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Findings from the Forest Plan Assessment Report: Focus Areas and Need for Change

Lincoln National Forest, New Mexico

Forest Service Lincoln National Forest May 2019

Cover photo: View of Lincoln National Forest from a mountain looking across ridges into a valley.

Contents

Introduction

The Lincoln National Forest is a unit of the Forest Service, a land management agency within the U.S. Department of Agriculture. The mission of the Forest Service is to sustain the health, diversity, and productivity of the Nation's forests and grasslands to meet the needs of present and future generations. The principal document that guides management on the Lincoln National Forest is the Lincoln National Forest Land and Resource Management Plan (forest plan) (USDA Forest Service 1986). The forest plan was approved in 1986 and has since been amended 18 times to accommodate management needs of specific projects or to reflect changes in social, economic, or ecological conditions. Two additional amendments are in process.

The National Forest Management Act of 1976 requires each national forest to develop a land management plan (forest plan) and revise the plan every 10 to 15 years. Under the 2012 Planning Rule, revising a land management plan is an iterative process that includes three phases: assessment, plan revision, and monitoring (36 Code of Federal Regulations 219.5).

The Lincoln National Forest recently completed the final assessment report (USDA Forest Service 2019a, b), which is available in two volumes online at: https://www.fs.usda.gov/detail/lincoln/landmanagement/planning/?cid=stelprd3814309. The assessment report describes the current conditions, trends, and risks to sustainability for various resources based on management direct from the 1986 forest plan. In short, the assessment report describes the current conditions of the Lincoln National Forest. Preparation for the assessment report included evaluating existing data, best available scientific information, forest plan amendments, and annual monitoring reports. In addition, comments from public meetings and other outreach efforts were considered. All of these sources provided valuable information about changes needed in the existing forest plan.

Need for Change Statements

Need for change statements are an identification of the need for change related to one or more components of the current forest plan based on findings from the assessment report. These statements are general and do not provide plan direction, and they do not necessarily discuss how the plan will address these issues. Rather, the need for change statements form the bridge between the identification of resource conditions and trends in the assessment and the development of the revised forest plan by presenting where and how the revised forest plan needs to be different from the current plan. These statements provide focus for the second phase of planning—the development of the revised plan—where plan components are created to help ensure management meets desired conditions for each resource. A need for change statement identifies the strategic changes necessary to address issues described by the assessment and presents a vision for future management of the Lincoln National Forest. The overarching question to be answered in developing a need for change statement is:

- What strategic, current plan content needs to be revised (added, modified, or deleted) to address the conditions, trends, and risks?

Using the results and trends from the assessment report, the Lincoln National Forest's planning team identified 15 initial focus areas. With public comment, those 15 areas were expanded to 21 focus areas that need to be considered and addressed through the plan revision process in order to provide sustainable resources, goods, and services. These focus areas include:

1. Monitoring;
2. Collaboration, Partnerships, and Relationships;
3. Terrestrial Ecosystems;
4. Riparian Ecosystems;
5. Soil Resources;
6. Watersheds and Water Resources;
7. Climate Change;
8. Carbon Stocks;
9. Air Quality;
10. At-Risk Species;
11. Social and Economic Conditions, and Multiple Uses;
12. Rangeland Resources;
13. Timber and Forest Products;
14. Water Resources;
15. Fish, Wildlife, and Plant Resources;
16. Cultural and Historic Resources and Tribal Uses;
17. Recreation and Scenic Character;
18. Designated Areas;
19. Infrastructure;
20. Land Ownership, Status, Use, and Access; and
21. Energy Resources, Mineral Resources

The focus areas were used during a series of public meetings to help guide and focus discussion about the need for change in those areas. Five public meetings took place October 1–4, 2018. The public was presented with the Draft Assessment Summary Report and the preliminary "need for change" focus areas. The public was then asked to discuss the importance of these focus areas and indicate where additional focus areas might be needed.

The initial 15 focus areas were posted to the plan revision website for review between September 5, 2018 and October 19, 2018. Based on additional comments and feedback received, the need for change statements were updated and 21 focus areas developed. Input from public meetings and internal resource-focused meetings was used to develop the need for change statements. The need for change statements, identified later in this document, are a reflection of the results of the assessment report and input gathered during public meetings and public comments submitted to the Lincoln National Forest.

The parts of the forest plan that need to be changed (that is, need for change statements) will ultimately be summarized in the Federal Register when the Lincoln National Forest publishes a

notice of intent to prepare an environmental impact statement related to forest plan revision. This announcement will convey the Lincoln National Forest's intent to develop a revised forest plan (and alternatives) based on identified needs for change, and analyze their respective effects on the environment.

Plan Content

A forest plan provides broad, program-level direction for management of National Forest System lands and its resources. The purpose of a plan is to address the risks to sustainability of resources, goods, and services the national forest produces and to provide a vision for the future management of the forest. Although the forest plan does not contain a commitment to select any specific project, future projects are carried out based on guidance provided in the plan. A forest plan:

- Applies to only those lands within the National Forest System;
- Is developed through an ongoing public process;
- Uses the best available scientific, local, and Native knowledge to inform the planning process;
- Provides a framework for integrated resource management and for guiding project and activity decisionmaking;
- Does not authorize projects or activities, commit the Forest Service to take action, or regulate uses by the public (in other words, no site-specific decisions are expected to be made in a forest plan); and
- Should not repeat laws, regulations, or program management policies, practices, and procedures that are in the Forest Service Directive System.

A forest plan consists of (1) plan components; (2) identification of where plan components apply; (3) other required plan content including the identification of priority watersheds, a description of the plan area's distinctive roles and contributions, a plan monitoring program, proposed and possible actions, and (4) optional plan content. Each of these is discussed below.

Plan Components

A forest plan consists of components that will be developed from the need for change statements and will guide future project and activity decisionmaking. Plan components will apply forestwide, to specific resources (for example, riparian areas, roads, seeps and springs, wildlife, and recreation); or to specific parcels of land that either have a certain management emphasis (management areas), or are a designated special area (designated areas), or have a certain geographic emphasis (geographic areas).

These components are:

Desired Conditions define a collective vision for conditions desired on the national forest into the future. Desired conditions are specific social, economic, and ecological characteristics of the plan area, or a portion of the plan area, that are described in terms specific enough to allow for progress toward their achievement. Desired conditions are what drive the plan. All project-level

management activities should be aimed at the achievement of the desired conditions for those resources in the area where the project is located.

Objectives are concise, measurable, and time-specific statements of a desired rate of progress toward desired conditions and should be based on reasonably foreseeable budgets. Objectives, along with the strategies (from management approaches or Forest Service Handbook direction) used to accomplish them, can be thought of as the tools the national forest will use to prioritize project activities to reach desired conditions. Objectives are mileposts along the road toward desired conditions.

Standards can be thought of as the rules the national forest will operate within as projects are developed to accomplish objectives and achieve desired conditions. These are mandatory constraints on project and activity decisionmaking.

Guidelines describe constraints on project and activity decisionmaking that allow for departure from its terms, so long as the intent of the guideline is met. In other words, guidelines are mandatory but can be replaced by something that is equal, or better, in meeting the intent of the existing guideline.

Suitability of lands is identified in a plan as specific lands within a plan area that are suitable for various uses or activities based on the desired conditions applicable to those lands. The plan also identifies 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; however, every plan must identify those lands that are not suitable for timber production (required by the National Forest Management Act).

Goals are broad statements of intent, other than desired conditions, usually related to interactions with the public, and are expressed in broad, general terms. Plans are not required to include goals since they are optional plan components.

Where Plan Components Apply

Every plan must identify management areas or geographic areas, or a plan may have both. The plan may identify designated or recommended designated areas as management areas or geographic areas.

Other Required Plan Content

In addition to plan components, the forest plan must include other required plan content. These are also linked to need for change statements. Other required plan content are not plan components.

Priority watersheds: Every plan must identify watersheds that are impaired or at risk for priority maintenance or restoration.

Roles and contributions: Every plan must describe the roles and contributions of the plan area to ecological, social, and economic sustainability within the broader landscape.

Monitoring program: Every plan must include a monitoring program. Monitoring information enables the responsible official to determine if a change may be needed in plan components or other plan content that guide management of resources in the plan area.

Proposed and possible actions: Every plan must describe proposed and possible actions that may occur during the life of the plan in the plan area. Possible actions are not a commitment to do work, but possible actions that could be performed to move toward desired conditions and objectives.

Optional Plan Content

Forest plans may include other optional plan content, such as existing conditions, explanatory narrative, and management approaches. Optional plan content are not plan components.

Management approaches and associated information do not offer plan direction, but describe an approach or strategy to manage the unit to achieve a desired condition. Management approaches often convey how plan components work together to achieve the desired condition. They may also describe context, intent, priorities, partnership opportunities or coordination activities, needs to survey, inventories or assessments, or approaches to risk and uncertainty. Not every resource topic area may have an associated management approach heading. Changes to management approaches do not require plan amendments.

Background and description and associated information do not offer plan direction, but give a brief sense of the history and description of the resource topic area being addressed, as of writing the plan. The background and description information also provide a context for the desired conditions identified as part of a plan component.

Other sources of information include existing laws, regulations, policies, executive orders, memorandums of understanding, and other guidance that may be incorporated into the plan as an appendix. These sources are important in designing projects and activities to achieve desired conditions. Most of these documents are available from Forest Service offices.

Need for Change to the Existing Forest Plan

The need to revise the Lincoln National Forest Land and Resource Management Plan is driven by the changing conditions identified in the assessment, including the changing public values and uses associated with the Lincoln National Forest. In the following sections, the “need for change” statements are listed following the summary of each focus area. Forestwide Management represents a cross cut of topics that cover all resources on the national forest, how the Forest Service manages the resources, collaboration, and partnerships. The Ecological Resources section represents the needed changes identified in Volume I of the Lincoln National Forest Assessment, while the Social, Cultural, and Economic Conditions section describes needed changes identified in Volume II of the Lincoln National Forest Assessment. Each of these sections has a summary of community feedback related to the need for change statements. Each focus area is summarized with need for change statements. It is important to note the need for change statements are not a complete list of what will be changing through the plan revision process and that components from the 1986 Lincoln National Forest Land and Resource Management Plan that have proven effective will not have need for change statements.

