United States Department of Agriculture

Gila National Forest
Draft Revised Forest Plan

Draft Environmental Impact Statement

Catron, Grant, Hidalgo, and Sierra Counties, New Mexico

Volume 2: Chapter 3 (continued), Glossary and References

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Cover Photo: View from Turkey Creek Road by Kris Deem

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Abstract: To comply with the National Forest Management Act and address changes that have occurred over the past 30 years, the Gila National Forest proposes to revise their existing land and resource management plan. This programmatic draft environmental impact statement documents analysis of impacts of five alternatives developed for programmatic management of the 3.3 million acres administered by the Gila National Forest. The analysis displays anticipated progress toward proposed desired conditions, as detailed in the Draft Revised Forest Plan, as well as the potential environmental and social consequences of implementing each alternative. Alternative 1 is the no-action alternative, which is the 1986 Forest Plan, as amended. Alternative 2 is the proposed revised plan and is reflected in the accompanying Draft Revised Forest Plan. This alternative addresses the needs for change since the Forest Plan was published and is the agency's proposed action. It promotes the Gila's niche of: dispersed recreation, traditional uses, and restoration. Alternative 3 maximizes mechanical restoration of grassland and open-canopy woodlands, while Alternative 4 maximizes mechanical restoration of forests and both alternatives limit the use of fire and emphasize access to traditional recreational, cultural, and historical uses of the forest. Alternative 5 emphasizes natural processes and maximizes wilderness recommendations.

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Contents

List of Tables

List of Figures

Chapter 3 (continued). Affected Environment and Environmental Consequences

Sustainable Recreation

Affected Environment

Recreation Niche and Settings

The 3.3-million-acre Gila NF offers spectacular scenery, ranging from high, cool mountains of aspen and Douglas-fir to warm semi-arid lowlands with juniper, oak, and cactus. It remains one of the most remote, uniquely continuous, and least developed national forests in the southwestern United States. Twenty-four percent of the forest's land mass consists of congressionally designated wilderness to be managed for primitive and semi-primitive non-motorized use.

The Gila NF includes the world's first designated wilderness and a proud history of excellence in wilderness stewardship of the Gila, Aldo Leopold, and Blue Range Wilderness Areas. Along with designated wilderness, there are a variety of additional designated and special management areas, designated trails, and scenic byways in the Gila. The quality of life and economic opportunities available for local communities are interwoven with the forest's future. The character of the Gila's recreation settings and opportunities are summarized in the Gila National Forest Recreation Facility Analysis (USDA FS Gila NF 2007), that describes the Gila NF's recreation niche and desired conditions:

> *"From wilderness to western heritage, visitors to the Gila National Forest have the opportunity to 'find themselves' in the wildness of the forest. The essence of the Gila is the freedom to explore vast expanses of backcountry. Heritage and cultural connections allow local communities, Native Americans, and recreationists to establish long-term bonds with the forest. Traditional gathering of forest products and hunting bring visitors from near and far. Rivers and lakes, uncommon in the Southwest, provide relief from heat across the forest."*

Because of its size, remoteness, light visitation, and the relatively sparse population of surrounding areas, the Gila provides for an unusually rustic recreation experience with many opportunities for solitude and a range of recreation opportunities, including access via roads and trails to vast expanses of backcountry. With vast undeveloped areas extending across the mountains and volcanic calderas, Gila provides backcountry opportunities including hiking, driving for pleasure, OHV use, camping, horseback riding, hunting, fishing, and wildlife viewing. The Gila's magnificent mountain scenery, cool summer temperatures and relatively warm winters permit a wide range of recreational opportunities year-round.

Ecosystem Services of Recreation

From cultural and social perspectives, the forest offers a variety of opportunities for recreation, scenic viewing, and places to connect with nature. It also offers rejuvenation and escape from urban environments and lifestyles, while providing an opportunity to experience solitude to connect to nature. Recreation contributes greatly to the physical, mental, and spiritual health of individuals, and bonds family and friends. Recreational gathering of forest products contribute to the public's

enjoyment and use. Hunting and fishing are two recreational activities that have regulating functions for ecosystems by serving to assist with management of wildlife populations.

Economic Contributions of Outdoor Recreation

According to the U.S. Bureau of Economic Analysis (2018), outdoor recreation annually contributes $412 billion to the Gross Domestic Product (GDP), or 2 percent of the entire United States economy.

Outdoor recreation in the Gila NF contributes to tourism and the economies of the local communities. Visitors to the Gila contribute spending to economies annually within the four-county area. Growing populations in Albuquerque, Las Cruces, El Paso, and Tucson have led to more people seeking the diverse recreation opportunities the forest offers. There are well-developed transportation links from these major population centers; however, the forest is still relatively remote distance-wise.

There were approximately 390,000 visits to the forest during 2016, with 48 percent of these visits from local residents (USDA FS 2016). The area holds ecotourism potential, and recently there has been increased marketing by the state and local entities to generate more visitation.

Recreational Opportunity Spectrum

Since the early 1980s, the Recreation Opportunity Spectrum (ROS) has been used by the Forest Service as a framework to identify, classify, plan, and manage a range of recreation settings for both existing and desired conditions. The recreation opportunity spectrum provides a framework for administrators to manage and users to enjoy a variety of recreation environments. The recreation opportunity spectrum is a management objective and provides a way of describing and providing a variety of recreation opportunities (USDA Forest Service 1982).

ROS provides a framework for stratifying and defining classes of outdoor recreation environments, activities and experience opportunities. The settings, activities and opportunities for obtaining experiences have been arranged along a spectrum divided into six classes. Each class is defined in terms of its combination of activity, setting, and experience opportunities. Opportunities for experience along the spectrum represent a range from a very high probability of solitude, self-reliance, challenge and risk (primitive) to a very social experience where self-reliance, challenge and risk are relatively unimportant (rural or urban; USDA Forest Service 1986).

When ROS classes were first determined for the Gila NF, they were incorporated into the 1986 forest plan. As part of the current forest plan revision process, a new ROS inventory and desired conditions process were completed and documented within GIS (USDA FS Gila NF 2016d). See appendix C for the ROS Inventory and draft ROS Desired Conditions maps.

ROS is divided into six classes as described below:

Primitive areas are characterized by essentially unmodified natural environment of fairly large size (generally, 5,000 acres in size or larger) and usually located at least 3 miles from any open road. Interaction between users is very low and evidence of other users is minimal. The area is managed to be essentially free from evidence of human-induced restrictions and controls. Motorized use and mechanized equipment within the area are not permitted.

Semi-Primitive Non-Motorized areas are characterized by a predominantly natural or natural-appearing environment of moderate-to-large size. They are managed to achieve a sense of remoteness, although semi-primitive non-motorized areas can be as small as 2,500 acres and generally are only a half-mile or greater from any open road. Interaction between users is low, but

there is often evidence of other users. The areas are managed in such a way that minimum on-site controls and restrictions may be present but are subtle.

Semi-Primitive Motorized areas are characterized by a predominantly natural or natural-appearing environment of moderate-to-large size. Concentration of users is low, but there is often evidence of other users. The areas are managed in such a way that minimum on-site controls and restrictions may be present but are subtle. Motorized use is permitted. Semi-primitive motorized areas generally either buffer semiprimitive non-motorized areas or stand alone as tracts of 1,500 acres or larger with a lower road density (less than 1.5 miles of road per 1,000 acres).

Roaded Natural areas are characterized by predominantly natural-appearing environments with moderate evidences of the sights and sounds of people. Such evidences usually harmonize with the natural environment. Conventional motorized access is accommodated. Roaded natural areas are located within 0.5 mile of a road and usually provide higher levels of development such as campgrounds, picnic areas, and river access points. Interaction between users may be low to moderate, but with evidence of other users prevalent. Resource modification and utilization practices are evident, but harmonize with the natural environment. Conventional motorized use is provided for in construction standards and design of facilities.

Rural areas are characterized by substantially modified natural environment. Resource modification and utilization practices are to enhance specific recreation activities and to maintain vegetative cover and soil. Sights and sounds of people are readily evident, and the interaction between users is often moderate to high. A considerable number of facilities are designed for use by large numbers of people. Facilities are often provided for special activities, such as amphitheaters, group pavilions, group fire rings and cooking units, and so forth. Moderate densities are provided far away from developed sites. Facilities for intensified motorized use and parking are available.

Urban areas are characterized by a substantially urbanized environment, although the background may have natural-appearing elements. Renewable resource modification and utilization practices are to enhance specific recreation activities. Vegetative cover is often exotic and manicured. Sights and sounds of people on-site are predominant. Large numbers of users can be expected, both on-site and in nearby areas. Facilities for highly intensified motor use and parking are available with forms of mass transit often available to carry people throughout the site.

A recreation opportunity inventory and assessment was conducted in 1980 for the Gila NF. This assessment was incorporated into the 1986 forest plan, identifying the five classes previously discussed in the affected environment. The recreation opportunity spectrum as inventoried in 1980, was used to develop the objectives identified in the existing forest plan, and was updated to include acres of desired condition for each classification based on those objectives. The acres of desired condition recreation opportunity spectrum class reflect what the land allocation direction of the plan is, not necessarily the inventoried acres. Standards and guidelines were included in the 1986 plan providing direction for making changes in inventory acreage to develop the desired conditions.

The 1986 plan identified existing condition primitive classification to be 526,611 acres, or 16 percent of the forest, but desired condition acres to be 326,363, or showing a decrease to 10 percent of the forest. Semi-primitive non-motorized classification acres of existing condition were 787,063 acres, or 24 percent of the forest, and desired condition acres increased significantly, to 31 percent of the forest at 1,023,684 acres.

Acres of existing semi-primitive motorized classification were inventoried as 7 percent of the forest, or 240,940 acres, and desired condition acres identified showed a slight decrease from that, at 194,169 acres, or 6 percent of the forest. Roaded natural existing conditions were 1,768,071 acres, or 53 percent of the forest, and though the total acres of desired condition were slightly less, at 1,771,995 acres, it was not enough of a decrease to change it from 53 percent. The rural existing condition consisted of 5,083 acres, or less than 1 percent of the forest, and showed a slight increase for desired condition at 7,647 acres, though this resulted in it remaining at less than 1 percent of the forest.

A GIS layer for ROS was never developed, based upon the inventoried or desired conditions identified by the analysis undertaken for the 1986 forest plan. The only existing, non-GIS mapping (Mylar sheets) is also incomplete, with a portion of one district is missing from the data. Due to technological changes and budget constraints, the existing ROS information was never transferred from these maps.

Table 58. Acres and percent of the Gila NF in each recreation opportunity spectrum class

Recreation Opportunity Spectrum Classes	Acres	Percentage of Gila NF
Primitive	522,748	16
Semi-Primitive, Non-Motorized	1,429,192	44
Semi-Primitive, Motorized	798,129	24
Roaded Natural	517,059	16
Rural	5,010	0.1
Urban	0	0
Total Evaluated for ROS	3,272,140	100

Developed Recreation Opportunities

Developed recreation is defined as requiring agency-provided facilities and results in concentrated use within an area (Gila Forest Plan 1986). The Gila NF currently has 33 developed campgrounds (including 2 group sites), 6 picnic sites (including 3 group sites), 98 developed trailheads, 3 public target shooting ranges on the Glenwood, Silver City, and Reserve Ranger Districts, an observation site, and an Interpretive Visitor Center near the Gila Cliff Dwellings National Monument. Developed sites and areas typically experience greater use during the summer and fall seasons and on holidays, although some facilities, typically southern and lower elevation locations, remain open year-round.

Dispersed Recreation Opportunities

Dispersed recreation includes all motorized and non-motorized activities that occur year-round throughout the forest at undeveloped locations outside of designated recreation sites and without use of developed facilities. The large size and contiguous land ownership of the Gila, combined with light visitation at many times of the year, provides unique opportunities for dispersed recreation solitude experiences outside of designated wilderness.

Motorized dispersed recreation includes, but is not limited to, OHV riding, scenic driving, and car camping. Most dispersed motorized recreation use occurs on or near existing NFS roads or motorized trails, which vary in condition and level of development.

Past Wildfires

In recent decades, the Gila has experienced large, high-severity wildfires that drastically changed some landscapes in parts of the forest. These large wildfires directly and indirectly affected recreation facilities and trails in the forest. Although some large-scale prescribed fires and wildfires have been managed for resource benefit, there were mitigations to minimize effects to values such as recreation facilities, trails, and scenic character.

Climate Conditions

The Southwest has recently experienced an extended drought, and climate predictions indicate drought conditions are likely to reoccur on a cyclical basis. As fire danger increases, restrictions are sometimes initiated to reduce the risk of human-caused fires. Depending on the severity of conditions, restrictions typically range from a ban on open campfires to forest closures. These restrictions limit forest visitor access to recreational settings and opportunities.

The extended droughts have also directly affected available water sources for hikers. Across the forest, there are limited water sources available, and in many areas, the distance between water sources limits the opportunities for trail users. The forest no longer has some previously reliable water sources from extended droughts, damage from wildfires, and a lack of maintenance to remote water developments.

Drought conditions have also affected water levels of the streams and lakes within the Gila NF. Decreased stream and lake levels have affected the diversity of recreational opportunities and resulted in concentrated use.

Recreation Access

Recreation access consists of trails, roads, and other transportation that connect people to recreation settings and opportunities. Recreation access to and within the national forests is provided by state highways, county roads, and a designated system of NFS roads and trails. Roads and trails not only provide access to recreation opportunities, but are themselves a recreation experience as driving for pleasure increases in popularity. Forest roads offer scenic views and provide direct access to trailheads, vistas, staging areas, campgrounds, and picnic facilities. Roads referred to as “maintenance level 1” are closed to motorized use and are maintained in storage and for future administrative access needs. Maintenance level 2 roads are managed to accommodate travel by off-highway and high-clearance vehicles. Maintenance level 3, 4 and 5 roads are managed to accommodate passenger cars and other licensed vehicles (these are closed to unlicensed off-highway vehicles, unless specifically designated).

In this analysis, the term “mechanized transport” is defined as transport powered by a living or non-living power source (such as an electric motor or internal combustion engine) and includes such things as bicycles and game carts. The term bicycle is used to represent mechanized transport in the discussion below. Bicycle use is allowed on designated motorized trails in addition to non-motorized trails except within congressionally designated wilderness or recommended wilderness.

Non-motorized trails are open to non-motorized uses including mechanized transport outside of wilderness and recommended wilderness unless otherwise closed by a Forest Service closure order. The Continental Divide National Scenic Trail (CDNST) allows mechanized transport outside of wilderness and recommended wilderness unless otherwise closed by a Forest Service Closure order. Electric bicycles are considered motorized vehicles and are restricted to designated motorized routes.

Non-Trail Motorized Vehicle Recreation Opportunities

Recreational motorized use in the forest is not restricted to the designated motorized trail system. Currently, there are 3,334 miles of NFS roads designated for public motorized use (table 59). Designated roads, trails, and areas open for motor vehicle use are identified on the Gila NF Motorized Vehicle Use Maps (MVUMs). Consistent with the rule, motor vehicle use off designated roads, trails, and areas identified on an MVUM is prohibited in the Gila NF.

Table 59. Miles of Gila NF roads by maintenance level currently open for motorized use

Road Maintenance Level:	ML2	ML3	ML4	ML5	Total
Miles of Roads:	2,932 (88%)	251 (8%)	129 (4%)	22 (<1%)	3,334 (100%)

Gila NF Visitation

Current levels of visitation to the Gila NF are considered to be at manageable levels. Total visitation showed a significant increase from 305,000 to 390,000 visitors between 2006 and 2016 NVUM survey results. However, the 2016 survey shows a significant decrease from the 2011 survey, which registered 514,000 visitors. While this represents an overall increase of 28 percent from 2006 to 2016, there was a 25 percent decrease between the 2011 and 2016 surveys (figure 40). This spike followed by a decrease in visitation may be attributed to multiple significant fires that occurred over large areas of the Gila during this time that may have affected public perceptions in a negative way, and discouraged potential visitors.

