, seed dispersal, soil formation, and nutrient cycling.
- **regulating** ecosystem services are the benefits people obtain from the regulation of ecosystem processes, such as long-term storage of carbon; climate regulation; water filtration, purification, and storage; soil stabilization; flood and drought control; and disease regulation.
- **provisioning** ecosystem services are the products people obtain from ecosystems, such as clean air and fresh water, energy, food, fuel, forage, wood products or fiber, and minerals.
- **cultural** ecosystem services are the nonmaterial benefits people obtain from ecosystems such as educational, aesthetic, spiritual, and cultural heritage values, recreational experiences, and tourism opportunities (36 CFR 219.19).

ecotone: The transition zone between two adjoining ecological communities.

encroachment: An increase in the density and cover of trees or shrubs in grasslands that reduces grass biomass, density, and cover.

endangered species: Any species that the Secretary of the Interior or the Secretary of Commerce has determined is in danger of extinction throughout all or a significant portion of its range. Endangered species are listed at 50 CFR sections 17.11, 17.12, and 224.101.

endemic: (1) Describes a population that has unique genetic characteristics and likely exists in a very limited geographic area. (2) Describes a population of native insects, diseases, plants, or animals which perform a functional role in the ecosystem when they are present at low levels, or constantly attack just a few hosts throughout an area but can become potentially injurious when they increase or spread to reach outbreak (epidemic) levels.

environmental impacts: Possible adverse effects caused by a development, industrial, or infrastructural project or by the release of a substance in the environment.

ephemeral stream: A stream that flows only in direct response to precipitation in the immediate locality (watershed or catchment basin), and whose channel is at all other times above the zone of saturation.

even-aged stand: A stand of trees composed of a single age class (36 CFR 219.19).

federally listed species: Threatened or Endangered species listed under the Endangered Species Act, as amended. Candidate and proposed species are species which are being considered for federal listing.

federally recognized tribe: An Indian or Alaska Native Tribe, band, nation, pueblo, village, or community that the Secretary of the Interior acknowledges to exist as an Indian Tribe under the Federally Recognized Indian Tribe List Act of 1994, 25 U.S.C. 479a (36 CFR 219.19).

fire intensity: The product of the available heat of combustion per unit of ground and the rate of spread of the fire, interpreted as the heat released per unit of time for each unit length of fire edge. The primary unit is British thermal unit per second per foot (Btu/sec/ft.) of fire front. See also fire severity.

fire regime: The pattern, frequency, and severity of wildfire that prevails in an area over long periods of time across a landscape and its immediate effects on the ecosystem in which it occurs. The LANDFIRE project classifies fire regimes into five groups based on a combination of fire frequency and fire severity:

Group *	Frequency	Severity	Severity Description
I	0 – 35 years	Low /Mixed	Generally low-severity fires replacing less than 25 percent of the dominant overstory vegetation; can include Mixed-severity fires that replace up to 75 percent of the overstory.
II	0 – 35 years	Replacement	High-severity fires replacing greater than 75 percent of the dominant overstory vegetation
III	35 – 200 years	Mixed/Low	Generally mixed-severity; can also include low-severity fires
IV	35 – 200 years	Replacement	High-severity fires
V	200+ years	Replacement/ Any severity	Generally, replacement-severity; can include any severity type in this frequency range

*Table is based on Fire Regime Condition Class Guidebook version 3.0, September 2010.

fire severity: Degree to which a site has been altered or disrupted by fire; also used to describe the product of fire intensity and residence time; usually defined by the degree of soil heating or mortality of vegetation.

fluvial: Relating to, or living in a stream or river or produced by the action of a stream.

forested land: Land that is at least 10 percent occupied by forest trees of any size or formerly having had such tree cover and not currently developed for non-forest use.

frequent fire-dependent ecosystem: A vegetation community that requires a fire regime 1 (greater than 35-year fire frequency) in order to maintain its natural function, structure, and species composition.

functional ecosystem: A system with intact abiotic and biotic processes. Function focuses on the underlying processes that may be degraded, regardless of the structural condition of the ecosystem. Functionally restored ecosystems may have a different structure and composition than the historical reference condition. As contrasted with ecological restoration that tends to seek historical reference condition, function refers to the dynamic processes that drive structural and compositional patterns. Functional restoration is the manipulation of interactions among process, structure, and composition in a degraded ecosystem to improve its operations. Functional restoration aims to restore functions and improve structures with a long-term goal of restoring interactions between function and structure. It may be, however, that a functionally restored system will look quite different than the reference condition in terms of structure and composition and these disparities cannot be easily corrected because some threshold of degradation has been crossed or the environmental drivers, such as climate, which influenced structural and (especially) compositional development have changed.

groundcover: The layer of dead and living vegetation that provides protection of the topsoil from erosion and drought.

groundwater-dependent ecosystem: Community of plants, animals, and other organisms whose extent and life processes depend on groundwater. Examples include many wetlands, groundwater-fed lakes and streams, cave and karst systems, aquifer systems, springs, and seeps.

habitat: The physical location or type of environment in which an organism or biological population lives or occurs.

habitat fragmentation: The process by which habitat loss results in the division of large, continuous habitats in smaller more isolated remnants.

habitat type: A land or aquatic unit, consisting of an aggregation of habitats having equivalent structure, function, and responses to disturbance.

herbivory: Loss of vegetation due to consumption by another organism.

hydrologic unit code (HUC): A unique hierarchical hydrologic unit based on the area of land that drains to a single stream mouth or outlet at each level, and nested levels are identified by successively longer codes. A HUC 8 subbasin is 700 square miles or larger and is divided into multiple HUC 10 watersheds that range from 62 to 390 square miles. HUC 12 subwatersheds are 15 to 62 square miles and nest inside HUC 10 watersheds.

infill: An increase in trees per acre in forests and woodlands, resulting in a decrease in the quality and size of interspaces.

information: For information collection from the public pursuant to 5 CFR part 1320, any statement or estimate of fact or opinion, regardless of form or format, whether in numerical, graphic, or narrative form, and whether oral or maintained on paper, electronic or other media. “Information” does not generally include items in the following categories; however, the Office of Management and Budget may determine that any specific item constitutes “information:”

- Affidavits, oaths, affirmations, certifications, receipts, changes of address, consents, or acknowledgments; provided that they entail no burden other than that necessary to identify the respondent, the date, the respondent's address, and the nature of the instrument (by contrast, a certification would likely involve the collection of “information” if an agency conducted or sponsored it as a substitute for a collection of information to collect evidence of, or to monitor, compliance with regulatory standards, because such a certification would generally entail burden in addition to that necessary to identify the respondent, the date, the respondent's address, and the nature of the instrument);
- Samples of products or of any other physical objects;
- Facts or opinions obtained through direct observation by an employee or agent of the sponsoring agency or through nonstandardized oral communication in connection with such direct observations;
- Facts or opinions submitted in response to general solicitations of comments from the public, published in the Federal Register or other publications, regardless of the form or format thereof, provided that no person is required to supply specific information pertaining to the commenter, other than that necessary for self-identification, as a condition of the agency's full consideration of the comment;
- Facts or opinions obtained initially or in follow-on requests, from individuals (including individuals in control groups) under treatment or clinical examination in connection with research on or prophylaxis to prevent a clinical disorder, direct treatment of that disorder, or the interpretation of biological analyses of body fluids, tissues, or other specimens, or the identification or classification of such specimens;
- A request for facts or opinions addressed to a single person;
- Examinations designed to test the aptitude, abilities, or knowledge of the persons tested and the collection of information for identification or classification in connection with such examinations;
- Facts or opinions obtained or solicited at or in connection with public hearings or meetings;
- Facts or opinions obtained or solicited through nonstandardized follow-up questions designed to clarify responses to approved collections of information; and
- Like items so designated by the Office of Management and Budget (5 CFR 1320.3(h)).

infrastructure: Includes all vertical and horizontal constructed structures managed by a national forest. Infrastructure is broken into three categories:

1. Transportation infrastructure includes both the road and trail systems. The road system infrastructure is all forest roads, drainage ditches, culverts, signage, and bridges. The trail system includes all motorized and non-motorized trails, signage, and bridges.
2. Facilities infrastructure includes administrative and recreation building and sites (driveways, parking, landscaping, etc.), support utilities (electrical, water, wastewater, etc.), dams, and other support buildings.
3. Other infrastructure directly supports natural resources, which includes fish barriers, wildlife drinkers, and range infrastructure (such as fencing, trick tanks, water gaps, and cattleguards).

inherent capability of the forest: The ecological capacity or ecological potential of an area characterized by the interrelationship of its physical elements, its climatic regime, and natural disturbances (36 CFR 219.19).

integrated resource management: Multiple-use management that recognizes the interdependence of ecological resources and is based on the need for integrated consideration of ecological, social, and economic factors (36 CFR 219.19).

integration: Recognizes and identifies key relationships between various plan resources and activities. Plan components are integrated to address a variety of ecological and human needs. For example, desired conditions for ponderosa pine incorporate habitat needs for a variety of species as well as the scenic components that recreationist's desire. Interrelationships between parts of the plan are identified with crosswalks to show their systematic nature.

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, and is 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. Intermittent streams are identified as dashed blue lines on U.S. Geological Survey 7.5-minute quadrangle maps.

in situ: Found or located in the original place.

invasive species: An alien species whose introduction does or is likely to cause economic or environmental harm or harm to human health. A species that causes, or is likely to cause, harm and that is exotic to the ecosystem it has infested. Invasive species infest both aquatic and terrestrial areas and can be identified within any of the following four taxonomic categories: plants, vertebrates, invertebrates, and pathogens (Executive Order 13112). Sometimes referred to as nonnative invasive or exotic species.

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 (36 CFR 219.19).

Leave No Trace: Guidelines that help protect the land and lessen the sights and sounds of forest visitors. http://www.lnt.org/.

line officer: A Forest Service official who serves in a direct line of command from the Chief (36 CFR 219.62).

litter: Litter consists of dead, unattached organic material on the soil surface that is effective in protecting the soil surface from raindrop splash, sheet, and rill erosion and is at least one-half inch thick. Litter is composed of leaves, needles, cones, and woody vegetative debris including twigs, branches, and trunks.

maintain: In reference to an ecological condition: To keep in existence or continuance of the desired ecological condition in terms of its desired composition, structure, and processes. Depending upon the circumstance, ecological conditions may be maintained by active or passive management or both (36 CFR 219.19).

management actions: Any alterations to ecosystems or activities that the Forest Service conducts or authorizes on National Forest System lands. These may include mechanical thinning, prescribed burning, permitted grazing, permitted fuelwood gathering, vehicular access, stream restoration treatments, seeding, trail construction, fencing, among others.

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 (36 CFR 219.19).

mechanical treatment: For the purposes of this plan, mechanical treatments include most vegetation treatments except fire. They may include mechanized cutting, hand thinning, and other silvicultural treatments.

memorandum of understanding (MOU): Describes a bilateral or multilateral agreement between two or more parties. It expresses a convergence of will between the parties, indicating an intended common line of action. It is often used in cases where parties either do not imply a legal commitment or in situations where the parties cannot create a legally enforceable agreement. It is a more formal alternative to a handshake agreement.

minimize: To reduce to the smallest possible amount, extent, size, or degree.

minimum requirements analysis: Required by law whenever land managers are considering a use prohibited by Section 4(c) of the Wilderness Act of 1964, and is a process that was developed by the Arthur Carhart National Wilderness Training Center to help land managers make informed, defensible decisions that comply with the Wilderness Act.

mitigate: To avoid, minimize, rectify, reduce, or compensate the adverse environmental impacts associated with an action.

monitoring: A systematic process of collecting information to evaluate effects of actions or changes in conditions or relationships (36 CFR 219.19).

mosaic: Mix of recurring patterns of forested and non-forested areas at the identified scale (for example, landscape, watershed, mid-scale). Patterns are variable and may change over time.

motor vehicle: Any vehicle that is self-propelled, other than:

- A vehicle operated on rails; and
- Any wheelchair or mobility device, including one that is battery-powered, that is designed solely for use by a mobility-impaired person for locomotion, and that is suitable for use in an indoor pedestrian area (36 CFR 212.1, 36 CFR 261.2).

motor vehicle use map (MVUM): A map reflecting designated roads, trails, and areas on an administrative unit or a ranger district of the National Forest System (36 CFR 212.1).

multiple use: The management of all the various renewable surface resources of the National Forest System so that they are utilized 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 use to conform to changing needs and conditions; that some land 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, consistent with the Multiple-Use Sustained-Yield Act of 1960 (16 U.S.C. 528–531) (36 CFR 219.19).

National Environmental Policy Act (NEPA): A U.S. environmental law (42 U.S.C. 4321 et seq.), enacted January 1, 1970 that established a U.S. national policy promoting the enhancement of the environment. Additionally, it established the President's Council on Environmental Quality.

National Forest System land: Includes national forests, national grasslands, and the national tallgrass prairie (36 CFR 219.62).

National Forest System road: A forest road other than a road which has been authorized by a legally documented right-of-way held by a state, county, or other local public road authority (36 CFR 212.1, 36 CFR 251.51, 36 CFR 261.2).

National Forest System trail: A forest trail other than a trail which has been authorized by a legally documented right-of-way held by a state, county, or other local public road authority (36 CFR 212.1).

National Forest Scenic Byway: A road that has been designated by the U.S. Forest Service as a scenic byway. The road many also be designated as a National Scenic Byway.

National Scenic Byway: A road recognized by the U.S. Department of Transportation for one or more of six "intrinsic" qualities: archeological, cultural, historic, natural, recreational, and scenic.

native species: An organism that was historically or is present in a particular ecosystem as a result of natural migratory or evolutionary processes and not as a result of an accidental or deliberate introduction into that ecosystem. An organism's presence and evolution (adaptation) in an area are determined by climate, soil, and other biotic and abiotic factors (36 CFR 219.19).

natural variability: Is a reference to past conditions and processes that provide important context and guidance relevant to the environments and habitats in which native species evolved. Disturbance driven spatial and temporal variability is vital to ecological systems. Biologically appropriate disturbances provide for heterogeneous conditions and subsequent diversity.

Conversely, “uncharacteristic disturbance,” such as high-intensity fire in plant communities that historically had a frequent low intensity fire regime can have the effect of reducing diversity, increasing homogeneity, and may result in permanently altered conditions.

objective: A concise, measurable, and time-specific statement of a desired rate of progress toward a desired condition or conditions. Objectives should be based on reasonably foreseeable budgets.

off-highway vehicle (OHV): Any motorized vehicle designed for or capable of cross county travel on or immediately over land, water, sand, snow, ice, marsh, swampland, or other natural terrain; except that term excludes (A) any registered motorboat, (B) any fire, military, emergency or law enforcement vehicle when used for emergency purposes, and any combat or combat support vehicle when used for national defense purposes, and (C) any vehicle whose use is expressly authorized by the respective agency head under a permit, lease, license, or contract (Executive Order 11644 as amended by Executive Order 11989). See also FSM 2355. 01 – Exhibit 01.

old growth characteristics: Old-growth forests are forests that have accumulated specific characteristics related to tree size, canopy structure, snags and woody debris and plant associations. Ecological characteristics of old-growth forests emerge through the processes of succession. Certain features—presence of large, old trees, multilayered canopies, forest gaps, snags, woody debris, and a particular set of species that occur primarily in old-growth forests—do not appear simultaneously, nor at a fixed time in stand development. Old-growth forests support assemblages of plants and animals, environmental conditions, and ecological processes that are not found in younger forests (younger than 150 to 250 years) or in small patches of large, old trees. Specific attributes of old-growth forests develop through forest succession until the collective properties of an older forest are evident.

online: Refers to the appropriate Forest Service website or future electronic equivalent (36 CFR 219.62).

openings: Generally persistent treeless areas having a fairly distinct shape or size, occurring naturally due to differences in soil types as compared to sites that support forests or woodlands. Openings include meadows, grasslands, rock outcroppings, and wetlands. In contrast, created openings result from disturbances like severe fire or windthrow, or management activities to intentionally create space for new tree regeneration. Natural and created openings are not the same as interspaces found in the frequent-fire forests or woodlands. See interspaces.

Outstanding National Resource Waters: Streams, lakes and wetlands that receive special protection against degradation under New Mexico’s water quality standards and the federal Clean Water Act. They are designated by the Water Quality Control Commission. Waters eligible for Outstanding National Resource Waters designation include waters that are part of a national or state park, wildlife refuge or wilderness areas, special trout waters, waters with exceptional recreational or ecological significance, and high-quality waters that have not been significantly modified by human activities (NMED 2012).

participation: Activities that include a wide range of public involvement tools and processes, such as collaboration, public meetings, open houses, workshops, and comment periods (36 CFR 219.19).