Need for change statements arising from public comment topics and the assessment findings are categorized by assessment sections as outlined below.

Forestwide Management

- Monitoring
- Collaboration, Partnerships, and Relationships

Ecological Sustainability

- Terrestrial Ecosystems
- Riparian Ecosystems
- Soil Resources
- Watersheds and Water Resources
- Climate Change
- Carbon Stocks
- Air Quality
- At-Risk Species

Social, Cultural, and Economic Sustainability

- Social and Economic Conditions, and Multiple Uses
- Rangeland Resources
- Timber and Forest Products
- Water Resources
- Fish, Wildlife, and Plant Resources
- Cultural and Historic Resources and Tribal Uses
- Recreation and Scenic Character
- Designated Areas
- Infrastructure
- Land Ownership, Status, Use, and Access
- Energy Resources, Mineral Resources

Forest health, restoration and thinning, fire and fire management relate to the need for desired conditions and management objectives for characteristic forest and woodland vegetation on the Lincoln and are addressed in the Ecological Sustainability section under Terrestrial Ecosystems, with additional needs for change addressed in the Social, Cultural, and Economic Sustainability section under Timber and Forest Products. Needs for change for riparian systems are stated in the Ecological Sustainability section under Riparian Ecosystems. Needs for change for wildlife habitat are implied in the larger need for ecosystem desired conditions, as stated in the Ecological Sustainability section under Terrestrial Ecosystems. Wildlife and rare plants needs for change are addressed in both the Ecological Sustainability section under At-Risk Species, and in the Social, Cultural, and Economic Sustainability section under Fish, Wildlife, and Plant Resources. Needs for change statements for watershed health and water resource protection are addressed in the Ecological Sustainability section under Soil Resources and Watershed and Water Resources; and also addressed in the Social, Cultural, and Economic Sustainability section under Water Resources. Grazing and rangeland management needs for change relating to ecological sustainability are implied in the larger need for ecosystem desired conditions, as stated in the Ecological Sustainability section under Terrestrial Ecosystems. Other needs for change related to rangeland management are addressed in the Social, Cultural, and Economic Sustainability section under Rangeland Resources. Needs for change to address climate change as well as carbon stocks and air quality are stated in the Ecological Sustainability section under Climate Change, Carbon Stocks, and Air Quality. Science and monitoring are a common theme throughout the needs for change document, compelling need for change statements for many individual resources, such as in the Forestwide Management section under Monitoring.

Forestwide Management

Topics that emerged from public meetings discussion and comments received with regard to forestwide management include collaboration and partnerships, education, monitoring, Forest Service staffing and internal workings, forest plan components, technology, communication, enforcement, transparency, resource protection, and project management.

Public meeting participants consistently stated that the Forest Service needs to communicate better within the agency as well as to the public. Transparency came up in most meetings, especially regarding how the Forest Service uses comments from the public in decisionmaking and how they can better acknowledge community input throughout the forest plan revision process. Many participants asked that the Forest Service revise language in the Draft Assessment Report to better reflect community input. The concept of the Forest Service maintaining working relationships and partnerships with existing members of communities neighboring the Lincoln National Forest was brought up frequently.

The Forestwide Management section addresses the following focus areas—Monitoring; and Collaboration, Partnerships, and Relationships.

Monitoring

The purpose of monitoring and evaluation is to determine if our management is meeting conditions and objectives laid out by the forest plan. However, the type and scale of monitoring in the current plan does not always answer those questions. The Lincoln National Forest staff have had a difficult time carrying out all monitoring components of the current plan because of increasingly limited resources. Furthermore, the monitoring questions are often either ambiguous or focused on very prescriptive components of the forest plan, such as comparing actual and planned outputs for timber harvest. Also, monitoring components do not take into account how monitoring is conducted beyond the Lincoln National Forest boundary by non-Forest Service entities, limiting the ability to compare and integrate monitoring data of surrounding areas and limiting the ability to compare resources on the national forest with their status at a larger context scale or even between neighboring national forests. Finally, the monitoring plan has not been amended since the current forest plan was published in 1986 and it is out of date with current science and trends in resources, such as the emergence of new recreational opportunities. Since monitoring is an essential component of adaptive management, the problems cited above make it difficult to determine if resource management as described by the plan is working as desired.

Plan Need for Change – Monitoring

- There is need for a monitoring plan that tracks progress toward desired conditions and allows for responsive adaptive management with available resources.
- There is a need for monitoring questions and associated indicators that look at the status of resources at appropriate scales.

Collaboration, Partnerships, and Relationships

Relationships are a key factor that can impact the success of how the forest plan is implemented. With the challenges faced by the Lincoln National Forest today, strong relationships are not a convenience, but a requirement in order to protect the land and serve the people. Lincoln National Forest staff struggle to reach all stakeholders, which include both rural and urban communities and customers, and relationships are weak because of this. Poor relationships are costly because they can cause increased time and energy through the planning process, misperceptions and miscommunications regarding the Lincoln's intentions and actions, and ultimately negatively impact resource management. While the forest plan cannot provide direction beyond the scope of managing resources on the Lincoln National Forest, better relationships may be part of strategies that help to achieve resource desired conditions.

Plan Need for Change – Collaboration, Partnerships, and Relationships

- There is a need to include management approaches that strengthen existing relationships, promote new relationships, and incorporate strategies that prioritize partnerships (for example, local, state, and federal agencies, tribal governments, law enforcement, permittees, recreation and forest user groups, environmental groups, users with historical ties to the national forest, and youth groups).
- There is a need for management approaches that promote seeking outside assistance in addition to working with partners and volunteers to manage resources and monitor activities.

Ecological Sustainability

Topics that emerged from public meeting discussions and comments with regard to ecological sustainability include forest health, restoration and forest thinning, fire and fire management, wildlife, rare plants and invasive species, watershed health and water resources protection, climate change, grazing and rangeland management, science, and monitoring.

Most discussions across the communities centered on watershed and forest health characteristics, the danger of large fires and using fire as a management tool, and the protection of local water resources. Species and species management were prevalent topics across most meetings, this included wildlife species and invasive species.

The Ecological Sustainability section addresses the following focus areas—Terrestrial Ecosystems; Riparian Ecosystems; Soil Resources; Watersheds and Water Resources; Climate Change; Carbon Stocks; Air Quality.; and At-Risk Species.

Terrestrial Ecosystems

Terrestrial ecosystems are comprised of upland vegetation that are not located near or influenced by streams or wetlands. Ecosystems on the Lincoln National Forest are classified as ecological response units to describe vegetative communities and are a classification of sites with similar plant species composition, succession patterns, and distribution regimes. Therefore, ecological response units do not represent current vegetation conditions but rather the potential

range of plant associations along with vegetative structure and processes that would occur when natural disturbance regimes (such as fire) and biological process prevail.

Fire exclusion and past management activities have led to high-to-moderate departure of current conditions from historical conditions (reference conditions) for most ecosystems, specifically among characteristic frequent fire woodland and forested ecological response units on the Lincoln National Forest. These ecological response units have much larger patch sizes, higher stand densities (trees and shrubs per acre), a loss of grass and forb diversity, an overall reduction in herbaceous cover, and are more prone to atypical wildfires (generally high-severity fires). In addition, these ecological response units have lower structural diversity where, on average, more acres are in closed-canopy states (specifically forested ecological response units). In general, there is low structural diversity of forest age and size classes relative to historical conditions. For the frequent fire mixed conifer forests, there has been an increase in shade tolerant and fire intolerant tree species.

These changes can negatively impact wildlife species that generally benefit from a diversity of structural attributes (such as canopy complexity and forest patchiness). In Mixed Conifer-Frequent Fire and Mixed Conifer with Aspen ecological response units, current forest management has plan direction to provide protections for wildlife species, in particular the northern goshawk and Mexican spotted owl (Lincoln National Forest Land and Resource Management Plan, Amendment 9, 1996). This direction, while defining some desired conditions, has also increased departure from reference conditions, both by establishing standards that are different from reference conditions and restricting management that could restore systems to reference conditions. Under the current management regime, the departure (difference between current and reference conditions) trend of vegetative structure is stable, and expected to remain moderate in the future, according to predictive modelling done for the assessment. However, with recent disturbances including several large fires and insect and disease infestations, as well as natural processes such as succession in the absence of the historical fire regime (fire suppression), the Lincoln National Forest has not been able to apply management treatments at the same rate as disturbance and succession, therefore risk to ecological integrity is still moderate-to-high.

Forest insects and diseases are another factor affecting terrestrial ecosystems on the Lincoln National Forest. Mistletoes, both true and dwarf, are common, to the extent that the Lincoln has the highest level of infestation of all national forests in the region. It is hypothesized to be due to the climatic regime of the Sacramento Mountains and the amount and timing of monsoonal rains. Furthermore, white pine blister rust was first detected in the Southwestern Region in 1990 on the Lincoln National Forest, although it had probably been here since the 1970s (Hawksworth and Conklin 1990). Climatic conditions on the Lincoln National Forest favor development of the rust during monsoonal storms in the Sacramento and Capitan mountains.