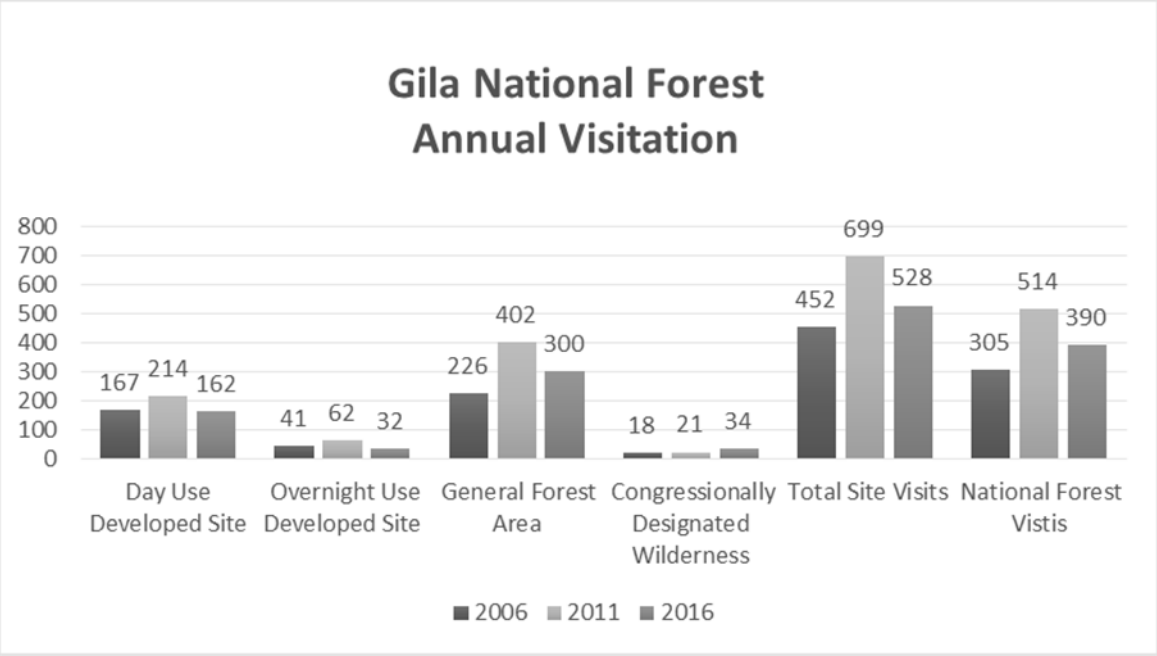


Figure 40. Gila National Forest annual visitation (X 1000)

Table 60 represents the estimated annual visits to the Gila NF between 2006 and 2016 by site category, total site visits, and overall visitation to the forest. It should be noted that multiple site visits may occur during a national forest visit, and therefore, site visits represent a larger number. Each site type demonstrated an overall increase of visitation between 2006 and 2011, with General Forest Areas (78 percent increase) having the largest growth. However, from 2011 to 2016 site visits

also showed a decrease except for congressionally designated wilderness, which actually shows an increasing trend from 18,000 site visits in 2006, to 21,000 in 2011, to 34,000 in 2016, or an overall increase of 89 percent.

Visitation to Day Use Developed Sites and Overnight Use Developed Sites, despite showing a spike in visitor use between 2006 and 2011, demonstrate an overall decrease in 2016 from 2006, by 3 percent and 22 percent, respectively. General Forest Areas had the highest spike in numbers between 2006 and 2011, and but also presented a precipitous decrease in 2016. Although General Forest Areas show a significant increase in numbers between 2006 and 2016, from 226,000 to 300,000 visits or 32 percent, the decrease from 2011 is by 102,000 or 25 percent. As stated before, the decrease in some types of site visits, as well as National Forest Visits, may be attributed to negative public perceptions due to recent fires.

When assessing the proportion of site type used from 2006 to 2011, there were actually decreases in both types of developed recreation sites; Day Use Developed Sites decreased by 6 percent and Overnight use Developed Sites (increased by 7 percent). The type of site visited is quite similar between 2006 and 2011, but there is a significant decrease for both day use and overnight use developed sites in 2016. Table 60 shows that while trend in total visitation has increased overall, it has decreased from 2011 to 2016.

The NVUM survey results demonstrate a trend of visitation shifting from developed sites to dispersed sites—including congressionally designated wilderness. A substantial extent of dispersed site use is associated with hunting and visitation of backcountry areas (including designated wilderness). A noteworthy trend demonstrated by the NVUM survey results is a considerable increase of visitation to designated wilderness. The most recent survey shows that visitation numbers in designated wilderness now exceed those of overnight use developed recreation sites by several thousand annual visits.

Table 60. Distribution of site type used between 2006, 2011, and 2016

Site Type	2006	2011	2016	Net Change
Day Use Developed Site	36.9%	30.6%	30.7%	-3.0%
Overnight Use Developed Site	9.1%	8.9%	6.1%	-22.0%
General Forest Area	50.0%	57.5%	56.8%	32.7%
Designated Wilderness	4.0%	3.0%	6.4%	88.9%
Total	100%	100%	100%	--

Visitor Activity Participation

The most popular activity for Gila NF visitors is hiking and/or walking, followed by viewing natural features and viewing wildlife. These pursuits may be accomplished in a variety of currently available and easily accessible forest settings.

Gila NF visitors have plentiful opportunities to experience solitude and pursue primitive recreation activities within wilderness areas and remote locations in the forest, or experience more social activities in frontcountry areas near communities and accessible by major travel routes within the

forest. Campers also have a range of opportunities from use of developed sites with services to dispersed camping in undeveloped or remote areas.

Water-based recreation opportunities include developed facilities located on lakes, along streams in close proximity to major travel routes, more challenging experiences along one of many remote streams accessible only by trail. Although it represents a small percentage compared to other types of activities visitors participate in, it is an important component of the Gila recreation niche, because by their nature such opportunities are unique and uncommon in the context of the southwestern United States.

Though limited by season, big-game hunting is a notably popular recreation activity in the Gila, and hunting experiences vary from using the services of an outfitter and guide to self-reliant hunts in remote areas, including designated wilderness. Although hunting is represented as a small percentage of participation and main activity by total NVUM respondents, it has the highest average hours being pursued as a main activity, at 43 hours per visit.

Figure 41 shows the diversity of and popularity of activities that respondents to the latest NVUM survey (conducted in 2016) participated in. The chart shows the percent of visitors that included each activity during their visit, the percentage of visitors who considered each as their main activity during their visit, and the average number of hours that visitors spent pursuing each as a main activity.

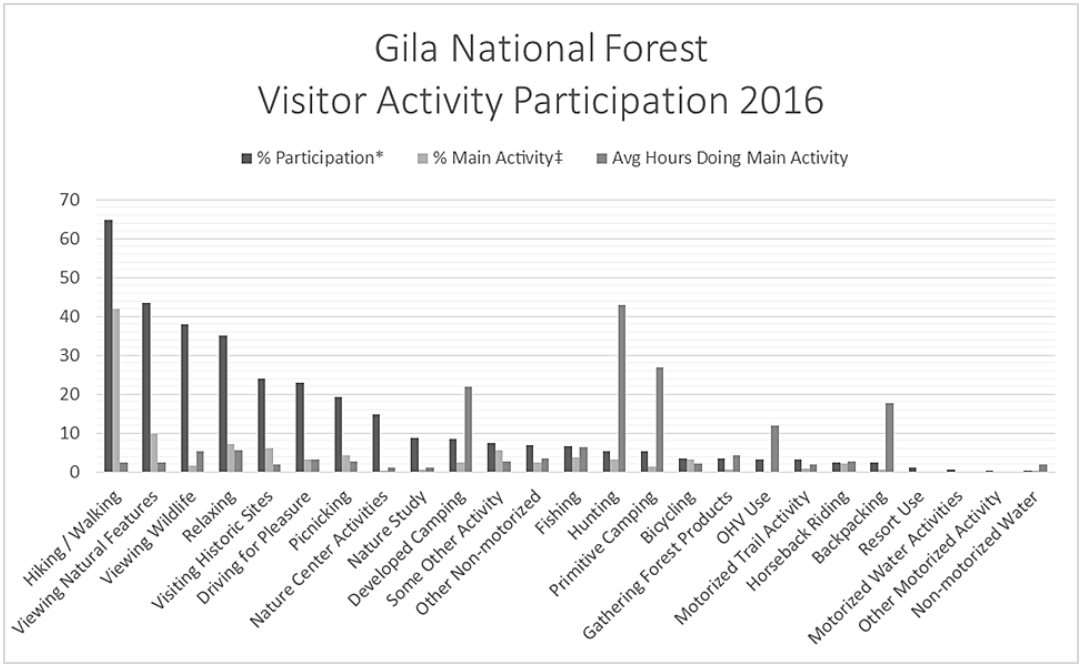


Figure 41. Visitor activity participation from the 2016 NVUM Survey

Sustainability of Recreation Opportunities

The Gila NF is no longer able to depend solely upon appropriated funding to provide a program that meets demands for recreation opportunities, and must unite diverse interests and focus scarce resources to sustain and expand the benefits of outdoor recreation. To sustain these benefits, the recreation program strives to achieve a sustainable balance among the three spheres of environmental, social, and economic conditions.

The current trend observed in the Gila NF is of increasing demand for services and levels of recreation use, in conjunction with flat or declining budgets and fewer staff. These factors make it increasingly difficult to maintain and operate the existing recreation and trails program infrastructure to standard. In addition, recreation facilities, particularly older sites, may no longer align with the capacity or use for which they were originally designed.

The Gila NF has created a Sustainable Recreation Strategy Action Plan to enable the recreation program to meet the needs of the public and protect resources, while being more efficient, effective, and sustainable within the current budget environment. The forest expects this action plan to be an evolving document based upon stakeholder input both internally and externally.

The goals of the Sustainable Recreation Action Plan are to:

- Provide a diverse range of quality natural and cultural resources-based recreation opportunities, and protect the natural, cultural, and scenic environment for present and future generations to enjoy
- Partner with public and private recreation benefit providers to meet public needs and expectations
- Implement systems and processes to ensure effective decisions, sound investments and economic efficiencies.

Partnerships Contributions to Sustainable Recreation

Partnerships and volunteerism are key components of sustainable recreation and allow the Forest Service to forge valuable relationships that help to provide a means of leveraging the agency's financial investment in recreation, while connecting people to the natural environment. It is generally through outdoor recreation activities, partnerships, and volunteerism that visitors interact with nature and experience the intrinsic values of the national forest.

Types of Recreation Opportunities

Dispersed Recreation

Dispersed recreation activities occur outside and completely independent of designated recreation sites or developed recreation facilities. The large size of the Gila NF and contiguous forest land ownership provide a unique opportunity for dispersed recreationists to experience solitude outside of designated wilderness areas. Dispersed recreation includes a variety of both motorized and non-motorized activities, and may occur throughout the year.

Motorized dispersed recreation activities may include, but are not limited to, OHV driving, scenic driving, and car camping. Most dispersed motorized recreation use occurs on existing NFS roads or motorized trails, which vary in condition and level of development.

Many roads are backlogged for maintenance, and have been degraded by flooding and erosion. Some motorized recreation visitors seek out these types of driving conditions, and consider them a challenging 4x4 experience. However, the risk of continued erosion will limit the use of these roads at the development level for which they are classified, as well as lead to further resource damage.

The trend of use for OHV recreational use has shown an increase over the five-year period from 2011 to 2016. Many of the roads and trails across the forest are user created that later became system roads/trails during a roads inventory process in the 1990s. The trend of user-created travel routes

creates a situation where many of these routes are in need of design features to minimize resource damages. Implementation of the Travel Management decision will reduce the number of user created roads and trails by identifying routes that are open for motorized travel and limit cross-country motorized travel to specific areas for specific purposes. These specific routes and areas identified for motorized travel have been selected to provide motorized access to areas while limiting resource damages.

Non-motorized dispersed recreation activities include, but are not limited to, hiking, backpacking, climbing, mountain biking, horseback riding and packing, some forms of dispersed camping, fishing, hunting, boating, exploring caves, geocaching, and nature viewing. Forest visitors engaging in these forms of dispersed recreation experiences often make use of the Gila NF's extensive single-track developed trail system.

Hunting while dispersed camping on-forest is a very popular recreation activity in the Gila NF. There are many popular user-developed dispersed campsites distributed throughout the forest. Most of these sites are in excellent condition. Many visitors that utilize existing user-developed campsites have been observed to be conscientious in maintaining a clean camp and minimizing any resource damage they may cause. Some common risks associated with dispersed campsites include litter, wheel ruts in the ground during wet conditions, and unattended campfires.

According to the 2016 NVUM survey, hiking/walking is most popular primary recreation activity of forest visitors. The Gila has limited opportunities for day hiking due to distances to trailheads, limited loop opportunities, and closures of popular trails following flooding and wildfire events. As a result of these conditions, there is a trend of increasing use at many popular day hiking trails. The risk associated with increased use at a limited number of trail opportunities include user conflicts, limited opportunities to experience solitude, and overcrowding during high use times.

Equestrian use (horseback riding and backcountry stock packing) are also popular forms of non-motorized recreation in the forest. This type of use primarily occurs within wilderness and less-developed forest areas adjacent to communities. Backcountry horseback riders visiting wilderness areas use vehicles and stock trailers to access trailheads and areas throughout the forest. It is common for some of these users to pull stock trailers for 3 to 5 hours to reach a trailhead. Many of these backcountry trips are multi-day in duration, and involve the use of both pack and saddle stock. Day-use equestrians are more likely to make use of forest trails located immediately adjacent to local communities. Conflicts between user groups are more likely to occur on these popular trails located near population centers.

Although not observed as being popular recreation activities, it is known that to some degree rock climbing and spelunking (cave exploration) do occur in the Gila. One limiting factor to the popularity of rock climbing has been the poor quality of the rock at many locations within the forest boundaries, compared to better quality locations nearby but outside of the forest boundary. However, there are some locations where rock climbing has been known to occur, sometimes with "bolted" routes, but more often less formal climbs using existing, natural anchors. Some better-known rock climbing locations include the Cherry Creek area in the Piños Altos Range, Purgatory Chasm in the Mimbres area, Chloride Canyon in the northeastern Black Range, some of the cliffs in the Jordan Spring area of the Gila Wilderness, and Saddle Rock in the northeastern area of the Burro Mountains. Similarly, cave exploration is also known to occur in the Gila, primarily in locations of the Black Range District, but is not a significantly popular activity. There is no direction in the current forest plan for management of either of these activities, inside or outside of designated wilderness. The risks associated with both of these activities include: if not accounted for in project

planning, these activities could be inadvertently impacted, and without appropriate oversight they may be a potential threat to wildlife, heritage, cave, or other forest resources.

Although the Gila NF is located within a semi-arid landscape, fishing and water-based recreation opportunities are available on approximately 957 miles of perennial streams and rivers, as well as on three reservoirs: Quemado Lake (112 acres), Lake Roberts (68 acres), and Snow Lake (72 acres). Some of the more common sport fish found in these waters include rainbow and brown trout, large and small mouth bass, as well as channel and flathead catfish. Quemado Lake is one of only two lakes in New Mexico that have a population of tiger muskie, which is a draw that attracts anglers from all across the region.

Many native fish are also found in the streams in the forest, some of which are federally listed as threatened or endangered under the Endangered Species Act. A particular draw attracting fishermen to the Gila NF region is the opportunity to fish for the threatened Gila trout. Many of the streams that had populations of wild Gila trout in the forest have experienced severe negative effects from wildfires to fish habitat. The Gila NF is partnering on several projects with the New Mexico Game and Fish Department and other groups with the goal of restoring Gila trout habitat and fish populations.

The available recreation facilities associated with the three lakes located in the forest have been steadily improved, including new boat ramps installed at Lake Roberts and Quemado Lake, improving access to for watercraft use on these waters. Several developed campgrounds are located near these bodies of water.