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. These streams are identified as solid blue on the U.S. Geological Survey 7.5-minute quadrangle maps.

permit area: Area in which an activity is authorized through a special use permit.

persistence: Continued existence (36 CFR 219.19).

plan or land management plan: A document or set of documents that provide management direction for an administrative unit of the National Forest System developed under the requirements of the land management planning regulation at 36 CFR part 219 or a prior planning rule (36 CFR 219.19).

plan area: The National Forest System lands covered by a plan (36 CFR 219.19), specifically lands managed by the Forest Service as the Lincoln National Forest.

plan components: The parts of a land management plan that guide future project and activity decisionmaking. Specific plan components may apply to the entire plan area, to specific management areas or geographic areas, or to other areas as identified in the plan. Every plan must include the following plan components: desired conditions, objectives, standards, guidelines, suitability of lands. A plan may also include goals as an optional component.

plan development: The second phase in the land management plan revision process. Plan development follows the NEPA process and plan revision requires preparation of an environmental impact statement. It is grounded in the information developed during the assessment phase and other information relevant to the plan area, it addresses needs for change, and it involves the public. Every plan must have management areas or geographic areas or both and may identify designated or recommended designated areas (36 CFR 219.7).

plan monitoring program: An essential part of the land management plan that sets out the plan monitoring questions and associated indicators, based on plan components. The plan monitoring program informs management of resources on the plan area and enables the responsible official to determine if a change in plan components or other plan content that guide management of resources on the plan area may be needed.

planned ignition: The intentional initiation of a wildland fire by 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 which influence fire behavior and fire effects. See prescribed fire.

plant and animal community: A naturally occurring assemblage of plant and animal species living within a defined area or habitat (36 CFR 219.19).

prescribed fire: A wildland fire originating from a planned ignition to meet specific objectives identified in a written, approved, prescribed fire plan for which NEPA requirements have been met prior to ignition.

productivity: The capacity of National Forest System lands and their ecological systems to provide the various renewable resources in certain amounts in perpetuity. For the purposes of the land management planning regulation at 36 CFR part 219 and this Handbook, productivity is an ecological term, not an economic term (36 CFR 219.19).

project: An organized effort to achieve an outcome on National Forest System lands identified by location, tasks, outputs, effects, times, and responsibilities for execution (36 CFR 219.19).

proper functioning condition (PFC): A methodology for assessing the physical functioning of riparian and wetland areas. The term proper functioning condition is used to describe both the assessment process, and a defined, on-the-ground condition of a riparian-wetland area. In either case, proper functioning condition defines a minimum or starting point.

proposed species: Any species of fish, wildlife, or plant that is proposed by the U.S. Fish and Wildlife Service or the National Marine Fisheries Service in the Federal Register to be listed under Section 4 of the Endangered Species Act (36 CFR 219.19).

rangelands: Forage-producing forested and non-forested lands.

recovery: For the purposes of the land management planning regulation at 36 CFR part 219 and with respect to threatened or endangered species: The improvement in the status of a listed species to the point at which listing as federally endangered or threatened is no longer appropriate (36 CFR 219.19).

recreation opportunity: An opportunity to participate in a specific recreation activity in a particular recreation setting to enjoy desired recreation experiences and other benefits that accrue. Recreation opportunities include non-motorized, motorized, developed, and dispersed recreation on land, water, and in the air (36 CFR 219.19).

recreation setting: The social, managerial, and physical attributes of a place that, when combined, provides 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, semi-primitive non-motorized, semi-primitive motorized, roaded natural, rural, and urban (36 CFR 219.19).

redundancy: The presence of multiple occurrences of ecological conditions such that not all occurrences may be eliminated by a catastrophic event.

reference conditions: Environmental conditions that infer ecological sustainability. When available, reference conditions are represented by the characteristic natural range of variation (not the total range of variation), prior to European settlement and under the current climatic period. For many ecosystems, natural range of variation also reflects human-caused disturbance and effects prior to settlement. It may also be necessary to refine reference conditions according to contemporary factors (e.g., invasive species) or projected conditions (e.g., climate change). Reference conditions are most useful as an inference of sustainability when they have been quantified by amount, condition, spatial distribution, and temporal variation.

refugia: Is an area where special environmental circumstances have enabled a species or a community of species to survive after extinction in surrounding areas.

regulated timber harvest: Tree harvest for the purposes of timber production, as opposed to tree harvest for other purposes, such as habitat and watershed improvement or fuelwood.

representativeness: The presence of a full array of ecosystem types and successional states, based on the physical environment and characteristic disturbance processes.

resilience: The ability of an ecosystem and its component parts to absorb, or recover from the effects of disturbances through preservation, restoration, or improvement of its essential structures and functions and redundancy of ecological patterns across the landscape (FSM 2020.5).

resource management zone: A resource management zone is determined according to considerations such as topography, existing land use and access, environmental concerns and resource values. A resource management zone may have a unique set of resource values, objectives to maintain or enhance those values and a number of strategies to achieve the objectives. They provide geographically focused, strategic direction in a planning area

responsible official: The official with the authority and responsibility to oversee the planning process and to approve a plan, plan amendment, and plan revision (36 CFR 219.62).

restoration, ecological: The process of assisting the recovery of an ecosystem that has been degraded, damaged, or destroyed. Ecological restoration focuses on reestablishing the composition, structure, pattern, and ecological processes necessary to facilitate terrestrial and aquatic ecosystems sustainability, resilience, and health under current and future conditions (36 CFR 219.19).

restore: To renew by the process of restoration. See restoration (36 CFR 219.19).

riparian areas: Three-dimensional ecotones [the transition zone between two adjoining communities] of interaction that include terrestrial and aquatic ecosystems that extend down into the groundwater, up above the canopy, outward across the floodplain, up the near-slopes that drain to the water, laterally into the terrestrial ecosystem, and along the water course at variable widths (36 CFR 219.19).

riparian management zone (RMZ): The interface between land and a river or stream. Plant habitats and communities along the river margins and banks are called riparian vegetation, characterized by hydrophilic plants.

risk: A combination of the likelihood that a negative outcome will occur and the severity of the subsequent negative consequences (36 CFR 219.19).

road: A motor vehicle route over 50 inches wide, unless identified and managed as a trail (36 CFR 212.1).

road maintenance levels:

- maintenance level 1 – Roads that are closed to public vehicular traffic intermittently for periods that exceed 1 year. Can be operated at any other maintenance level during periods of use.
- maintenance level 2 – Roads that are open and maintained for use by high-clearance vehicles; surface smoothness is not a consideration. Most have native material surface (not paved and no aggregate surface).

- maintenance level 3 – Roads that are open and maintained for use by standard passenger cars. Most have gravel surface.
- maintenance level 4 – Roads that are open and maintained for use by standard passenger cars and to provide a moderate degree of user comfort and convenience at moderate travel speeds. Most are paved or have an aggregate surface.
- maintenance level 5 – Roads that are open and maintained for use by standard passenger cars.

routine maintenance: Work that is planned to be accomplished on a continuing basis, generally annually or more frequently (FSH 7709.58, 13.41).

Scenery Management System (SMS): A classification system that recognizes scenery as the visible expression of dynamic ecosystems functioning within “places,” which have unique aesthetic and social values. It recognizes that in addition to naturally occurring features, positive scenery attributes associated with social, cultural, historical, and spiritual values, including human presence and the built environment, can also be valued elements of the scenery. The SMS also allows for “seamless” analysis and conservation beyond National Forest System lands into adjacent communities and other jurisdictions, through the application of varying scenery “themes” within a single analysis. It is structured to emphasize "natural appearing” scenery.

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 (36 CFR 219.19).

scenic integrity objective: A desired level of excellence based on physical and sociological characteristics of an area. Refers to the degree of acceptable alterations to the valued attributes of the characteristic landscape. Objectives include Very High, High, Moderate, and Low.

sensitive species: Sensitive refers to fish and wildlife that are facing one or more threats to their populations and/or habitats. Sensitive Species are defined as having small or declining populations, are at-risk, and/or are of management concern. Implementation of appropriate conservation measures to address existing or potential threats may prevent them from declining to the point of qualifying for threatened or endangered status.

seral stage (seral state): One of a series of transitional plant communities that develop during gradual successive change following disturbance.

snags: Standing dead or partially dead trees (snag topped), often missing many or all limbs. They provide essential wildlife habitat for many species and are important for forest ecosystem function.

soil condition rating: A qualitative rating developed within the Southwestern Region of the Forest Service that provides an overall picture of soil condition vital in sustaining ecosystems. It is based on **three soil functions**: the ability of soil to resist erosion, infiltrate water, and recycle nutrients. There are four soil condition ratings:

- satisfactory – Soil function is being sustained and soil is functioning properly and normally.
- impaired – The ability of the soil to function properly and normally has been reduced or there exists an increased vulnerability to degradation.

- unsatisfactory – Degradation of vital soil functions result in the inability of the soil to maintain resource values, sustain outputs or recover from impacts.
- inherently unstable – These soils are eroding faster than they are renewing themselves.

soil condition risk rating: Risk is a function of departure and trend as low, moderate, or high. A risk analysis in the forest plan assessment identified systems at risk due to specific management activities. Soils condition risk ratings are presented in a matrix risk analysis, based on condition and trend as portrayed in the Forest Plan Assessment Report Lincoln National Forest Volume I: Ecological Resources (2019a).

species of conservation concern: A species, other than federally recognized threatened, endangered, proposed, or candidate species, which is known to occur in the plan area and for which the regional forester has determined that the best available scientific information indicates substantial concern about the species' capability to persist over the long-term in the plan area (36 CFR 219.9(c)).

stand: A contiguous group of trees generally uniform in age class distribution, composition, condition, and structure, and growing on a site of generally uniform quality, to be a distinguishable unit, such as mixed, pure, even-aged, and uneven-aged stands. A stand is the fundamental unit of silviculture reporting and record keeping.

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.

stressors: For the purposes of the land management planning regulation at 36 CFR part 219, factors that may directly or indirectly degrade or impair ecosystem composition, structure, or ecological process in a manner that may impair its ecological integrity, such as an invasive species, loss of connectivity, or the disruption of a natural disturbance regime (36 CFR 219.19).

sustainable operations: Commitment by the Forest Service to use energy efficiently and reduce consumption of resources in daily operations. The Lincoln National Forest is reducing its environmental impact by doing work differently in six footprint focus areas.

1. Energy – Improve energy efficiency and reduce greenhouse gas emissions, through the reduction of energy. Shift toward renewable energy, such as solar power and biomass.
2. Water – Reduce water consumption in Forest Service buildings, grounds, and related facilities.
3. Green purchasing – Increase the sustainability performance of purchased goods and services, and the performance of suppliers, contractors, and partners. Increase the number of Forest Service buildings that are Leadership in Energy and Environmental Design (LEED) certified.
4. Fleet and transportation – Improve our transportation and travel practices, which in turn will reduce harmful emissions, increase operational and fuel efficiency, and reduce the use of non-renewable fuel.
5. Waste prevention and recycling – Minimize waste generation and reduce landfill use. Reduce, reuse and recycle materials.

6. Sustainability leadership – Make strong efforts to meet or exceed the requirements of executive orders and policies related to sustainable operations. Leadership and management have a commitment to communicate the agency's vision for sustainable operations.

sustainability: The capability to meet the needs of the present generation without compromising the ability of future generations to meet their needs. For the purposes of the land management planning regulation at 36 CFR part 219, ''ecological sustainability'' refers to the capability of ecosystems to maintain ecological integrity; ''economic sustainability'' refers to the capability of society to produce and consume or otherwise benefit from goods and services including contributions to jobs and market and nonmarket benefits; and ''social sustainability'' refers to the capability of society to support the network of relationships, traditions, culture, and activities that connect people to the land and to one another, and support vibrant communities (36 CFR 219.19).

sustainable recreation: The set of recreation settings and opportunities on the National Forest System that is ecologically, economically, and socially sustainable for present and future generations (36 CFR 219.19).

sustainable-yield limit: The sustained-yield limit is an estimate of the amount of commercial wood products that may be sustainably harvested over a long period of time.

subwatershed: A HUC 12 hydrologic unit, the smallest subdivision considered in this assessment.

terrestrial ecosystem: All interacting organisms and elements of the abiotic environment in those vegetation and soil types, which are neither aquatic nor riparian.

terrestrial ecosystem survey: An inventory of soil types or terrestrial ecosystem units on the Lincoln National Forest. It contains predictions and limitations of soil and vegetation behavior for selected land uses. This survey also highlights hazards or capabilities inherent in the soil and the impact of selected uses on the environment. At the context scale, upland ecological response units are derived from the Lincoln National Forest Terrestrial Ecosystem Survey (USDA FS 1980).

terrestrial ecosystem unit: The classification unit used in the terrestrial ecosystem survey. A spatially explicit area with a similar combination of soils, land types, and vegetation c Threatened species. Any species that the Secretary of the Interior or the Secretary of Commerce has determined is likely to become an endangered species within the foreseeable future throughout all or a significant portion of its range. Threatened species are listed at 50 CFR sections 17.11, 17.12, and 223.102.

timber harvest: The removal of trees for wood fiber use and other multiple use purposes (36 CFR 219.19).

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 (36 CFR 219.19).

traditional community: A land-based rural community that has a long-standing history in and around the lands managed by the Forest Service.

traditional cultural property: A property that is eligible for inclusion in the National Register of Historic Places based on its associations with the cultural practices, traditions, beliefs, lifeways, arts, crafts, or social institutions of a living community.

tribal consultation: The timely, meaningful, and substantive dialogue between Forest Service officials who have delegated authority to consult, and the official leadership of federally recognized American Indian Tribes, or their designated representatives, pertaining to USDA Forest Service policies that may have tribal implications.

tree size: The diameter of the bole of a tree measured at breast height (diameter at breast height):

- seedling/sapling – 0.0 to 4.9 inches diameter at breast height
- small tree – 5.0 to 9.9 inches diameter at breast height
- medium tree – 10 to 19.9 inches diameter at breast height
- large tree – equal to or greater than 20.0 inches diameter at breast height

uncharacteristic wildfire: An increase in wildfire size, severity, and resistance to control compared to reference conditions which occurred historically. These fires result as a consequence of more continuous canopy cover, ladder fuels, and accumulated live and dead woody material. Uncharacteristic wildfires burn with more intensity; cause higher tree mortality; degrade watersheds; sterilize soils; and threaten adjacent communities, forest infrastructure, and wildlife habitat. See reference conditions.

ungulate: A hooved animal, which includes wildlife (pronghorn, deer, elk, etc.) and domestic livestock (sheep, cattle, horses, etc.).

unplanned ignition: The initiation of a wildland fire by lightning or unauthorized and accidental human-caused fires. See wildfire.

upland: May refer to areas, species, systems, or conditions that are characteristic of terrestrial ecosystems, as opposed to riparian or aquatic ecosystems.

vegetation community: A group of sites that have similar plant species composition, successional patterns, and disturbance regimes, such that similar sites will respond in similar ways to disturbance, biological, and physical processes. In some areas, there is a difference between the existing vegetation on a site and the vegetation community it belongs to, such as where historical grasslands are currently invaded by trees. The desired vegetation community, not the existing vegetation, determines which desired conditions apply. Most vegetation communities correspond to a mapped ecological response unit), though it is appropriate to base management for a particular vegetation community on local conditions, including soils and other site-specific indicators.

vegetation structure: Both vertical and horizontal arrangement of vegetation. Horizontal structure may refer tree size, tree density, and to patterns of trees or groups of trees and their adjoining openings. Vertical structure may refer to the layers, appearance, and composition of vegetation between the ground and the top of the vegetation canopy and includes any grasses, forbs, shrubs, and trees.

watershed: A region or land area drained by a single stream, river, or drainage network; a drainage basin (36 CFR 219.19). Specifically, a hydrologic unit code 10, larger than a subwatershed, and nested in a subbasin.

watershed condition: The state of a watershed based on physical and biogeochemical characteristics and processes (36 CFR 219.19).

wetlands: A specific subtype within the Wetland Riparian group of vegetation communities. In wetlands saturation with water is the dominant factor determining the nature of soil development and plant and animal communities. For regulatory purposes under the Clean Water Act, the term wetlands means "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." [taken from the Environmental Protection Agency regulations listed at 40 CFR 230.3(t)]. The Wetland Riparian vegetation community as defined in this plan is slightly more inclusive and includes open water wetlands and cienegas that may not be considered wetlands for regulatory purposes.

wild and scenic river: A river designated by Congress as part of the National Wild and Scenic Rivers System that was established in the Wild and Scenic Rivers Act of 1968 (16 U.S.C. 1271 (note), 1271–1287) (36 CFR 219.19).

wilderness: Any area of land designated by Congress as part of the National Wilderness Preservation System that was established in the Wilderness Act of 1964 (16 U.S.C. 1131–1136) (36 CFR 219.19).

wildfire: Unplanned ignition of a wildland fire (fires caused by lightning or unauthorized and accidental human-caused fires) and escaped prescribed fires. See unplanned ignition.

wildfire hazard: A fuel complex, defined by volume, type condition, arrangement, and location that determines the degree or ease of ignition and of resistance to control.

wildland: An area in which development is essentially nonexistent, except for roads, railroads, power lines, and similar transportation facilities. Structures, if any, are widely scattered.

wildland-urban interface (WUI): That area where human development adjoins public or private natural areas, or an intermix of rural and urban land uses. From a natural resource perspective, the wildland-urban interface is an area where increased human influence and land-use conversion are changing natural resource goods, services, and management techniques.

woodland: Lands with over 10 percent tree canopy cover where the majority of the trees are non-timber species (such as piñon pine and juniper) not traditionally used for industrial wood products.

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Appendices

Appendix A: Maps

Appendix B: List of Resource Codes for Plan Components

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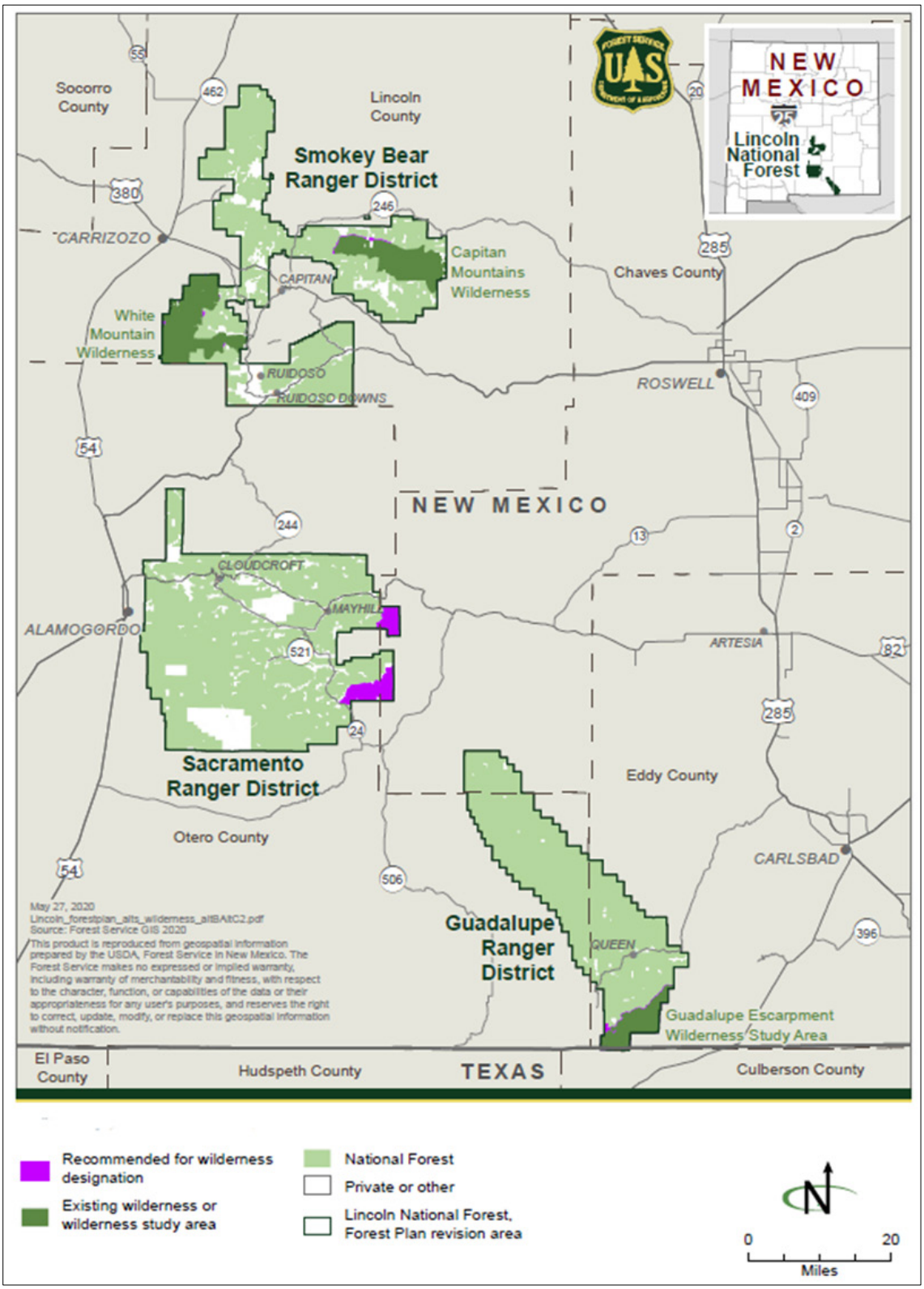
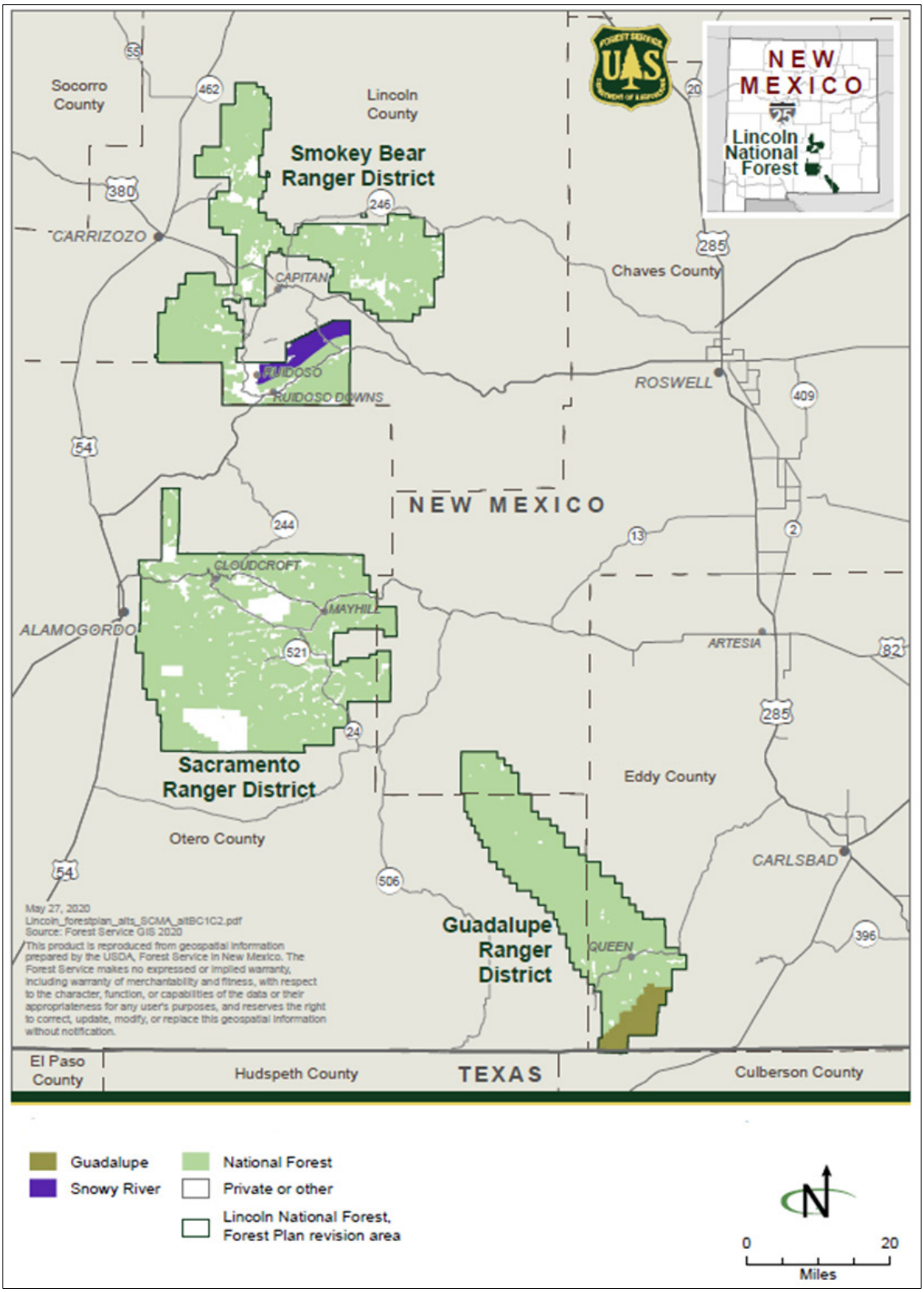
Appendix A: Maps