Both of the grassland ecological response units on the Lincoln National Forest, Montane/Subalpine Grassland and Semi-Desert Grassland, are highly departed for seral state proportion, which is a result of encroaching woody vegetation. Conifer encroachment in the higher altitude Montane/Subalpine Grassland is primarily attributed to the lack of fire to reduce regeneration, while shrub and cactus encroachment into the lower elevation Semi-Desert Grassland may be due to historical grazing practices as well as lowering water tables resulting in

greater presence of shrubs over grasses. Montane/Subalpine Grassland may show some improvement over time with a reduction in trees and an increase in grassland, but models predict that departure will always be at least moderate because native grasses have been replaced by nonnatives such as Kentucky bluegrass over much of the ecological response unit. The loss of native grasses can result in decreased site productivity and reduced soil productivity. Furthermore, nonnative grasses are not as effective in the prevention of erosion (especially during droughts) or as productive for forage. Soil loss can lead to shifts in species composition with increases in shallow-rooted grasses that are less effective in stabilizing soils. These shifts and increases in bare soil can lead to the increased chance of infestations of noxious weeds and other nonnative invasive plants, and decrease biodiversity.

Terrestrial ecosystems constitute 96 percent of the Lincoln National Forest. For some of these terrestrial ecosystems, the Lincoln may act as a refuge. Relative to the surrounding non-Forest Service lands, many of the ecological response units have a considerable presence on the national forest relative to the surrounding non-Forest Service lands. In other cases, the distribution of a particular ecological response unit may be small, however rare in the larger context landscape. Therefore, the Lincoln National Forest has a significant role in maintaining the ecological integrity of these ecological response units.

Plan Need for Change – Terrestrial Ecosystems

- 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 include plan components that focus on addressing the impacts of nonnative invasive species on terrestrial and aquatic ecosystems.
- There is a need for plan components, including desired conditions and objectives, that recognize fire-adapted ecosystems, the role of fire on the landscape (including wilderness), and its use as a management tool, including planned and unplanned ignitions.
- There is need for plan direction that allows managers the flexibility to manage naturally ignited fires 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 fires, 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 such as northern goshawk and Mexican spotted owl. 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.
- There is a need to develop management objectives to meet desired conditions, and monitoring criteria to measure effectiveness of management toward meeting desired conditions.

Riparian Ecosystems

Riparian areas are where ecosystems develop from the influence of water, along streams, lakes, springs and other waterbodies. On the Lincoln National Forest, riparian areas are generally small (only comprising approximately 0.3 percent of the national forest) with little transition to upland ecosystems. Many perennial streams on the Lincoln may have subsurface stretches where the "riparian area" may look similar to, and respond to disturbances similarly to, the adjacent upland types. While changes in condition may be a function of normal processes following disturbance, other changes leading to vegetation type conversion may indicate management concerns or shifting climate. This may highlight a threat to the sustainability of the riparian ecosystem, as well as the ecological structure of the forest as a whole. 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.

Seral state proportion departure was low-to-moderate for all riparian ecological response units. However, most of the riparian ecological response units are exhibiting some level of departure with regard to fire regimes. Riparian areas were also assessed using the proper functioning condition method, which is an assessment using a consistent approach for considering hydrology, vegetation, and erosion and deposition (soil) attributes and how well the physical processes are functioning. There are approximately 174 miles of perennial streams on the three ranger districts of the Lincoln National Forest. As an estimate of proper functioning condition, the national forest is approximately 48 percent in proper functioning condition, 34 percent functioning at risk, and 18 percent nonfunctioning. It is worth noting that there is a need to collect more proper functioning condition assessments on the Lincoln. Currently, assessments are done in response to some specific management need, such as reviewing a grazing allotment management plan. Proper functioning conditioning assessments at key locations that are representative of a watershed or subwatershed and conducted on a systematic and repeatable basis would allow for more accurate monitoring of trends.

Overall, shallow water tables, cooler temperatures, and greater productivity typically characterize riparian areas. However, human alterations to the landscape such as impoundments, diversions, pumping, introduction of invasive plants, grazing, and recreational impacts have the potential to alter these systems. Roads, grazing, and recreational uses (including trails and dispersed recreation) remove vegetation and compact soils in riparian areas, which can lead to significant departures from reference condition in terms of species composition, proportion of bare soils, and streambank stability, ultimately causing erosion and sedimentation downstream. Increased water demand (water withdrawal) and climatic changes (for example, long-term drought) will continue to affect these systems. Water tables are lower and there have been decreases in periodic flooding, which is necessary for the regeneration of some important riparian species. This results in shifts in species composition and a reduction in available soil moisture. Bare soil and reduced native species provide conditions suitable for establishment of invasive species. Invasive species, in combination with adjacent uncharacteristically dense upland vegetation, lead to an increased risk of fire from the uplands entering riparian areas, where fire is not a natural part of the ecosystem. Loss of riparian vegetation leads to higher water temperatures, increased erosion and sedimentation, and an overall decrease in water quality that negatively affects aquatic biota and wildlife.

The Lincoln National Forest has a significant role in maintaining the ecological integrity of riparian ecological response units because the percentages of land area in riparian ecological response units are low for the Lincoln as well as the surrounding landscapes. Some of the ecological response units show a higher occurrence (50 percent or greater) on the national forest relative to off-forest, while others, such as the Little Walnut-Chinquapin Oak, Little Walnut/Desert Willow, and Little Walnut-Ponderosa Pine ecological response units are found only in the Guadalupe Ranger District and adjacent lands. It is also important to maintain the ecological integrity of riparian areas on the national forest because most (43) of the at-risk species on the Lincoln are associated with aquatic, wet, or relatively moist microenvironments and habitats.

Plan Need for Change – Riparian Ecosystems

- 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 to develop desired conditions for riparian areas—including vegetation structure, ecological status (composition), ground cover, coarse woody debris, and snags—that characterize different riparian ecological response units.
- There is a need for plan components that minimize ecological impacts of multiple uses in riparian areas.
- There is a need to develop more effective riparian plan monitoring criteria in order to better assess riparian conditions and trends.

Soil Resources

Three key ecosystem characteristics were evaluated to describe soil diversity and distribution on the Lincoln National Forest: soil condition, soil loss, and erosion hazard.

Trends of soil condition on the Lincoln National Forest are a product of a variety of factors and interactions. Among those factors are current and future management objectives, management practices, climate change, and natural disturbances. Satisfactory soil condition (soil quality) is important in maintaining long-term soil productivity—key to sustaining ecological diversity. Unsatisfactory and impaired soil conditions have resulted in the reduced ability of the soil to grow plants and sustain productive, diverse vegetation. Approximately 67 percent of the Lincoln is currently in satisfactory soil condition and more than half (11 of 14) of the upland ecological response units have satisfactory soil conditions: Spruce-Fir Forest, Mixed Conifer with Aspen, Mixed Conifer-Frequent Fire, Ponderosa Pine Forest, Ponderosa Pine-Evergreen Oak, Piñon-Juniper Evergreen Shrub, Piñon-Juniper Woodland, Gambel Oak Shrubland, Montane/Subalpine Grassland, Semi-Desert Grassland, and Chihuahuan Desert Scrub. Eight of these ecological response units have a stable trend; however, Ponderosa Pine-Evergreen Oak, Semi-Desert Grassland, and Montane/ Subalpine Grassland, though currently considered in satisfactory soil condition, are trending away from reference conditions because 25 percent or more have unsatisfactory soil conditions.

Approximately 33 percent of the Lincoln National Forest is currently in unsatisfactory and impaired soil condition. The Juniper Grass, Piñon-Juniper Grass, and Mountain Mahogany Mixed Shrubland ecological response units have portions that contain impaired and unsatisfactory soil condition due to high amounts of bare soil from drought, grazing, and dense tree and shrub overstory due to lack of fire and continue to trend away from reference conditions. The loss of soil productivity (unsatisfactory soil condition) through a reduction in soil function is due to a lack of effective vegetative groundcover and organic matter. A reduction in vegetative ground cover also decreases the sites ability to buffer the soil surface again raindrop impact and excessive animal or mechanical traffic, which compacts the soil surface. Overall, out of the 14 ecological response units analyzed on the Lincoln National Forest, four are considered at high risk for soil condition—Ponderosa Pine-Evergreen Oak, Juniper Grass, Piñon-Juniper Grass, and Montane/Subalpine Grassland.

Although all of the ecological response units analyzed on the Lincoln National Forest have current soil loss rates that exceed natural soil loss rates, many are still within the threshold of soil loss tolerances. Ponderosa Pine-Evergreen Oak, Piñon-Juniper Evergreen Shrub, and Piñon-Juniper Grass ecological response units are significantly departed from reference conditions and have unsustainable levels of soil loss to maintain inherent site productivity. The Ponderosa Pine-Evergreen Oak ecological response unit has a significant departure due to potential for high and moderate burn severities resulting from the current overstocked forest structure. These areas have experienced slow recovery of vegetative groundcover and soil loss is occurring at an accelerated rate. The reasons for significant departure in Piñon-Juniper Evergreen Shrub and Piñon-Juniper Grass ecological response units are relatively large difference between the canopy cover of grasses, and bare soil between reference (more grass and litter) and current conditions (less grass and litter). The remaining ecological response units analyzed on the Lincoln National Forest currently have soil loss rates that do not exceed threshold soil loss rates and are considered low in departure.

Soil Erosion Hazard is the probability of soil loss resulting from complete removal of vegetation and litter—an inherent soil property (not influenced by management). Juniper Grass, Piñon-Juniper Grass, Gambel Oak Shrubland, Montane/Subalpine Grassland, Mountain Mahogany Mixed Shrubland, and Chihuahuan Desert Scrub ecological response units have a slight erosion hazard rating. In the grassland, shrubland, and woodland ecological response units, the slight erosion hazard rating is typically associated with lower slope gradients and landforms that are more level. Slopes over 40 percent may be unstable and have been excluded from past mechanical vegetation treatments on the Lincoln National Forest. Low impact harvesting technology is available. Approximately 68 percent of the forest occurs on slopes over 40 percent. All ecological response units contain areas with slopes of over 40 percent, but the Spruce-Fir Forest ecological response unit has the largest area.