Current fisheries improvements along with increased stocking levels has created an increase of fishing based recreation. Access to many of the rivers and streams located in the forest is by way of system trails. Fishing and other water-based recreation activities are dependent upon current water quality conditions. One of the most significant risks to water conditions is negative effects from wildfire to vegetation and soils. Another risk to fisheries in the forest is the effects of prolonged severe droughts limiting the availability of water and affecting the amount of stream flow. Many lakes and streams rely on winter snowpack runoff, are spring feed, or some combination of both.

Developed Recreation

Developed recreation is defined as recreation that requires facilities and results in concentrated use of an area (Gila Forest Plan 1986). The Gila NF currently has 33 developed campgrounds (including 2 group sites), 6 picnic sites (including 3 group sites), 98 developed trailheads, 3 public target shooting ranges operated under special-use permits by their respective counties in the Glenwood, Silver City, and Reserve Ranger Districts, an observation site, and an Interpretive Visitor Center near the Gila Cliff Dwellings National Monument. Developed sites and areas experience greater use during the summer and fall seasons and on holidays, although several facilities (primarily on the southern and lower elevation portion of the forest) remain open and receive use year-round.

The Gila NF conducted a Recreation Facility Analysis (RFA) process in 2007 (USDA FS Gila NF 2007). Through this process, forest recreation staff analyzed all recreation facilities and evaluated how they might operate and maintain these sites and facilities more efficiently. The product resulting from the RFA process was a document that outlined a five-year program of work that included all of the tasks required to bring the forest's recreation infrastructure into alignment with the resources available to operate and maintain it to standard. These tasks included such actions as a seasonal closure of some facilities after hunting season; suspension of trash removal services at several sites; a

change in visitor capacity at some facilities; installation of new signs; repairs and renovations; decommissioning of some sites; establishing fees at some facilities and increasing them at other current fee sites; and increasing the recruitment and use of volunteers to help maintain facilities.

Many of the tasks identified by the RFA were completed within the five-year time period, which streamlined the management of many of the facilities. Revisions to the fee structure across the forest have not yet been accomplished at the time of this analysis. Additional opportunities for fee sites have been explored since the RFA was completed. These opportunities are currently being evaluated and initial planning is being conducted, including some site improvements required to be completed prior to implementation. One such opportunity currently being evaluated is to implement a cabin rental program in the Gila NF.

All recreation facilities are scheduled for a recreation facility condition assessment to be conducted and the results entered into the INFRA Recreation database at least once every five years. The inspections result in the documentation of all completed deferred maintenance requirements. An analysis that compares the between completed and deferred maintenance costs to the replacement value for each asset is known as the facility condition index. The facility condition index correlates to a facility condition rating of good, fair, or poor. A good condition rating describes a recreation site that is fully functional and poses little to no safety concerns to the public and agency personnel. A fair condition rating indicates that there is room for improvement, but overall function of the site is acceptable. A facility condition index rating of poor typically indicates the need for major repairs, replacement, or decommissioning of the facility.

The majority of the Gila NF developed recreation facilities are currently rated as in good condition. Annual and deferred maintenance needs and costs are identified and tracked in the INFRA Recreation database. Many forest-developed recreation facilities are in declining condition due to the growing backlog of deferred maintenance, age of infrastructure, cost of maintenance or replacement, and vandalism (e.g., graffiti, litter, physical damage to facilities, etc.). The risks associated with developed recreation facilities not being maintained to a minimum acceptable condition include threats to public safety by such hazards as poor condition of infrastructure, deficiency of hazard tree mitigations, non-accomplishment of improvements to limit damages from flooding and other environmental conditions, and health and safety issues associated with vault toilets. Other risks include a limitation on services provided at some facilities, site closures, imposing seasonal closures at more locations, or longer timeframes for seasonal closure periods.

Many of the risks to developed recreation facilities are posed by environmental conditions and natural disaster events such as fires, flooding, and prolonged drought, as well as insect and disease outbreaks. Any of these natural events may impact and create hazard trees within and surrounding developed recreation sites. Additionally, the presence of dead and dying trees within and near recreation facilities will have negative effects to the visual qualities of the area. Dead and dying hazard trees also result in decreased shading and increased risk to public safety due to dead trees falling on roads, trails, or facilities. To mitigate safety risks to the public, developed recreation sites are continuously evaluated for hazardous conditions and appropriate mitigation actions are taken as needed. Where appropriate, signage is posted within recreation sites and at trailheads warning of risks from falling trees.

Several developed recreation sites are currently closed due to damage from recent wildland fires and/or flooding. Other sites have instituted some type of seasonal closure or restrictions due to seasonal threat of flooding (e.g., monsoon season). Many of the forest's developed recreation sites are located within floodplains, which increases of the risk of flooding-related damages. Since these

sites are within riparian areas and floodplains, there are many limitations on what type of improvements can be implemented due to resource and public safety concerns. This creates a management challenge because terrain often limits moving these sites immediately outside of floodplains. The forest is attempting to balance meeting the visitor needs for developed recreation sites near water and providing for public safety concerns.

A trend on the forest is increased seasonal closures of some developed recreation sites. The risks associated with implementing additional seasonal closures include limiting availability of recreation opportunities, possibility of increased vandalism, and decreased visitation to these sites.

Vandalism that is known to occur in the Gila NF includes graffiti to structures within sites, destruction of government property, theft and damage to signs, and cutting of vegetation within the developed recreation sites. The Gila NF has been implementing the use of building materials that are more durable and resistant to environmental factors and vandalism. The disadvantage to using these materials is that they tend to be expensive, which places financial limitations on how many sites can be upgraded each year.

Night Sky

Boasting some of the darkest nights in the Southwest, the Gila NF offers many visitors the chance to view and admire the natural night sky, a glittering dome peppered with stars, planets, and passing meteors. Much of the forest lies within the darkest category on the Clear Sky Chart light pollution map, and on the Bortle scale rates a 1 or a 2 as being in the range of excellent to typical truly dark sky.

The Cosmic Campground on the Glenwood Ranger District has gained the recognition as an International Dark Sky Sanctuary by the International Dark Sky Association. This is the first International Dark Sky Sanctuary located on NFS lands. International Dark Sky Sanctuaries are lands possessing an exceptional or distinguished quality of starry nights. The Cosmic Campground offers a 360-degree, unobstructed view of the night sky, and often hosts “star parties” in cooperation with the partner group Friends of the Cosmic Campground. Having this designation will help further protect and raise awareness for the value for dark skies. This site is situated where there is little light pollution and low development. The greatest threat to this dark sky resource is increased development in the immediate area that could cause light pollution. However, design for the campground will ensure light pollution controls will be in place for the immediate area.

With trends of more and more people residing in expanding urban and suburban areas, the experience of viewing the natural night sky is becoming rarer and more unique This opportunity to view the natural night sky is relevant not only to astronomers, but also stargazing recreationists. The trend of recreationists utilizing the Cosmic Campground for stargazing will increase as awareness about the designation and as opportunities to view the natural night sky become rarer across the United States. Currently, there are limited islands of areas with these qualities across the region, and they will be increasingly rare as more development occurs.

Compatibility of Different Recreation Activities

Participants in the Values, Attitudes and Beliefs Survey for the Gila NF (USDA FS 2006a) discussed increasing demand for limited recreational resources, which results in the increased potential for one type of use to conflict with another (USDA FS 2006a). Participants in the Values, Attitudes and Beliefs Survey were concerned about conflicts between motorized and non-motorized uses. Participants also believed that many of the “problem users” simply lacked information about

appropriate forest rules and regulations. Unauthorized routes continue to appear and are created by both motorized and non-motorized activities, such as OHVs, horses, and hikers. Mountain biking is becoming an increasingly popular activity in the forest. There is a variety of opportunities for bikers in the Gila NF, but there is potential for conflict with other trail users, in addition to impacts to the resource if bikers travel off designated routes.

Many visitors tend to use the Gila NF for multiple types of recreation purposes in a single visit. For example, a visitor to the forest for big game hunting is also likely to camp either in a dispersed site or in a developed campground, using NFS roads and trails, viewing scenery and wildlife, or driving an OHV or using pack stock. A visitor enjoying a scenic drive viewing wildlife may also picnic, day hike, or visit an interpretative area.

Since most visitors to the Gila NF enjoy multiple recreation uses within a single visit, and are typically seeking solitude, conflicts between different user groups are minimal. The Gila NF is a large uninterrupted area of public lands, providing many opportunities for recreationists to find less crowded areas. Additionally, different user groups use the same locations but at different times of year. Where the majority of user conflicts occur are at developed recreation sites and areas where the forest is near communities, and are more likely during popular weekends and holidays when there is increased visitation.

Other recreation activities that may contribute to the demand for recreation within the Gila National Forest plan area include the growing interest in zip lines, use of drones, and geo- or eco-tourism. Depending on where these activities may occur, if not managed they could exacerbate environmental and social stressors described throughout this section. If managed appropriately, these activities attract visitation to the area and contribute to the local economies without undesirable impacts.

Recreation Fees

The Federal Lands Recreation Enhancement Act (FLREA) was signed into law by President Bush in 2004. It permits Federal land management agencies to establish, modify, charge and collect modest recreation fees at campgrounds, rental cabins, and at day use sites that meet specific facility criteria. Recreation fees provide crucial resources that allow the Federal agencies to respond to increased recreational demand on Federal lands. The goal is to provide visitors with a quality recreation experience through enhanced facilities and services.

The forest charges use fees at some of the developed recreation areas including the Catwalk Recreation Area, Dipping Vat Campground, Juniper Campground, Mesa Campground, Piñon Campground, and Upper End Campground. A majority of the revenue generated from these fee areas stays in the forest and supplements appropriated dollars to maintain and enhance recreation opportunities and amenities. However, the revenue that is generated by the fee areas is not sufficient to address all deferred maintenance needs.

The Catwalk National Recreation Trail is a tourist destination that experiences high visitation levels. This site contributes significantly to the local economy of the town of Glenwood. Due to the location of the trail within lower Whitewater Canyon, it is susceptible to damage from flooding, and has experienced periodic closures for cleanup and repairs. The risk associated with these periodic closures of the trail include impact to the economy of Glenwood and surrounding areas, while the loss of FLREA fee revenue affects future maintenance and enhancements. When significant damages occur to the trail, repairs are prohibitively expensive, causing strain to the forest recreation budget.

Since the Dipping Vat, Juniper, Mesa, Piñon, and Upper End Campgrounds all collect fees and generate revenue used in their maintenance and improvement, these facilities are currently in good condition. These sites typically have volunteer campground hosts to assist with collecting fees, distributing information, and performing routine maintenance. As unforeseen events occur and maintenance issues arise, having a campground host on-site to address or report them to managers helps to minimize the extent of damage and likelihood of closure for repairs.

Visitation to these fee sites has trended increasing in recent years, as observed by total fees collected. Total revenues increased from $57,758 in FY 2014 to $63,488 in FY 2015. Dipping Vat Campground is located at Snow Lake, Mesa and Upper End Campgrounds are located at Lake Roberts, and Juniper and Piñon Campgrounds are located at Quemado Lake. Since all of these forest campgrounds are located near lakes, drought and associated lower lake levels are among the greatest risks to visitation numbers for these campgrounds. Other risks that could affect visitation include quality of fishing opportunities, occurrence of nearby wildfires, condition of access roads, and negative impacts to the viewshed of the surrounding forest.

Compared to adjacent national forests, the Gila NF has very few sites that charge fees. Many campgrounds and developed recreation sites are provided at no cost to the visitor. While providing many campgrounds and other developed sites without user fees allows forest visitors from all economic backgrounds the opportunity use these sites, it does strain the recreation budget to continue to operate, maintain, and improve these sites. The risks associated with lack of user fees include a lack of maintenance funding as appropriated funding stagnates or declines. To mitigate impacts from these trends, the forest may need to consider alternative management actions that may include increasing the number of facilities that charge fees; increasing existing fees; reducing services at non-fee sites; implementing seasonal closure of sites during lower-use times of the year; and seeking assistance from outside partners.

Plan-Level Environmental Consequences

Analysis Methodology

This section provides analysis of the potential consequences that implementation of each alternative may have to the sustainable recreation program in the Gila NF.

Assumptions

- All alternatives will provide for a variety of motorized and nonmotorized recreation settings and opportunities.
- Motorized recreation under all alternatives will continue to be designated and managed in accordance with the Travel Management Rule, 36 CFR parts 212, 251, 261 and 295. Any changes to the forest transportation system would be as a result of updates to the current Travel Management decision or other project-level planning.
- The framework for recreation opportunity spectrum characteristics and the sustainable recreation strategy will be applied by project-level planning for all Gila NF activities.
- Although the recreation resource managers can manage settings, they do so to provide opportunities for recreation experiences and the benefits those experiences produce for individuals and society. Those experiences are influenced by many factors, the settings, the activities, other resources present, activities by managers, and by the values, expectations and other characteristics of the recreationists (USDA Forest Service 1986).

- Visitor use information specific to each ranger district is not available. National visitor use monitoring information is collected for the entire Gila National Forest. Site-specific and recreation-opportunity-spectrum-related use data is not available.
- Revision of the 1986 forest plan does not affect visitation rates in the Gila National Forest; however, new or altered management direction may influence the type of opportunities that are available to the public.

Methodology consists of analysis of a diversity of information sources, including but not limited to, data from recent NVUM surveys, the updated ROS analysis, and institutional knowledge of forest staff in all program areas. These were all considered in context of being in alignment with relevant law, policy, and regulations. The potential differences in treatments within Ecological Response Units (ERUs) as indicated by activities associated with vegetation management activities across alternatives were used to consider effects to recreation opportunities and resources from those activities.

In addition, the potential for effects to sustainable recreation opportunities and resources by implementation of the alternatives for recommended wilderness and eligible wild and scenic rivers were also considered.

Environmental Consequences Common to all Alternatives

Settings and Opportunities

Demand for recreational opportunities in the Gila NF is increasing, while many in-demand opportunities have limited availability on lands adjacent and nearby to the forest. Effects to the recreation program are known to be increasing by more frequent, uncharacteristically severe intensity wildfires, post-fire flooding, drought, insects and disease, and an increasing backlog of deferred maintenance for recreation facilities and trails. These impacts are likely to degrade the quality of recreation settings, opportunities, seasons of use, and visitor experiences. Management of forest recreation opportunities with stagnant or declining budgets, limited staffing, conflicting user group demands, and resource impacts will continue to be a challenge. It will be vital for the forest recreation program to work internally with other program areas and externally various partner groups, currently underserved communities, and volunteers to develop and implement a sustainable recreation program.

The ability for the Gila NF to remain relevant and responsive to changing recreation user trends, adapting to fluctuations in budget, and ability to adequately maintain existing recreation infrastructure are at risk of being unsustainable. Many of the forest recreation programs and opportunities are not aligned with current visitation trends and demands.

An unsustainable recreation program is likely to result in poorly maintained and degraded conditions for most or all recreation settings and opportunities due to a scarcity of available resources. Conditions are unlikely to improve, and more likely to continue to degrade over time. Some opportunities and settings may deteriorate to the point of no longer being safe and available for use, or if still available and safe for use, not adequate to provide for the quality or amount of use desired by Gila NF visitors.

Because of the likely deterioration to the safety, serviceable condition, or availability of recreation settings and opportunities resulting from the recreation program not being in a sustainable condition,

it is also likely that these circumstances will consequently result in a degradation to recreation experiences for many, or even most, Gila NF visitors.

Sustainability of Recreation Opportunities

Regardless of which alternative is implemented, by current regional office direction the forest will implement and update a Sustainable Recreation Plan. The effects associated with implementing this action plan under all alternatives is an improvement of the provision and quality of recreation resources and opportunities due to prioritizing essential programs and facilities directed by the plan. This effect will vary between alternative 1 and alternatives 2 through 5 commonly, due to additional plan components implemented later that provide supplementary direction likely to enhance the sustainability of the recreation program.