Recommended Wilderness and Guadalupe Escarpment Wilderness Study Area



Guadalupe Caves and Snowy River Cave Management Area



Appendix B: List of Resource Codes for Plan Components

Table 4. Resource codes for plan components

Code	Resource
AIR	Air
AQSPH	Aquatic Species and Habitats
ARCH	Cultural Resources
ATRISK	At-Risk Species
CAVE	Significant Caves
CAVEMA	Cave Management Area
CDS	Chihuahuan Desert Scrub Shrubland
COLPART	Collaboration, Partnerships, Education, and Relationships
DEVREC	Developed Recreation
DISREC	Dispersed Recreation
ELIGWSR	Eligible Wild and Scenic Rivers
FAC	Facilities
FIRE	Fire and Fuels
FORESTRY	Forest Products
GAMB	Gambel Oak Shrubland
INVASIVE	Nonnative Invasive Species
IRA	Inventoried Roadless Area
JUG	Piñon-Juniper Grass and Juniper Grass Woodland
LANDS	Lands and Access
LANDSU	Lands Special Uses
LEASEMIN	Leasable Energy Minerals
LOCMIN/SALMIN	Locatable and Salable Minerals
MCD	Mixed Conifer-Frequent Fire Forest
MCW	Mixed Conifer with Aspen Forest
MMS	Mountain Mahogany Mixed Shrubland
MSDG	Montane Subalpine and Semi-Desert Grassland
MSG	Montane Subalpine Grassland
NRT	National Recreation Trail
PJC	Piñon-Juniper Evergreen Shrub Woodland
PJO	Piñon-Juniper Woodland
PPE	Ponderosa Pine-Evergreen Oak
PPF	Ponderosa Pine Forest
RANGE	Range
REC	General Recreation
RECSU	Recreation Special Uses
RECWILD	Recommended Wilderness and Wilderness Study Area
RENEWENRGY	Renewable Energy
RIPAR	Riparian Area
RNA	Proposed Research Natural Area
ROADS	Roads
SB	Scenic Byway
SCENIC	Scenery Resources
SFF	Spruce Fir Forest
SOIL	Soil Resources
TERSPH	Terrestrial Species and Habitats
TRIBE	Tribal Uses
VEG	All Vegetation Types
WATER	Water Resources
WILD	Wilderness Area

Appendix C: Fire Return Interval

There are 15 terrestrial ecological response units on the Lincoln National Forest that are fire-adapted and have naturally occurring fire regimes spanning various frequencies and intensities (see Vegetation and Fire in the draft environmental impact statement). The ecological response units and their associated fire return intervals are listed below in table 5, where the return interval is shown divided into moderate and high frequencies. Within each ecological response unit, each frequency is paired with the trend toward reference (historical) fire return interval.

Table 5. Ecological response units and associated fire return interval

Ecological Response Unit	Current Departure from Historical Fire Return Interval	Predicted Trend for Fire Return Interval (10 Years)
Spruce-fir forest	High	Slowly Toward
Mixed conifer with aspen	High	Moderately Toward
Mixed conifer-frequent fire	Moderate	Moderately Toward
Ponderosa pine forest	Moderate	Moderately Toward
Ponderosa pine-evergreen oak	Moderate	Moderately Toward
Piñon-juniper evergreen shrub	High	Moderately Toward
Juniper grass	Moderate	Quickly Toward
Piñon-juniper woodland	Moderate	Moderately Toward
Piñon-juniper grass	Moderate	Quickly Toward
Gambel oak shrubland	High	Away
Mountain mahogany mixed shrubland	High	Slowly Toward
Chihuahuan desert scrub	High	Away
Montane subalpine grassland	Moderate	Slowly Toward
Semi-desert grassland	Moderate	Moderately Toward
Colorado Plateau-Great Basin grassland	High	Away

The values here were used to determine vegetation treatment acreages given in the plan objectives for Fire and Fuels FW-FIRE-O.

Appendix D: Eligible Wild and Scenic Rivers

Table 6. Lincoln National Forest eligible river segments by location, outstandingly remarkable values, and classification

Ranger District	Named Streams*	Segment	Potential Outstandingly Remarkable Values	Free Flowing	Classification
Smokey Bear	North Fork Rio Ruidoso	109	A – Scenery, Sierra Blanca B – Recreation	Yes	Not eligible Change in Circumstance
Smokey Bear	Three Rivers	110	A – Scenery, waterfalls in Fall Creek B – Wilderness area, trail C – Rock formations, cliffs, steep gradients E – Golden eagle nest, Mexican spotted owl, peregrine falcon	Yes	Recreation
Smokey Bear	South Fork Bonito Creek	120	A – Scenery, stream B – Wilderness area, high trail use	Yes	Recreation
Smokey Bear	Duran Canyon	339	A – Scenery, stream and rock formations C – Spire rock formations	Yes	Wild
Smokey Bear	Hale Canyon	343	A – Scenery, stream and rock formations C – Spire rock formations	Yes	Wild
Smokey Bear	Pancho Canyon	354	A – Scenery, rock formations C – Spire rock formations E – Peregrine falcon nest	Yes	Scenic
Sacramento	Monument Canyon	31	C – Travertine dams E – Bald eagle wintering area, Mexican spotted owl	Yes	Recreation
Sacramento	Fresnal Canyon	10	A – Scenery, Tunnel Vista C – Box canyon/ travertine F – Tunnel and Fresnal Shelter site E – Sacramento prickly poppy	Yes	Recreation
Sacramento	Dog Canyon	18	A – Cliffs B – State Park, geologic interpretation F – Mescalero Apache travel route, Mescalero Stronghold E – Sacramento penstemon, Sacramento prickly poppy, Chaplin's columbine, golden eagle nest	Yes	Recreation

Ranger District	Named Streams*	Segment	Potential Outstandingly Remarkable Values	Free Flowing	Classification
Sacramento	Rio Peñasco	82–84, 86–90	E – Purled thistle, Mexican spotted owl, New Mexico meadow jumping mouse	Yes	Recreation
Sacramento	Sacramento	29	A – Travertine deposits, waterfall and wetlands E – Mexican spotted owl	Yes	Recreation
Guadalupe	Sitting Bull Falls	8, 19, 20, 21	A – Scenery B – Wading, picnic shelters C – Waterfall, pools D – Native fish E – Sparsely-flowered jewelflower, Guadalupe mescal bean, Chapline's columbine	Yes	Wild
Guadalupe	Last Chance Canyon	26, 28, 31, 36–41	A – Scenery C – Rock formations, cliffs, steep gradient D – Native fish E – Sparsely-flowered jewelflower, royal red penstemon F – National Register listed site, Mescalero Apache site	Yes	Wild
Guadalupe	Turkey Canyon	52	A – Scenery C – Rock formations, cliffs, steep gradient E – Sparsely-flowered jewelflower, royal red penstemon F – National Register listed site	Yes	Wild
Guadalupe	Upper Dark Canyon	69, 70, 73, 74, 76, 77, 81, 85, 92, 96, 97	A – Scenery C – Rock formations, cliffs, steep gradient E – Sparsely-flowered jewelflower, royal red penstemon F – Cultural resource sites G – Caves	Yes	Wild
Guadalupe	Big Canyon	133, 134, 137, 138, 141, 142, 144, 145, 149	A – Scenery C – Rock formations, cliffs, steep gradient D – Native fish E – Mexican spotted owl, sparsely-flowered jewelflower, Chapline's columbine G – Pools, caves	Yes	Wild

Ranger District	Named Streams*	Segment	Potential Outstandingly Remarkable Values	Free Flowing	Classification
Guadalupe	North McKittrick	151–155	A – Scenery C – Rock formations, cliffs, steep gradient D – Native fish E – Mexican spotted owl, sparsely-flowered jewelflower, Chapline's columbine G – Pools, caves	Yes	Wild

* Source: U.S. Geological Survey 7.5-minute quadrangle maps.

Appendix E: Proposed Probable and Possible Future Actions

This appendix describes some of the proposed and possible management actions that may take place on the Lincoln National Forest at the project or activity level during the plan period (approximately 10 to 15 years) to maintain or move toward desired conditions as described in this plan. Proposed actions are based on objectives described in chapters 2 and 3 of the plan and are designed to be clearly measurable outcomes that advance the specified resource toward desired conditions. Possible actions are management approaches drawn from chapters 2 and 3 that describe potential actions or strategies compatible with achieving desired resource conditions and objectives. Program strategies, inventories, assessments, resource analyses, and ongoing work with partners and cooperating agencies anticipated during the next 10 to 15 years are outlined below (FSH 1909.12 Chapter 22.34).

This list is not intended to be all-inclusive; it is simply a list of possible actions that may take place based on the plan objectives and management approaches. This information is not a commitment to take any action and is not a "proposal" as defined by the Council on Environmental Quality regulations for implementing the National Environmental Policy Act (40 CFR 1508.23, 42 U.S.C 4322(2)(C)). During the life of the plan, the Lincoln National Forest is not limited to these possible actions when proposing projects and activities. A plan amendment is not required to change of modify the possible actions. These probable and possible future actions can be updated at any time through an administrative change of the plan.

Proposed Management Actions

Objectives as outlined in chapters 2 and 3 of the plan represent projects or activities intended to be accomplished during the 10 to 15 year plan period. Objectives are listed below.

All Vegetation Types

Objectives for all vegetation types are based on previous Lincoln National Forest accomplishments, anticipated need, and estimated future accomplishment based on capacity.

Objective 1: Over a 10-year period, complete the following treatments to move vegetation resources toward desired conditions:

Vegetation Ecological Response Unit	Mechanical Treatment (acres)	Prescribed Fire and Naturally Ignited Wildfire (acres)
Mixed conifer with aspen	1,000–3,000	40,000
Mixed conifer with frequent fire	6,000–8,000	40,000
Ponderosa pine forest	2,000–3,000	40,000
Piñon-juniper woodland	1,000–3000	40,000
Piñon-juniper grass	1,000–2,500	20,000
Piñon-juniper evergreen shrub	Treatments are included in the piñon-juniper woodland acres	20,000

Objective 2: Over a 10-year period, complete 400 to 1,000 acres of combined vegetation treatments in highly departed non-forested ecological response units[6] to move vegetation toward desired conditions (such as restoration). Treatments may include mechanical treatments, prescribed fire or naturally ignited wildfires, seeding, or other techniques still to be determined by best available science depending on the specific ecological response unit.

Riparian Areas

Objective 1: Maintain and enhance existing riparian areas exhibiting properly functioning condition within the next 10 years.

Objective 2: Restore to properly functioning condition a minimum of 25 percent of stream reaches considered to be functioning at-risk over a 10-year period.

Objective 3: Restore or enhance to a functioning at-risk or properly functioning condition a minimum of 25 percent of non-functioning stream reaches over the next 10 years.

Soil Resources

Objective 1: Improve impaired and unsatisfactory soil condition scores in the Watershed Condition Framework in priority watersheds over 5-year periods.

Water Resources

Objective 1: Improve the Watershed Condition Framework score for two watersheds over the life of the plan.

Objective 2: Restore or enhance 20 acres of wetlands over 10 years.

Terrestrial Species and Habitats

Objective 1: Restore or enhance 50,000 acres of terrestrial wildlife habitat during each 10-year period following plan approval.

Objective 2: Reconstruct or maintain 20 existing water developments for wildlife, during each 10-year period following plan approval.

Objective 3: Restore or improve 50,000 acres of pollinator habitat, during each 10-year period following plan approval.

Objective 4: Establish or maintain five pollinator gardens, during each 10-year period following plan approval.

Objective 5: Improve wildlife connectivity by removing unneeded structures (fences, roads, cattleguards, water improvements, spring developments, etc.) or completing improvement projects (such as removing barriers and connecting fragmented habitat) in 10 locations during each 10-year period following plan approval.

6 Highly departed non-forested ecological response units are Gambel oak shrubland, semi-desert grassland, and montane-subalpine grassland. Columbia Plateau-Great Basin grassland is less than 1 percent of plan area and occurs as small inclusions in other piñon-juniper types, and included within their objectives.

Objective 6: Complete five projects to improve habitat connectivity for riparian species (remove barriers, relocate and decommission roads, restore dewatered stream segments, connect fragmented habitat, construct wildlife passage friendly fences, etc.) during a 10-year period.

Aquatic Species and Habitats

Objective 1: Restore or protect 5 miles of aquatic habitat over a 10-year period.

Objective 2: Implement a project to establish a Rio Grande cutthroat trout reintroduction and management zone into the upper reaches of the Rio Bonito Watershed to assist in management and recovery of the species within 10 years of plan approval.

Objective 3: Reduce nonnative fish within native fish populations in four stream reaches during each 10-year period following plan approval.

Objective 4: Complete five projects to improve habitat connectivity for aquatic and riparian species (remove barriers, relocate and decommission roads, restore dewatered stream segments, connect fragmented habitat, wildlife passage friendly fences, etc.) during the 10 years following plan approval.

Nonnative Invasive Species

Objective 1: Treat or remove invasive species in 1,000 acres of habitat during each 10-year period following plan approval.

Fire and Fuels

See objectives for All Vegetation Types.

Significant Caves

Objective 1: Twenty-five percent of caves known to contain sensitive or special status biological species, cultural, or paleontological resources will be monitored annually.

Objective 2: Inspect all infrastructure at the entrance or interior of caves twice per year. This includes, but is not limited to, gates, ladders, fixed ropes, bolts, etc.

Objective 3: Survey and map a minimum of 5,000 linear feet per year in caves on the Lincoln National Forest.

Objective 4: Strategically survey a minimum of 250 acres of surface area for cave and karst features annually.

Objective 5: Provide for volunteer opportunities to conduct cave resource restoration quarterly.

Objective 6: As caves are discovered, they should be evaluated for significance under the Federal Cave Resources Protection Act of 1988.

Collaboration, Partnerships, Education, and Relationships

Objective 1: Complete 30 products or activities that educate the public, particularly youth, about wildlife, fish, and plant resources during each 10-year period following plan approval. Examples of products include educational signs and brochures, website pages, species checklists, presentations, and field trips.

Objective 2: Complete 30 products or activities that educate the public, particularly youth, about fish and aquatic resources during each 10-year period following plan approval. Examples of products include educational signs and brochures, website pages, species checklists, presentations, and field trips.

Objective 3: Complete 30 products or activities that educate the public, particularly youth, about species at-risk and species of conservation concern during each 10-year period following plan approval. Examples of products include educational signs and brochures, website pages, species checklists, presentations, and field trips.

Objective 4: Complete 30 products or activities that educate the public, particularly youth, about nonnative invasive species impacts during each 10-year period following plan approval. Examples of products include educational signs and brochures, website pages, species checklists, presentations, and field trips.

Range

Objective 1: Maintain, improve, or install five water features per 5-year increment to improve water availability for wildlife or livestock where natural water sources are limited. These water features can serve dual purposes for both wildlife and livestock and can be done in conjunction with objective for water features in the wildlife section.

Objective 2: Evaluate vacant allotments every 5 years to determine availability to livestock grazing at appropriate stocking levels and compatibility with other multiple use values.

General Recreation

Objective 1: Recreation opportunity spectrum classes are kept to within 15 percent of those identified for 15 years or the life of the plan in order to support the continued spectrum of recreation opportunities.

Developed Recreation

Objective 1: Ninety-five percent of recreation facilities are maintained in a fair to good condition within 15 years.

Dispersed Recreation

Objective 1: Twenty percent of trails are maintained to meet national quality standards within 10 years.

Objective 2: Verify and correct signage for 100 percent of system trails in 15 years.

Roads

Objective 1: Maintain 100 miles of maintenance level 3 passenger car roads and 60 miles of maintenance level 2 high clearance roads yearly for the life of the plan.

Objective 2: Decommission 75 miles of road within 15 years.

Locatable and Salable Minerals

Objective 1: To reduce erosion, restoration and reclamation of surface disturbance associated with locatable mineral activities achieve 70 percent of groundcover (as compared to nearby undisturbed areas) with permanent native vegetation within three growing seasons.

Wilderness Areas

Objective 1: Within 10 years of plan approval, wilderness areas continue to meet baseline measures of wilderness character as annually reported in Wilderness Stewardship Performance.

Possible Management Actions

Management approaches as outlined within chapters 2 and 3 of the plan describe some of the possible management actions for achieving desired conditions and objectives. These are summarized below by resource area.

All Vegetation Types

Management approach 1: Look for management actions that replicate natural disturbances.

Riparian Areas

Management approach 1: Consider underlying causes for degradation at the watershed scale when planning or implementing restoration activities.