Ecological response units that have soil erosion hazard risks of 50 percent or greater (moderate and severe erosion hazard classes combined) are Spruce-Fir Forest, Mixed Conifer with Aspen, Mixed Conifer-Frequent Fire, Ponderosa Pine Forest, Ponderosa Pine-Evergreen Oak, Piñon-Juniper Evergreen Shrub, Piñon-Juniper Woodland, and Semi-Desert Grassland. The moderate and severe erosion hazard classes indicate a high probability that accelerated erosion would occur if erosion control measures are not addressed when natural or management-induced disturbances occur.

Public comments related to soil are located in the recreation section since soil compaction was tied to the effects of dispersed camping.

Plan Need for Change – Soil Resources

- 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

The Lincoln National Forest is located within portions of 34 watersheds and 122 subwatersheds. The majority of the subwatersheds on the Lincoln, approximately 93 percent, are classified as functioning-at-risk or impaired. Water quantity, aquatic habitat, aquatic biota, riparian vegetation, roads and trails, and soil condition are the watershed conditions indicators that have the greatest impact on overall watershed condition scores.

There are 501 springs within the Lincoln National Forest plan area. Sixty-two of the springs were inventoried, with site conditions rated for level of disturbance: 17 rated as “undisturbed,” 16 rated as “slight,” 21 rated as “moderate,” and 5 rated as “high.” Three springs were not given a rating or the rating was not recorded. Major factors that lead to moderate and high ratings are spring developments, diversion structures and livestock (domestic and feral) disturbances. Trends are stable since the number of spring developments are not expected to increase substantially.

Groundwater basins that overlap the plan area include the Tularosa, Hondo, Peñasco, Salt, Roswell Artesian, and Carlsbad. Although some basins only have a small amount of land within the plan area, these areas provide a substantial amount of recharge for the basin and provide a substantial benefit as drinking water, as well as for agricultural and industrial uses in the area surrounding the forest. Changing precipitation patterns may inhibit recharge of the many aquifers within these basins. Under the current management scenario, trends for groundwater conditions would be site specific and variable, with some local areas moving upwards and some downwards. However, water withdrawals through surface water diversions and groundwater pumping exceed the natural range of variation.

Both natural and human caused disturbances impact the condition of water resources across the Lincoln National Forest. Although some wildfires are a natural disturbance, high burn severity areas within 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 in close proximity to stream channels increase delivery of water and sediment to stream networks on and off the national forest. Likewise, grazing, recreation, and other multiple uses continue to impact water resources into the future.

Plan Need for Change – Watershed and Water Resources

- There is a need to include plan components to maintain or restore the integrity of aquatic ecosystems and watersheds.

- There is a need for plan components that improve hydrological function and condition of water-dependent systems by maintaining and restoring upland and riparian vegetative 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 there is a need to develop more effective aquatic biotic monitoring items in order to better assess biological condition and trends.

Climate Change

There is general agreement among climate modelers that the Southwestern United States is experiencing a warming and drying trend that will continue well into the latter part of 21st century. While some models predict increased precipitation for the region, researchers expect the overall balance between precipitation and evaporation would still likely result in an overall decrease in available moisture. Temperatures are predicted to rise by 5 to 8 degrees Fahrenheit by the end of this century, with the greatest warming occurring during winter months. Some climate model results also suggest a five-fold increase in unusually hot days by the end of the century.

Thirteen major upland ecological response units were identified for the Lincoln National Forest climate change vulnerability assessment. Of these, the Piñon-Juniper Woodland ecological response unit makes up the largest portion of the national forest at 29 percent, while the remaining upland ecological response units represent between 1 and 15 percent. Minor ecological response units, collectively represented about 5 percent of the forest. The climate change vulnerability assessment results indicate that considerable portions of ecosystems in the plan area and characteristic plant communities within and near the Lincoln are at risk of ecological departure due to climate change, at present and in the future. Based on the climate change vulnerability assessment results, approximately 61 percent of the plan unit (including all ecological response units or ecosystems regardless of land ownership) is at high or very high risk (vulnerability) due to climate change. Specifically, 26 percent of the plan unit is at very high risk; 35 percent is at high risk; 29 percent is at moderate risk; and 10 percent is at low risk.

Within the plan unit, Spruce-Fir Forest, Ponderosa Pine-Evergreen Oak, Piñon-Juniper Grass, and Ponderosa Pine Forest are the most vulnerable, while Mountain Mahogany Mixed Shrubland, Piñon-Juniper Evergreen Shrub, and Semi-Desert Grassland are the least vulnerable to climate change. As stated in the climate change vulnerability assessment, results infer vulnerability based on the projected climate departure from the historic climate envelope for a given ecological response unit and location (Triepke et al. 2014). Both the Ponderosa Pine Forest and Ponderosa Pine-Evergreen Oak ecological response units are significantly departed from seral state proportion reference (historical) conditions. Drought, past timber harvesting, livestock grazing, and historical and current fires have contributed to departure away from reference conditions. Some of these areas have experienced slow recovery of vegetative groundcover and as a result have experienced loss of soil site productivity. The Ponderosa Pine-Evergreen Oak ecological response unit has a significant departure from reference soil loss rates due to high and moderate burn severities.

Public comments on climate change included support for adaptive management.

Plan Need for Change – Climate Change

- There is a need to include plan components that consider potential climate change impacts or stressors (for example, increases in storm events, uncharacteristic wildfire, drought, flooding, and other extreme weather) to ecosystems and natural resources.

Carbon Stocks

The emission of greenhouse gases by human activities and natural processes contribute to the warming of the Earth's climate. Warming could have significant ecological, economic, and social impacts at regional and global scales (Intergovernmental Panel on Climate Change 2007). In 2005, U.S. forests were estimated to be sequestering nearly 220.5 million tons of carbon, suggesting that forests and woodlands of the Southwest could have a significant role to play in the sequestration of carbon and climate change mitigation. There are other components (for example forest products) that would provide a more complete picture of carbon stock and flux, but for strategic purposes of forest planning, the following components are readily assessed: biomass, carbon emissions, and soil organic carbon.

Biomass (vegetative carbon) serves as an integral component in forest carbon cycles. Forest vegetation, through the process of photosynthesis, converts atmospheric carbon dioxide to carbohydrates (referred to as carbon fixation). The primary influences on biomass carbon stock are plant growth (primary productivity)—which serves to increase biomass carbon stock, decay and decomposition that slowly decreases biomass carbon stock—and disturbance in the form of fire and harvest. The overarching pattern of biomass carbon stock projections on the Lincoln National Forest indicates an increase in total carbon storage above current conditions in most modeled ecological response units, with an overall increase of 23 percent (just over 5.5 metric tons). This translates to an increase beyond reference condition levels across the national forest. The greatest proportional increases in biomass carbon stocks are predicted to occur in the woodland systems, with biomass carbon greater than doubling in Juniper Grass and Piñon-Juniper Grass, and increasing by over 60 percent in Piñon-Juniper Evergreen Shrub and Piñon-Juniper Woodland over the 100-year projection period. Smaller changes from current condition are predicted in the grassland, shrubland, and forest ecological response units, ranging from a 6 percent reduction in biomass carbon in Mountain Mahogany Mixed Shrubland to a 30 percent increase in Ponderosa Pine Forest. This has the potential for increased risk from uncharacteristically severe fire behavior and loss of forest cover over time.

Currently there are no binding commitments by the federal government to regulate carbon emissions (carbon dioxide), though there has been increasing activity at local levels to control carbon emissions. Long-term differences in carbon stocks and emissions between treated and untreated national forest land was investigated using the nearby Apache-Sitgreaves National Forest (Vegh et al 2013, discussed in chapter 9 in Volume I of the assessment). In this simulation study, it was found that the no-action (treatment) alternative resulted in the lowest total carbon emissions while treatment alternatives produced five times more carbon emissions. However, carbon emissions by wildfire (the largest contributor to emissions on the Lincoln National Forest) was lowest in the treatment alternatives (thinning), than in the no-action alternative, with

heavier thinning showing lowest carbon emissions. Total carbon stocks were also lower in treated alternatives than the no-action alternative. Accumulation of carbon in untreated forests, however, may increase the risk of uncharacteristic wildfire and accompanying carbon emissions.

Soil organic carbon is the energy source for soil organisms that, through their activity and interactions with mineral matter, impart structure to soil that affects its stability and capacity to provide water, air, and nutrients to plant roots. The current trend of sustaining soil organic carbon is strongly influenced by vegetation growth and by activities that remove biomass; including climatic factors that influence the rates of weathering and decomposition of aboveground and belowground biomass. Given the projection that biomass carbon will potentially increase into the future, it is logical to assume that soil organic carbon will remain the same, or potentially increase, under current rates of decomposition.

Biomass carbon, particularly in the form of standing trees, is a storage sink for carbon but also a source for future emissions from biomass removal, prescribed fire, and potential wildfires. Thinning to promote larger trees can put more carbon in fewer stems that may be more resistant to wildfire and less prone to crown fires, and reduce the risk of severe wildfires and resulting carbon emissions.

There were no specific public comments on carbon stocks.

Plan Need for Change – Carbon Stocks

- There is a need to describe desired conditions for carbon storage and emissions, particularly as they relate to historical and current vegetation structure, including the potential for emissions from biomass removal and prescribed and wildfires.

Air Quality

The Lincoln National Forest airshed covers most of New Mexico, plus all or portions of 36 counties in southwest Texas and part of the State of Chihuahua in Mexico. In total, the relevant airshed includes areas within 300 kilometers (186.4 miles) of the Lincoln National Forest. Overall, 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 continue to have episodic periods of very high levels, which result from wildfires and increases in fugitive dust due to the effects of climate change. In addition, 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. Lastly, modeled critical loads from nitrogen deposition are insufficient to assess the full range of possible impacts to the ecosystems potentially affected.