Visitation

The current level of visitation within the forest is considered to be at manageable levels. Potential impacts common to implementation of plan direction under all alternatives that may occur due to significant increases of visitation include negative effects to visitor experiences due to overcrowding in some popular areas, potential resource damage from overuse, and conflicts between incompatible types of recreation user groups seeking to use the same areas.

The largest projected increases in visitation are likely to occur in general forest areas, which tend to attract different uses at different locations and be dispersed widely across the forest. To date there have been minimal issues with overcrowding or conflicts between user groups within general forest areas. Areas of concentrated use are a current and projected management concern, especially in popular sites and trails such as those near Silver City and popular developed sites like the Sapillo and Grapevine Campgrounds, especially during holiday weekends and a risk of user conflicts between different use types.

NVUM survey results indicate a perceptible trend of visitor use shifting from developed sites to dispersed sites and congressionally designated wilderness, and this trend is likely to continue regardless of the forest plan alternative. Potential impacts common to implementation of all alternatives that are associated with increased dispersed recreation degraded visitor experiences due to resource damage from overuse within riparian areas, increased litter, perceptions of overcrowding, conflicts between visitors due to crowding, and conflicts between non-compatible uses. Increased visitation to the forest is one of the biggest factors contributing to the risk of conflict among different user groups. As visitation numbers rise, the likelihood of user conflicts also increases. Competition between user groups for more desirable recreation sites also increases the risks for user conflicts.

See the Socioeconomics section for analysis of contributions to local economies.

Facilities and Level of Development

The current trend observed in the Gila NF is of increasing demand for services and levels of recreation use, in conjunction with flat or declining budgets and fewer staff. Regardless of which alternative is implemented, these factors will make it increasingly difficult to maintain and operate the existing recreation and trails program infrastructure to standard. Recreation facilities, particularly older sites, may no longer align with the capacity or use for which they were originally designed. Such conditions are in contrast to forest plan desired conditions, and are likely to cause diminished quality and availability of desired recreation experiences for some forest visitors.

The forest has many developed recreation facilities that have been heavily impacted by recent fires and floods; are in declining condition due to an increased backlog of deferred maintenance; and/or not properly designed to provide the desired services. The forest cannot adequately maintain all of its facilities to standard. Many of developed recreation sites are currently being managed to accommodate many different uses within the same site, which can result in a site not properly functioning to meet the need of any of the desired uses. In addition, many developed sites are located within floodplains, which poses safety hazards and limits the opportunity to redesign the site to better meet the needs of the public. Though the forest may be better equipped to mitigate of the likely degraded physical condition and diminished availability for visitor use that impact recreation experiences by providing updated plan direction, the effects are still likely to be present to some extent, regardless of which plan alternative is implemented.

The forest sustainable recreation program, which will be implemented under any of the alternatives, may require closing underutilized recreation sites, the planning and development of new sites, and/or upgrading existing sites to meet user needs and desires. The negative effects associated with this will be lack of availability of some facilities that may have been favored by some visitors, or a reduction in the type or amount of services provided at some facilities. However, the long-term positive effects will be improved physical conditions and availability of services at all remaining sites, with a corresponding positive effect to visitor experiences.

The current trail system will be assessed as part of the sustainable recreation strategy, will the objective of establishing a more manageable trail system that better meets the needs of trail users while reducing the potential for user conflicts. The effects of a sustainable trail strategy may include negative effects to visitor experiences due to the loss of availability of preferred trails, should the strategy determine that trails should be decommissioned. Positive effects would be longer-term and of greater magnitude, due to enhancement of the forests ability to provide improvements to physical conditions, increased availability for use, and improvement of visitor experiences to the overall trail system.

Permitted Grazing

Under implementation of all alternatives as part of the agency's multiple use mandate codified by the Multiple-Use Sustained-Yield Act of 1960 permitted livestock grazing would occur on many areas of the forest, and would overlap with many recreation settings and opportunities. Regardless of the setting, whether in designated wilderness (and similarly managed areas), low development general forest areas, or areas with higher levels of development, the presence of cattle or the visible signs of grazing could have potential negative effects to recreation experiences of some forest visitors.

Dispersed recreation settings on trails and in undeveloped areas would be the most affected by permitted grazing, including activities such as camping, hiking, backpacking, mountain biking, and motorized trail use. These negative effects may include uneasiness or displeasure created by the presence of cattle, which could also affect experiences of solitude by the presence of domestic animals in an otherwise isolated setting. There may also be conflicts with both motorized and non-motorized trail users when animals are blocking passage or present a collision hazard, negatively affecting visitor safety and enjoyment of the trail.

Other effects to visitor recreation experiences may include visible evidence of grazing on the landscape, such as the visible presence of cattle congregating in riparian areas and other environments susceptible to degradation, visible trampling of vegetation, muddying or compaction of soils, and the presence of cattle feces. Any of these visible disturbances could also have the effect of

making general forest areas, campsites, or sections of trails temporarily or permanently unusable. They may also affect the recreation program by requiring additional maintenance, repairs, and associated costs.

Timber Sales and Mechanical Vegetation Treatments of Restoration Projects

Implementation of plan direction under all alternatives will result in use of varied mechanical harvest methods and vegetation treatments that are expected to have some effects to sustainable recreation resources and opportunities. The amount and duration of mechanical harvest and restoration treatments, as well as settings would vary by alternative due to the resource emphasis and objectives of each.

Anticipated negative consequences to recreation resources and opportunities of each alternative varying degrees of displacement (long-term and short term) during active timber sales and/or restoration projects from dispersed recreation sites, trails, and (less often) developed recreation areas. During timber harvests and mechanical vegetation treatments there will also be adverse effects to opportunities for solitude due to the presence and sounds of motorized equipment. This includes solitude opportunities both within and outside of designated wilderness. There will also be short and long-term affects to scenic character for persons recreating within and nearby to areas where treatments are currently in progress or have recently occurred.

There are also likely short-term physical effects to trails, dispersed recreation sites (including user-developed campsites), and to a lesser extent, developed recreation facilities due to mechanical vegetation harvest and restoration treatments. There are likely to be mitigated by best management practices under all alternatives, but likelihood and intensity of the effects will vary based upon alternative objectives.

Probable positive effects to recreation opportunities from mechanical treatments implemented under all alternatives will include varying amounts of (temporary and longer-term) improved access because of associated road construction and maintenance. This improved access will also have positive effects for access by visitors pursuing traditional forest uses such as permitted personal fuelwood gathering.

Prescribed Fire and Wildfires

Although unplanned wildfires are likely to occur regardless of which alternative is implemented, occurrence, extent, and intensity of wildfire and the resulting effects to the recreation program is not predictable across the alternatives. The amount and duration of prescribed fires, and the resulting effects to sustainable recreation, would vary by alternative according to the resource emphasis and objectives of each if implemented.

The scope and intensity of effects to recreation due to the occurrence of fire, both prescribed and wildfires, would vary by alternative, but include physical damage and impeded access to dispersed recreation sites, trails, and developed recreation areas due to post-fire flooding, debris flows, and burned tree snags. These will have a greater effect due to wildfires than with prescribed fire, due to prior planning and best management practices in place to mitigate effects due to prescribed burning. In both instances, effects will be mostly temporary, though in some cases may be of longer durations of months to decades.

Current trends indicate a likelihood for higher severity fire and flood events to occur in the future, along with more frequent intervals of these events. There are many common impacts from the

aforementioned wildfires to recreation facilities and trails. Some of the impacts likely to be experienced commonly across all alternatives include temporary recreation area and trail closures during the incident and post-fire effects of infrastructure damage and visual impacts to the landscape.

Typically, impacts from large, high-severity wildfires may cause greater damage with a longer duration of effect. Areas within and surrounding large fires typically experience more intense and frequent flooding. Other impacts/damages include landslides, dead trees falling on or within facilities and trails, encroaching nuisance vegetation, erosion, extended closures due to hazardous conditions, and silting in of available water sources. Rehabilitation and restoration projects may take several years to fund and complete, which could delay other planned projects from being addressed. There are probable effects to recreation opportunities and resources due to implementation of plan direction under all alternatives due to the occurrence of fire on the landscape, including both prescribed, agency ignited fires and unplanned wildfires

Climate Conditions

The Southwest has recently experienced an extended drought, and climate predictions indicate drought conditions are likely to reoccur on a cyclical basis. Regardless of alternative implemented, as fire danger increases, restrictions may be put in place to reduce the risk of human-caused fires. Depending on the severity of conditions, restrictions typically range from a ban on open campfires to forest closures. These restrictions would potentially limit access to recreational settings and opportunities.

Extended periods of warm weather may also lead to a longer “summer” recreation season, starting earlier in the spring and extending later into the fall. A longer recreation season may benefit visitors by increased availability of time to undertake some recreation experiences, but it may also necessitate the need to extend employment for seasonal staff, while incurring additional operation and maintenance costs for the forest. This could lead to a backlog of maintenance of trails and facilities, affecting recreation resources and opportunities by causing degradation of their availability and condition.

Under implementation of all alternatives, occurrence of extended droughts would directly affect available water sources for hikers. Across the forest, there is already limited water sources, and in many areas, the distance between water sources limits the opportunities for trail users. The forest has experienced loss of previously reliable water sources from extended droughts, damages from wildfires, and a lack of maintenance to remote water developments. The effects associated with the loss or limited availability of water sources, regardless of alternative, is limitations to user experiences due to lack of reliable water and an increasing need to carry larger amounts over longer distances.

In addition to water sources, these same stressors affect water levels of the streams and lakes located within the Gila NF. As stream and lake levels decrease, the diversity of recreational opportunities become more limited. This results in concentrated use of streams that continue to have flowing water conditions, and adds pressure to streamside trails. The flow rate, along with depth, can determine the quality of fishing, navigability by watercraft, and suitability for swimming or bathing in hot springs. Decreasing lake levels affect recreation access along shorelines, practical utility of boat ramps, and may result in lower visitation numbers.

Access

Under all alternatives, changes to the forest transportation system would only result from updates to the Travel Management decision or other project-level planning, and not a forest plan decision. Therefore, regardless of alternative, there are likely to be no direct effects to motorized access within the forest due to plan implementation. Implementation of all alternatives would provide for existing and future access to the forest recreation resources and opportunities to continue, however there are variables affecting the short-term quality and availability of motorized access that will differ between implementation of the alternatives that will be addressed separately in those sections.

See also the section on Trails.

Motorized Recreation

Under implementation of all alternatives, there would be no change to motorized recreation resources or opportunities from plan direction. With all alternatives, likely limited funding availability will also affect the physical condition of trails due to the inability to maintain all motorized trails to the highest standard, and many trails will be maintained infrequently. This will result in deterioration of physical trail conditions, and will likely diminish both the availability for use, and the quality of visitor experiences.

Night Sky

With implementation of all of the alternatives, Cosmic Campground on the Glenwood Ranger District would continue to have status as an International Dark Sky Sanctuary by the International Dark Sky Association. This designation will continue to further the protection and awareness for the values of dark skies for which it is intended. There is no likelihood for increased development in the immediate area that could cause light pollution under any of the alternatives, and the design of the campground will ensure light pollution controls will be in place for the immediate area. Under all alternatives, there will be positive effects by the availability of a dark sky experience sought by these visitors, also enhancing availability and enjoyment opportunities for camping combined with stargazing with telescopes minus light pollution. Campground physical condition will likely improve as well, positively influencing availability for use, and the quality of visitor experiences.

Emerging Trends

There is a trend of growing interest in adventure races and similar events such as boot camps, mud events and endurance races in the Gila NF. These events are usually held under a special-use permit by “for profit” organizations, although some are conducted as fundraisers. The activities associated with these recreation events may include: running, bicycling, paddling, climbing, orienteering, and other activities that require endurance, strength and agility.

There would be effects to the recreation program by these trends under implementation of all alternatives, including short-term effects experienced only for the duration of the event itself, to recreation experiences due to crowding, displacement of casual visitors not participating in organized events, degradation of solitude experiences, and conflicts between non-compatible use types. Other effects include physical degradation to trails, dispersed recreation sites, and developed sites by short-term increased occupancy of large groups of people within a limited area. Positive effects include increased enjoyment of experiences by visitors to whom they are desirable and enjoyable experiences.

Environmental Consequences to Alternative 1

Settings and Opportunities

Implementation of alternative 1 would result in the continued management of the Gila NF recreation program under direction of the 1986 forest plan, and would not include updates made under alternatives 2 through 5. These updates are intended to address identified Need for Change to desired conditions, standards, guidelines and management approaches to address the long-term sustainability, changing trends in demands, and intended use of recreation infrastructure, trails, and facilities.

Existing management direction would not direct the Gila to adequately manage recreation opportunities and settings, because the current forest plan was developed over 30 years ago. The 1986 plan also does not account for changing uses, emerging uses, or changing demographics. A good example of a changing use not adequately reflected under alternative 1 is that the technology advancements for off-highway vehicles has changed since the last forest plan was written. Outdated recreation opportunity spectrum classifications currently exist as a result of changes in management and land status since the plan was written. The current recreation opportunity spectrum would not adequately capture valued recreation settings and opportunities. This circumstance could result in management actions being taken, or recreational activities authorized, within areas that may alter the physical and social conditions that are appropriate to the desired opportunity class for that area. This may degrade the quality or availability of desired recreation experiences of visitors to these areas.

Existing standards and guidelines would not be updated to improve management direction of recreation activities and permitted special uses that occur in areas that are sensitive or at risk of resource degradation due to high visitation. Guidelines and management approaches in the 1986 forest plan that would facilitate public education, anticipate future program demands, and minimize conflicts between uses. Existing plan components do not emphasize the importance of effects to scenery and recreation opportunity classifications when planning site-specific resource management projects across all forest program areas. This lack of management direction could result in impairment to the safe and overall physical conditions of recreation settings and opportunities, and therefore also degrade the availability and quality of recreation experiences sought by visitors to these areas of the Gila NF.

Plan components would not be implemented with direction to address emerging uses such as management of caves, backcountry river use, and rock-climbing. Management direction in the existing plan does not provide a range of year-round developed and dispersed recreation settings that offer a variety of motorized and nonmotorized opportunities and recreation experiences. A lack of this plan direction could result in missed opportunities to manage settings and opportunities to accommodate and enhance visitor experiences and prevent unsafe conditions or impacts to other forest resources. Consequences of this circumstance may include degradation to the physical conditions and availability for use of recreation opportunities and settings, therefore causing impairment to the quality of visitor recreation experiences.

The existing plan guidance also does not recognize and account for the probability of stagnant or decreasing budgets foreshadowed by trends in recent decades, which if it continues, could limit the forest's ability to effectively manage recreation settings across the recreation opportunity spectrum. This would likely result in deteriorating conditions of recreation facilities and trails, which would also negatively affect visitor safety, and availability for use, all of which cumulatively would likely also diminish the availability and level of quality of visitor experiences.

Alternative 1 would also not provide adequate management direction on the need for partnerships and volunteers to help manage recreation opportunities and settings across the recreation opportunity spectrum in the context of limited current and future budgets. Absence of this emphasis in plan direction may include a diminished likelihood that prioritization of pursuing partnership and volunteers opportunities would occur. This may result in a diminished likelihood of progress toward recreation opportunities and settings desired conditions.

The combined lack of plan direction designed to address the identified Needs for Change in the context of increased costs and stagnant or even decreasing budgets is a probable continuation of downward trend in the availability and quality of settings of all components of the recreation program, including motorized and non-motorized trails, dispersed recreation, backcountry-specific recreation (including wilderness, eligible wild and scenic rivers, an similar settings and opportunities) and developed recreation. These factors would all combine to have a negative effect to the physical condition and availability for use of the spectrum of facilities, settings, and opportunities across the entire recreation program. This more pronounced decline of physical conditions and availability for use by implementing alternative 1 rather than the updated plan direction will also combine to have negative effects to visitor safety and enjoyment of recreation experiences.