Management approach 2: Follow regional strategies using collaboration and partnerships to develop forest and riparian restoration activities that provide for increased water quality and capacity, and related resource resiliency.

Soil Resources

Management approach 1: Work collaboratively with other agencies and groups that facilitate soil conservation, watershed improvement, and research projects.

Water Resources

Management approach 1: Work with local, state, and tribal governments, nongovernment organizations, and other stakeholders to identify improvement projects and priorities for protection and management of watersheds, especially in priority watersheds (Watershed Condition Class Framework).

Management approach 2: Consider developing watershed-specific plans that prioritize specific roads for decommissioning or maintenance to result in improved water quality and a smaller road system (administrative or public).

Terrestrial Species and Habitats

Management approach 1: During project planning, consider mitigations to wildlife and plant habitat resulting from the effects of long-term and short-term climate fluctuations (drought, El Niño Southern Oscillation, global climate change, etc.), and subsequent effects of management activities.

Management approach 2: Work with the New Mexico Department of Game and Fish and other partners to develop projects that improve terrestrial habitat conditions and enhance hunting and wildlife viewing opportunities.

Management approach 3: Work collaboratively with the New Mexico Department of Game and Fish and other organizations, individuals, and groups to plan and implement projects for the management and research of terrestrial wildlife and plant species and their habitats.

Management approach 4: Prioritize restoration projects based on factors such as watershed conditions, at-risk species, and restoration after disturbances (fire, flood, etc.), partner interest, and other immediate needs.

Management approach 5: Prioritize mapping of rare and endemic species and habitats and work on maintaining or restoring intact, functioning habitat sufficient for species persistence.

Management approach 6: Prioritize restoration projects based on factors such as watershed conditions, at-risk species, and restoration after disturbances (fire, flood, etc.), partner interest, and other immediate needs.

Aquatic Species and Habitats

Management approach 1: Work collaboratively with the New Mexico Department of Game and Fish and other organizations, individuals, and groups to plan and implement projects for the management and research of fish and other aquatic species and their habitats.

Management approach 2: Work with partners to develop and implement conservation strategies beneficial to aquatic habitats (such as the Rio Grande Cutthroat Conservation Strategy).

Management approach 3: During project planning, consider management actions to mitigate the effects of long-term and short-term climate fluctuations on aquatic species (climate change, drought, El Niño Southern Oscillation, etc.).

Management approach 4: Prioritize restoration projects based on factors such as watershed conditions, at-risk species, and restoration after disturbances (such as fire and flood), partner interest, and other immediate needs.

At-Risk Species

Management approach 1: Periodically assess at-risk species and habitat and review if information indicates concern about a species' capability to persist over the long term in the plan area.

Management approach 2: Strengthen and develop programs to survey, monitor, and collect data on at-risk species, especially when basic distribution and species status information is lacking on the Lincoln National Forest. Identify, document, and correct any management conflicts to the species or their habitat.

Management approach 3: Coordinate and collaborate with the state, federal, nonprofit organizations, and other specialists as well as other interested stakeholders in support of gathering information on at-risk species for which little information is known or available.

Management approach 4: Collaborate with universities, state and federal agencies, and other organizations to obtain, manage, and disseminate data and encourage research on at-risk species.

Management approach 5: Work with partners to promote public education and valuing of at-risk species on the Lincoln National Forest.

Management approach 6: Ensure that in project-level planning, at-risk species should reference the appropriate species-specific documentation and the species of conservation concern analysis to identify the disturbance mechanisms necessary to maintain and enhance species and their habitat.

Management approach 7: Prioritizes areas for at-risk plant and animal habitat surveys by focusing on rare soil types, geological features, or biodiversity hotspots.

Management approach 8: Collaborate on avoiding or mitigating management actions that may reduce long-term reproductive success or directly harm populations of at-risk species in subalpine and alpine habitats.

Management approach 9: Collaborate on management activities along cliff faces, rock features, and other known at-risk species sites to avoid or mitigate impacts during reproduction season.

Management approach 10: Prioritize mapping at-risk species and habitats and maintain or restore to an intact, functioning condition sufficient for species persistence.

Nonnative Invasive Species

Management approach 1: Focus on reducing nonnative fish in order to protect and promote the recovery of native species or existing multiple uses.

Management approach 2: Habitat improvement and aquatic restoration projects should identify sites of occurrence and provisions to remove nonnative invasive plants and animals.

Management approach 3: Make efforts to eradicate feral hogs in coordination and cooperation with the New Mexico Department of Agriculture, USDA Animal and Plant Health Inspection Service, and other stakeholders consistent with the National Feral Swine Damage Management Program.

Air

Management approach 1: Work with agencies, organizations, federally recognized tribes, and other entities to actively pursue actions designed to reduce the impacts of pollutants from sources within and outside the Lincoln National Forest. These measures may include:

- Continuing to comply with local, New Mexico, and federal air quality regulations.
- Implementing air pollution mitigations where appropriate.
- Monitoring ambient air quality.

Management approach 2: Consider deploying smoke monitors when there is potential for significant impacts to the public.

Fire and Fuels

Management approach 1: Collaborate with stakeholders and partnering agencies early and often to successfully meet resource objectives through the use of fire. Educate internally and externally the potential challenges and tradeoffs of wildland fire.

Management approach 2: Coordinate management of wildland fire across jurisdictional boundaries whenever there is potential for managing a wildfire or a prescribed fire on more than one jurisdiction (federal, state, county, local, tribal governments, land grants, etc.). This includes water sources, access, and land use agreements. This is done with the understanding that fire-adapted ecosystems and communities transcend jurisdictional boundaries.

Management approach 3: When planning and implementing fuels projects and all hazard response, work collaboratively with federal, state, local governments, and private landowners; consider promoting public safety and reducing the risk of wildfire on lands of other ownership by supporting the development and implementation of community wildfire protection plans or similar assessments and management plans to mitigate negative impacts of wildfire. Community wildfire protection plans are also important tools for mitigation efforts such as wildfire preparedness, evacuation planning, and other mitigations that will aid in wildfire response.

Management approach 4: Consider an interdisciplinary assessment of site-specific values to develop Wildfire objectives (for example, desired conditions, existing fuel conditions, current and expected weather, fire location, resource availability, and social and economic conditions) to enhance or protect those values.

Management approach 5: In areas departed or trending away from desired conditions, combine the use of wildland fire with mechanical treatments, as this is often the most effective approach to restoring forest structure and function.

Management approach 6: In areas, highly vulnerable to climate change, increase resiliency by using a diversity of treatments to facilitate natural adaptation to changing conditions such as managing in favor of early- to mid-seral species over late-seral species in ecotones, as species characteristic of lower life zones are adapted for warmer and drier conditions. Managing tree basal area at the low end of the range of desired conditions to mitigate water stress.

Management approach 7: Develop practices and protocols to reduce non-prescribed human ignitions by providing timely and disseminating widely fire danger and fire restriction information. Educate the public on their responsibility to help reduce human-caused wildfires by providing information in the form of signage, public contacts, and fire restrictions in locations such as trailheads and designated recreation areas.

Management approach 8: Take into account, the scenic effects from prescribed fire during project planning and implementation to provide for related cultural ecosystem services. Blackened and scorched vegetation may be visible in project areas in the short term following treatments, but take into consideration the long-term scenic integrity objectives. Short term is defined as 10 years or less and long-term is greater than 10 years.

Management approach 9: In wildland fire areas that are not expected to reseed naturally, use seeding with native vegetation and implement other site rehabilitation practices, as necessary. Consider that fire suppression support activities and facilities (including constructed firelines, fuelbreaks and safety areas, fire camps, staging areas, helibases, and helispots) follow the same site rehabilitation practices.

Management approach 10: Collaborate with scientists (from universities, Forest Service Research and Development, U.S. Geological Survey, Ecological Restoration Institute, etc.) to conduct research on areas impacted by uncharacteristic wildfire to understand how fire has altered the ecological conditions outside the natural range of variation and develop strategies to better manage these areas.

Management approach 11: Use the wildfire strategic response zones to facilitate informed and transparent decisionmaking that will allow beneficial fires to burn under the right conditions and inform aggressive strategies when fires need to be suppressed. Five strategic zones were developed for the Lincoln National Forest: (1) maintain, (2) restore, (3) protect, (4) exclusion, and (5) high complexity. These zones are dynamic over time and space, and will change as conditions change,

affecting management opportunities. For example, an area currently identified as a “restore” zone could become a “maintain” zone after treatment (mechanical or prescribed fire). Conversely, a “restore” zone could become a “protect” zone if changing fuel conditions change expected fire behavior and effect such that fire would not meet land management plan desired conditions.

Management approach 12: In areas, highly vulnerable to climate change, increase resiliency by using a diversity of treatments to facilitate natural adaptation to changing conditions such as managing in favor of early- to mid-seral species over late-seral species in ecotones, as species characteristic of lower life zones are adapted for warmer and drier conditions. Consider managing tree basal area at the low end of the range of desired conditions to mitigate water stress.

Significant Caves

Management approach 1: Collaborate with state and federal agencies, nongovernmental organizations, and universities as well as local, regional, and national speleological societies to identify significant caves, obtain data, encourage research on karst environments and karst-dependent species, and develop conservation strategies for protecting karst-dependent species and their habitats.

Management approach 2: If timber harvesting is permitted near a cave, consider directionally felling trees away from a cave and its course.

Management approach 3: Identify and document cave and karst features when they are found to occur across the landscape; these features include springs, sinkholes, and losing streams.

Collaboration, Partnerships, Education, and Relationships

Management approach 1: Forest managers utilize collaboration, partnerships, youth, diverse communities, volunteerism, citizen stewardship, and conservation education to support work across program areas, connect people with public lands, and foster a sense of stewardship.

Management approach 2: Use a collaborative approach when developing and implement projects by engaging representative stakeholders and communities of place and interest to develop relationships and inform decisions.

Management approach 3: Form partnerships with stakeholders where common interests and leveraging respective resources can bring synergy, support, and broader accomplishments to fruition.

Management approach 4: Develop and implement consistent methods to recruit, train, and coordinate volunteers across the Lincoln National Forest.

Management approach 5: Work with partners and stakeholders involved in community wildfire protection plans to meet the broad intent and goals of those plans.

Management approach 6: Work with partners to promote public education on the value of the terrestrial and aquatic wildlife on the Lincoln National Forest.

Management approach 7: Work with partners to promote public education on the value of rare and endemic species on the forest.

Management approach 8: Lincoln National Forest personnel use collaborative information and education programs to build awareness of nonnative invasive species and the threats they pose at all levels and across all jurisdictions.

Management approach 9: Consider developing and promoting programs that educate the public on the importance of staying on trails and not disturbing natural plant communities, including biological soil crusts.

Management approach 10: Use heritage programs, interpretive presentations, publications, and interactive learning opportunities to provide the public with opportunities to learn about, understand, and experience the forest's cultural resources (prehistory and history).

Management approach 11: Promote established programs and develop conservation education programs at schools, youth activities, fairs, and volunteer events that help connect people to nature, reach underserved populations, and encourage responsible use of natural resources.

Management approach 12: Develop conservation education, visitor information, and interpretation materials to inform and engage visitors and local communities. These resources are readily available and encourage increased forest stewardship, ecological awareness, visitor orientation, and knowledge of recreation opportunities.

Management approach 13: Develop public education opportunities and information about the importance of scenery.

Management approach 14: Use interpretation and education to encourage visitors to adopt techniques, equipment, and ethics specific to wilderness values.

Tribal Uses

Management approach 1: Collaborate with American Indian Tribes to manage historic sites and other traditional areas of importance.

Management approach 2: Develop collaborative proposals and partnerships with American Indian Tribes to implement projects of mutual benefit and economic development.

Management approach 3: Collaborate with American Indian Tribes to identify mitigation measures for historic properties, traditional cultural properties, and cultural landscapes during management activities.

Management approach 4: Work with partners such as the American Indian Tribes, New Mexico Historic Preservation Division SiteWatch program, Archaeological Society of New Mexico, the National Park Service, and local museums to identify, study, protect, and monitor sites and artifact collections.

Management approach 5: Improve relationships with American Indian Tribes.

Management approach 6: Draft new and update existing agreements with American Indian Tribes as needed.

Cultural Resources

Management approach 1: Maximize opportunities for partnerships and volunteerism with the heritage program. Cooperate with local, state, and federal agencies, as well as institutions and the tribes in accomplishing program goals and objectives.

Management approach 2: Collaborate with traditional communities to manage historic sites and other traditional areas of importance.

Management approach 3: Work with partners such as the American Indian Tribes, New Mexico Historic Preservation Division SiteWatch program, Archaeological Society of New Mexico, the National Park Service, and local museums to identify, study, protect, and monitor sites and artifact collections.

Management approach 4: Collaborate with traditional communities to identify mitigation measures for cultural resource properties and cultural landscapes during management activities.

Management approach 5: Use programs (such as site stewards, volunteers, and Passport in Time) that engage the public to assist in protecting, managing, and documenting cultural resources.

Management approach 6: Update the Forest Overview and Cultural Resources Planning Assessment into a comprehensive document to include a synthesis of known cultural data as well as lists of priorities for non-project survey, National Register of Historic Places nominations, site stabilization, interpretation, and public involvement.

Management approach 7: Restore select historic structures for appropriate recreation or interpretive use.

Management approach 8: When mitigating resource deterioration, implement the following protective measures:

- Vegetation treatment in and adjacent to site boundaries (provided appropriate protection measures are in place)
- Signing
- Fencing
- Administrative closure
- Patrols
- Interpretive signs
- Stabilization
- Data recovery

Management approach 9: Consider prioritizing non-project-related surveys as follows:

- Areas where historic properties 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 understanding of the prehistory or history.

Forest Products

Management approach 1: In areas, highly vulnerable to climate change, increase resiliency by using a diversity of treatments to facilitate natural adaptation to changing conditions such as managing in favor of early- to mid-seral species over late-seral species in ecotones, as species characteristic of lower life zones are adapted for warmer and drier conditions. Retain refugia of vegetation types in draws and cold drainages. Manage tree basal area at the low end of the range of desired conditions to mitigate water stress.

Management approach 2: Prepare pest control plans with forest health specialists that contain appropriate mitigation measures (such as use of resistant tree species, maintenance of species diversity, removal of damaged trees, or use of pesticides) and monitoring procedures.

Range

Management approach 1: Lincoln National Forest land managers cooperate, collaborate, and coordinate with livestock producers and stakeholders to respond to changing resource conditions. Cooperation, collaboration, and coordination with stakeholders is key to improving rangeland and forest conditions for multiple uses, moving towards desired conditions, and contributing to the socio-economic wellbeing of local communities.

Management approach 2: Develop partnerships with livestock grazing permit holders, agencies, and other groups and individuals to develop collaborative proposals and implement projects that benefit multiple use on the Lincoln National Forest.

Management approach 3: Coordination with livestock producers holding national forest grazing permits should occur at the early stages of planning and project design to include local perspectives, needs, concerns, and traditional knowledge.

Management approach 4: Acknowledge the economic, traditional, and cultural importance of livestock grazing to southern New Mexico families.

Management approach 5: Consider emphasizing large-scale landscape approaches and treatments for restoring rangelands and the use and perpetuation of a diversity of native plant species, with an emphasis on grass, forb, and shrub communities.

Management approach 6: Consider an adaptive management strategy to manage livestock grazing in a manner that promotes ecosystem resiliency, sustainability, and species diversity based on changes in range conditions, climate, and other resource conditions. The adaptive management strategy is to provide more flexibility to grazing management while improving or maintaining the health of rangelands.

Management approach 7: Facilitate dialogue between the New Mexico Department of Game and Fish and livestock producers about ungulates (elk, deer, and livestock) and the cumulative impacts on forest resources.

Management approach 8: Where an allotment fence intersects a designated trail, consider a pass-through section (for example, easy-to-use gate, walk-through gate, horseback accessible) to provide access for recreation users unless it interferes with range management and resource protection.

General Recreation

Management approach 1: Develop or enhance partnerships and collaborate with agencies, groups, communities, volunteers, permit holders, and other individuals to increase forest stewardship, ecological awareness, volunteerism, and user satisfaction, promote a sustainable recreation program, support local recreation-based economic development, and cultural ecosystem services.

Management approach 2: Convene and encourage multi-stakeholder groups to address recreation maintenance concerns in specific areas.

Management approach 3: Collaborate with permitted livestock producers and recreationists to resolve conflicts.

Management approach 4: Multilingual interpretation in recreation areas popular with non-English speaking visitors.

Management approach 5: Incorporate information technology (such as scannable QR codes, web addresses, interactive maps) into signs and interpretive materials to direct public to additional information.

Management approach 6: Manage excessive recreation use resource impacts by using techniques that change habitual behaviors, and promote citizen stewardship and education. Issue closure orders to maintain public safety or where short-term measures are adequate to reduce resource impacts.

Management approach 7: Use sustainable operations (recycling receptacles, electric maintenance vehicles, etc.) at developed recreation sites.

Developed Recreation

Management approach 1: Consider the financial sustainability of the developed recreation program and prioritize sites for decommissioning, closing, repurposing the facilities, increasing revenue, decreasing costs, and/or leveraging partnerships.

Management approach 2: Consider the volume of use, resource protection needs, and opportunities for public-private partnerships, geographic distribution, and operating costs and revenues to determine the operation or closure of a site.

Management approach 3: Build relationships, identify common interests and leverage resources that support tourism and support sustainable operations.

Management approach 4: Consider adaptively managing recreation facilities and shifting limited program resources to prioritized sites.

Management approach 5: Consider repurposing closed or unused facilities (such as fire towers, cabins, and recreation residences) as possible recreation rentals.

Management approach 6: Consider posting public safety and stewardship information at developed recreation sites that includes a welcome to the site as well as rules and regulations on recreational activities.

Dispersed Recreation

Management approach 1: Work with volunteer groups, partners, local governments, and adjacent landowners to maintain trail corridors, maintain the condition and character of the surrounding landscape, and facilitate trail use that promotes “Leave No Trace” principles and reduces conflict.

Management approach 2: Implement programs and educational techniques (such as brochures, signs, websites, and social media) that promote visitor knowledge of:

- Proper non-motorized and motorized trail use etiquette
- “Leave no Trace” principles
- Fire prevention (especially, how to properly extinguish campfires)
- At-risk species habitat

Management approach 3: Discourage the creation and use of non-motorized user-created routes (for example, redirect recreation use to National Forest System trails).

Management approach 4: Construct barriers and add signage to control unauthorized use in areas with a high potential for illegal cross-country motorized vehicle use.

Management approach 5: Post information to redirect use and encourage public compliance in site rehabilitation efforts.

Management approach 6: Promote clean camping practices (such as "Leave No Trace" and "Pack-It-In, Pack-It-Out") at dispersed sites.

Recreation Special Uses

Management approach 1: Collaborate with New Mexico Game and Fish, New Mexico Council of Outfitters and Guides, and other New Mexico national forests to coordinate special use permitting consistency for outfitters and guides. Consider convening an annual meeting between the Lincoln National Forest, the New Mexico Council of Outfitters and Guides, and State of New Mexico representatives to discuss issues and management strategies.

Management approach 2: Consider directing applicants desiring special use authorizations on heavily-used areas to alternative areas that can better support the desired activities.

Management approach 3: Consider using tools that assist in efficiencies to the program and expand administrative capacity (such as Lincoln National Forest's categorical exclusion week, special use modernization efforts, proposed statewide outfitter and guide permits, and regional billing team).

Scenery Resources

Management approach 1: Cooperate with other entities, such as the New Mexico Department of Transportation, tribal and local governments, and commercial and private entities to protect scenic integrity on and adjacent to the national forest, including along scenic byways.