Plan Need for Change – Air Quality

- There is a need to describe desired conditions and objectives for air quality, incorporated by reference from applicable federal and state regulations (for example, Clean Air Act) without duplicating or conflicting with those regulations.

At-Risk Species

In accordance with the 2012 Planning Rule, the Lincoln National Forest identified at-risk species that occur on the forest. There are two categories of at-risk species, which include 1) those recognized under the Endangered Species Act as endangered, threatened, proposed, or candidate; and 2) species of conservation concern. Species of conservation concern are those that are native to and known to occur in the plan area and 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.

The Lincoln National Forest identified a total of 9 federally listed species and 51 species of conservation concern, for a total of 60 proposed at-risk species, of which more than half of these species are flowering plants. Each at-risk species was ascribed to particular ecological response units, special habitat features, water resources, and threats. The highest numbers of proposed at-risk species were associated with the Ponderosa Pine Forest ecological response unit. The proportion of all proposed at-risk species that use ponderosa pine was 50 percent, followed closely by mixed conifer (47), and piñon-juniper (40). Furthermore, most (43) of the species are associated with aquatic, wet, or relatively moist microenvironments and habitats, with 15 species associated with dry environments. Regarding landform type, the largest number of species (12) were associated with canyon bottoms, streamsides, and lower slopes. Combined, aquatic, meadows, marshes, springs, riparian, canyon bottoms, streamsides, and lower slopes were associated with 24 of the 58 species. The basin and lower slope landscape setting was attributed to 26 species, and 5 species were attributed to prominently inhabiting both basin and lower slope and upland settings. Upland was attributed to 27 species.

Threats most frequently associated with at-risk species were related to fire regime modification issues (47 percent of species), followed by grazing issues (31 percent), climate change and severe weather (31 percent), recreation, military, and work disturbance (29 percent), hydrological modifications (24 percent), and invasive and problematic species (22 percent). The number of threats per species was particularly high in cave, meadow, spring, montane/subalpine grassland, and aquatic-associated species, and fewest for rock-associated species.

Public comments included finding a reasonable way to mitigate listed species impacts and that the Lincoln's Sparrow be included in the at-risk species.

Plan Need for Change – At-Risk 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.

Social, Cultural, and Economic Sustainability

Topics identified from public meeting discussions and comments with regard to social, cultural, and economic sustainability include economics, multiple uses, grazing, recreation, wilderness, military use of the national forest, law enforcement, access, resource concerns, outreach, managed use, public involvement, communities, stewardship, and road maintenance.

Most discussions across the communities focused on economics regarding timber management and the trend toward the lack of jobs, mills, and markets for timber products. Specifically noting the need for the Lincoln National Forest to help reinvigorate the local markets.

There is a need to minimize user conflicts between multiple uses, mostly with regards to recreational users such as pedestrian, mountain bike, motorized, and equestrian groups. Recreational shooting near other users was identified as an issue. Commenters wanted to limit the duration of dispersed camping stays and to limit the number of vehicles at campsites. Dispersed camping was seen to cause soil and vegetation impacts.

Grazing was said to have priority over recreation uses. There is the need to recognize the importance of water sources and infrastructure (pumps and wells) to neighboring communities and the risk of water shortages during drought. Finally, many individuals expressed concern about potential wilderness designations and the risk of losing access or the ability to use portions of the national forest as in the past.

The Social, Cultural, and Economic Sustainability section addresses the following focus areas—Social and Economic Conditions, and Multiple Uses; Rangeland Resources; Timber and Forest Products; Water Resources; Fish, Wildlife, and Plant Resources; Cultural and Historic Resources and Tribal Uses; Recreation and Scenic Character; Designated Areas; Infrastructure; Land Ownership, Status, Use, and Access; and Energy Resources, Mineral Resources and Geologic Hazards.

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. Many people that live adjacent to the national forest have families going back several generations that supported themselves ranching, mining, or working in the timber industry. Some uses of the national forest may have included more cultural, historical, or traditional purposes such as hunting, fishing, gathering plants for food and medicinal uses, and firewood gathering. Native American use of the area now encompassed by the Lincoln National Forest dates back centuries. However, over the past few decades, uses of the forest have shifted. Resource-based industries such as mining, ranching, and timber harvest have declined, while amenity based activities such as recreation and residential development have emerged as the predominant use in and around the Lincoln National Forest.

Counties surrounding the Lincoln National Forest are experiencing economic and demographic changes, resulting in changes in racial and economic diversity, multiculturalism, and social values. Socioeconomic data for the four counties (Chaves, Eddy, Lincoln, and Otero) surrounding the Lincoln National Forest reflect upward trends in employment rates, educational attainment, and household income that are expected to continue increasing. Over the past three decades,

Hispanic and Latino populations have increased in the counties, with the exception of Lincoln County where the population exhibited a marked increase in the number of non-Hispanic retirees. In addition, continued population growth in predominately rural areas has brought about significant changes in the dynamic relationships between human communities and publicly administered lands, especially in the wildland urban interface—an area commonly characterized as the transition zone where urban development intersects with private and public wildlands. It is now common to have a large number of homes, second homes, and vacation homes bordering or surrounded by public lands in the Western United States, including lands adjacent to the national forest.

The four counties surrounding the Lincoln National Forest contain roughly one-sixth of New Mexico's wildland-urban interface, which is almost entirely located within Lincoln and Otero counties. These two counties are ranked first (Otero County) and third (Lincoln County) in New Mexico (out of 33 counties) for the risk of wildfire on lands in the wildland-urban interface. Homes in the wildland-urban interface adjacent to the national forest were heavily impacted in the 2000s by large fires. The greatest number of structures lost occurred during the 2012 Little Bear Fire in which 254 structures burned. This trend may be expected to continue or increase on the Lincoln National Forest as more and more people inhabit wildland-urban interface areas, and warmer temperatures, less snow pack, and drier forests result in longer, more intense fire seasons across the West. Together, these demographic shifts of communities surrounding the Lincoln National Forest carry important implications for the development of good relations between management agencies and the local public.

The government has consistently provided a significant portion of jobs within the four-county area of influence since 1970. On average, the government provides approximately 19 percent of total employment within the area of influence. The area economy is dependent on federal dollars from entities like Fort Bliss, White Sands Missile Range, and Holloman Air Force Base. Furthermore, the extraction and consumption of forest products (for example, timber and livestock forage), recreation visitors, and Lincoln National Forest expenditures (for example, equipment and salaries) contribute to economic activity in the area of influence. Market transactions attributable to activities on the national forest support an estimated 991 jobs and $31.5 million in labor income in the regional economy. In reviewing spending influenced by Lincoln National Forest management, grazing and Forest Service expenditures contribute the most to employment in the regional economy. Livestock grazing supports the most jobs; however, Forest Service expenditures contribute nearly double the income of that generated by livestock grazing.

Public comments generally noted the importance of the Lincoln National Forest for local economics and individual livelihoods. Comments specific to Rangeland Resources and Timber and Forest Products are addressed in this section.

Plan Need for Change – Social and Economic Conditions, and Multiple Uses

- There is a need to add plan components that recognize the Lincoln National Forest's role in contributing to local economies (for example, timber, grazing, and other multiple-use activities and products).

- There is a need for plan components that build 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 national forest—for the management of resources such as water, timber and other forest products.

Rangeland Resources

About 65 percent of the Lincoln National Forest is classified as capable of sustaining livestock grazing, with the remaining 35 percent classified as incapable for grazing activities due to steep slopes or because the herbaceous vegetation produced is insufficient to sustain livestock grazing. Livestock grazing has important economic and cultural value to communities surrounding the national forest. Many livestock operations rely heavily on the use of public lands to remain viable. In turn, resource conditions are directly affected by stocking levels and range management practices.

Factors affecting current range management and resource condition include increasing concerns for the management of endangered species along with the spread of invasive plant species, feral hog impacts, encroachment of woody vegetation, and drought. These factors all lead to reduced forage availability either in the short or long term. One opportunity to help maintain forage on these lands are projects that reduce piñon-juniper densities and increase grass production.

Public comments on livestock grazing included the desire to work cooperatively between ranchers and the Forest Service. A commenter noted the priority of grazing over other resources and uses. Another commenter saw the need to include impacts from grazing in determining departure from reference conditions. Other comments are addressed elsewhere in the document under Soil Resources; Water Resources; Fish, Wildlife, and Plant Resources, and Recreation and Scenic Character.

Plan Need for Change – Rangeland Resources

- There is a need to add plan components for rangeland management that maintain or restore ecological integrity and productivity of rangelands.

Timber and Forest Products

Suitable timberlands on the Lincoln comprise 21 percent of the national forest and include spruce fir, mixed conifer, and ponderosa pine forest types. Historically, forest stands on the Lincoln National Forest were dominated by fire tolerant Douglas-fir and ponderosa pine with more open spacing supporting a more frequent, less severe fire regime. Current stand conditions are generally overly crowded with trees of 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 crown fire. Forest trees have experienced a shift in abundance from fire-resistant, shade-intolerant species to shade-tolerant species such as white fir.

Historical logging practices and fire suppression have created a landscape that is more homogenous than what would be expected to occur under the frequent-fire regime that the vast majority of these forest types developed under. The decline of harvest levels in the early 1990s on the Lincoln National Forest and many other national forests in the west was due to a combination of pressures related to threatened and endangered species, appeals and litigation directed at federal timber sales, market demand, and federal budget levels. In New Mexico, federal listing of the Mexican spotted owl had a profound impact on national forest harvest levels. Logging on the Lincoln National Forest between 1970 and 1989 generated an average annual revenue of approximately $11,000,000 per year with a high of almost $24,000,000 in 1972. Between 1990 and 1999, logging revenues decreased 86 percent to approximately $1,500,000 per year. The economic loss incurred by the four counties over those years was estimated at $14.7 million.