Sustainability of Recreation Opportunities

Although a forest-wide Sustainable Recreation Action Plan would still be implemented and updated with implementation of alternative 1, the existing plan would not contain specific direction designed to support and enhance a sustainable recreation program in the Gila NF. This is particularly true for unmanaged recreation, where timely response to new uses that have potential ecological effects would be necessary into the future. The current forest plan also lacks the direction to adaptively manage new and emerging uses. Absence of this emphasis in the plan direction could result in these important strategic considerations not being adequately prioritized, diminishing progress toward desired conditions for recreation opportunities and settings on the Gila NF.

Absent any change in current trends of forest conditions that could adversely affect recreation settings (such as stand-replacing wildfire, disease, and mortality), implementation of current plan direction under this alternative would have a high potential for adverse effects in the form of degradation to the availability and quality of visitor experiences and condition of trails and on recreation settings. These recreation settings facilitate recreation opportunities such as hiking, wildlife viewing, and fishing. Therefore, any degradation to the physical condition of these settings would precipitate adverse effects to the availability and quality of all associated visitor experiences. These would likely be short-term impacts to recreation settings that would in most cases displace recreational visitors to unaffected areas rather than discouraging them from being engaged in at all. Long-term impacts to the quality of recreation settings and opportunities, negatively affecting visitor enjoyment, would result without restoration activities.

Visitation

The existing 1986 forest plan does not provide direction for managing current trends in visitor use. Without direction on managing visitor use, visitor experiences could be negatively impacted by an inadequate response to visitor conflict, crowding, or under-represented populations and uses. The existing plan does not provide updated informing management decisions on current and future trends of activities and visitor expectations. Implementation of alternative 1 would have negative outcomes to the availability of a broad range of visitor activities and recreation opportunities and settings would likely fail to meet visitor expectations.

There is no specific direction under alternative 1 addressing the necessity to protect resources where over-use or incompatible uses occur. Without clear updated management direction on managing visitor uses, visitor experiences could be negatively impacted due to perceived crowding, particularly where it is not expected, or by availability because resource damage could necessitate closure of recreation sites or areas.

Facilities and Level of Development

Management direction under the current forest plan does not provide a framework for the Gila NF to improve, maintain, or change management of existing recreation sites. There is no direction to develop plans for redesigning, restoring and rehabilitating sites if unacceptable resource impacts are occurring. A lack of this plan direction prioritizing such actions could result in deterioration of the safe and functional physical condition of recreation opportunities and settings, possibly necessitating closure of recreation sites. This circumstance could also result in the forest not creating new recreation facilities where demand and use warrant the development of additional infrastructure. This may result in the deterioration of the quality and availability of settings and opportunities appropriate to the desired recreation experiences desired by forest visitors. Although the 1986 plan does not inhibit such management direction to be undertaken in site-specific project-level planning, the likelihood that it will occur is greatly reduced by an absence of clear plan direction. This circumstance would result in negative effects that include a more pronounced deterioration of the physical condition of recreation sites and settings, and their availability for use. These would further contribute to negative effects to visitor safety, and degradation of visitor enjoyment of associated recreation activities, or their inability to pursue them.

The current plan also does not provide adequate specific direction to manage and maintain the condition, function, and accessibility of recreation facilities to accommodate a diverse public. A lack of clear management direction to address this would likely result in degradation to the quality of maintenance, physical condition, availability for use, and accessibility of recreation facilities to all forest visitors, and in particular would be likely to inhibit availability for use and degrade the quality of visitor experiences for those persons with needs for special accommodations by implementation of alternative 1.

Current management direction of the 1986 plan by implementation of alternative 1 also does not provide integrated direction for managing and operating recreation facilities in a changing environment, or respond to changes in visitor demands and uses or environmental conditions that may require new, or necessitate changes to existing facilities or changed access to recreation facilities. Without an integrated and responsive approach to managing these facilities, recreation development and facilities would likely be negatively impacted by deteriorating conditions, and degradation or availability of visitor recreation experiences could result in closure or underutilization.

Timber Sales and Mechanical Vegetation Treatments of Restoration Projects

Implementation of plan direction in alternative 1 would not be updated to reflect identified need for change to mitigate possible negative consequences to recreation resources and opportunities during active timber sales and/or restoration projects. Dispersed recreation sites, trails, and developed recreation areas would all be affected by this lack of updated direction. Effects may include physical damage or degradation of condition due to recreation settings and opportunities not being considered in planning or decisions. This may result in some opportunities or settings being unsafe or unavailable for use, and consequently degrading recreation experiences of visitors desiring to use them.

Although implementation of alternative 1 would address adverse effects to opportunities for solitude due to the presence and sounds of motorized equipment, both within and outside of designated wilderness, it would not be sufficient to address the identified need for change of current plan direction. There will also likely be short- and long-term effects in the form of depredation to the quality of scenic character for persons recreating within and near areas where treatments are currently in progress or have recently occurred, due to the Scenery Management System (SMS) not being implemented by the forest, and therefore, not integrated into project-level planning under alternative 1.

Because the current plan does not have direction to address relevant needs for change, there are likely short-term effects including depredation to the condition of trails, dispersed recreation sites (including user-developed campsites), and developed recreation facilities during mechanical vegetation harvest and restoration treatments. This may result in them being of a poor quality, unsafe or unavailable for use. These negative effects would likely be somewhat mitigated by best management practices.

Probable positive effects to recreation opportunities from mechanical treatments implemented in alternative 1 would include improved access resulting from associated road construction and maintenance. This improved access to certain areas of the forest would also be likely have positive effects by improving access to traditional forest uses such as permitted personal fuelwood gathering. This would also have positive effects to the experiences of visitors due to the improved access to and availability of these traditional uses.

Prescribed Fire and Wildfires

There are probable effects to recreation opportunities and resources with continued implementation of current plan direction by the occurrence of fire on the landscape, including both prescribed fires and unplanned wildfires. The occurrence, extent, and intensity of wildfire and the resulting effects to the recreation program are addressed under this alternative, but relevant needs for change to improve conditions would not be addressed.

Damage and impeded access to dispersed recreation sites, trails, and developed recreation areas due to post-fire flooding, debris flows, and burned tree snags would occur under implementation of this alternative. These will have a greater effect by wildfires than with prescribed fire, due to prior planning and best management practices intended to mitigate effects due to prescribed burning. These circumstanced may cause degradation to the quality and availability of recreation settings, opportunities, and experiences within fire-affected areas.

Recreation Opportunity Spectrum Classifications

As part of the forest plan revision efforts, a digital mapping update for the forest has been completed. However, without a GIS layer of the existing ROS classes, and due to differences in the inventory methodology from the 1986 Gila ROS to the 2016 Gila ROS including terrain adjustment, trends and comparisons are not possible and a quantitative comparison of ROS between alternative 1 and alternatives 2 through 5 cannot be completed.

The effects to recreation by continued implementation of the ROS classifications under the 1986 forest plan include a strong likelihood that ROS would not be accurately and effectively applied during project-level planning efforts. This would result in the forest not effectively achieving goals and objectives for recreation opportunities, resources, and experiences, causing degradation to both

physical condition of settings and facilities, as well as degrading the availability and quality of all types of recreation experiences for forest visitors.

Access

Existing recreation opportunity spectrum settings would not change under alternative 1; therefore, there would be no impact to nonmotorized, motorized or mechanized transport access under this alternative. The number of miles of access roads and trails would remain the same under alternative 1. Any changes to the forest transportation system would be as a result of updates to the current Travel Management decision or other project-level planning.

There is no recommended wilderness in this alternative; therefore, there would be no impact to mechanized access (mountain bike use) because there would be no direction implemented that would change the miles of system trails that allow mountain bike use. The number of miles of motorized trails and roads available would not be impacted since there would be no change.

Although there is no change to the number of miles of roads and trails available under implementation of plan direction in alternative 1, updated management direction would not be provided for motorized and nonmotorized trail systems that meet current demands, uses; as well as managing conflicting uses. This would likely have negative consequences to the ability to conduct and the quality of future trail management without relevant direction to meet current demands and uses. Management would likely be unable to achieve future program goals and objectives for maintaining and improving access to some areas of the forest, or be able to provide the level of availability and quality of recreation experiences desired by Gila NF visitors. There is also no current direction provided for trail connectivity, linkages to local communities, or access to destinations, all of which are a critical component of trail access.

Without a change in current trends of forest conditions (such as stand-replacing wildfire, disease, and mortality), there would be potential for decline in the physical condition or outright loss of availability of recreation access. These impacts would likely be short term in nature as roads and trails could be closed due to high-severity wildfires or hazardous conditions along roads and trails from hazard trees.

Mechanized and Motorized Recreation

Under alternative 1, there would be no change to the existing trails currently open to motorized and mechanized recreation (most commonly, mountain biking) as a result of the continued implementation of the 1986 forest plan.

Alternative 1 does not provide direction to adequately manage motorized and nonmotorized trails given that budgets are expected to decline. There is limited emphasis in the existing plan direction on using volunteers and partnerships to help manage trails with fewer federally appropriate funds available. Without adequate management direction for using volunteers and partnerships, there would be likely result in a decline in motorized recreation availability and quality of experiences to users of forest system trails, because they would not be maintained to Forest Service standards.

Recommended Wilderness

Alternative 1 is the “no action” alternative that analyzes effects if no changes were to the previous forest plan (as amended): consequently no new areas would be recommended as wilderness, and therefore there is no necessity to develop analysis criteria for this alternative. Additionally, under the 1986 forest plan, both the Hell Hole and Lower San Francisco River Wilderness Study Areas

(WSAs) were not recommended to Congress to be designated as wilderness, and so are also not recommended to Congress for designation as wilderness under this alternative.

Emerging Trends

There is a growing interest in adventure races and similar events such as boot camps, mud events and endurance races. These events are usually held under a special-use permit by "for profit" organizations, although some are conducted as fundraisers. The activities associated with these recreation events may include: running, bicycling, paddling, climbing, orienteering, and other activities that require endurance, strength and agility.

There will be effects to the recreation program by these trends under alternative 1 that would not be mitigated by changes identified in the need for change. These would be effects to recreation experiences due to crowding, displacement of visitors not participating in organized events, degradation of solitude experiences in the location of events and surrounding areas, and conflicts between non-compatible use types. Other effects under implementation of alternative 1 would include degraded condition of trails, dispersed recreation sites, and developed sites by short-term, but increased occupancy of large groups of people within a limited area. Positive effects include increased enjoyment of experiences by visitors to whom they are desirable and enjoyable experiences.

Environmental Consequences Common to Alternatives 2 Through 5

Quality of Recreational Settings and Opportunities

The revised forest plan implemented under alternatives 2 through 5 includes desired conditions, standards, guidelines and management approaches to address the long-term sustainability, changing trends in demands, and intended use of recreation infrastructure, trails, and facilities that were identified by the plan revision Needs for Change analysis of the Assessment Report.

Updates to existing, and addition of new desired conditions, standards, and guidelines in the revised forest plan implemented under alternatives 2 through 5 will address management of recreation activities and permitted recreation special uses that occur in areas that are sensitive or at risk of resource degradation due to high visitation. The effects of implementing this plan direction will be positive, and include the mitigation of likely physical impacts such as damage or degradation from lack of maintenance actions to resources, also reducing the likelihood of occurrence of these negative effects to the availability for use and quality of experiences for visitors.

Guidelines and management approaches are included in the revised forest plan implemented under alternatives 2 through 5 to facilitate public education, anticipate future program demands, and minimize conflicts between uses. This direction, if implemented will serve to enhance the provision of public education and interpretation programs, ensure that future program needs are anticipated, planned for, and executed, and that strategies and actions are planned and executed to address conflicts between user groups. All of these will likely result in the continued maintenance and condition of facilities, availability of facilities for use as needed, and the quality of visitor experiences.

Existing desired conditions, standards, guidelines, and management approaches would be updated in the revised plan in alternatives 2 through 5 to emphasize the importance of effects to scenery and recreation opportunity classifications when planning site-specific resource management projects

across all forest program areas. These plan components, if implemented, will likely maintain and improve the condition of scenic resources, ensuring that desired conditions for the SMS are met.

In alternatives 2 through 5, desired conditions, standards, guidelines, and management approaches have been created in the revised forest plan for addressing management of caves, backcountry river use, and rock climbing, because these activities that now occur in the forest were not addressed in the 1986 forest plan. This updated plan direction is likely to protect and enhance the safety, availability, and enjoyment of visitors seeking these recreation experiences, while also preventing impairment to the availability and quality of experiences of other forest visitors within the same general area, and reducing the likelihood of degradation to the physical conditions and availability of recreation settings and opportunities.

Updated management direction under alternatives 2 through 5 would mandate consideration of desired conditions of recreation opportunities and settings, and planning to account for changing uses, emerging uses, or changing demographics. Recreation opportunity spectrum desired condition classifications would be updated to adequately capture valued recreation settings and opportunities. This would enhance the characteristics of the desired classifications for these opportunities, in turn also enhancing the availability and quality of recreation experiences for visitors seeking them within these areas.

Changes to plan direction under alternatives 2 through 5 account for the likelihood of decreasing budgets that may affect effective management of recreation settings across the recreation opportunity spectrum. Effects of implementing alternatives 2 through 5 would include reduced or abated deterioration of the physical condition of desired settings and opportunities, and therefore, likely sustain or improve the usability of recreation facilities and settings that would also likely improve visitor safety preserving or enhancing the quality of recreation experiences. In anticipation of decreasing budgets, alternatives 2 through 5 provide updated management direction regarding the need for developing partnerships and recruiting volunteers to help manage the recreation program.

Sustainability of Recreation Opportunities

Although regardless of which alternative is implemented, in line with current agency policy direction, the forest will develop, implement, and update a sustainable recreation strategy intended to improve the provision and quality of recreation resources and opportunities. Alternatives 2 through 5 include additional plan components specific to sustainable recreation identified by the Need for Change. If implemented, these plan components would provide explicit management direction that is likely to enhance the sustainability of the recreation program. Therefore, implementation of these alternatives would result in enhanced sustainability of the overall recreation program, likely preserving and improving the quality and availability of recreation experiences for forest visitors.

Visitor Use

The updated forest plan under alternatives 2 through 5 provides updated direction on managing visitor use, to reduce impacts to visitor experiences due to visitor conflict, crowding, or under-represented uses.

The updated forest plan components provide a framework for informing management decisions on current and future activities and visitor expectations. This will serve to enhance the availability of a broad range of visitor activities and the national forest in a manner to meet visitor expectations.

Revised plan components provide direction to adapt to changes in visitor use levels, patterns of use, or the necessity to protect resources where over-use or incompatible uses occur. By providing clear direction on managing visitor uses, impacts to recreation visitor experiences due to crowding or closure of recreation sites or areas due to resource damage will be avoided.

Facilities and Level of Development

Management direction implemented under the revised forest plan would provide a framework for how the Gila NF will improve, manage, or limit existing recreation sites, including redesigning, restoring and rehabilitating sites, should unacceptable resource impacts occur. Revised plan direction for sustainably managing these recreation sites into the future will mitigate deterioration of existing recreation facilities preventing undesired closures of recreation sites or development of new recreation facilities where demand and use warrant additional infrastructure.

Revised plan direction under alternatives 2 through 5 provides integrated direction for managing and operating recreation facilities in a changing environment, and responding to changes in visitor demands and uses (or environmental conditions) that may be needed to make changes to facilities or alter access to recreation facilities. With an integrated and responsive approach to managing these facilities, existing and future recreation developments and facilities are unlikely to be closed or become under-utilized.

Recreation Opportunity Spectrum Classifications

As part of the forest plan revision efforts, a digital mapping update of ROS inventoried and desired conditions for the forest has been completed. Alternatives 2 through 5 would update all ROS classifications in the revised forest plan. This re-inventory uses updated methodology and has more refined information than the previous plan. Classifications identified are common across alternatives 2 through 5.

Primitive and roaded natural settings each make up 16 percent of the forest. The majority of the recreation opportunity settings under alternatives 2 through 5 would be semi-primitive non-motorized, comprising more than 44 percent of the forest. The three congressionally designated wilderness areas would be classified as primitive and semi-primitive non-motorized settings, providing an emphasis on linkages between wilderness and more remote opportunities. However, these settings will be available outside of designated wilderness in some circumstances, and often coincide with WSAs and IRAs. In most instances, recommended wilderness will consist primarily of these classifications, due to overlap of qualities of wilderness characteristics and primitive and semi-primitive non-motorized settings.