Management approach 2: Use best environmental design practices to advance environmentally sustainable design solutions (such as the Forest Service Sustainable Recreation Site Design Guide).

Management approach 3: Use the Forest Service Built Environment Image Guide in construction or reconstruction of Forest Service facilities to ensure consistency with the scenic character of the Southwestern Region.

Management approach 4: When setting priorities for scenic integrity rehabilitation consider the following:

- foreground (within one-half mile) of high public use areas is highest priority;
- amount of deviation from the scenic integrity objectives;
- length of time it would take natural processes to reduce scenic impacts so that they meet the scenic integrity objectives;
- length of time it will take rehabilitation measures to meet the scenic integrity objectives;
- benefits to other resource management objectives to accomplish rehabilitation; and

- as a component of project work or as funds are available, coordinate restoration of scenic integrity in areas where it has been negatively impacted, and where existing scenic integrity is lower than the scenic integrity objectives.

Management approach 5: Prior to vegetation work in developed recreation sites or administrative facilities, develop vegetation management plans that outline activities to sustain the desired scenic character.

Management approach 6: Use of native planting and key scenery elements over time.

Management approach 7: Consider the following types of activities to enhance scenic resources: restore grasslands and aspen, decommission or rehabilitate unneeded and unauthorized roads and routes, remove unnecessary fences, and paint facilities along scenic byways in colors that blend with the landscape.

Roads

Management approach 1: Within project areas, prioritize decommissioning of roads and routes that are redundant, adversely impact flow regimes, or cause resource damage.

Management approach 2: Mitigate or decommission roads that may be susceptible to erosion, landslides, rock falls, or other landslide movements and hazard trees.

Management approach 3: Maintain relationships and communications with internal and external customers as well as partners. Notify local governments, partners, adjacent landowners, permit holders, etc., of changes in road status and significant deviations in traffic patterns.

Management approach 4: Prioritize road system maintenance to provide for safe travel on all roads as well as to prevent or mitigate resource damage. Continue current maintenance agreements and entering into new agreements with other entities including federal, state, tribal, and local government agencies, as well as private organizations and individuals.

Facilities

Management approach 1: Follow a comprehensive preventive maintenance program for buildings and infrastructure to minimize major unplanned repairs or replacements.

Management approach 2: Prioritize infrastructure needs and investments for current need and long-term planning goals as described in facilities master plan, sustainable recreation plan, recreation facility analysis, and other resource planning documents, and health and safety requirements for employees and visiting public. All infrastructure with employee occupancy is subject to the Occupational Safety and Health Administration standards and will be evaluated regularly to protect the health and safety of forest employees, volunteers, and the visiting public.

Management approach 3: Decommission potable water systems that no longer serve the current needs.

Management approach 4: When work is being planned for administrative facilities and infrastructure that are historic resources, work with the heritage program and partnerships to administer and maintain facilities according to the facility master plan and any developed preservation maintenance plans (historic property plans).

Management approach 5: Partner with local, state, federal, and tribal agencies, nongovernmental and academic organizations, and special interest groups to conduct maintenance or to repurpose excess infrastructure as outlined in facilities master plans, sustainable recreation plans, recreational facility analysis, and other resource planning documents, while following applicable standards and guidelines.

Management approach 6: Consider using photovoltaic systems for administrative facilities, range improvements, resource monitoring, public safety, and recreation projects.

Lands and Access

Management approach 1: Consider encouraging the protection of existing public access rights and the acquisition of new public access opportunities to National Forest System lands.

Management approach 2: Work with interested stakeholders to identify suitable parcels for acquisition and explore funding opportunities that leverage the Land and Water Conservation Fund, grant opportunities, and third-party financing.

Management approach 3: Consider updating the existing landownership adjustment plan, which will identify lands desirable for acquisition, as well as identify parcels or areas as suitable for exchange or sale.

Management approach 4: On easements acquired from private landowners, consider prioritizing public access interests over road closures.

Management approach 5: Consider using the following criteria to prioritize boundary management surveys:

- Where known litigation is pending, a title claim has been asserted, encroachments are suspected, or the probability of encroachment can be reduced.
- Where significant resource values exist and use or manipulation of resources is planned (this includes the location, by survey, of right-of-way easements necessary for resource management).
- To ensure that any conveyance of land, resource, or restoration project that occurs near or adjacent to any Lincoln National Forest boundary does not proceed until the legal national forest boundary lines are properly located and physically marked in the field prior to any management action.
- To provide an accurate delineation and location of national forest boundary lines will help prevent boundary disputes and/or loss of valued National Forest System land and its resources.
- When all remaining property boundary lines have not been previously surveyed.

Lands Special Uses

Management approach 1: Add stipulations to authorizations to install raptor protection devices on all existing poles.

Management approach 2: Consider including in the operation and maintenance plan of recreation residence special uses authorizations to us the most recent edition of “A Guide to maintaining the Historic Character of Your Forest Service Recreation Residence” for guidance on any improvement or maintenance to eligible historic or unevaluated recreation residences.

Management approach 3: Explore cost recovery measures that balance commercial viability with program sustainability.

Management approach 4: Limit diesel-powered generators at facilities operating under a lands special-use permit.

Locatable and Salable Minerals

Management approach 1: Prior to the destruction of access to adits, shafts, and other mine workings, provide an opportunity to record mineral resource information when safe.

Management approach 2: Inspect commercial use mineral material sites to identify and mitigate resource damage due to overuse.

Wilderness Areas

Management approach 1: Work with local partners, volunteers, Adopt-a-Trail organizations, and other entities to maintain wilderness, including trails maintenance and construction.

Management approach 2: Coordinate with the New Mexico Department of Game and Fish on management of wildlife within wilderness using techniques consistent with wilderness character.

Management approach 3: Wilderness management is guided by the elements outlined in the Forest Service's Wilderness Stewardship Performance or other current guidance. This framework tracks how well the wilderness character is being preserved through measuring progress in 10 elements selected by managers for each wilderness from a suite of possible options (such as, management of fire, range, and cultural resources).

Management approach 4: When revising allotment management plans, consider encouraging non-motorized or non-mechanized practices (range riders) and minimizing structural development in wilderness.

Management approach 5: Consider adaptive management and corrective measures if overuse causes unacceptable resource damage or unacceptable loss of opportunities for solitude. Use proactive approaches in identifying and addressing visitor use management challenges before effects to resources become unacceptable.

Management approach 6: Prioritize the decommissioning, realignment, or reconstruction of trails in designated wilderness areas based on need, the amount of use it receives, and potential impacts on wilderness character and recreation opportunities.

Management approach 7: Consider using methods to prevent unauthorized use in wilderness such as education, law enforcement, barriers, road closures, and trail design.

Management approach 8: When fire threatens a wilderness area, dispatch a resource advisor-fire Line qualified (REAF) or resource advisor (READ) with a specialized knowledge of wilderness, or dispatch a wilderness program specialist in the absence of a wilderness REAF or READ.

Management approach 9: Use news releases, postings, permit issuance, and individual visitor contacts to inform visitors of areas of concentrated resource damage and use restrictions.

Management approach 10: Consider rehabilitating human-caused disturbed areas (such as compacted sites) that do not complement wilderness character to a natural appearance.

Management approach 11: Reintroduce extirpated (locally extinct) or restoring populations of native species when consistent with ecological conditions and social values.

Management approach 12: Treat nonnative invasive species using methods, and in a manner, consistent with wilderness character in order to allow natural processes to predominate in designated wilderness, except where nonnative invasive species unacceptably threaten (large infestations) wilderness characteristics.

Inventoried Roadless Areas

Management approach 1: Prioritize roads in inventoried roadless areas for decommissioning.

National Recreation Trails

Management approach 1: Work with volunteer groups, partners, local governments, and adjacent landowners to maintain trail corridors, maintain the condition and character of the surrounding landscape, and facilitate trail use that promotes “Leave No Trace” principles and reduces conflict.

Management approach 2: Ensure that incident management teams are aware of all national trails as a resource to be protected during wildland fire management activities. Clearly identify fire-related rehabilitation and long-term recovery of the national trail corridor(s) as high priorities for fire managers, incident management teams, burned area emergency response teams, and post-fire rehabilitation interdisciplinary teams.

Scenic Byways

Management approach 1: Work with the New Mexico Department of Transportation and county highway departments to manage hazard trees within the immediate foreground of scenic byways (up to 300 feet on either side).

Management approach 2: Work with the New Mexico Department of Transportation, the Federal Highway Administration, and local communities to improve services and interpretive opportunities on byways.

Management approach 3: Consider using signs, kiosks, exhibits, and other educational tools (such as brochures, auto tours, websites, and social media) to provide interpretive, educational, and safety information along scenic byways, in adjacent recreation sites, and at visitor contact points (including ranger stations).

Eligible Wild and Scenic Rivers

Management approach 1: Seek opportunities for enhancing outstandingly remarkable values in all project management activities within an eligible wild and scenic river corridor.

Proposed Research Natural Areas

Management approach 1: Collaborate with appropriate agencies and universities regarding scientific opportunities of research natural areas.

Management approach 2: Encourage partnerships and volunteers to provide onsite interpretation and monitoring for the research natural areas.

Management approach 3: Mark the boundary of the research natural area and use signs to educate the public about the research natural area purpose, including permitted and prohibited activities.

Cave Management Areas

Management approach 1: Work with the Bureau of Land Management and National Park Service in the management of the Guadalupe Caves Management Area.

Management approach 2: Work with the Bureau of Land Management, in the management of the Snowy River Cave.

Management approach 3: Work with the Fort Stanton Cave Study Project for survey, exploration and research of the Snowy River Cave.

Appendix F: Relevant Laws, Regulations, and Policy

Federal and State Statutes

The following is a partial list of relevant laws which have been enacted by Congress. A federal statute, or law, is an act or bill which has become part of the legal code through passage by Congress and approval by the President (or via congressional override). Although not always specified below, many of these laws have been amended.

American Indian Religious Freedom Act, as amended (42 U.S.C. 1996)

Protects and preserves for American Indians their inherent right of freedom to believe, express, and exercise the traditional religions of the American Indian, Eskimo, Aleut, and Native Hawaiians, including but not limited to access to sites, use, and possession of sacred objects and the freedom to worship through ceremonial and traditional rites.

Americans with Disabilities Act of 1990

Provides a clear and comprehensive national mandate for the elimination of discrimination against individuals with disabilities; for clear, strong, consistent, and enforceable standards addressing discrimination against individuals with disabilities; to ensure that the federal government plays a central role in enforcing the standards established in this act on behalf of individuals with disabilities; and to invoke the sweep of congressional authority, including the power to enforce the fourteenth amendment and to regulate commerce, in order to address the major areas of discrimination faced by people with disabilities.

Anderson-Mansfield Reforestation and Revegetation Act of October 11, 1949

Provides for the reforestation and revegetation of National Forest System lands and other lands under the administration or control of the Forest Service.

Antiquities Act of 1906 (16 U.S.C. 431-433)

Prevents the appropriation, excavation, injury, or destruction of any historic or prehistoric ruin or monument, or any object of antiquity, situated on lands owned or controlled by the United States, without permission. Provides for permits, for misdemeanor-level penalties for unauthorized use, and authorizes the President to declare by public proclamation historic landmarks, historic and prehistoric structures, and other objects of historic or scientific interest that are situated upon lands owned or controlled by the United States to be national monuments, and to reserve as a part thereof parcels of land needed for the proper care and management of the objects to be protected. The Archaeological Resources Protection Act has replaced the Antiquities Act as the authority for special use permits if the resource involved is 100-years old or greater.

Archaeological and Historic Preservation Act of 1974 (16 U.S.C. 469)

This act is also known as the Archaeological Recovery Act. The Archaeological and Historic Preservation Act amended and expanded the Reservoir Salvage Act of 1960 and was enacted to complement the Historic Sites Act of 1935 by providing for the preservation of significant scientific, historical, and archaeological data which might be lost or destroyed as the result of the construction of a federally authorized dam or other construction activity. The Archaeological and Historic Preservation Act also allows for any federal agency responsible for a construction project to appropriate a portion of project funds for archaeological survey, recovery, analysis, and publication of results.

Archaeological Resources Protection Act of 1979, as amended (16 U.S.C. 470aa et seq.)

The act establishes permit requirements for removal or excavation of archaeological resources from federal and Indian lands. Provides criminal and civil penalties for the unauthorized excavation, removal, damage, alteration, defacement, or the attempted unauthorized removal, damage, alteration, or defacement of any archaeological resource more than 100 years of age found on federal or Indian lands. Prohibits the sale, purchase, exchange, transportation, receipt, or offering of any archaeological resource obtained from public lands or Indian lands. The act further directs federal land managers to survey land under their control for archaeological resources and create public awareness programs concerning archaeological resources.

Section 470ii (c): States that "each federal land manager shall establish a program to increase public awareness of the significance of the archaeological resources located on public lands and Indian lands and the need to protect such resources." It further directs that an annual report of such progress will be submitted to Congress.

Section 470mm: Directs federal agencies to "develop plans for surveying lands under their control to determine the nature and extent of archaeological resources on those lands; prepare a schedule for surveying lands that are likely to contain the most scientifically valuable archaeological resources; and develop documents for the report of suspected violations of this act and establish when and how those documents are to be completed by officers, employees, and agents of their respective agencies."

Bald and Golden Eagle Protection Act of 1940, as amended

The act prohibits anyone, without a permit issued by the Secretary of the Interior, from "taking" bald and golden eagles, including their parts, nests, or eggs. The act defines "take" as "pursue, shoot, shoot at, poison, wound, kill, capture, trap, collect, molest or disturb." Disturbance includes impacts that result from human-induced alterations in the nesting area even when eagles are not present. Sections 22.26—28 allow take of bald and golden eagles or their nests where it is unavoidable and where it is compatible with the continued preservation of the eagle. Permits for take are issued based on certain criteria such as, but not limited to, certifications, reporting, and monitoring.

Bankhead-Jones Farm Tenant Act of July 22, 1937, as amended

Authorized federal government to purchase invaluable land and rehabilitate to the forest needs. It also helped tenant farms take care of their land.

Clarke-McNary Act of 1924

Allowed for easier purchase of land intended for Forest Service use, and gave a strong action for state offices to open to represent the Forest Service.

Clean Air Act of August 7, 1977, as amended (1977 and 1990) 42 U.S.C. 7401 et seq. (1970)

Enacted to protect and enhance the quality of the Nation's air resources; to initiate and accelerate a national research and development program to achieve the prevention and control of air pollution; to provide technical and financial assistance to state and local governments in connection with the development and execution of their air pollution prevention and control programs; and to encourage and assist the development and operation of regional air pollution prevention and control programs.

Clean Water Act (see Federal Water Pollution Control Act)

Clean Water Restoration Act of 1966

Authorizes the Secretary of Interior to conduct a comprehensive study of the effects of pollution, including sedimentation, sport and commercial fishing, recreation, water supply and power, and other specified uses

Common Varieties of Mineral Materials Act of July 31, 1947

Authorizes the Secretaries of the Interior and Agriculture, under such rules and regulations as they may prescribe, to dispose of common variety mineral materials (including but not limited to sand, stone, gravel, pumice, pumicite, cinders, and clay) and vegetative materials (including but not limited to yucca, manzanita, mesquite, cactus, and timber or other forest products) on public lands of the United States, if the disposal of such materials is not otherwise expressly authorized by law, is not expressly prohibited by laws of the United States, and would not be detrimental to the public interest.

Cooperative Forestry Assistance Act of July 1, 1978

Authorizes the Secretary of Agriculture to assist in the establishment of a coordinated and cooperative federal, state, and local forest stewardship program for the management of non-federal forest lands and forest lands in foreign countries.

Emergency Flood Prevention Act (Agricultural Credit Act) of August 4, 1978

Authorizes the Secretary of Agriculture to undertake emergency measures for runoff retardation and soil erosion prevention, in cooperation with landowners and users, as the Secretary deems necessary to safeguard lives and property from floods, drought, and the products of erosion on any watershed whenever fire, flood, or other natural occurrence is causing or has caused a sudden impairment of that watershed.

Endangered American Wilderness Act of 1978

Congress created the Chama River Canyon Wilderness in February 1978, as part of a larger concern for preservation of wildlife and quality of habitats. The designated 50,000-acre Chama River Canyon Wilderness is located on the Santa Fe and Carson national forests.

Endangered and Threatened Wildlife and Plants; Designation of Critical Habitat for Southwestern Willow Flycatcher; Final Rule

U.S. Fish and Wildlife Service. 2013. Endangered and threatened wildlife and plants; designation of critical habitat for Southwestern Willow Flycatcher; final rule. Federal Register. 78(2): 344–534.

Endangered and Threatened Wildlife and Plants; Final Designation of Critical Habitat for the Mexican Spotted Owl; Final Rule

U.S. Fish and Wildlife Service. 1993b. Endangered and threatened wildlife and plants; final rule to list the Mexican spotted owl as a threatened species. Federal Register. 58(49):14248–14271.

Endangered Species Act of 1973, as amended

Authorizes the determination and listing of species as endangered and threatened; prohibits unauthorized taking, possession, sale, and transport of endangered species; authorizes the assessment of civil and criminal penalties for violating the act or regulations; and, authorizes the payment of rewards to anyone furnishing information leading to arrest and conviction for any violation of the act or any regulation issued thereunder. Section 7 of the act requires federal agencies to use their authorities to carry out programs for the conservation of endangered and threatened species and to

ensure that any action authorized, funded, or carried out by them is not likely to jeopardize the continued existence of listed species or adversely modify their critical habitat.

Section 4 of the act directs the development and implementation of recovery plans for threatened and endangered species and the designation of critical habitat. Several species listed under the act are found on the Lincoln National Forest, some with recovery plans and some with designated critical habitat. Those with a recovery plan and/or a critical habitat designation are listed below.

Energy Independence and Security Act of December 19, 2007

Reinforces the energy reduction goals for federal agencies put forth in Executive Order 13423, as well as introduces more aggressive requirements. The three key provisions enacted are the Corporate Average Fuel Economy Standards, the Renewable Fuel Standard, and the appliance and lighting efficiency standards.

Energy Policy Act of 2005

Requires the Secretary of Agriculture to ensure timely action on oil and gas permits, improve collection and retrieval of oil and gas information, and improve inspection and enforcement of permit terms (Section 362).

Energy Security Act of June 30, 1980

Authorizes the Secretary of Agriculture to make available timber resources of the National Forest System, in accordance with appropriate timber appraisal and sale procedures, for use by biomass energy projects.

Environmental Quality Act (1970)

This act sets forth a national policy for the environment which provides for the enhancement of environmental quality. Congress recognizes there has been changes to the environment and sets out to improve quality and quantity of healthy environments across the U.S.

Federal Advisory Committee Act of October 6, 1972

Sets standards and uniform procedures to govern the establishment, operation, administration, and duration of advisory committees.

Federal Cave Resources Protection Act of November 18, 1988

Established requirements for the management and protection of caves and their resources on federal lands, including allowing land managing agencies to withhold the location of caves from the public, and requiring permits for any removal or collecting activities in caves on federal lands.

Federal Insecticide, Rodenticide, and Fungicide Act of October 21, 1972

Requires the administrator of the Environmental Protection Agency to prescribe standards for the certification of individuals authorized to use or supervise the use of any pesticide that is classified for restricted use; regulates the sale of restricted use pesticides; and provides penalties for the unauthorized use or sale of restricted use pesticides.