After a 10-year period of passive management and a decline in timber sale activities, the Lincoln National Forest has generally shifted planning and implementation efforts to encompass primarily forest ecosystem restoration and management of larger landscapes. This is creating local and regional interest in the feasibility of commercial use of traditionally sub-merchantable materials, such as small-diameter, dimensional lumber and wood-based energy production. Currently, there are five active small production sawmills in Otero County, multiple firewood processors throughout the four counties, and one full production pallet mill in Canutillo, Texas. The increased emphasis in forest ecosystem restoration projects should allow the continued ability to contribute to both timber and fuelwood demands. An increase in forest restoration projects will be vital to help sustain forest and watershed health, prevent uncharacteristic wildfire, reduce insect and disease outbreaks, and improve or maintain wildlife habitat, as well as to contribute to local economies.

Currently, fuelwood and miscellaneous products such as posts and poles, Christmas trees, and transplant permits expand the existing forest product market for the Lincoln National Forest. The ability to gather firewood for heating and cooking is important for many of the communities surrounding the national forest. Firewood gathering is often a family social event, but more importantly, it provides a means for many people to heat their homes at a large economic savings over propane, natural gas, and electricity. Other wood products that come off the Lincoln, such as Christmas trees, transplants, nuts, and native plant materials, are also important cultural and social products gathered from the national forest.

Public comments included support for timber management. Timber harvest should be used to treat the forest and maintain meadows. Other commenters indicated environmental laws have killed the timber industry. The importance of timber management was seen as a way to treat fuels and mitigate the risk of fires. Public comments noted the importance responsible timber harvest and educating the public on how timber harvest funds local schools.

Plan Need for Change – Timber and Forest Products

- 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.

Water Resources

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. Both the sights and sounds of clear water, along with the associated riparian vegetation and wildlife, are cited as valued amenities that draw people to live in communities surrounding the Lincoln National Forest. In addition, the distribution of water, whether it be naturally occurring on the landscape or constructed features (such as trickle tanks and troughs), is critical for wildlife management and hunting opportunities.

Within the six subbasins that constitute the Lincoln National Forest context area, 15 water bodies are impaired. Nonpoint sources of pollutants for surface water quality include wildfire, grazing, agriculture, recreation, hydromodification, streambank destabilization or modification, removal of riparian vegetation, road and highway maintenance, land disposal, resource extraction, road runoff, and septic tanks.

Regional climate assessments have found that temperatures in the Southwestern United States have increased and are predicted to continue to increase. Serious water supply challenges are expected as snowpack and streamflow amounts are projected to decline in parts of the Southwest, resulting in decreasing surface water supply reliability for cities, agriculture, and ecosystems. Water is one of the important resources of the Lincoln National Forest, ecologically and socially. However, ongoing and future concerns for water quality and quantity will continue to be an issue considering ecological pressures and increasing demands.

Public comments supported forest thinning and fire prevention for the recharge of water tables. Other comments indicated that water usage was subject to New Mexico water laws and management of water rights. A commenter noted that moving water from a spring to another canyon was not appropriate use. There is a need to encourage rain infiltration by treatment methods such as check dams. There are municipal concerns for the protection of water supplies and wells.

Plan Need for Change – Water Resources

- There is a need for updating and developing plan components that provide for the management of sustainable water supply for multiple uses.

Fish, Wildlife, and Plant Resources

Fish, wildlife, 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 the habitat, while the State manages wildlife populations and hunting and fishing programs.

Culturally, hunting is an important activity for the people of New Mexico. Early inhabitants hunted and lived off the land. Many of the people in rural areas and small towns in southeastern New Mexico continue the traditional practice that provides food, serves as a bonding activity between parents and children, and is a way of teaching children about nature and the land

around them. Sport hunting remains a social recreational activity, which can involve larger groups, off-highway vehicles, and hunting camps. The growth of sport hunting supports a community of commercial outfitters and guides. The Lincoln National Forest is known for its trophy animals, especially elk, which attract hunters from all over the country and ranchers are taking advantage of the hunting opportunities by developing outfitting and guiding businesses. Outfitters and guides look to the national forest for special use permits that allow them to guide hunters on Forest Service lands. Some rely on this as a main portion of their income. The Lincoln National Forest provides habitat for 10 legally hunted big game or trophy species, multiple small game species, and two fished nonnative fish species.

Some national data sources suggest a slight downward trend in consumptive fish and wildlife activities. Birdwatching is on the rise, however, and the greater Lincoln National Forest area contains the Peñasco Canyon important bird area, designated by the Audubon Society. This important bird area is a high-altitude riparian area and wetland that contains Mexican spotted owls and other high-priority species in great abundance and is the southernmost known breeding location in New Mexico for the Lincoln's sparrow.

The task of planning multiple resource use must also take into account the number and nature of interest groups and stakeholders that interact with the Lincoln National Forest in a given community. Evidence of the dynamic nature of relationships between the national forest and various groups, individuals, and organizations is found in ongoing debates over the preservation of open spaces, the administration of recreation and grazing fees, and the protection of water resources and wildlife. Although the information above represents a fraction of the elements covered in any single assessment of social and economic sustainability for community and Lincoln National Forest relations, it reflects the diversity and urgency of the issues facing national forest personnel as they take positive steps to respond to a rapidly changing demographic, political, and physical environment.

Public comments indicated that overpopulation of some species such as elk destroy ecological conditions of many habitats. Elk impacts on aspen was a concern. Public comments identified the need to manage nonnative species such as invasive love grass and the facilitation of herbicide spraying of forbs and woody plants. Acres treated should not be limited and riparian areas should be treated for invasive species.

Plan Need for Change – Fish, Wildlife, and Plant Resources

- There is a need for plan components to meet desired ecological conditions that allow a wide range of management practices to promote forest health, resiliency, and sustainability.
- 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 and Tribal Uses

Human occupation of the areas in and around the Lincoln National Forest has spans thousands of years. Although it is unclear when humans first inhabited the area that comprises the national forest, much of the Southwest was occupied by 10,000 BC. Both prehistoric and historic properties occur in association with riparian areas, though riparian areas on the Lincoln tend to be limited. Historic period properties on the forest tend to be farming and ranching related within and near the Smokey Bear and Sacramento ranger districts. Railroad grades in the Sacramento Mountains tend to follow drainages, and sawmills and are often located on the banks. Prehistoric sites are most often found in association with Little Walnut-Ponderosa Pine, Little Walnut-Chinquapin Oak, and Little Walnut/Desert Willow ecological response units, all of which are found on the Guadalupe District. There is a substantial concern for the effect of erosion on washing away archaeological sites.

Four sites have been listed on the National Register of Historic Places, including the Cloudcroft Trestle, Monjeau Lookout Tower, the Wizard's Roost (a prehistoric solar observatory), and the Jicarilla Schoolhouse. This area is also famous for Smokey Bear, a cub burned in a fire in the Capitan Mountains in 1950 and who became the living symbol of fire prevention. Smokey Bear is buried at a museum in Capitan, New Mexico.

The Lincoln National Forest maintains a governmental relationship and routinely consults with three federally recognized tribes based in New Mexico and Arizona: the Pueblo of Zuni, the Hopi Tribe, and the Mescalero Apache Tribe. All three tribes have expressed some level of interest in the resources and management of the national forest and sometimes provide input pursuant to Section 106 of the National Historic Preservation Act and the National Environmental Policy Act. These tribes recognize the lands managed by the Lincoln National Forest as part of their aboriginal or traditional use areas and acknowledge contemporary use of these lands for traditional cultural and religious activities.

Places and properties valued and used by the tribes for a variety of purposes have been identified on every unit of the Lincoln National Forest. Properties of cultural and religious significance can have traditional cultural or religious significance for a number of reasons. Some of these include locations with long-standing cultural use, locations of buried human remains repatriated, locations where ceremonial objects have been retired, locations of contemporary ceremonies, and locations where specific forest products are gathered for ceremonial use. The tribes consider all of these types of locations to be traditional cultural properties. Some locations such as shrines, caves, springs, and resource collection areas have long-standing and ongoing historical, cultural, and religious significance. The Lincoln National Forest has formally documented three of these locations as traditional cultural properties, some of which have been determined eligible for the National Register of Historic Places. These consist of site-specific locations. Other locations remain minimally documented, but clearly meet the criteria of traditional cultural properties.

In addition to specific noted locations, 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 direction of everyday life for 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.

Many tribes also rely on the Lincoln National Forest for products for personal, commercial 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 both personal and commercial use. 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 also a heavy reliance on forest products for traditional and cultural purposes.

A public commenter asked about the guidelines used to evaluate historic properties, indicating that the 50-year requirement seemed too recent.

Plan Need for Change – Cultural and Historic Resources

- There is a need for plan components to evaluate, stabilize, preserve, interpret, and protect historic and sensitive properties (for example, archeological sites, historic structures, and traditional properties).
- There is a need for plan components 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 uses.

Recreation and Scenic Character

One of the smaller national forests in the west, the Lincoln has three distinct districts, each with its own constituents. Outstanding recreational opportunities from the most primitive and wild to the highly developed are available throughout the year. Based on an analysis of the niche of the Lincoln National Forest relative to recreation, the primary recreation opportunities on the Lincoln include climatic relief from the summer heat, easily accessible day use activities in dispersed settings, scenic touring, and opportunities for family gatherings in developed sites. Visitors participate in a variety of activities, with the most popular being viewing natural features, hiking and walking, relaxing, and driving for pleasure. The variety of uses can create conflicts between user groups. This is predominately occurring between the nonmotorized and the motorized uses throughout the Lincoln National Forest. There is a large concentration of this within the highly motorized use areas of the Sacramento Ranger District. User conflict between motorized and nonmotorized uses is expected to continue and possibly increase. Conflicts also occur between mountain bike users, equestrians, and hikers.