An additional 24 percent of the forest would consist of semi-primitive motorized settings, and roaded natural settings make up an additional 16 percent, while rural classification is only 0.1 percent of the forest. These settings would continue to provide opportunities for visitors to access and enjoy the forest by motorized access and for enjoying motorized recreation activities.

As has been related previously, absent a GIS layer of the existing ROS classes, and due to differences in the inventory methodology from the 1986 Gila ROS, including terrain adjustment, trends and comparisons are not possible and a quantitative comparison of ROS between alternative 1 and alternatives 2 through 5 cannot be completed.

The effects to recreation by the ROS classifications by implementation under alternatives 2 through 5 include a likelihood that ROS goals and objectives identified in the revised forest plan would be

implemented accurately and effectively applied during project-level planning efforts. This would likely result in the forest more effectively achieving goals and objectives for recreation opportunities, resources, and experiences, preventing the degradation to both physical condition of settings and facilities, as well as maintaining or increasing the availability and quality of all types of recreation experiences for forest visitors.

Access

The existing recreation opportunity spectrum settings would be updated and replaced under alternatives 2 through 5, however there would be no negative impacts to nonmotorized or motorized access under these alternatives. The number of miles of access roads and trails (both motorized and non-motorized) would remain the same under alternatives 2 through 5. Any changes to the forest transportation system would be as a result of updates to the current Travel Management decision or other project-level planning.

Although there is no change to the number of miles of roads and trails available under alternatives 2 through 5, management direction would be provided in the proposed updated forest plan for motorized and nonmotorized trail systems designed to better address current and future demands and uses while managing conflicts between different uses. This would improve the quality of future trail management activities and likely result in increased trail connectivity, linkages to local communities, and access to specific destinations.

Mechanized Recreation

Under alternatives 2 through 5, there would be some level of changes to the current 432 miles of trails open to mechanized transportation in the form of mountain biking as a result of some areas being recommended to Congress as wilderness. Effects to mechanized transport dependent recreation opportunities is discussed separately for each alternative below.

Motorized Recreation

Because the Inventory and Evaluation processes for recommended wilderness excludes all Maintenance Level 2 or higher NFS roads currently open to public use and designated motorized trails, there are no currently open motorized routes that will be directly affected by recommended wilderness.

All areas included as recommended wilderness under alternatives 2 through 5 would not be available for future road or motorized trail development by future modification of the Travel Management decision or other project-level planning. However, due to current and projected future budget constraints, and challenges to maintain the existing road and trail infrastructure, it is unlikely that the forest will develop additional roads and trails open to public use. Therefore, negative impacts to current and future motorized recreation are expected to be none to very minimal under alternatives 2 through 5.

Recommended Wilderness

Under implementation of any of alternatives 2 through 5, any land recommended to Congress for wilderness designation would be managed to maintain their wilderness characteristics, including their apparent naturalness, opportunities for solitude or primitive and unconfined recreation, manageability to protect wilderness characteristics, and any special features of value identified by the evaluation process.

Although plan direction for the management of areas recommended to Congress for inclusion in the National Wilderness Preservation System is common to alternatives 2 through 5, the amount and location of lands recommended for designation, and therefore managed to protect wilderness characteristics, are not. This variability is due to each alternative applying differing criteria to the analysis to determine if individual areas should be recommended under that alternative.

Common effects to recreation opportunities and resources described below are likely to be experienced under alternatives 2 through 5, because there would be some significant acres of lands recommended to Congress under implementation of each of these alternatives. However, the degree of effects is variable across the alternatives, and will be addressed separately within each, due to the variability across the alternatives of which areas, their location, their orientation to existing areas, what portions of individual areas, and the volume of overall acres are recommended in each.

Availability of non-motorized dispersed recreation activities such as hiking, horseback riding, camping, fishing, and hunting would not be negatively affected by recommendation of forest lands to Congress for wilderness designation under alternatives 2 through 5, because these activities are unaffected by the required management of these areas to protect wilderness characteristics. There would be maintenance or enhancement of the quality and availability of recreation experiences that are dependent on opportunities for experiences of solitude and remoteness from civilization and opportunities to pursue primitive and unconfined recreation activities by implementation of alternatives 2 through 5. This is because the areas recommended in these alternatives would be managed to protect these wilderness characteristics; however, the positive effects will vary and will be addressed separately in analysis of each of these alternatives.

Common to implementation of each of these alternatives, use levels mechanized recreation in the form of mountain biking would be reduced, negatively affecting this type of recreation use. This will vary and be addressed separately for each alternative.

Additional acreage for recommended wilderness would allow wilderness user impacts to be dispersed across a larger area providing an increase in wilderness visitor satisfaction. However, it would also result in decreased access for some wilderness non-conforming activities. A decrease in opportunities for bicycling and other forms of recreation requiring motorized transport or mechanized equipment would result. Bicycle and motorized use, as well as some other vehicular dependent activities would be displaced to other areas. Although this displacement would likely cause some increased use of other areas, is unlikely to be of a significant enough volume to substantially affect the availability and quality of recreation experiences for most visitors, due to the relatively light volume of mountain biking use in the Gila overall.

With implementation of each of these alternatives, within any recommended areas later designated by Congress as wilderness, maintenance of trails and infrastructure would be completed using hand tools only and administrative access would be made using non-mechanized and non-motorized means. This would likely increase the availability and overall quality of recreation opportunities dependent upon the presence of wilderness characteristics that would vary by alternative, but would have no positive or negative effects to physical recreation resources. Maintenance of trails and other infrastructure would be directed to continue, only the methods for accomplishment of these tasks would be different.

Research indicates that visitation and economic benefits resulting from tourism would increase in the surrounding local communities from more areas designated by Congress as wilderness. How much

of an effect that an area recommended but not designated by Congress would have is difficult to quantify, but is likely to some extent.

Emerging Trends

Due to proposed plan direction in common to implementation of alternatives 2 through 5 would all have the same effects to recreation resources and opportunities for addressing the trending recreation opportunities including, but not limited to, adventure races, similar events such as boot camps, mud events and endurance races that are most commonly facilitated by a special-use permit. The activities associated with these recreation events may include: running, bicycling, paddling, climbing, orienteering, and other activities that require endurance, strength and agility.

Under implementation of plan direction proposed by alternatives 2 through 5, effects to recreation experiences including crowding, displacement of casual visitors not participating in organized events, degradation of solitude experiences, and conflicts between non-compatible use types. There would also be physical degradation to trails, dispersed recreation sites, and developed sites by short-term increased occupancy of large groups of people within a limited area. However, the plan direction proposed that would be implemented in these alternatives would provide for very significant mitigation of both negative social effects and negative physical effects to resources. For this reason, negative effects would be minor and short-term in duration.

Positive effects from implementing plan direction proposed in alternatives 2 through 5 include increased enjoyment of experiences by the set of visitors that consider these types of recreation events desirable and enjoyable experiences.

Alternatives 2 through 5 would include direction to adaptively manage new and emerging uses, decreasing potential for adverse effects on recreation settings. There would a reduced likelihood of short- and long-term deterioration to the physical condition and availability of recreation opportunities and settings that would displace recreational visitors, increasing use and impacts to other areas. There would also be fewer long-term impacts due to a decline in quality of the recreation settings.

See the section on Recreation Special Uses for additional consideration of these types of recreation uses.

Environmental Consequences to Alternative 2 (Proposed Action)

Prescribed Fire and Wildfires Timber Sales and Mechanical Vegetation Treatments of Restoration Projects

Alternative 2 emphasizes a combination of naturally ignited wildfire, prescribed fire and mechanical treatments or thinning treatments, and while the negative effects that were described before for all alternatives will occur, they will be well mitigated by updated direction and best management practices. Effects will also be reduced from levels expected in alternatives that emphasize either timber harvest and mechanical restoration or use of prescribed fire over use of the appropriate method for individual circumstances.

Mechanized Recreation

Recommendation of 13 separate areas totaling 110,402 acres for wilderness designation would negatively affect mountain biking by prohibiting its use on 97 miles of trail where it is currently allowed, including 6 miles of the CDNST. This will affect mountain bikers by restricting this activity

in areas where it was previously allowed. This may affect use patterns by increasing mechanized uses on other trails that currently see less of this type of use. However, 335 miles of trails will remain open to mechanized transportation across the forest.

Environmental Consequences to Alternative 3

Prescribed Fire and Wildfires Timber Sales and Mechanical Vegetation Treatments of Restoration Projects

Alternative 3 emphasizes mechanical treatments or thinning treatments and limits the use of fire and concentrates predominantly on treatment of grassland and open-canopy woodlands, and while the negative effects described before for all alternatives will occur, they will be predominantly effects from mechanical treatment rather than use of prescribed fire. Effects would also be concentrated in the alternative emphasis areas and would be anticipated to be elevated from levels expected in alternatives that balance use of timber harvest and mechanical restoration with use of prescribed fire appropriate for individual circumstances.

Mechanized Recreation

Under this alternative, recommended wilderness in 26 areas would affect mechanized recreation, by prohibiting its use on 60 miles of trail where it is currently allowed, including 6 miles of the CDNST. This will affect mechanized users (mountain bikers) by restricting their enjoyment of this activity in areas where it was previously allowed. This may affect use patterns by increasing mechanized uses on other trails that currently see less of this type of use. However, 372 miles of trails will remain open to mechanized transportation across the forest.

Environmental Consequences to Alternative 4

Prescribed Fire and Wildfires Timber Sales and Mechanical Vegetation Treatments of Restoration Projects

Alternative 4 emphasizes mechanical treatments or thinning treatments and limits the use of fire and concentrates predominantly on treatment of forested ERUs, and while the negative effects described before for all alternatives will occur, they will be predominantly effects from mechanical treatment rather than use of prescribed fire. Effects would also be concentrated in the alternative emphasis areas and would be anticipated to be elevated from levels expected in alternatives that balance use of timber harvest and mechanical restoration with use of prescribed fire appropriate for individual circumstances.

Mechanized Recreation

Under this alternative, 17 areas totaling 72,901 acres recommended as wilderness, would affect mechanized recreation by prohibiting its use on 15 miles of trail where it is currently allowed, but including none of the CDNST. This will affect mechanized users (mountain bikers) by restricting their enjoyment of this activity in areas where it was previously allowed. This may affect use patterns by increasing mechanized uses on other trails that currently see less of this type of use. However, 417 miles of trails will remain open to mechanized transportation across the forest.

Environmental Consequences to Alternative 5

Prescribed Fire and Wildfires Timber Sales and Mechanical Vegetation Treatments of Restoration Projects

Alternative 5 emphasizes the use of fire and limits mechanical treatments or thinning treatments, but allows for some mechanical treatments or thinning treatments in the wildland urban interface. While the negative effects described before for all alternatives will occur, they will be predominantly effects from use of prescribed fire, and would be anticipated to be elevated from levels expected in alternatives that balance use of timber harvest and mechanical restoration with use of prescribed fire as appropriate for individual circumstances.

Mechanized Recreation

Under this alternative, 58 areas totaling 745,286 acres recommended for inclusion in the National Wilderness Preservation System would affect mechanized recreation by prohibiting its use on 207 miles of trail where it is currently allowed, including 56 miles of the CDNST. This would affect mechanized users (mountain bikers) by restricting their enjoyment of this activity in areas where it was previously allowed. This may affect use patterns by increasing mechanized uses on other trails that currently see less of this type of use. However, 225 miles of trails will remain open to mechanized transportation across the forest.

Cumulative Effects

Influences Outside of the Plan Area Affecting Demand for Recreation

Many factors and influences outside of the planning area that affect the use of and demand for recreation in the Gila NF. Examples of these influences include the preferences of New Mexico residents and out of state visitors for recreation opportunities, economic conditions, statewide and national recreation activity trends, and current / future recreational development within New Mexico.

Approximately every five years, the New Mexico State Parks with cooperating agencies and partners produce a comprehensive outdoor recreation plan. These documents compile data of trends and influences that affect recreation along with objectives and actions for New Mexico State Parks and partners. The two most recent plans were published in 2009 and 2015.

According to the 2015 Plan (NM EMNRD 2015), the favorite outdoor activities across the state of New Mexico are:

- Walking, hiking, and running 41 percent
- Hunting, fishing, shooting, and wildlife viewing 17 percent
- Camping 10 percent
- Visiting parks, lakes, and sightseeing 6 percent
- Team and individual sports 6 percent
- Biking and equestrian 5 percent
- Swimming and boating 4 percent
- Other activities 9 percent

These numbers are comparable to the NVUM data collected on the forest and show that the trend of preferred activities in the Gila NF and within the State of New Mexico are similar. This information emphasizes the importance of meeting the desired activities of visitors.

The Viva New Mexico plan identifies five key themes in which objectives and action items were identified to increase benefits that outdoor recreation can provide within New Mexico. The five themes are:

- Community Livability
- Trails
- Health
- Economic Vitality
- Environmental Health

These plans provide useful information such as the availability of alternative funding sources that could be taken advantage of to assist with completing future projects. Wherever the goals and actions of these plans align with those of the Gila NF recreation program, coordinated efforts could result in improved recreational opportunities within the Gila NF to future potential visitors.

Currently, there is an emphasis by the Gila NF to coordinate and partner with the State of New Mexico, local communities, chamber of commences, and other government agencies. Coordination with these partners helps to develop a common vision for needs and desires of the recreating public, and to make the most of developing new opportunities and improving existing ones. The forest is already working with local communities to emphasize recreation opportunities that could attract visitation and provide benefit to local economies, and NM True and Western New Mexico University also actively market the outdoor recreation qualities of the area. Implementing this alternative could result in insufficient communication and coordination with these partners that could also result in possible differences of priorities and vision. This could result in such consequences as unnecessary duplication of effort, or contradictory actions and priorities that would also likely result in diminished quality and availability of recreation experiences for Gila NF visitors.

Recreation opportunities on other lands within the broader landscape

There are a number of recreation opportunities available adjacent to and near the Gila NF. The Gila Cliff Dwellings National Monument, administered by the National Park Service, is located near the center of the Gila NF; and to the west of the Gila NF and across the border in the state of Arizona are the Apache-Sitgreaves NFs; and to the northeast are segments of the Cibola NF. Both of these forests offer recreational opportunities similar to ones found in the Gila NF. Differences from opportunities with these two nearby forests are the Gila NF has significantly larger wilderness areas and less development, while the Apache-Sitgreaves NFs tend draw more visitors for snow related activities, and have more fishing opportunities.

There are several New Mexico State Parks in the area surrounding the Gila NF that offer hiking and camping. Two nearby State Parks are located on some of largest lakes in New Mexico (Elephant Butte Lake and Caballo Lake), offering a variety of water related recreation opportunities as well as camping and hiking. Two other state managed lakes in the area that are popular fishing destinations are Bill Evans Lake and Bear Canyon Lake. City of Rocks State Park offers camping and hiking opportunities.

There are a number of BLM developed recreation sites in the region that offer hiking, camping, visitor center activities, and other opportunities. Additionally, many adjacent BLM and New Mexico State Lands allow both hunting and dispersed camping, although there may be more use restrictions on state owned lands. The primary difference between many of these aforementioned areas (except for the Apache-Sitgreaves NFs) is that they feature a semi-arid desert environment with limited forested areas as compared to the Gila NF.

There are several National Wildlife Refuges administered by the U.S. Fish and Wildlife Service located within the broader area, including the Bosque Del Apache, Sevilleta, and San Andres National Wildlife Refuges. These refuges all provide excellent opportunities for wildlife viewing, including large bird migrations.