Federal Land Policy and Management Act of October 21, 1976

Requires that public lands be managed in a manner that will protect the quality of scientific, scenic, historical, ecological, environmental, air and atmospheric, water resource, and archaeological values; that, where appropriate, will preserve and protect certain public lands in their natural condition; that will provide food and habitat for fish and wildlife and domestic animals; and that will provide for

outdoor recreation and human occupancy and use. Also states that the United States shall receive fair market value of the use of the public lands and their resources unless otherwise provided for by law.

Federal Noxious Weed Act, 1974, as amended

Authorizes the Secretary of Agriculture to designate plants as noxious weeds by regulation; to prohibit the movement of all such weeds in interstate or foreign commerce except under permit; to inspect, seize and destroy products, and to quarantine areas, if necessary to prevent the spread of such weeds; and to cooperate with other federal, state and local agencies, farmers associations, and private individuals in measures to control, eradicate, prevent, or retard the spread of such weeds.

Federal Power Act of June 10, 1920

Created federal regulations concerning hydroelectric projects and the Federal Energy Regulatory Committee (FERC) was deemed as the licensing authority of future plants.

Federal-State Cooperation for Soil Conservation Act of December 22, 1944

Authorized the adoption of eleven watershed improvement programs in various states for the improvement of water runoff, water flow retardation, and soil erosion prevention.

Federal Water Pollution Control Act and Amendments of 1972 (Clean Water Act) Public Law 92-500, as amended in 1977 (Public Law 95-217) and 1987 (Public Law 100-4)

Enacted to restore and maintain the chemical, physical, and ecological integrity of the Nation's waters. Provides for measures to prevent, reduce, and eliminate water pollution; recognizes, preserves, and protects the responsibilities and rights of States to prevent, reduce, and eliminate pollution, and to plan the development and use (including restoration, preservation, and enhancement) of land and water resources; and provides for federal support and aid of research relating to the prevention, reduction, and elimination of pollution, and federal technical services and financial aid to state and interstate agencies and municipalities for the prevention, reduction, and elimination of pollution.

Established goals for the elimination of water pollution; required all municipal and industrial wastewater to be treated before being discharged into waterways; increased federal assistance for municipal treatment plant construction; strengthened and streamlined enforcement policies; and expanded the federal role while retaining the responsibility of states for day-to-day implementation of the law. In New Mexico, the designated agency for enforcement of the Clean Water Act is the New Mexico Environmental Department. Relevant sections of the Clean Water Act:

Clean Water Act Sections 208 and 319: recognizes the need for control strategies for non-point source pollution.

Clean Water Act Section 303(d): requires waterbodies with water quality determined to be either impaired (not fully meeting water quality standards for designated uses) or threatened (likely to violate standards in the near future) to be compiled by New Mexico Environment Department in a separate list, which must be submitted to Environmental Protection Agency every 2 years. These waters are targeted and scheduled for development of water quality improvement strategies on a priority basis.

Clean Water Act Section 305(b): requires that states assess the condition of their waters and produce a biennial report summarizing the findings.

Federal Water Project Recreation Act of July 9, 1965

Requires that recreation and fish and wildlife enhancement opportunities be considered in the planning and development of federal water development.

Final Recovery Plan Southwestern Willow Flycatcher

U.S. Fish and Wildlife Service, Southwestern Willow Flycatcher Recovery Team Technical Subgroup. 2002. Final Recovery Plan Southwestern Willow Flycatcher (*Empidonax traillii extimus*). Albuquerque, New Mexico 87103

Fish and Wildlife Conservation Act of September 15, 1960

Requires the Secretaries of the Interior and Agriculture, in cooperation with state agencies, to plan, develop, maintain, and coordinate programs for the conservation and rehabilitation of wildlife, fish, and game on public lands under their jurisdiction.

Fish and Wildlife Coordination Act of March 10, 1934

Authorizes the Secretaries of Agriculture and Commerce to provide assistance to and cooperate with other federal and state agencies to protect, rear, stock, and increase the supply of game and fur-bearing animals, as well as to study the effects of domestic sewage, trade wastes, and other polluting substances on wildlife. The Act also authorizes the preparation of plans to protect wildlife resources, the completion of wildlife surveys on public lands, and the acceptance by federal agencies of funds or lands for related purposes provided that land donations receive the consent of the state in which they are located.

Food, Conservation and Energy Act of 2008 (2008 Farm Bill) Public Law 110-246 Title VIII – Forestry, Subtitle A, B, and C

Subtitle A: Amendment to the Cooperative Forestry Assistance Act of 1978. Establishes national priorities for private forest conservation, a community forest and open space conservation program, and a Secretary level forest resources coordinating committee.

Subtitle B: Cultural and Heritage Cooperation Authority. Authorizes the Secretary of Agriculture to provide forest products to Indian tribes for traditional and cultural purposes; to protect the confidentiality of certain information, including information that is culturally sensitive to Indian tribes; to utilize National Forest System land for the reburial of human remains and cultural items, including human remains and cultural items repatriated under the Native American

Graves Protection and Repatriation Act; prevent the unauthorized disclosure of information regarding human remains or cultural items reburied on National Forest System land; to ensure access to National Forest System land, to the maximum extent practicable, by Indians and Indian tribes for traditional and cultural purposes; to increase the availability of Forest Service programs and resources to Indian tribes in support of the policy of the United States to promote tribal sovereignty and self-determination; and to strengthen support for the policy of the United States of protecting and preserving the traditional, cultural, and ceremonial rites and practices of Indian tribes, in accordance with the American Indian Religious Freedom Act (42 U.S.C. 1996).

Subtitle C: Amendments to Other Forestry Related Laws. Amends the Lacey Act to include the illegal taking of plants, establishes an Emergency Forest Restoration Program, and renews authority and funding for the Healthy Forest Reserve Program.

Forest Highways Act of August 27, 1958

Requires that funds available for forest development roads and trails be used by the Secretary of Agriculture to pay for the costs of construction and maintenance thereof, including roads and trails on experimental and other areas under Forest Service administration, or for adjacent vehicular parking areas and sanitary, water, and fire control facilities. Authorizes the Secretary of Agriculture to enter into contracts with a state or civil subdivision thereof, and issue such regulations, as he deems desirable. See also Highways (23 U.S.C. Chapter 205 Forest development roads and trails).

Forest and Rangeland Renewable Resources Planning Act of August 17, 1974 as amended by National Forest Management Act of 1976 (16 U.S.C. 1600-1614, 472a)

Directs the Secretary of Agriculture to prepare a renewable resource assessment every 10 years; to transmit a recommended renewable resources program to the President every 5 years; to develop, maintain, and, as appropriate, revise land and resource management plans for units of the National Forest System; and to ensure that the development and administration of the resources of the National Forest System are in full accord with the concepts of multiple use and sustained yield.

Freedom of Information Act of November 21, 1974

Governs which government records are released to the public either automatically or upon request.

Healthy Forests Restoration Act of 2003 (H.R. 1904)

Purposes are to reduce wildfire risk to communities and municipal water supplies through collaborative hazardous fuels reduction projects; to assess and reduce the risk of uncharacteristic fire or insect or disease infestation; to enhance efforts to protect watersheds and address threats to forest and rangeland health (including wildfire) across the landscape; to protect, restore, and enhance forest ecosystem components such as biological diversity, threatened/endangered species habitats, and enhanced productivity.

Granger-Thye Act of 1950

Authorizes range improvements from appropriated funds and allows the Forest Service to authorize grazing advisory boards and to issue grazing permits for periods not exceeding ten years.

Highway Safety Act of 1966 (S. 3052)

The Department of Transportation was introduced for each regulatory state, which implemented driver education, license regulations, vehicle registration, and roadway and highway maintenance.

Historic Sites Act of 1935 (16 U.S.C. 461)

Establishes a policy to preserve for public use historic sites, buildings, and objects of national significance for the benefit of the people. Authorizes the National Park Service’s National Historic Landmarks Program.

Intergovernmental Cooperation Act of October 16, 1968 (31 U.S.C. 6505)

The act permits federal agencies to provide specialized or technical services to state and local units of government.

Joint Surveys of Watershed Areas Act of September 5, 1962

Authorizes the Army and the Secretary of Agriculture to jointly investigate watershed areas for flood prevention, conservation, development and utilization.

Knutson-Vandenberg Act of June 9, 1930

Allowed the forest to hold timer companies accountable for the reforestation of heavily timber used forested areas.

Land Acquisition Act of March 3, 1925

Authorizes the Secretary of Agriculture to purchase land for national forest headquarters, ranger stations, dwellings, or other sites required for the effective performance of the authorized activities of the Forest Service.

Land and Water Conservation Fund Act of September 3, 1964

Authorizes the appropriation of funds for federal assistance to states in planning, acquisition, and development of needed land and water areas and facilities and for the federal acquisition and development of certain lands and other areas for the purposes of preserving, developing, and assuring accessibility to outdoor recreation resources.

Mexican Spotted Owl Recovery Plan

U.S. Fish and Wildlife Service, Mexican Spotted Owl Recovery Team. 2012. Mexican Spotted Owl Recovery Plan, First Revision (*Strix occidentalis lucida*). Albuquerque, NM: U.S. Fish and Wildlife Service, Southwest Region.

Migratory Bird Treaty Act of 1918

Makes it unlawful to “take” migratory birds, their eggs, feathers, or nests. A migratory bird is any species or family of birds that live, reproduce, or migrate within or across international borders at some point during their annual life cycle. Presidential executive order number 13186 additionally directs federal agencies to integrate bird conservation into agency activities and to design migratory bird habitat and conservation principles and practices into agency environmental planning.

Mineral Leasing Act of February 25, 1920

Provides that the deposits of certain minerals on land owned by the United States shall be subject to lease to citizens of the United States, provided royalties on such deposits are paid to the United States.

Mining Claims Rights Restoration Act of August 11, 1955

States that all public lands belonging to the United States which have been withdrawn or reserved for power development or power sites shall be open to entry for location and patent of mining claims and mineral development, subject to certain conditions.

Mining and Minerals Policy Act of December 31, 1970

States that it is the policy of the federal government to foster and encourage the development of economically sound and stable domestic mining, minerals, metal, and mineral reclamation industries; the orderly and economic development of domestic mineral resources, reserves, and reclamation of metals and minerals to help assure satisfaction of industrial, security, and environmental needs; mining, mineral, and metallurgical research to promote the wise and efficient use of our natural and reclaimable mineral resources; and the study and development of methods for the disposal, control, and reclamation of mineral waste products and the reclamation of mined land.

Multiple-Use Sustained-Yield Act of June 12, 1960 (16 U.S.C. 528-531)
States that it is the policy of Congress that the national forests are established and shall be administered for outdoor recreation, range, timber, watershed, and wildlife and fish purposes, and authorizes and directs the Secretary of Agriculture to develop and administer the renewable surface resources of the national forests for the multiple use and sustained yield of products and Services.

National Environmental Policy Act of January 1, 1970
Directs all federal agencies to consider and report the potential environmental impacts of proposed federal actions and established the Council on Environmental Quality.

National 1990 Farm Bill Act (Title XII – Forest Stewardship Act) of November 28, 1990
Directs the Secretary of Agriculture to establish a competitive forestry, natural resources, and environmental grants program, and provides for other research programs.

National Forest Management Act of October 22, 1976
The National Forest Management Act reorganized, expanded, and otherwise amended the Forest and Rangeland Renewable Resources Planning Act of 1974, which called for the management of renewable resources on National Forest System lands. The National Forest

Management Act requires the Secretary of Agriculture, public agencies, or a combination of these methods. The act also authorizes the secretary to grant rights-of-way and easements over National Forest System lands.

National Forest Roads and Trails Act of October 13, 1964
Authorizes the Secretary of Agriculture to provide for the acquisition, construction, and maintenance of forest development roads within and near the national forests through the use of appropriated funds, deposits from timber sale purchasers, cooperative financing with other public agencies, or a combination of these methods. The act also authorizes the secretary to grant rights-of-way and easements over National Forest System lands.

National Historic Preservation Act of 1966 as amended (16 U.S.C. 470)
Sets forth the federal government's policy to preserve and protect historical and cultural resources. This act states that the historical and cultural foundations of the Nation should be preserved as a living part of the Nation's community life and development in order to give a sense of orientation to the American people. Directs all federal agencies to take into account the effects of their undertakings (actions, financial support, and authorizations) on properties listed in or eligible for listing in the National Register of Historic Places. Establishes inventory, nomination, protection, and preservation responsibilities for federally owned historic properties. As amended 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. Establishes criteria for designating tribal historic preservation officers to assume the functions of a state historic preservation officer on tribal lands.

Section 101(a) (8): Gives the Secretary of the Interior the responsibility and authority to assess "significant threats" to properties included in, or eligible for inclusion in, the National Register of Historic Places in order to determine the kinds of properties that may be threatened; ascertain the causes of the threats; and develop and submit to the President and Congress recommendations for appropriate action.

Section 106: Requires each agency to take into account the effects of its actions on historic properties prior to approving expenditure of federal funds on an undertaking or prior to issuing any license. Furthermore, an agency must afford the State Historic Preservation Office, the Tribal Historic Preservation Office, and the Advisory Council on Historic Preservation (an independent federal agency created by the National Historic Preservation Act) an opportunity to comment on any of the agency's undertakings that could affect historic properties.

Section 110 (a)(2)(A): Directs federal agencies to establish "a preservation program for the identification, evaluation, and nomination to the National Register of Historic Places, and protection of historic properties" to "ensure that such properties under the jurisdiction or control of the agency are identified, evaluated, and nominated to the National Register." This would require development of a schedule for the identification, evaluation, and nomination of unrecorded sites.

National Trails System Act of October 2, 1968 (16 U.S.C.1241-1251)

Created a series of national trails "to promote the preservation of, public access to, travel within, and enjoyment and appreciation of the open-air, outdoor areas and historic resources of the Nation." The Act and its subsequent amendments authorized a national system of trails and defined four categories of national trails. National scenic trails provide outdoor recreation and the conservation and enjoyment of significant scenic, historic, natural, or cultural qualities; national historic trails follow travel routes of national historic significance; national recreation trails are in, or reasonably accessible to, urban areas on federal, state, or private lands; and connecting or side trails provide access to or among the other classes of trails.

Native American Graves Protection and Repatriation Act of 1990 (25 U.S.C. 3001)

Provides a process for federal agencies to return Native American human remains, funerary objects, and sacred objects to the ancestors and appropriate Native American tribe. Includes provisions for the 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 to identify holdings of such remains and objects and to work with appropriate Native American groups toward their repatriation.

New Mexico Wilderness Act of 1980 (16 U.S.C. 1132 et seq.)

Authorized the designation of a few wilderness areas in New Mexico following the Wilderness Act of 1964. Additional land was also added to existing wilderness areas.

North American Wetlands Conservation Act of December 13, 1989

Authorizes a wetlands habitat program that provides grants to protect and manage habitats for migratory birds and other wetland wildlife in the United States, Mexico, and Canada.

Oil and Gas Leasing Reform Act of 1987

Amended the Mineral Lands Leasing Act of 1920 regarding competitive leasing of oil and gas for onshore federal lands. Sets forth guidelines for the promulgation of regulations regarding lease sales, and prohibits the issuance of oil or gas leases upon certain lands allocated or designated as wilderness areas.

Organic Administration Act of June 4, 1897

Authorizes the President to modify or revoke any instrument creating a national forest; states that no national forest may be established except to improve and protect the forest within its boundaries, for

the purpose of securing favorable conditions of water flows, and to furnish a continuous supply of timber for the use and necessities of citizens of the United States. Authorizes the Secretary of Agriculture to promulgate rules and regulations to regulate the use and occupancy of the national forests.

Pipelines Act of February 25, 1920

Authorizes the Secretary of the Interior or appropriate agency head to grant rights-of-way through any federal lands for pipeline purposes for the transportation of oil, natural gas, synthetic liquid or gaseous fuels, or any refined product produced therefrom to any applicant possessing the qualifications provided in the act.

Public Buildings Cooperative Use Act of 1976

Authorizes the federal government to acquire and utilize space in suitable buildings of historic, architectural, or cultural significance, unless use of such space would not prove feasible and prudent compared with available alternatives; to encourage the location of commercial, cultural, educational, and recreational facilities and activities within public buildings; to provide and maintain space, facilities, and activities, to the extent practicable, which encourages public access to and stimulates public pedestrian traffic around, into, and through public buildings, permitting cooperative improvements to and uses of the area between the building and the street, so that such activities complement and supplement commercial, cultural, educational, and recreational resources in the neighborhood of public buildings; and to encourage the public use of public buildings for cultural, educational, and recreational activities.

Public Rangelands Improvement Act of October 25, 1978

Establishes and reaffirms the national policy and commitment to inventory and identify current public rangeland conditions and trends; manage, maintain and improve the condition of public rangelands so that they become as productive as feasible for all rangeland values in accordance with management objectives and the land use planning process; charge a fee for public grazing use which is equitable; continue the policy of protecting wild free roaming horses and burros from capture, branding, harassment, or death, while at the same time facilitating the removal and disposal of excess wild free roaming horses and burros which pose a threat to themselves, their habitat, and to other rangeland values.

Rehabilitation Act of 1973, as amended

States that it is national policy that the federal government plays a leadership role in promoting the employment of individuals with disabilities, and in assisting states and providers of services in fulfilling the aspirations of such individuals with disabilities for meaningful and gainful employment and independent living.

Religious Freedom Restoration Act (42 U.S.C. 2000bb)

Government shall not substantially burden a person’s exercise of religion even if the burden results from a rule of general applicability, except when the government demonstrates that application of the burden to the person is in furtherance of a compelling governmental interest; and is the least restrictive means of furthering that compelling governmental interest.

Rescission Act of 1995

Directs the Forest Service to establish and adhere to a schedule for analysis and decisions on all grazing allotments where National Environmental Policy Act (NEPA) compliance is required.

Notwithstanding any other law, term grazing permits that expire or are waived before the NEPA analysis and decision pursuant to the schedule developed by individual Forest Service units, shall be issued on the same terms and conditions and for the full term of the expired or waived permit. Upon completion of the scheduled NEPA analysis and decision for the allotment, the terms and conditions of existing grazing permits may be modified, if necessary, to conform to such NEPA analysis and subsequent decision.

Safe Drinking Water Amendments of November 18, 1977

Authorizes appropriations for research conducted by the Environmental Protection Agency relating to safe drinking water; federal grants to states for public water system supervision programs and underground water resource protection programs; and grants to assist special studies relating to the provision of a safe supply of drinking water.

Secure Rural Schools and Community Self-Determination Act of 2000

Through this law the Forest Service gives rural communities the means to build and improve schools, and provide road maintenance, emergency services, and conservation programs for their citizens. Thus, communities are no longer dependent on federal timber sales from national forests to improve local schools and roads.

Sikes Act of October 18, 1974, as amended

Authorizes the Secretary of the Interior and the Secretary of the Agriculture, in cooperation with the State agencies, to develop, maintain, and coordinate programs on public lands under their jurisdiction for the conservation and rehabilitation of wildlife, fish, and game. Provides that no individual will be permitted to hunt, trap, or fish on any public land within the State which is subject to a conservation and rehabilitation program under this section unless he/she has a valid public land management stamp. Makes provisions for the issuance and sale of such stamps.

Small Tracts Act of January 22, 1983

Authorizes the Secretary of Agriculture to sell, exchange, or interchange by quitclaim deed all right, title and interest, including the mineral estate, of the United States in and to certain lands within the national forest when he/she determines it to be in the public interest.