The 2014 National Visitor Use Monitoring Program results revealed that one-quarter of Lincoln National Forest visitors are “local,” almost 35 percent are considered “near-by neighbors,” and over 40 percent are “destination” visitors traveling more than 200 miles to the Lincoln. The 2014 national visitor use monitoring results estimated total visitation to the Lincoln National Forest at 767,000 people, which is a 10 percent increase from 2009.

The 2014 national visitor use monitoring results also show that 59 percent of visits are made by males versus 41 percent by females. In addition, Hispanic and Latinos (26.5 percent of visitors)

are the most common racial or ethnic minority. The Lincoln National Forest will need to serve this segment of the population better to maintain relevance. This may require more forest information in both English and Spanish and more opportunities for large groups of people to recreate together.

The scenic character of the Lincoln National Forest stands out, making it a major local and regional recreation destination with many visitors arriving from El Paso, west Texas, and Mexico. Most of the national forest area, about 40 percent, has a natural appearing scenic character and appears unaltered, although some human activities are present. While roads and trails are evident, they serve as the viewer platform, offering opportunities and access to view scenery, especially along the Sunspot and Billy the Kid scenic byways.

Viewing natural features or scenery has been among the top two recreation activities on the forest during the last two rounds of national visitor use monitoring. The population growth of regions surrounding the Forest and suburban development encroaching on lands adjacent to the Lincoln National Forest bring challenges for managing scenery. Changes from a natural appearing setting to a rural or urban setting are often quite abrupt. However, communities and homeowners value the natural appearing backdrop that the national forest provides.

Most noticeable changes to scenic conditions across the landscape occur through natural processes such as wildfires or flooding. These natural disturbances will continue to shape the vegetation and landform features of the landscape, affecting the overall sustainability of the scenic character. Fire can also benefit scenic character. Historical fires in the Sacramento Mountains have resulted, at certain elevations, in large areas of aspen that provide beautiful golden fall colors against green conifer-covered mountains. Other factors that will continue to affect the sustainability of the scenic character of the Lincoln National Forest include drought conditions affecting vegetation and water features, invasive species affecting native vegetation, tree encroachment on meadows and other forest openings, and aspen stands succeeding to conifer-dominated forest.

Several recent uncharacteristic, stand-replacing wildfires on the Lincoln National Forest have affected the quality of recreational settings. In order to protect the public during drought conditions, the Lincoln may at times put restrictions on campfires allowed in the national forest. When fire restrictions are in effect at any level, fewer people visit the forest. Over the past five years, with the exception of 2016, some fire restrictions have been in place on the Lincoln National Forest generally from May through July. Over the past 10 years, the Lincoln has been closed to all visitors three times for a period of two or more months. In addition to impacting forest visitors, local communities and their economies suffer as well. Fires affect trail conditions and create visitor hazards. The scenic quality of an area is also affected by fire as it changes the entire landscape.

In addition to environmental conditions, unmanaged recreation has been identified by the Forest Service as one of four key threats to the Nation’s forests and grasslands. The unauthorized use of off-highway vehicles in areas not designated for use is seen as a major component of unmanaged use. Off-highway vehicle use trends—including increasing numbers of participants and changing technology that has allowed access to previously inaccessible areas—impacts recreational settings because of dust, soil disturbance, the spread of noxious weeds, a proliferation of unauthorized routes, and other damage. Visitors also can cause damage,

including vandalism, graffiti, and more subtle impacts such as trampling, creation of bare ground, and user created trails.

Historically the Lincoln National Forest, like most national forests, relied primarily on appropriated funds to support its recreation program. Over time, the costs of doing business have increased and budgets have been declining. The Lincoln now depends on a wider variety of funding sources including volunteers and partners, fee revenue, and grants to meet recreation needs. The volunteer and partnership program on the Lincoln National Forest significantly contributes to the recreation program, with both on-the-ground accomplishments and by building community and goodwill.

The Lincoln National Forest collects fees at 17 recreation sites, six managed on the Smokey Bear and Guadalupe ranger districts and 11 concessionaire-managed sites on the Sacramento Ranger District. The developed recreation fee sites are Sitting Bull Falls on the Guadalupe Ranger District, Three Rivers Campground, Oak Grove Campground, Cedar Creek Picnic Shelter, and Sam Tobias Group Campground on the Smokey Bear Ranger District. South Fork Campground was included, but has not collected fees since 2012 due to damage from the Little Bear Fire. Over the last 10 years, an annual average of $51,869 was collected from the six recreation fee sites managed by the Lincoln. Currently, there is no clear trend of increasing or decreasing recreation fee income for the Lincoln National Forest. Fee collections have varied significantly (from a low of $28,287 in 2012 to a high of $85,406 in 2010); fees are highest when fire danger is low and the entire national forest is open to visitation, including both Sitting Bull Falls and South Fork Campground. These are two of the Lincoln's most popular fee sites and they have been closed various years due to fire and flood damage. Closures appear to have the most effect on fee collection, as most developed sites have hosts to assist with collection. The trend in fee collection is expected to increase in the future as the forests in New Mexico are in the process of a statewide fee proposal review. The very popular South Fork Campground is scheduled to reopen in 2020. Fee sites on the Lincoln are a critical component of the national forest's sustainable recreation program both because of recreation opportunities they provide and income they generate.

In 2006, the Lincoln National Forest began a comprehensive analysis of existing recreation facilities to evaluate how these facilities might operate more efficiently while receiving the required maintenance. This was an inward evaluation of what the national forest offers to the public—the financial costs of facilities and visitor use—to meet the changing preferences of our users. This evaluation identified the Lincoln National Forest as a dispersed day-use forest; the campgrounds offered are likely adequate for current and projected use; and that most visitors to the Lincoln choose to stay off-forest (for example, at hotels or recreational vehicle parks).

With current levels of appropriated funds, retained fees, partnerships and volunteer labor, the Lincoln National Forest is able to operate and maintain the existing recreation program; however, acquiring funds to make improvements is difficult. Some services are lacking, such as patrols of illegal off-highway use. Forest law enforcement officers have large areas to patrol and are not able to address every issue. These types of situations provoke visitor complaints and dissatisfaction with their recreation experience. Limited funding is available to improve visitor satisfaction or offer new and different recreation opportunities as visitor demand changes.

Recreation provides significant contributions to local and nearby communities within the Lincoln National Forest since recreational activities are one of the main reasons people come to this area. The Lincoln is considered an "introductory forest" in which most nonlocal visitors do not know the difference between a national forest and other similar looking undeveloped land ownerships. Thus, it is important to provide education and recreation opportunities that visitors find desirable so the national forest remains relevant.

Average overall satisfaction of all visitors for 2014 was high with 69 percent of all visitors rating their experience as very highly satisfied. National visitor use monitoring and interaction with the public has noted the need for social media resources to provide information about the Lincoln National Forest. There is a need to provide tourism type guides via digital media for handheld devises, especially where maps are concerned. The Forest Service as a whole, including the Lincoln National Forest, has not kept up with electronic technology trends. There is a need to use the latest technology to provide maps, guides, suggestions of places to visit, and available activities.

Public comments expressed concern for resource and soil damage from large campsites in dispersed areas. Other commenters saw the need to limit the duration of dispersed campers in a campsite or limit the number of vehicles. Other commenters saw the need for more camping sites. Comments also expressed concern for recreational shooting in areas with other users.

Plan Need for Change – Recreation and Scenic Character

- 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 other resource management such as soils and vegetation.
- There is a need for plan components to address illegal use and compliance to prevent resource damage.
- There is a need for management approaches to address those areas of public concern with law enforcement for the protection forest users and resources.
- There is a need for plan components to reduce user conflicts (for example, recreational shooting and hikers; equestrians, hikers, and bicyclists; and motorized and nonmotorized users).
- There is a need for plan components to better integrate scenery management within all forest management (for example, restoration, habitat diversity, and timber management) to further 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. The Lincoln National Forest assessment report documents the locations, purposes, and types of existing and proposed designated areas from the 1986 forest plan. Designated or eligible areas on the Lincoln include:

- Wilderness Areas (2)
- Wilderness Study Area (1)
- Eligible Wild And Scenic Rivers (17, totaling 132.8 miles)
- 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)
- Critical Habitat Areas Under Endangered Species Act (2)

The designated areas on the Lincoln National Forest (especially wilderness, national recreation trails, significant caves, and scenic byways) serve as destinations for many visitors and will continue to receive high visitor use levels. Management considerations will need to emphasize public education on the values and contributions of designated areas and resource protection efforts. During the forest plan revision process, inventories and evaluations will be conducted for wilderness and wild and scenic rivers to determine if additional areas should be designated. Research natural areas were proposed in the 1986 forest plan but not recommended or designated. In at least one case, ecological conditions that made the site desirable for study of old-growth spruce-fir systems were dramatically changed by the Little Bear Fire (2012). Proposed research natural areas should be evaluated for whether they meet the need of the intended research natural area, and should be evaluated for retention in the revised forest plan.

Public comment on designated areas indicated that the public did not want permanent designations or that they sought approval from allotment owners.

Plan Need for Change – Designated Areas

- There is a need to re-evaluate designated and proposed special areas (such as research natural areas and botanical areas) excluding congressionally designated areas, as considerable time has passed and conditions may have changed.
- There is a need to conduct designated area and wilderness evaluations for the revised plan while taking into account existing uses of the areas being evaluated and recommended

Infrastructure

Infrastructure consists of physical facilities and systems constructed to support the use of National Forest System lands. The predominant trend affecting the Lincoln National Forest's transportation system is decreasing budgets for repairs, maintenance, and improvements. The Lincoln has been successful in cooperating with counties to maintain roads that are used by the

general public and local communities. However, deferred maintenance needs required to bring the existing National Forest System roads on the Lincoln to their objective maintenance level exceeds $40 million. It is anticipated that demand for road use will increase with growing populations and desire for access to recreation opportunities and national forest commodities. In addition to National Forest System roads, many unauthorized routes exist that are not part of the Lincoln National Forest transportation system but the Lincoln has not done a comprehensive inventory or compilation of these routes.