Many of the recreation opportunities adjacent to the Gila NF have a minimal impact on the demand for recreation services provided by the forest. In many situations, visitors to nearby opportunities will make use of recreation sites on the forest as well. The majority of adjacent recreation opportunities offer a different recreation experience (either in a different ecological setting or unique activity not offered in the Gila NF), which allows visitors to southern New Mexico a variety of experiences in diverse settings. A common trend observed among visitors to southern New Mexico is that when visiting their planned destination, they discover other recreation opportunities found within the area. This is likely to enhance both the availability and the quality of their overall recreation experiences for the duration of their visit to the area.

Herbicide-Use Environmental Consequences

The following discussion of environmental consequences addresses the effects of the herbicide-use alternatives on recreation uses of the forest.

Effects of Herbicide-Use Alternative A-No Action

The no-action alternative would not authorize or initiate any new actions for treating noxious plants or the use of additional herbicides beyond what is currently covered under project-level decisions. This alternative would not approve new invasive plant treatments, and the current effects of invasive plants and their treatment would continue as approved based on the 2000 forest-level decision. With limited treatment options, infestations are likely to continue to multiply, particularly in disturbed areas.

If noxious weeds multiply throughout forest recreation areas and settings, they could outcompete and eventually replace native vegetation. Where non-native species dominate, they would not appear natural or appropriate to desired conditions for recreation settings, would likely be visually evident even to the casual observer. This could affect forest visitors by degrading the availability and quality of desired recreation experiences that depend upon settings that appear natural. This may also result in dispersing some recreation uses to other areas not yet affected by noxious weeds, with this increased and concentrated use resulting in physical degradation to resources by compaction, trampling and other damage to vegetation, and premature deterioration of the maintained condition of heavily used facilities. This could also degrade the quality of visitor experiences due to perceived crowding and the visible effects of physical degradation to recreation settings and facilities.

Some recreation areas and settings could be see reduced or suspended use by visitors if noxious weeds become prevalent as a result of degraded scenery or conditions, such as stiff plant stalks, thorns, goatheads, or sharp bristles. Travel through some areas may become difficult because of thick growth, abrasive vegetation and unpleasant thorns or burs. Weeds are most likely to spread along

roads and motorized trails. Roadsides and adjacent areas, such as turnouts, campgrounds, and firewood gathering areas, are most likely to have areas of disturbance that promote the proliferation of many noxious weed species. It is likely that new populations and species could be introduced, further degrading recreation settings and visitor experiences.

Weeds can affect the recreation or wilderness experience. Invading weeds such as spotted knapweed, Scotch thistle, and yellow star thistle detract from the desirability of using recreation sites and enjoyment of the wilderness. These species diminish the usefulness of dispersed wilderness and non-wilderness camp sites because the stiff plant stalks, thorns, or sharp bristles can discourage or prevent walking, sitting, or setting up a camp. Weeds also detract from the recreation experiences by reducing the variety and amount of native flora to observe or study and reducing forage availability for wildlife and recreational livestock.

Recreational experiences and values are likely to decline where tall, dense invasive species such as saltcedar dominate and limit access to riparian areas and stream banks. Proliferation of noxious weed species may also affect persons using nearby recreation sites that are susceptible to allergies, and would likely diminish the quality of recreational experiences for susceptible people.

Effects Common to All Herbicide-Use Action Alternatives

All of the action alternatives include the use of manual removal and herbicide treatments as noxious weed control methods. Under implementation of each of these alternatives, there will be common effects to recreation, although these effects will likely vary by frequency, location, and magnitude.

Herbicide effects include short-term degradation to visitor experiences due to visible evidence of dye use and the presence of dead and dying plants, but they have a high potential to improve long-term recreational experiences by eliminating invasive species and restoring native plants. Dyes used in conjunction with herbicides would fade within a few days. As plants die from herbicide treatment, they wilt and turn brown, and the plants generally become smaller than surrounding native plants. In the fall, as vegetation turns brown, treated plants may not be as distinguishable from native plants, and by the following spring could be unnoticeable. Other effects are the long-term improvement of visitor experiences due to the continued absence of noxious weeds in recreation areas and settings.

Manual treatments may result in an unnatural look if parts of the plants remain on site. Minor soil disturbance may be expected in small areas where noxious weeds are found, as the current conditions indicate generally patchy distribution of noxious weeds in the Gila NF. These treatments by themselves may only contain plant populations and could have to be repeated unless other treatment methods are used, causing visual effects to persist. As a result, manual treatment methods may not be effective at re-establishing native vegetation to desired conditions, and recreation experiences could continue to be degraded.

Under all treatment methods, the degree of effects to recreation experiences generally would depend on the size and density of the treated invasive plant infestation. Effects are most likely to occur in small patches, interspersed with native vegetation, and treatments would not likely be noticeable within several weeks. Larger patches may be present in open, dry areas. Broadcast spraying along open system roads and open spaces could result in more concentrated short-term degradation of recreation experiences, but these areas are already negatively affected by the presence of noxious weeds. Short-term impacts could be offset by improvement in long-term visual quality and recreational experience by restoring native vegetation.

Recreational experiences may be degraded and recreationists may be inconvenienced by all types of treatments due to the presence of warning signs, noise from equipment, smells, and possibly some areas being temporarily closed to public use. These short-term recreational impacts, usually a few days in duration, may be offset by the positive effects to recreation experiences by long-term restoration in native plant populations. Other social impacts that may occur include degradation or loss of availability of use of areas for visitors that are uncomfortable or fearful of the perceived health effects of herbicides.

Effects of Alternative B

The effects from this alternative would include all areas likely to be treated for noxious weeds and native vegetation for restoration and fuels reduction, and therefore effects to sustainable recreation described as being common to all alternatives would be likely to occur in these areas.

Effects of Alternative C

The effects from this alternative would not include any areas treated for native species, and therefore, the effects that are described as common to all alternatives are only likely to occur in areas that may be treated for noxious/non-native species.

Effects of Alternative D

This alternative would allow chemical treatment of native species, but would restrict herbicide applications to the urban interface. The effects that are described as common to all alternatives are only likely to occur in areas that may be treated for noxious/non-native species, and native re-sprouting woody species in the WUI.

Effects to human health for all alternatives are covered in the Social and Economic Conditions section.

Cumulative Effects

The cumulative effects analysis area for sustainable recreation and scenic resources areas is the forest boundary since treatments off-forest are not likely affect conditions within.

Past and current actions have resulted in the introduction of nonnative invasive and noxious plant species that are on the forest today. Past road construction created ground disturbance conducive to invasive species establishment, and facilitated the transport of invasive plant seeds and parts on vehicles and equipment used for recreation, logging, mining, grazing, fire suppression and administration. People and livestock have also brought in invasive plant seeds and parts on their equipment, clothes, and fur.

Under alternative A with limited noxious and herbicide treatment options could lead to further spread of noxious weeds impacting visual quality and recreation experiences.

Under the action alternatives, weed treatments would meet visual quality objectives in the long term. The visual effects of treatments, which are dead or dying plants, are temporary. Brown, dead, or dying vegetation would last no longer than it takes for native vegetation to grow back, normally a season. Dead or dying vegetation is a natural phenomenon, especially given the current drought. Even weed control treatments applied in designated wilderness would be expected to conform to the visual quality objective of preservation since treatments would not substantially alter the form, line, color, or texture of the landscape, or create a stark contrast with the surrounding vegetation.

Cumulatively, the action alternatives would incrementally slow the spread of invasive and noxious species introduced by past and present (ongoing) actions and would move toward restoring native plant populations. The proposed actions would also allow for rapid treatment and containment of invasive and noxious plants prior to, during and after future ground-disturbing projects (such as road construction or maintenance, and vegetation management projects) that might otherwise spread existing invasive species populations. Having the option to treat invasive and noxious weeds with herbicides, along with best management practices for weed prevention, would reduce the potential for spread, and maintain or improve both scenic objectives, and the availability and quality of visitor experiences.

The forest has implemented a travel management decision that identifies motorized routes (roads and trails) and prohibits cross-country motorized use except for corridors allowing for dispersed camping. Because vehicles are a very common method of spread of invasive species, restricting where the motorized use may occur on the forest has the additional effect of minimizing their spread from current infestations, helping to maintain scenery quality and recreational experience in relation to noxious/invasive plants.

Recreation Special Uses

Affected Environment

Introduction

All occupancy, use, and improvements on NFS lands that are not directly related to timber harvesting, grazing or mining activities are referred to as special uses. Special use authorizations (permits, leases or easements) are legal instruments whose terms and conditions are fully enforceable and support the Forest Service mission and meet the needs of the public. Authorizations may be short term, such as for recreation events or noncommercial group uses, or longer term such as resorts and communication uses.

Special uses authorizations are divided into two categories: recreation and non-recreation. Non-recreation special uses are analyzed under the section: Land Ownership, Use, and Access. Recreation special uses include activities related to resorts, ski areas, outfitting and guiding services, and recreation events. Recreation special-use authorizations are a partnership between the Forest Service and private businesses and individuals to provide services, activities and facilities.

All uses of NFS lands, improvements and resources are considered “special uses” except for noncommercial recreational activities and certain activities governed by other regulations such as mining, timber, or grazing. Authorizations are issued to commercial and non-commercial operations that provide occupancy and use of NFS. Authorizations are also issued for private, non-exclusive use.

The Forest Service Special Uses Program authorizes occupancy and use of NFS lands and resources through the issuance of a permit. Permit terms and conditions protect public and natural resource values while affording the permit holder the opportunity to conduct commercial business in the national forest. Recreation special uses also include certain private recreation opportunities in limited circumstances (such as recreation residences).

Under various laws and regulations set by Congress, the Forest Service collects land use fees for special-use authorizations. While most land use fees are returned to the United States Treasury, some fees are retained by the forest. Certain recreation special-use authorizations, such as outfitter-guides and recreation events, generate revenue for the forest, which is directed to improve visitor services and address upgrades or deferred maintenance of recreation facilities.

Procedures for the review and response times for special-use applications and requests are now set by policy and regulations outside the forest plan and will apply regardless of the alternative selected.

Currently. the Gila NF administers recreation residence permits, a marina permit, target range permits, a visitor center / museum permit, and church group events along with many single occurrence type events. Some the single occurrence type events that typically occur on the forest are weddings, family reunions, field schools, school-related field trips, and many others.

Plan-Level Environmental Consequences

Analysis Methodology

This section analyzes the potential consequences for implementation of forest plan direction each alternative to recreation special uses in the Gila NF.

Assumptions

- The Gila NF recreation special uses program will continue to be administered in consistent alignment with applicable law, policy, and regulation.
- Administration of outfitter-guide permits in congressionally designated wilderness will be conducted in alignment with the direction of the Wilderness Act section 4(6)(d) and in alignment with other relevant law, regulation, and policy.
- Recreation special uses authorized in areas recommended to Congress for wilderness designation will be administered with similar considerations to those for existing, designated wilderness to comply with the legal mandate to protect their wilderness characteristics until Congress either designates the area, or provides changed management direction.
- A trend of growing interest in adventure races and similar events such as boot camps, mud events and endurance races involving activities such as running, bicycling, paddling, climbing, orienteering, and other activities that require endurance, strength and agility is likely to continue throughout the next forest planning cycle.
- Visitor experiences are negatively impacted due to crowding or conflict and the sustainability of the natural and cultural resources that support these activities are degraded when recreation special uses are authorized at levels of use or within locations where they are not appropriate.
- Regardless of alternative implemented, where need is demonstrated adaptive management will be used to align issuance of any new authorizations to existing law, policy, and regulations

The analysis methodology for recreation special uses consists of consideration of a diversity of information sources. These sources include data from recent NVUM surveys, the updated ROS analysis, the current plan revision wilderness recommendation process, and institutional knowledge of forest staff in all program areas. These were all considered in the analysis within the context of being in alignment with law, policy, and regulations. The differences in proposed treatment types within Ecological Response Units (ERUs) across all alternatives were used to consider effects to resources from those activities.

Effects Common to All Alternatives

Emerging Trends

Gila NF recreation staff has identified an anecdotal trend of growing interest in adventure races and similar events such as boot camps, mud events and endurance races in the Gila NF. The activities associated with these recreation events may include: running, bicycling, paddling, climbing, orienteering, and other activities that require endurance, strength and agility.

There could be effects to the recreation special uses program by recreation special uses trends observed anecdotally by Gila NF recreation staff under implementation of all alternatives. These effects may include degradation to availability and quality of visitor experiences due to crowding and conflicts due to competition with other use types.

Other effects could include physical degradation to recreation special uses settings by short-term increased occupancy of large groups of people within a limited area. Positive effects may include increased enjoyment of experiences by visitors to whom they are desirable and enjoyable experiences. There may be some variability in the magnitude of these effects because of differences in plan direction resulting from the plan revision Need for Change process.

Alternative 1 – 1986 Forest Plan

In general, continued implementation of the 1986 plan would provide direction on suitable places for special-use permits and a goal for special uses meeting the needs of communities and the public. It would encourage working to approve uses that meet the needs of expanding communities, while minimizing impacts to other resource values.

However, administration of recreation special uses has seen changes in policy and regulation since development of the 1986 plan. Some direction and terminology in alternative 1 is considered overly prescriptive and in some instances is no longer be consistent with current policy direction. In order to provide a legally defensible special-use permitting process, it must be in alignment with current regulations and policy direction.

The 1986 plan direction would not be updated for administration of the special uses program to allow for current and future alignment with current national, regional, and forest policy direction without the need for amending the forest plan. Effects to special uses may include possible program of work capacity impacts due to the need for completion of legally required NEPA analysis to facilitate amending the 1986 plan to be in alignment with policy requirements.

The existing plan lacks specific management direction on when and where it is appropriate to emphasize recreation special-use authorizations is somewhat deficient in providing considerations that should inform decision making. As a result, special uses could be permitted where they may not be appropriate and could result in effects such as over-crowding in popularly visited areas, or permitted uses exceeding the sustainability of the natural and cultural resources that support the activities. The availability and quality of visitor experiences could be degraded due to crowding or conflict. Resources may also deteriorate due to soil compaction or muddying, trampling, cutting or other damage to vegetation due to overuse within an area, or use occurring in areas not appropriate for use.

Effects Common to Alternatives 2 through 5

Plan direction is updated in alternatives 2 through 5 for administration of the special uses program to allow for current and future alignment with current national, regional, and forest policy direction without the need for amending the forest plan.

The revised forest plan would retain much of the special uses direction from the 1986 plan, and would include direction authorizing uses when they are compatible with other resource objectives. Desired conditions, standards, and guidelines are included in the revised forest plan to better balance consideration of special-use requests with impacts to natural and cultural resources, wilderness character, and other forest resources. Direction under the revised plan avoids being overly prescriptive as well, in order to prevent conflict necessitating amendment of the plan to be aligned with policy and regulation.

Cumulative Effects

Demand for Recreation Special Uses in other National Forests

Anecdotally, recreation staffs on national forests in New Mexico, as well as the Apache-Sitgreaves in eastern Arizona, have identified a trend of increased demand for recreation special uses authorizations, indicating a likely trend of increased demand for recreation special-use delivered services, in particular outfitter-guide services. This trend of increased demand could affect workloads of administrators on multiple forests, affecting their ability to administer their recreation special uses

program, and could potentially create impact permit holders that operate their business in two or more national forests. This, in turn, could degrade their ability to make available desired services to visitors.

In the past, outfitter-guide special-use permits have been issued for authorization to operate multiple forests, which greatly simplified operations for permittees. However, administration of these permits across multiple administrative jurisdictions were sometimes problematic, so this is no longer a common practice.

Outfitters, Guides, Outfitted Hunts, and Landowner Agents Offering Services on Non-Forest Service Lands

The New Mexico Department of Game and Fish (NMDGF) regulates registered outfitters, guides and outfitted hunts. Persons offering such services to the public on private, state, or non-Forest Service Federal lands would not be required to also have a special-use authorization with the agency, but must still meet these state requirements, along with permitting requirements of other land management agencies.

Outfitter-guides who operate under a Forest Service special-use authorization must also be certified by the state to provide services as an outfitter in New Mexico. Any person who advertises or promotes himself or herself for hire, and accepts compensation for provision of equipment or services for hunting is considered by the State of New Mexico to be an outfitter. However, the term "New Mexico Outfitter" is only applied by the state to identity a person who has met qualifications to participate in a 10 percent special drawing pool for big game hunting licenses. Individual hunting guides must work under the supervision of a certified New Mexico Outfitter.