Soil and Water Resources Conservation Act of November 18, 1977

Provides for a continuing appraisal of the United States' soil, water and related resources, including fish and wildlife habitats, and a soil and water conservation program to assist landowners and land users in furthering soil and water conservation.

Surface Mining Control and Reclamation Act of August 3, 1977

Authorizes the Secretary of Agriculture to enter into agreements with landowners, providing for land stabilization, erosion, and sediment control, and reclamation through conservation treatment, including measures for the conservation and development of soil, water, woodland, wildlife, and recreation resources, and agricultural productivity of such lands.

Timber Exportation Act of April 12, 1926

Authorizes the exportation of lawfully cut timber from the state or territory where grown if the supply of timber for local use will not be endangered, and authorizes the Secretary to issue rules and regulations to carry out the provisions of the act.

Transfer Act of February 1, 1905

Transferred the management and control of the Forest Reserves from the General Land Office in the Department of the Interior to the Bureau of Forestry in the Department of Agriculture.

Tribal Forest Protection Act of 2004 (Public Law 108-278)

Authorizes the Secretary of Agriculture and the Secretary of the Interior to enter into an agreement or contract with Indian tribes meeting certain criteria to carry out projects to protect Indian forest land.

U.S. Mining Laws Act (Public Domain Lands) of May 10, 1872

Provides that all valuable mineral deposits in lands belonging to the United States, both surveyed and unsurveyed, are free and open to exploration and purchase, and the lands in which they are found to occupation and purchase by citizens of the United States and those who have declared their intention to become such, under regulations prescribed by law, and according to the local customs or rules of miners, so far as the same are applicable and not inconsistent with the laws of the United States. There are a number of acts which modify the mining laws as applied to local areas by prohibiting entry altogether or by limiting or restricting the use which may be made of the surface and the right, title, or interest which may pass through patent.

Water Quality Improvement Act of April 3, 1965

Authorizes greater water quality standards to be implemented and regulations that reduce water pollutants.

Water Resources Planning Act of July 22, 1965

Encourages the conservation, development, and utilization of water and related land resources of the United States on a comprehensive and coordinated basis by the federal government, states, localities, and private enterprises.

Watershed Protection and Flood Prevention Act of August 4, 1954

Establishes policy that the federal government should cooperate with states and their political subdivisions, soil or water conservation districts, flood prevention or control districts, and other local public agencies for the purposes of preventing erosion, floodwater, and sediment damages in the watersheds of the rivers and streams of the United States; furthering the conservation, development, utilization, and disposal of water, and the conservation and utilization of land; and thereby preserving, protecting, and improving the Nation's land and water resources and the quality of the environment.

Weeks Law of 1911, as amended (at 16 U.S.C. 515, 552)

Authorizes the Secretary of Agriculture to enter into agreements with States for the purpose of conserving forests and water supply, and, to acquire forested, cutover, or denuded lands within the watersheds of navigable streams to protect the flow of these streams or for the production of timber, with the consent of the State in which the land lies.

Wild Free-Roaming Horses and Burros Act of December 15, 1971, as amended

Protects wild free roaming horses and burros from capture, branding, harassment, or death; and states they are to be considered in the area where presently found an integral part of the natural system of the public lands.

Wild and Scenic Rivers Act of October 2, 1968

Instituted a National Wild and Scenic Rivers System by designating the initial components of that system, and by prescribing the methods by which and standards according to which additional components may be added to the system from time to time.

Wilderness Act of September 3, 1964

Established a National Wilderness Preservation System to be composed of federally owned areas designated by Congress as "wilderness areas" and administered for the use and enjoyment of the American people in such manner as will leave them unimpaired for future use and enjoyment as wilderness. Provides for the protection of these areas, the preservation of their wilderness character, and for the gathering and dissemination of information regarding their use and enjoyment as wilderness. States that no federal lands shall be designated as "wilderness areas" except as provided for in the act or by a subsequent act.

Lincoln National Forest wilderness areas are designated under the following authorities:

- The United States Congress designated the White Mountain Wilderness in 1964 (The Wilderness Act – Public law 88-577). The Wilderness Act of 1964 (Public law 88-577).
- The United States Congress designated the Capitan Mountains Wilderness in 1980 and it now has a total of 35,091 acres. New Mexico Wilderness Act – Public law 96-550

Youth Conservation Corps Act of August 13, 1970

Establishes a Youth Conservation Corps whom the Secretaries of the Interior or Agriculture may employ without regard to the civil service or classification laws, rules, or regulations for the purpose of developing, preserving, or maintaining the lands and waters of the United States.

Executive Orders

Below is a partial listing of relevant executive orders. Executive orders are official mandates presented by the President and go through judicial review. An executive order may be used to reassign functions among executive branch agencies. It may adopt guidelines, rules of conduct, or rules of procedure for government employees or units of government.

Executive Order 11514 issued March 5, 1970, as amended by Executive Order 11991 issued May 24, 1977. Protection and enhancement of environmental quality (35 FR 4247, March 7, 1970)

This order states that the federal government shall provide leadership in protecting and enhancing the quality of the Nation's environment to sustain and enrich human life. This order provides for monitoring, evaluation, and control on a continuing basis of the activities of each federal agency so as to protect and enhance the quality of the environment.

Executive Order 11593 Protection and Enhancement of the Cultural Environment, 1973

Mandates that the federal government shall provide leadership in preserving, restoring, and maintaining the historic and cultural environment of the Nation, and that federal agencies shall administer the cultural properties under their control in a spirit of stewardship and trusteeship for future generations; initiate measures necessary to direct their policies, plans, and programs in such a way that federally-owned sites, structures, and objects of historical, architectural, or archaeological significance are preserved, restored, and maintained for the inspiration and benefit of the people; and, in consultation with the Advisory Council on Historic Preservation, institute procedures to assure that

federal plans and programs contribute to the preservation and enhancement of non-federally owned sites, structures, and objects of historical, architectural, or archaeological significance.

Executive Order 11644 issued February 8, 1972. Use of off-road vehicles on the public lands. (37 FR 2877, February 9, 1972). Amended by Executive Order 11989 issued May 24, 1977 and Executive Order 12608 issued September 9, 1987

This order requires federal agencies to develop and implement procedures that will ensure that the use of off-road vehicles on public lands will be controlled and directed so as to protect the resources of those lands, to promote the safety of all users of those lands, and to minimize conflicts among the various uses of those lands.

Executive Order 11988 (Floodplain Management (42 CFR 26951, May 25, 1977)

The purpose of this Order is "…to avoid to the extent possible the long and short-term impacts associated with the occupancy and modification of floodplains and to avoid direct and indirect support of floodplain development wherever there is a practicable alternative." Section 1 states: "Each agency shall provide leadership and shall take action to reduce the risk of flood loss, to minimize the impact of floods on human safety, health and welfare, and to restore and preserve the natural and beneficial values served by floodplains in carrying out its responsibilities for (1) acquiring, managing, and disposing of federal lands, and facilities; (2) Providing federally undertaken, financed, or assisted construction and improvements; and (3) Conducting federal activities and programs affecting land use, including but not limited to water and related land resources planning, regulating, and licensing activities."

Executive Order 11990 Protection of Wetlands, 1977

Requires each federal agency to provide leadership and to take action to minimize the destruction, loss or degradation of wetlands, and to preserve and enhance the natural and beneficial values of wetlands in carrying out the agency's responsibilities for acquiring, managing, and disposing of federal lands and facilities; providing federally undertaken, financed, or assisted construction and improvements; and conducting federal activities and programs affecting land use, including but not limited to water and related land resources planning, regulating, and licensing activities.

Executive Order 12862 Setting Customer Service Standards, 1993

Requires all executive departments and agencies that provide significant services directly to the public to provide those services in a manner that seeks to meet the customer service standard established in the order, and requires agencies to identify customers, survey customers and front-line employees to determine the kind and quality of services needed and barriers to those services, benchmark customer service performance against the best in the business, make information, services, and complaint systems easily accessible, and provide a means to address customer complaints.

Executive Order 12898 Federal Actions to Address Environmental Justice in Minority and Low-Income Populations

Addresses environmental justice in minority and low-income populations and is designed to focus federal attention on the environmental and human health conditions in minority communities and low-income communities with the goal of achieving environmental justice. The order is also intended to promote nondiscrimination in federal programs substantially affecting human health and the environment, and to provide minority communities and low-income communities' access to public

information on, and an opportunity for public participation in, matters relating to human health or the environment.

Executive Order 13007 Indian Sacred Sites, 1996

Requires each executive branch agency with statutory or administrative responsibility for the management of federal lands, to the extent practicable, permitted by law, and not clearly inconsistent with essential agency functions, to accommodate access to and ceremonial use of Indian sacred sites by Indian religious practitioners and to avoid adversely affecting the physical integrity of such sacred sites. Where appropriate, agencies shall maintain the confidentiality of sacred sites.

Executive Order 13112 Invasive Species, 1999

Ensures that federal programs and activities to control and prevent invasive species are coordinated, effective, and efficient. It defines invasive species as "…an alien (or nonnative) whose introduction does or is likely to cause economic or environmental harm or harm to human health."

Executive Order 13175 Consultation and Coordination with Indian Tribal Governments

Promotes regular and meaningful consultation and collaboration with tribal officials in the development of federal policies that have tribal implications, strengthens the United States government-to-government relationships with Indian tribes, and reduces the imposition of unfunded mandates upon Indian tribes.

Executive Order 13186 Responsibility of Federal Agencies to Protect Migratory Birds

Directs federal agencies, as practicable, to support the conservation of migratory birds, restore and enhance the habitat of migratory birds, prevent or abate pollution or detrimental alteration of the environment for the benefit of migratory birds, ensure agency plans and actions promote programs and recommendations of comprehensive migratory bird planning efforts such as Partners-in-Flight, ensure that environmental analyses of federal actions required by NEPA evaluate effects on migratory birds, and promote research, education, and training related to conservation of migratory birds.

Executive Order 13195 Trails for America in the 21st Century

"Federal agencies will… protect, connect, promote, and assist trails of all types… This will be accomplished by… protecting the trail corridors associated with National Scenic Trails… to the degree necessary to ensure that the values for which [the] trail was established remain intact."

Executive Order 13287 Preserve America, 2003

Advances the protection, enhancement, and contemporary use of the historic properties owned by the federal government, and promotes intergovernmental cooperation and partnerships for the preservation and use of historic properties. Directs federal agencies to increase their knowledge of historic resources in their care and to enhance the management of these assets.

Encourages agencies to seek partnerships with state, tribal, and local governments and the private sector to make more efficient and informed use of their resources for economic development and other recognized public benefits. Better combines historic preservation and nature tourism by directing agencies to assist in the development of local and regional nature tourism programs using the historic resources that are a significant feature of many state and local economies.

Executive Order 13352 Facilitation of Cooperative Conservation, 2004

Ensures that the Departments of the Interior, Agriculture, Commerce, and Defense and the Environmental Protection Agency implement laws relating to the environment and natural resources

in a manner that promotes cooperative conservation, with an emphasis on appropriate inclusion of local participation in federal decisionmaking, in accordance with their respective agency missions, policies, and regulations.

Executive Order 13423 Strengthening Federal Environmental, Energy, and Transportation Management

Directs federal agencies to conduct their environmental, transportation, and energy-related activities in support of their respective missions in an environmentally, economically and fiscally sound, integrated, continuously improving, efficient, and sustainable manner.

Executive Order 13433 Facilitation of Hunting Heritage and Wildlife Conservation, 2007

Directs federal agencies with programs and activities that have a measurable effect on public management, outdoor recreation, and wildlife management, to facilitate the expansion and enhancement of hunting opportunities and the management of game species and their habitat.

Executive Order 13514 Federal Leadership in Environmental, Energy, and Economic Performance

Expands on the energy reduction and environmental performance requirements for federal agencies identified in Executive Order 13423. The goal is to establish an integrated strategy towards sustainability in the federal government and to make reduction of greenhouse gas emissions a priority for federal agencies. Lays out numerical targets for agencies, sets non-numerical targets that agencies must reach, and calls for specific management strategies to improve sustainability.

Executive Order 13604 Improving Performance of Federal Permitting and Review of Infrastructure Projects

An initiative to modernize decisionmaking processes throughout the federal government through improved efficiency and transparency. On May 17, 2013, in following up on the Executive Order, President Obama issued a Presidential Memorandum—"Modernizing Federal Infrastructure Review and Permitting Regulations, Policies, and Procedures" (The White House 2013). the memorandum highlighted the need for improved mitigation policies that provide project developers with greater predictability, facilitate landscape-scale mitigation and interagency mitigation plans (where appropriate), and enhance accountability, transparency, and effectiveness. The administration has charged the Forest Service with participating in this modernization effort.

Forest Service Directives

The following is a partial listing of Forest Service policies relevant to the land management plan; a complete listing can be found in the Forest Service Manual and the Forest Service Handbook. Together, the Forest Service Manual and Forest Service Handbook are known as the Forest Service Directives System.

The Forest Service Manual contains legal authorities, goals, objectives, policies, responsibilities, instructions, and guidance needed on a continuing basis by Forest Service line officers and primary staff to plan and execute assigned programs and activities. The Forest Service Handbook contains directives that provide instructions and guidance on how to proceed with a specialized phase of a program or activity. Handbook directives are based in part on the manual, or they incorporate external directives. The Forest Service Manual (FSM) and applicable Forest Service Handbook (FSH) directives provide guidance only and do not provide required direction.

FSM 1000 Organization and Management

FSM 1010 Laws, Regulations, and Orders

FSM 1020 Forest Service Mission

FSM 1400 Controls

FSM 1410 Management Reviews

FSM 1500 External Relations

FSM 1560 State, Tribal, County, and Local Agencies, Public and Private Organizations

FSM 1563 American Indian and Alaskan Native Relations

FSM 1600 Information Resources

FSM 1900 Planning

FSH 1909.12

Chapter 10 – Assessments

Chapter 20 – Land Management Plan

Chapter 30 – Monitoring

Chapter 40 – Public Participation

Chapter 50 – Objection Process

Chapter 60 – Forest Vegetation Resource Management

Chapter 70 – Wilderness Recommendation

Chapter 80 – Wild and Scenic River Evaluation

FSM 1900 – Zero Code

FSM 1910 – National Resource Planning

FSM 1920 – Land and Resource Management Planning

FSM 1930 – Program Development and Budgeting

FSM 1950 – Environmental Policy and Procedures

FSM 1960 – Policy Analysis

FSM 1970 – Economic and Social Analysis

FSM 1990 – Special Plans and Studies

FSM 2000 National Forest Resource Management

FSM 2020 Ecological Restoration and Resilience

FSM 2030 Large Scale Event Recovery

FSM 2060 Ecosystem Classification, Interpretation, and Application

FSM 2070 Biological Diversity

FSM 2070.3 Vegetation Ecology (use of native plants in revegetation, rehabilitation, and restoration)

FSM 2080 Noxious Weed Management, Southwestern Region supplement (weed free policy)

FSH 2090.11 Ecological Classification and Inventory Handbook

FSM 2200 Range Management

Chapter 2090

FSM 2260 Wild Free-Roaming Horses and Burros

FSM 2300 Recreation, Wilderness, and Related Resource Management

FSH 2309.18 Trails Management Handbook

FSH 2309.24 Cultural Resources Handbook, Southwestern Region Supplement

Chapter 10 – Survey Standards

Chapter 40 – Damage Assessment

FSM 2320 Wilderness Management

FSM 2323.22-Exhibit 01, Congressional Grazing Guidelines

FSM 2330 Publicly Managed Recreation Opportunities

FSM 2332.11 Hazard Trees

FSM 2350 Trail, River, and Similar Recreation Opportunities

FSM 2353.4 Administration of National Scenic and National Historic Trails

FSM 2360 Heritage Program Management

FSM 2360 Special Interest Areas, Southwestern Region Supplement 2300-99-3

FSM 2380 Landscape Management

FSM 2300-99-3 Southwest Region Supplement

FSM 2400 Timber Management, Southwestern Region

FSM 2430 Commercial Timber Sales, Southwestern Region, Small Sales and Commercial/Personal Use Permits of Timber, Fuelwood, and other forest products

FSM 2470 Silvicultural Practices

FSM 2500 Watershed and Air Management

FSH 2509.13 – Burned-Area Emergency Rehabilitation Handbook

FSH 2509.16 Water Resource Inventory Handbook

FSH 2509.21 National Forest System Water Rights Handbook

FSH 2509.22 Soil and Water Conservation Handbook

FSH 2509.23 Riparian Area Handbook

FSH 2509.24 National Forest System Watershed Codes Handbook

FSH 2509.25 Watershed Conservation Practices Handbook

FSM 2510 Watershed Planning

FSM 2520 Watershed Protection and Management

FSM 2526 Riparian Area Management

FSM 2527 Floodplain Management and Wetland Protection

FSM 2530 Water Resource Management

FSM 2532 Water Quality Management

FSM 2540 Water Uses and Development, Southwestern Region supplement

FSH 2509.25 Watershed Conservation Practices Handbook

FSM 2560 Groundwater Resource Management

FSM 2580 – Air Resource Management

FSM 2600 Wildlife, Fish, and Sensitive Plant Habitat Management

FSM 2610 Cooperative Relations

FSM 2630 Management of Wildlife and Fish Habitat

FSM 2670 Threatened, Endangered and Sensitive Plants and Animals

FSM 2700 Special Uses Management

FSM 2726 Energy Generation and Transmission

FSM 2728 Communications

FSH 2709.11 Special Uses Handbook

FSH 2709.14 Recreation Special Uses Handbook

FSM 2800 Minerals and Geology

FSM 2810 Mining Claims

FSM 2820 Mineral Leases, Permits, Licenses

FSM 2850 Mineral Materials

FSH 2809.15 Minerals and Geology Handbook

FSM 2880 Geologic Resources, Hazards, and Services

FSM 3100 Cooperative Fire Protection

FSM 3400 Forest Pest Management

FSM 3400 Forest Health Protection and Southwestern Region Supplement 3400-91-1

FSM 5100 Fire Management

FSM 5400 Land Ownership

FSM 5410 Appraisals

FSM 5420 Land Purchases and Donations

FSH 5409.13 Land Acquisition Handbook

FSM 5430 Exchanges

FSM 5460 Right-of-Way Acquisition

FSH 5409.17 Rights-of-Way Acquisition Handbook

FSM 5500 Land Ownership Title Management

FSM 7300 Buildings and Other Structures

FSM 7310 Buildings and Related Facilities

FSH 7309.11 Buildings and Related Facilities Handbook

FSM 7400 Public Health and Pollution Control Facilities

FSM 7420 Drinking Water

FSM 7500 Water Storage and Transportation

FSM 7700 Transportation System

FSM 7710 Travel Planning

FSH 7709.55 Travel Analysis

FSH 7709.56 Pre-construction Handbook

FSH 7709.57 Road Construction Handbook

FSH 7709.59 Road Operations

FSM 7720 Development (Policy on Transportation)

FSM 7730 Operation and Maintenance

State and Local Laws and Regulations

20.6.1-4,6,11 New Mexico Administrative Code – Environmental Protection

Regional Haze Rule to meet PM 2.5 and ozone standards

Conservation Agreement for Rio Grande Cutthroat Trout (*Oncorhynchus clarkii virginalis*) in the States of Colorado and New Mexico (2013)

Code of Federal Regulations

33 CFR 323 Permits for Discharges of Dredged or Fill Material into Waters of the United States

Authorize the discharge of dredged or fill material into waters of the United States. Certain discharges of dredged or fill material into waters of the United States are also regulated under other authorities of the Department of the Army. These include dams and dikes in navigable waters of the United States.