Aviation facilities for the Lincoln National Forest include airstrips, heliports, launch pads, and other developed facilities such as an air tanker base used by the Forest Service and other agencies. Airstrips are popular destinations for backcountry pilots. There are two known historical airstrips located within the national forest. They include the Sunspot "Heliport" Airstrip and the Bluewater Airstrip on the Sacramento Ranger District. Neither of these airstrips are officially part of the Lincoln National Forest transportation system. Launch pads for recreational hang-gliders and paragliders are another form of aviation facilities on the Lincoln. On the Sacramento Ranger District, recreational pilots actively use the Horse Ridge Launch Pad.

Only about 29 percent of trails on the Lincoln National Forest are maintained to standard. The current trail system is not sustainable without assistance from resources outside of the Forest Service. The decreasing trend in federal budgets is expected to continue, thereby challenging managers' abilities to operate and maintain trails. The total estimated cost for deferred maintenance of the Lincoln's trail system is approximately $1.3 million, indicating a backlog of work and current substandard trail conditions. Fees used to maintain developed campgrounds and other fee sites cannot be used for trail maintenance, as they are not collected there. It is important that the needs of the public are met and that maintenance of trails and other infrastructure reasonably addresses the safety and accessibility needs of users of all ages and abilities.

Administrative facilities include office buildings, work centers, visitor centers, fire lookouts, warehouses, communications buildings, other utility buildings, and living quarters such as barracks and individual residences. The Lincoln National Forest manages and maintains 31 administrative sites, 9 of which include lookouts. Recreational facilities include toilet buildings, shower buildings, storage, entry stations, shade structures and other structures maintained for public recreational use in campgrounds, camping areas, interpretive sites, and picnic or day use areas. The Lincoln National Forest manages and maintains 29 developed recreation sites; however, recreational facilities are not exclusive to developed sites.

For example, current estimates of deferred maintenance needs on the Lincoln National Forest is approximately $21,000 for water systems and $178,000 for waste water systems. The future trend may be to decommission water systems resulting in reduced services at campgrounds. Furthermore, due to aging buildings, increasing deferred maintenance costs, and budget reductions, the trend in direction from the Forest Service Washington Office, General Service Administration and the White House is to focus on decommissioning under-utilized facilities and reducing square footage.

Despite the challenges faced in terms of budget limitations and resource protection concerns, the Lincoln National Forest has generally been able to meet the current plan objectives in the management of administrative facilities and has been successful in providing safe recreational

experiences for visitors. Facilities are provided for employees to work in that are safe and functional. Water and wastewater systems are provided that meet all operational safety requirements. Although the trend for funding is declining, there is no known resource damage occurring as a result of the management of administrative and recreational facilities on the national forest.

Public comment on facilities indicated a desire for more motorized trails. Other comments on trails saw a need to be fair, providing trails for equestrian in addition to hikers.

Plan Need for Change – Infrastructure

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

Land Ownership, Status, Use, and Access

The Lincoln National Forest boundary encompasses 1,095,470 acres that include 166,425 acres of other ownership. This mix of ownership includes the State of New Mexico, the Villages of Ruidoso and Cloudcroft, the City of Alamogordo, communities like Queen, High Rolls, Weed, Timberon, Nogal, and White Oks, and private land ownership scattered throughout the planning area. For the most part, these private inholdings were created when homestead or mineral entries were patented to private individuals. Due to the high number of inholdings within the Lincoln National Forest boundary and the amount of private land abutting the forest, unauthorized use, trespass, and encroachment occurs along the boundaries. Trespass cases include personal property being stored, roads being created, and entire homes and other structures being built on National Forest System lands.

Many land and recreation uses are covered by special use authorizations, which include permits, leases, and easements that allow occupancy and use on National Forest System lands. Special use authorizations are legal instruments whose terms and conditions are fully enforceable, and consistent with law, regulations, and policy. Currently, there are 378 special use authorizations issued on the Lincoln National Forest, which includes two long-term ski area lift permits. As an example, special uses permits like the two issued to the ski areas provide economic benefits to local economies.

Access to the Lincoln National Forest is primarily through U.S. highways, state highways, county roads, and National Forest System roads. A large portion of the national forest can be accessed directly from National Forest System roads. However, due to the “checkerboard” style of interspersed ownership within the national forest boundary, the Lincoln has significant access needs across private land on which there is no right-of-way. The Lincoln National Forest currently has 206 access road and trail easements across private land. There are a number of acquired rights-of-way in place but more could be acquired for access.

Public comments expressed opposition or concern for military use of the national forest, questioning the tool used for authorization, compensation to the Lincoln National Forest, and if military use conflicts with multiple use. Other commenters identified special uses as important to local economies.

Plan Need for Change – Land Ownership, Status, Use, and Access

- There is a need to develop plan components to manage special uses for the purpose of resource protection and public needs.
- There is a need to develop plan components related to the Forest Service land uses and adjustment programs to provide access, resolve boundary inconsistency, create connectivity for wildlife, and facilitate management.
- There is a need for plan components that encourage the acquisition of public access and protection of existing public access.
- There is a need for plan components related to military uses of the national forest.

Energy Resources, Mineral Resources, and Geologic Hazards

The National Renewable Energy Laboratory identified the Lincoln as a national forest with high potential for the development of two or more solar and wind energy sources. The potential for wind energy is highest on the Guadalupe Ranger District and fair-to-moderate on the rest of the Lincoln. At this time, there is no development of solar or wind energy on the Lincoln National Forest, but there has been significant development in areas adjacent to the national forest.

There are currently no hydroelectric or geothermal facilities on the Lincoln National Forest or within the four counties surrounding the forest and none predicted in the future. Potential for hydroelectric development within the plan area is extremely low due to the lack of water resources on the national forest.

Small diameter wood products produced by the Lincoln National Forest could potentially have social value by creating another local economy while meeting and enhancing restoration efforts. Interest in biomass and other products such as biochar has grown as the technology has improved. In the past 10 years, Otero and Lincoln counties have investigated the feasibility of woody biomass facilities, but so far nothing has emerged. The Lincoln National Forest, in combination with other sources, has potential to supply woody biomass for local industries.

There are numerous subtransmission, distribution, and underground 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—is planned to serve southwest New Mexico and southern Arizona. Another major transmission line, a 345-kilovolt line, crosses Otero, Chavez, and Eddy counties serving western Texas and southern New Mexico. Additional development of renewable energy could max out existing transmission corridors, which could prompt a need for new transmission lines over Forest Service lands.

The Lincoln National Forest has a long history of mining. Selected areas of the Lincoln National Forest were historically mined, which produced significant amounts of precious and heavy metals (gold, silver, lead and copper) in the early 1900s. World War II caused a revival of mining for a limited time but economic conditions limited production following the war. Currently, known deposits do not favor economic exploitation. Future developments in technology may change interest in the Lincoln's locatable mineral resources. At present, the Smokey Bear Ranger

District has one authorized plan of operation for access across a National Forest System road to an iron mine on private land, and there has been past interest in expanding the iron mine to include Forest Service land. There are currently no active mines on the Sacramento or Guadalupe ranger districts.

Coal mining was once a prosperous industry in Lincoln County in the White Oaks District and extensive coal deposits were found near Capitan in the late 1800s. From the late 1800s to the early 1900s, Lincoln County was the third-ranking producer of coal in New Mexico. However, numerous faults and dikes interrupted the coal beds, making them difficult to mine, and that led to the closing of a majority of coalmines in the early 1900s. The White Oaks District continued to produce coal for local use, including generating electric power for the town of Carrizozo until 1939. It is unlikely any future coal mining will occur due to economic costs and value of the resource. Currently, there are no oil or gas leases on the Lincoln National Forest and no leases for solid resources (coal, sodium, potassium, and phosphate).

Concerning saleable mineral materials such as sand, gravel, and other common variety materials, there is one active commercial pit on the Lincoln National Forest 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.

Interest in exploration and development of oil and gas may occur in the future. The Bureau of Land Management has approached the Lincoln National Forest in the past for leasing of natural gas in the northwest portion of the Sacramento Ranger District. Portions of the Guadalupe Ranger District have been closed to oil exploration in the past in order to protect cave resources. The current plan identifies limits for oil and gas surface use (but not locatable or salable minerals) to protect visual resources for specific locations. The protection of visual resources does not protect other resources such as traditional tribal activities or subsurface cave resources.

Lastly, the main geologic hazards of the Lincoln National Forest are flash flooding, rock falls, and debris flows. All of these to an extent have affected roads, trails, recreation areas, and infrastructure. Widely unregulated, production from mines throughout the national forest yielded a variety of metals and minerals with booms in the late 1800s and again during World War II. The decline of mining since in mid-19th century left behind hundreds of abandoned mines, many on National Forest System lands. The Southwestern Region and the Lincoln National Forest have an active Abandoned Mine Land Program with the program priorities being closing abandoned mine sites near trails, campgrounds, roads, and any other populated areas. Over the past 20 years, about 50 abandoned mine features on the Lincoln have been addressed.

Plan Need for Change – Energy Resources, Mineral Resources, and Geologic Hazards

- There is a need for plan components that address transmission corridors, nonrenewable, and renewable energy generation—including wind, solar, biomass, and geothermal—to protect natural resources, heritage and sacred sites, traditional tribal activities, caves, and scenery.

- There is a need for plan components regarding the use of common variety salable mineral materials, such as commercial contracts, personal use, and free use permits, while protecting natural resources, heritage and sacred sites, traditional tribal activities, and scenery.
- There is need for plan components regarding locatable minerals such as commercial leasing, while protecting natural resources, heritage and sacred sites, traditional tribal activities, and scenery.

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