36 CFR 60 National Register of Historic Places, Criteria for Evaluation

Sets forth the procedural requirements for listing properties in the National Register.

36 CFR 62 National Natural Landmarks Program

The procedures in this part set forth the processes and criteria for the identification, evaluation, designation, and monitoring of national natural landmarks.

36 CFR 63 Determinations of Eligibility for Inclusion in the National Register of Historic Places

Developed to assist agencies in identifying and evaluating the eligibility of properties for inclusion in the National Register, and to explain how to request determinations of eligibility

36 CFR 65 National Historic Landmarks Program

Sets forth the criteria for establishing national significance and the procedures used by the Department of the Interior for conducting the National Historic Landmarks Program.

36 CFR 79 Curation of Federally Owned and Administered Archaeological Collections

Establishes standards, procedures, and guidelines to be followed by federal agencies to preserve collections of prehistoric and historic material remains and associated records that are recovered in conjunction with federal projects and programs under certain federal statutes. This action should ensure that federally owned and administered collections of prehistoric and historic material remains and associated records are deposited in repositories that have the capability to provide adequate long-term curatorial services.

36 CFR 212 Travel Management

Sets forth the requirements for the development and administration of the forest development transportation system.

36 CFR 215.5 Road System Management

Traffic on roads is subject to State traffic laws where applicable. For each national forest or national grassland, the responsible official must identify the minimum road system needed for safe and efficient travel and for administration, utilization, and protection of National Forest System lands.

36 CFR 219 Planning

Sets forth a process for developing, adopting, and revising land and resource management plans for the National Forest System.

36 CFR 219.24 Cultural and Historical Resources

Provides guidance for addressing cultural resources in land management plans. Land management planning shall provide for the identification, protection, interpretation, and management of significant cultural resources on National Forest System lands.

36 CFR 221 Timber Management Planning

Sets forth the requirements for management plans for national forest timber resources.

36 CFR 222 Range Management

Sets forth the requirements for range management on the national forests, and for the administration of wild and free roaming horses and burros and their environment. See Subpart B (Management of Wild Free-Roaming Horses and Burros).

36 CFR 223.1 Authority to Sell Timber

Sets forth the requirements relating to the sale and disposal of National Forest System timber.

36 CFR 223.5 through 36 CFR 223.10 Parks, Forests, and Public Property, Scope of Free-Use Granted to Individuals, Cutting and Removal of Timber in Free-Use Areas, Permission for Free-Use of Timber Outside Free-Use Areas, Delegations of Authority to Approve Free Use by

Individuals, Free-Use to Owners of Certain Mining Claims, Free-Use to Alaskan Settlers, Miners, Residents, and Prospectors

36 CFR 223.12 Permission to Cut, Damage, or Destroy Trees without Advertisement

36 CFR 223.261 Sale and Disposal of National Forest System Timber; Special Forest Products and Forest Botanical Products

36 CFR 228 Minerals

Sets forth the rules and procedures through which use of the surface of National Forest System lands, in connection with mining and mineral operations, shall be conducted so as to minimize adverse environmental impacts on National Forest System surface resources.

36 CFR 228.42 Plan of Operations – Notice of Intent Requirements

A notice of intent to operate is required from any person proposing to conduct operations which might cause significant disturbance of surface resources.

36 CFR 228.57 Plan of Operations – Approval

A proposed plan of operation shall be submitted to the district ranger, who will promptly acknowledge the operator. The authorized officer shall analyze the proposal, considering the economics of the operation along with the other factors in determining the reasonableness of the requirements for surface resource protection.

36 CFR 228, Subpart A – Locatable Minerals

36 CFR 228 Subpart E, Oil and Gas Resources;

36 CFR 241.2 Fish and Wildlife

Sets forth the rules and procedures relating to the management, conservation, and protection of fish and wildlife resources on National Forest System lands.

36 CFR 251 Land Uses Subpart B

Sets forth the rules and procedures relating to the use and occupancy of National Forest System lands.

36 CFR 251.9 Management of Municipal Watersheds

The Forest Service will observe national forest watersheds that supply local watersheds under multiple use prescriptions in land management plans.

36 CFR 254 Land ownership Adjustments

Sets forth the rules and procedures relating to exchange and conveyance of National Forest System lands.

36 CFR 261 Prohibitions in Areas

Sets forth the general prohibitions relating to the use and occupancy of National Forest System lands.

36 CFR 800 Protection of Historic Properties

Provides explicit direction for the identification of sites, the determination of project effects on sites, and requirements for consultation with the appropriate State Historic Preservation Office, any relevant Tribal Historic Preservation Office, and the Advisory Council on Historic Preservation, as well as how to develop agreements.

36 CFR 291.19 Suspension and Revocation of Permits

Authorizes appointed officer to revoke permit when resource management is violated.

36 CFR 293 Wilderness-Primitive Areas

Sets forth the requirements for the administration of wilderness and primitive areas.

36 CFR 294 Special Areas

Sets forth the requirements for designation of special recreation areas.

36 CFR 295 Use of Motor Vehicles off Forest Development Road

Sets forth the rules and procedures relating to the administrative designation and location of specific areas and trails of National Forest System lands on which the use of motor vehicles traveling off of national forest development roads is allowed.

36 CFR 296 Protection of Archaeological Resources: Uniform Regulations

Implements the Archaeological Resources Protection Act by establishing the uniform definitions, standards, and procedures for federal land managers to follow in providing protection for archaeological resources located on public lands and Indian lands, including definitions of prohibited acts and penalties. The regulations also provide requirements for issuing permits under the authority of the Archaeological Resources Protection Act to any person proposing to excavate and/or remove archaeological resources from public lands or Indian lands.

36 CFR 297 Wild and Scenic Rivers

Sets forth the rules and procedures relating to federal assistance in the construction of water resources projects affecting wild and scenic rivers or study rivers on lands administered by the Secretary of Agriculture.

36 CFR 800 Protection of Historic Properties

Sets forth the provisions for the administration of the National Historic Preservation Act

40 CFR 51.300-309 Regional Haze Rule

The primary purposes of this subpart are to require states to develop programs to assure reasonable progress toward meeting the national goal of preventing any future, and remedying any existing, impairment of visibility in mandatory Class I federal areas which impairment results from manmade air pollution; and to establish necessary additional procedures for new source permit applicants, states, and federal land managers to use in conducting the visibility impact analysis required for new sources under §51.166. This subpart sets forth requirements addressing visibility impairment in its two principal forms: “reasonably attributable” impairment (such as impairment attributable to a single source/small group of sources) and regional haze (widespread haze from a multitude of sources which impairs visibility in every direction over a large area).

40 CFR 121-135 Water Programs

Sets forth the provisions for the administration of water programs including state certification of activities requiring a federal license or permit, Environmental Protection Agency administered permit programs, state program requirements, procedures for decision making, criteria and standards for the National Pollutant Discharge Elimination System, toxic pollutant effluent standards, water quality planning and management, water quality standards, water quality guidance for the Great Lakes

System, secondary treatment regulation, and, prior notice of citizen suits. See Title 40 (Protection of Environment), Chapter 1 (Environmental Protection Agency), subchapter D (Water Programs).

40 CFR 1502.12 Environmental Impact Statement

Carefully considers alternatives to a proposed action as well as providing probable mitigation procedures if needed.

43 CFR 3 Preservation of American Antiquities

Implements the provisions of the Antiquities Act of 1906.

43 CFR 10 Native American Graves Protection and Repatriation Act Regulations

Implements the provisions of the Native American Graves Protection and Repatriation Act of 1990.

49 CFR 24.102, 103, 104 Basic Acquisition Policies, Criteria for Appraisals, Review of Appraisals

Real property acquisition through negotiation, follows criteria for appraisals, and continues with review.

Programmatic Agreements

Memorandum of Agreement on Fostering Collaboration and Efficiencies to Address Water Quality Impairments on National Forest System Lands

Agreement between U.S. Forest Service and the U.S. Environmental Protection Agency signed in 2007: The purpose is to coordinate between agencies and address issues of water quality impairment regarding the 303-d list, as well as total maximum daily loads. The leading cause of water quality impairments on National Forest System lands includes temperature, excess sediment, and habitat modification. These issues are to be addressed via best management practices to the greatest extent possible. In terms of this project analysis area, best management practices can be applied to soil and watershed condition and are applicable everywhere on the national forest.

Memorandum of Understanding – USFS MOU 17-MU-11031600-049/New Mexico Environment Department MOU 18-667-2060-0003 6-27-17

New Mexico Water Quality Protection Agreement. Agreement between the U.S. Forest Service Southwestern Region and the State of New Mexico Environment Department. Cooperation between the parties with the common objective of improving and protecting the quality of New Mexico's waters by implementing progressive watershed-based restoration protection programs to meet applicable water quality standards.

Memorandum of Understanding – USFS MOU 20-MU-11020800-052

Agreement between the State of New Mexico Department of Game and Fish, New Mexico Department of Agriculture, the Otero Soil and Water Conservation District, and the USDA Forest Service.

Memorandum of Understanding between Forest Service Southwestern Region and the State of New Mexico Environment Department

Memorandum of Understanding Regarding Interagency Coordination for Protection of Indian Sacred Sites

Memorandum of Understanding among the U.S. Department of Defense, U.S. Department of the Interior, U.S. Department of Agriculture, U.S. Department of Energy, and the Advisory

Council on Historic Preservation Regarding Interagency Coordination and Collaboration for the Protection of Indian Sacred Sites

Memorandum of Understanding between the Mescalero Apache and the USDA, Forest Service Lincoln National Forest

Appendix G: Climate Change Vulnerability Analysis and Adaptation Strategies

Table 7 displays the ecological response units and associated vegetation system types for the Lincoln National Forest climate change vulnerability analysis.

Table 7. Ecological response units and associated vegetation system types

Ecological Response Unit (ERU)	ERU Code	Vegetation System Type
Spruce fir forest	SFF	forest
Mixed conifer with aspen	MCW	forest
Mixed conifer-frequent fire	MCD	forest
Ponderosa pine forest	PPF	forest
Ponderosa pine-evergreen oak	PPE	forest
Piñon-juniper woodland	PJO	woodland
Piñon-juniper evergreen shrub	PJC	woodland
Piñon-juniper grass	PJG	woodland
Juniper grass	JUG	woodland
Mountain mahogany mixed shrub	MMS	shrubland
Montane subalpine grassland	MSG	grassland
Semi-desert grassland	SDG	grassland

Lincoln National Forest Climate Change Vulnerability Analysis

The results of the Lincoln National Forest climate change vulnerability analysis (USDA FS 2016b) are presented in table 8, which shows the percentage of area in ecological response units that have high to very high, moderate, or low vulnerability of a change in vegetation type as an effect of climate change. Results are shown for the national forest scale and the local unit scale (approximating hydrologic unit code 5 watersheds), as defined in the Lincoln National Forest, Forest Plan Assessment Report (USDA FS 2019a). Nearly all forested vegetation types (ecological response units) have a very high vulnerability to type change for all watersheds and the national forest as a whole. The mixed conifer-frequent fire ecological response unit is also highly vulnerable to a type change, although not as extreme as the other forested types. The woodland types (piñon-juniper and juniper) range from moderately to highly vulnerable, with more grassland dominated types (juniper-grass and piñon-juniper grass) being more vulnerable. Shrublands and grasslands seem to be more resistant to projected climate change; however, this is variable depending on the local unit.

Table 8. Ecological response units and percentage of area that has high to very high, moderate, or low vulnerability to change in vegetation type as an effect of climate change. Values are shown for the Lincoln National Forest scale and the local unit (watershed) scales.

Ecological Response Units	Vulnerability to Change	Lincoln National Forest	Arroyo del Macho	Rio Hondo	Rio Peñasco	Salt Basin	Tularosa Valley	Upper Pecos
All ecological response units combined	High to Very High	61%	75%	74%	51%	56%	56%	64%
	Moderate	29%	23%	24%	30%	36%	31%	36%
	Low	10%	2%	2%	20%	9%	13%	0%
Spruce fir forest	High to Very High	100%	100%	100%	na	na	99%	na
	Moderate	0%	0%	0%	na	na	0%	na
	Low	0%	0%	0%	na	na	0%	na
Mixed conifer with aspen	High to Very High	96%	na	9%	95%	97%	95%	na
	Moderate	4%	na	55%	4%	51%	5%	na
	Low	0%	na	37%	0%	15%	0%	na
Mixed conifer-frequent fire	High to Very High	72%	56%	50%	77%	77%	60%	100%
	Moderate	28%	43%	47%	23%	22%	39%	0%
	Low	0%	1%	2%	0%	0%	0%	0%
Ponderosa pine forest	High to Very High	94%	93%	89%	99%	99%	86%	na
	Moderate	5%	7%	10%	0%	1%	14%	na
	Low	0%	0%	0%	0%	0%	0%	na
Ponderosa pine-evergreen oak	High to Very High	100%	na	na	na	99%	na	100%
	Moderate	0%	na	na	na	1%	na	0%
	Low	0%	na	na	na	0%	na	0%
Piñon-juniper woodland	High to Very High	65%	71%	74%	na	49%	45%	58%
	Moderate	34%	29%	26%	na	51%	53%	42%
	Low	0%	0%	1%	na	0%	2%	0%
Piñon-juniper evergreen shrub	High to Very High	0%	na	na	0%	0%	0%	4%
	Moderate	50%	na	na	51%	55%	31%	96%
	Low	50%	na	na	49%	45%	69%	0%
Piñon-Juniper Grass	High to Very High	99%	97%	96%	99%	100%	95%	100%
	Moderate	2%	3%	5%	1%	0%	5%	0%

Ecological Response Units	Vulnerability to Change	Lincoln National Forest	Arroyo del Macho	Rio Hondo	Rio Peñasco	Salt Basin	Tularosa Valley	Upper Pecos
	Low	0%	0%	0%	0%	0%	0%	0%
Juniper Grass	High to Very High	86%	71%	87%	na	74%	na	91%
	Moderate	14%	29%	14%	na	26%	na	9%
	Low	0%	0%	0%	na	0%	na	0%
Mountain mahogany mixed shrub	High to Very High	39%	7%	7%	1%	33%	2%	76%
	Moderate	39%	43%	43%	57%	51%	19%	24%
	Low	22%	51%	51%	42%	15%	79%	0%
Montane subalpine grassland	High to Very High	51%	52%	29%	28%	28%	14%	na
	Moderate	31%	12%	15%	72%	72%	50%	na
	Low	18%	35%	55%	1%	0%	36%	na
Semi-desert grassland	High to Very High	34%	na	na	31%	61%	28%	38%
	Moderate	57%	na	na	69%	39%	55%	61%
	Low	9%	na	na	0%	1%	17%	0%

*na (not applicable) means the ecological response unit is not present in the watershed.

Adaptation Strategies

Adaptation strategies have been developed to link vulnerability assessments with appropriate types of projects and activities that may best provide resistance and resilience, as defined below, to the adverse effects of projected climate change.

Resistance—Influence of structure and composition on disturbance severity. Resistance is the ability of a community to remain unchanged when challenged by disturbances (Grimm and Wissel 1997).

Resilience—Influence of disturbance on subsequent structure and composition. Resilience is "the capacity of a system to absorb disturbance and reorganize while undergoing change so as to still retain essentially the same function, structure, identity, and feedbacks" as originally defined by Holling (1973), modified by Walker et al. (2004), and cited in De Rose and Long 2014.

The adaptation strategies are restoration, maintenance, preservation, realignment, and refugia. Below, each strategy is described, expectations are summarized, and a guide to vulnerability ratings appropriate to the strategy is provided. Some areas may benefit from a combination of adaptation strategies.

Restoration Strategy

- Refers to treatments with the likely effect of restoring the characteristic structure, composition, or processes of the ecological response unit, and favoring resilience.
- Project objectives and effectiveness monitoring are unknown. Assignment of the "restoration" strategy assumes that treated areas were significantly departed from the characteristic conditions of the ecological response unit in terms of either structure, composition, or process (in contrast to an assignment of "maintenance"); however, this assignment was usually paired with maintenance since the degree of ecosystem departure was unknown.
- This assignment is limited to low vulnerability areas. The working assumption for the vulnerability assessment is that moderate and high or greater vulnerability areas are susceptible to type conversions and therefore are unlikely candidates for a restoration objective. The equivalent assignments in a moderate or high or greater vulnerability area would be "preservation" or "realignment."

Maintenance Strategy

- Refers to treatments with the likely effect of maintaining the characteristic structure, composition, or processes of the ecological response unit, and favoring resilience.
- Project objectives and effectiveness monitoring are unknown. Assignment of the "maintenance" strategy assumes that treated areas were not significantly departed from the characteristic conditions of the ecological response unit in terms of either structure, composition, or process (in contrast to an assignment of "restoration"); however, this assignment was usually paired with restoration since the degree of ecosystem departure was unknown.
- This assignment is limited to low vulnerability areas. The working assumption for the vulnerability assessment is that moderate and high or greater vulnerability areas are susceptible to type conversions and therefore are unlikely candidates for an objective of system maintenance. The equivalent assignments in a moderate or high or greater vulnerability area would be "preservation" or "realignment."

Preservation Strategy

- Preservation refers to the ability of an ecosystem to endure natural disturbance and maintain the characteristic structure, composition, process, and function of the system. Resistance may be reduced by ecosystem departure (Fire Regime Condition Class), as with fire-adapted ecosystems (for example, ponderosa pine forest, piñon-juniper grass, juniper grass) that are significantly departed from reference condition.
- Refers to treatments with the likely effect of favoring the resistance of an ecosystem to type-converting disturbances, in terms of the characteristic structure, composition, or processes of the ecological response unit. With some past plans and prescriptions, resistance may have been realized though not originally intended.
- Project objectives and effectiveness monitoring are unknown. Assignment of the "preservation" strategy assumes that treated areas may have been significantly departed from the characteristic conditions of the ecological response unit in terms of either structure, composition, or process.
- This assignment is limited to moderate and high or greater vulnerability areas. The working assumption for the vulnerability assessment is that moderate and high or greater vulnerability areas are susceptible to type conversions, and that resistance treatments can forestall conversion for a particular objective such as habitat preservation. The equivalent assignments in a low vulnerability area would be "restoration" or "maintenance."

Realignment Strategy

- Refers to treatments with the likely effect of favoring long term and gradual ecological adaptation (facilitated type conversion) to another functioning system, in terms of structure, composition, or processes that are uncharacteristic to the site. "The most proactive strategic actions are those that work directly with the changes that climate is provoking; that is, they assist transitions to future states by mitigating and minimizing undesired and disruptive outcomes" (Peterson et al. 2011). With some past plans and prescriptions, realignment may have been realized though not originally intended.
- Project objectives and effectiveness monitoring are unknown. Assignment of the "realignment" strategy does not assume that treated areas were or were not significantly departed from the characteristic conditions of the ecological response unit, in terms of structure, composition, or process.
- This assignment is limited to moderate and high or greater vulnerability areas. The working assumption for the vulnerability assessment is that moderate and high or greater vulnerability areas are susceptible to type conversions, and that realignment treatments facilitate type conversions in a way that favors continual functioning and resilience of an ecosystem, albeit while an area transitions from one ecological response unit to another. The equivalent assignments in a low vulnerability area would be "restoration" or "maintenance."

Refugia Strategy

- A small percentage of the area in most ecological response units occurs as low vulnerability, warranting prioritization for restoration and maintenance, also serving as a refugia strategy for dependent plants and animals.