A landowner or their agent who is guiding or outfitting on the landowner's property is exempt from the department's registration. A landowner agent is a person who is legally authorized to act on behalf of a private landowner to oversee the landowner's hunting operation on their deeded property.

These outfitters and guides legally certified by the state, as well as private landowners or landowner agents that guide on private lands, provide a similar service on state, private, and other Federal lands to those authorized by recreation special uses in the Gila and other national forests. This makes available provision of a wider range of opportunities across the Gila NF area, and be of particular importance and utility to persons who may be assigned a hunt in areas that contain little or no NFS land.

Climate Conditions

The Southwest has recently experienced an extended drought, and climate predictions indicate drought conditions are likely to reoccur on a cyclical basis. Regardless of alternative implemented, as fire danger increases, restrictions may be put in place to reduce the risk of human-caused fires. Depending on the severity of conditions, restrictions typically range from a ban on open campfires to forest closures. These restrictions could potentially limit access to recreation special uses settings and opportunities due to safety concerns due to high fire danger within these areas.

Occurrence of extended droughts would directly affect available water sources. Across the forest, there is already limited water sources, and in many areas, the distance between water sources limits the opportunities for recreation special uses.

In addition to water sources, these same stressors affect water levels of the streams and lakes located within the Gila NF. As stream and lake levels decrease, the diversity of permitted recreation special-

use opportunities become more limited. This results in concentrated use of streams that continue to have flowing water conditions, and adds pressure to streamside trails, possibly effecting management decisions regarding if to permit, and the level of use, of recreation special uses in these areas. The flow rate, along with depth, can determine the quality of fishing, navigability by watercraft, and suitability for swimming or bathing in hot springs. Decreasing lake levels affect recreation access along shorelines, practical utility of boat ramps, and may result in reduced availability and quality of recreation special-use services.

Scenic Resources

Affected Environment

Introduction

Natural-appearing scenic character is a key component of recreation settings that attract outdoor recreation participants from all walks of life. The forest has recognized the important contributions that scenic character plays by emphasizing it in the forest recreation niche. Management of scenic character is intended to be planned in concert with the various multiple-uses that occur across the forest to sustain the natural appearance of the landscape.

The 2012 Planning Rule defines scenic character as: "A combination of the physical, biological, and cultural images that gives an area its scenic identity and contributes to its sense of place. Scenic character provides a frame of reference from which to determine scenic attractiveness and to measure scenic integrity." (36 CFR 219.19). Forest Service policy (FSM 2382.3) mandates that the Gila NF will update scenery inventory using the SMS with the initiation of the current forest plan revision.

Ecosystem Services of Scenic Resources

Aesthetics and scenery are an important component of the Gila NF and the four-county area. The forest is perceived as having a range of aesthetic resources that are valued by both local residents and visitors to the area. Scenery and other natural amenities are also believed to attract new residents to the four-county area (USDA FS 2006a). The opportunity to be away in an environment perceived to be vast, aesthetically pleasing, and readily accessible is an important characterization of forest lands by longtime residents and visitors alike (USDA FS 2006a). The scenery and perceived beauty of the area contributes to the recreation and tourism industry in the area. For example, the Gila NF is a scenic backdrop to many communities within the area and influences the value of real estate. Property adjacent to or near the forest boundary can sell for a much higher price than a similar property located further away.

Visual Management System

To evaluate current conditions and potential effects to scenic resources, the 1986 forest plan used the Visual Management System (VMS), which was a systematic approach to inventory, analyze, and monitor scenic resources, and allocated visual quality objectives that were a combined measurement of the scenic quality of the landscape and the public's level of concern for that scenic quality. However, the VMS did not recognize or incorporate natural disturbance processes such as fire, insects, and disease.

The VMS determined the scenic resource management direction and visual quality objectives described the degrees of alteration (including vegetation manipulation) that were considered to be acceptable on the landscape. Preservation is the least altered of the VMS scenic integrity objectives; maximum modification was the most altered.

In 1995, the more comprehensive SMS replaced the VMS. The forest's scenic resources have been re-inventoried to comply with the new terminology and the newer system (see Landscape Aesthetics, A Handbook for Scenery Management, Agricultural Handbook Number 701). To see how the two systems relate, see table 61, a crosswalk between the older and the newer systems.

Table 61. Crosswalk between visual quality objectives of the Visual Management System and scenic integrity objectives of the Scenery Management System

Visual Quality Objectives	Scenic Integrity Objectives
Preservation (P)	Very High (VH)
Retention (R)	High (H)
Partial Retention (PR)	Moderate (M)
Modification or Maximum Modification (M)	Low (L) or Very Low (VL)

The SMS differs in approach from the VMS by increasing the role of constituents throughout the inventory and planning process and is integrated with the basic concepts and terminology of Ecosystem Management (USDA 1996).

Scenery Management System

The SMS facilitates incorporating aesthetics into the planning process along with biological, physical, and social/cultural resources, provides a vocabulary for managing scenery, and outlines a systematic approach for determining the relative value and importance of scenery. (USDA 1996).

The SMS is described in the Department of Agriculture's National Forest Landscape Management Series (FSM 2380.6) as consisting of the following:

1. The basic concepts, elements, principles, and variables of environmental art and design.
2. Landscape character, existing scenic integrity, and scenic classes.
3. Constituent information including, but not limited to, users, public expectations, sense of place, viewsheds, and viewpoints.
4. Landscape character goals and scenic integrity objectives integrated with other resource, cultural, and administrative needs.

Scenic Character

Scenic character is defined as the combination of the physical, biological, and cultural images that gives an area its scenic identity and contributes to its sense of place. A combination of these attributes define scenic character. The concept of scenic character is embodied in the "image of an area."

Descriptions of different types of scenic character include:

- **Naturally Evolving** – Scenic character expressing the natural evolution of biophysical features and processes, with very limited human intervention. These landscapes are largely associated with wilderness areas."
- **Natural Appearing** – Scenic character that expresses predominantly natural evolution, but also human intervention including cultural features and processes.
- **Cultural** – Scenic character expressing built structures and landscape features that display the dominant attitudes and beliefs of specific human cultures. These landscapes are largely associated with areas containing recreation site development, administrative sites, or public uses under special-use permits.

- **Pastoral** – Scenic character expressing dominant human-created pastures, meadows and associated structures, reflecting valued historic land uses and lifestyles. Pastoral lands also occur on private lands outside of the national forest administrative boundary, where they may be viewed while traveling on forest roads or trails.
- **Agricultural** – Scenic character expressing dominant human agricultural lands uses producing food crops and domestic products. These landscapes generally occur on private lands that are outside of the NFS administrative boundary, but may be visible while traveling on national forest roads or trails.
- **Historic** – Scenic character expressing valued historic features that represent events and period of human activity in the landscape.
- **Urban** – Scenic character expressing concentrations of human activity, primarily of commercial, cultural, education, residential, transportation structures, and supporting infrastructure. These landscapes generally occur on private lands, but may be visible while visiting a national forest.

Scenic Integrity

Scenic integrity measures the degree to which a landscape is free from visible disturbances that detract from the natural or socially valued appearance, including any visible disturbances from human activities or extreme natural events outside of the natural range of variation.

Scenic integrity uses a graduated scale of five levels ranging from very high integrity to low integrity. It is emphasized within view of travelways, use areas, and special places. These levels include:

- **Very High Integrity** – The valued scenery appears natural or unaltered. Only minute visual disturbances to the valued scenery, if any, are present.
- **High Integrity** – The valued scenery appears natural or unaltered, yet visual disturbances are present; however, they remain unnoticed because they repeat the form, line, color, texture, pattern and scale of the valued scenery
- **Moderate Integrity** – The valued scenery appears slightly altered. Noticeable disturbances are minor and visually subordinate to the valued scenery because they repeat its form, line, color, texture, pattern and scale.
- **Low Integrity** – The valued scenery appears moderately altered. Visual disturbances are co-dominant with the valued scenery, and may create a focal point of moderate contrast. Disturbances may reflect, introduce or "borrow" valued scenery attributes from outside the landscape being viewed.
- **Very Low Integrity** – The valued scenery appears heavily altered. Disturbances dominate the valued scenery being viewed; and they may only slightly borrow from, or reflect, valued scenery attributes within or beyond the viewed landscape.

Common developments that alter scenic integrity include but are not limited to powerlines, communication sites, substations, propane tanks, geothermal developments, ski areas, hydropower facilities, reservoirs, recreation facilities, resorts, and temporary conditions like dust and smoke.

Scenic Stability

Scenic stability measures the degree to which the scenic character and its scenery attributes can be sustained through time and ecological progression. Scenic stability recognizes major changes to the landscape that are outside of the natural range of variation, such as large wildfires and land clearing for developments, but it also includes subtle, incremental changes that can severely diminish or eliminate scenic character.

The natural range of variation can be used to assess the scenic stability of forest landscapes. This can be measured in terms of the landscape's departure from the natural range of variation. Insufficient fire or too much fire on the landscape can determine the level of departure from the natural range of variation. Departures in fire regime, insect outbreaks, and other disturbances from the natural range of variation help assess scenic stability.

Existing Scenic Character

The Gila National Forest features an abundance of spectacular scenery, ranging from high cool mountains forested with aspen and Douglas-fir to warm semi-arid lowlands of juniper, oak and cactus. Forest Service lands that provide the scenic backdrop to adjacent communities offer a sense of place and contribute to the identity of those communities, while benefiting the local and regional economies.

Natural-appearing scenery provides the basis for high-quality recreation experiences in the forest

Many ecological and physical considerations factor into the scenic character assessment of the Gila National Forest, along with considerations for management of specially designated areas. The diversity of vegetation across the landscapes of the forest is a key attribute of scenic character. Species composition across the various elevation zones and ecological settings, existing conditions, and distribution all contribute to scenic character conditions.

The Gila NF is home to many diverse landforms and landmarks that enhance scenic qualities. Landform types found in the forest include steep rugged mountains, rolling hills, valleys, steep canyons, water features, and vast open grasslands. Where multiple and/or unique landforms occur in a single location, it tends to create unique landmarks that enhances scenic opportunities within the Gila NF. The management of specially designated areas require additional considerations to protect and enhance the scenic character that contributes to the designation.

A variety of landscapes across the forest are managed to appear natural. This is done through a variety of management scenarios including providing semi-primitive non-motorized recreation settings. Approximately 45 percent of forest lands are either designated wilderness areas or are IRAs. Together these areas of the forest provide an abundance of natural appearing landscapes.

The landscapes identified as suitable for timber harvesting may range from appearing slightly altered (but still natural appearing) to heavily altered depending upon implementation of planned management activities. Timber harvesting records from 1945 to 1993 show that 8 percent of the forest had been managed for timber. During this time period timber production could be very noticeable in the landscape over several years. Although timber harvesting is one of the most noticeable activities on the landscape besides mining activities, because activity is site-specific and limited in scale, the majority of the scenic characteristics of the landscape were intact.

Natural disturbances affect forest landscapes to varying degrees. Typically, the events that create the most notable changes in the landscapes are insect and disease infestations, and fires that burn outside of the range of historic variability.

Factors Affecting the Condition of Scenic Character in the Gila National Forest

Landscape characteristics of scenery have been modified over the last century by implementation of management activities such as timber harvesting, prescribed burning, fire suppression, grazing, wildlife habitat improvements, utility corridor development, and recreation developments. These management activities typically impact scenic resources, but not to the same extent for all activities.

Natural Disturbance Regimes

A wildfire that burns outside of the natural range of variability is likely to dramatically impact scenic resources over a long period of time. In contrast, localized patches of insect epidemics may cause tree mortality in a random pattern across a landscape level area. The mortality would impact scenic character, but may not be a dramatic effect to scenic character at the landscape level. These natural disturbance drivers combined with drought cycles have played a role in creating the current vegetative mosaic.

Human-Caused Disturbance

A variety of management activities have occurred over a century across the landscape of the Gila NF. Some of these activities have included timber harvesting to support the railroad industry, grazing, mining, and fire suppression. Spread of nonnative species and noxious weeds has occurred in various locations. These historical activities have contributed to the vegetative mosaic influencing the current scenic characteristics.

Suppression of fire has led to stands to becoming overstocked, creating a higher risk of wildfire. Grazing has been taking place since before the establishment of the national forest. Other activities include, but are not limited to, communication site development, utility lines, and mining. Fuel reduction treatments, including mechanical methods and prescribed burning, help contribute to a natural-appearing landscape and reduce the risk of high-intensity fire, which would negatively impact scenic character.

Developed Recreation

Developed recreation facilities in the forest should be designed to complement and blend into the landscape. This is true of both Forest Service facilities and facilities operated under special-use permit. The 1986 forest plan, along with national policies for developed recreation sites, have provided direction as to what visual quality objectives needed to be met for developed recreation facilities on the forest. Under the new plan, the Scenery Integrity Objectives for these areas will be managed under the SMS.

The Gila NF has a range of developed recreation facilities, including day use sites, trailheads, campgrounds, and boat ramps. The facilities vary in the degree that they blend into the surrounding landscape characteristics.

Utilities

Installation and maintenance of utilities rights-of-way on forest lands usually create long-term modifications to the landscape. Powerline corridors are by necessity managed to keep vegetation at a minimum height over the width of the corridor to ensure reliable electrical service and human safety.

Plan-Level Environmental Consequences

Analysis Methodology

This section provides analysis of the potential consequences that implementation of each alternative may have to the scenic resources in the Gila National Forest.

Assumptions

- High-quality, natural appearing scenic character is a key component of recreation settings that are valued by both local residents and visitors to the area.
- Scenic character plays an important role in the Gila National Forest recreation niche, with a diverse range of spectacular scenery available, ranging from high cool meadows and mountains forested with aspen and Douglas-fir to warm semi-arid lowlands of juniper, oak and grasslands.
- Forest lands provide a scenic backdrop to adjacent communities, offering a distinctive sense of place and contributing to the identity of those communities, while also benefiting the local and regional economies.
- The Gila NF is home to many diverse landforms and landmarks that enhance scenic qualities, and natural-appearing scenery provides the basis for high quality recreation experiences in the forest.
- Landform types found in the forest include steep rugged mountains, rolling hills, valleys, steep canyons, water features, and vast open grasslands.
- Where multiple and/or unique landforms occur in a single location, it tends to create unique landmarks that enhances scenic opportunities.
- The diversity of vegetation across the landscapes of the forest is a key attribute of scenic character. Species composition across the various elevation zones and ecological settings, existing conditions, and distribution all contribute to scenic character conditions.
- The management of specially designated areas require additional considerations to protect and enhance the scenic resources that contributes to their designation.
- Approximately 45 percent of forest lands are either designated wilderness areas or are IRAs, providing an abundance of natural appearing landscapes.
- Natural disturbances affect forest landscapes to varying degrees. Typically, the events that create the most notable changes in the landscapes are insect and disease infestations, and fires that burn outside of the range of historic variability.
- Common developments that alter scenic integrity may include but are not limited to utility corridors, powerline substations, communication sites, propane tanks, gravel pits, mining developments, administrative facilities, reservoirs, recreation facilities, and temporary conditions like dust and smoke.
- Management of scenic character is intended to be planned in concert with the various multiple-uses that occur across the forest to sustain the natural appearance of the landscape.
- The landscapes identified as suitable for timber harvesting may range from appearing slightly altered (but still natural appearing) to heavily altered depending upon implementation of planned management activities.

- Although timber harvesting is one of the most noticeable activities on the landscape besides mining activities, because activity is site-specific and limited in scale, the majority of the scenic characteristics of the landscape were intact.

Analysis methodology consists of consideration of a diversity of information sources, including but not limited to, public input to the planning process, data from recent NVUM surveys, the SMS analysis, the updated ROS analysis, and institutional knowledge of forest staff. These were all considered in context of being in alignment with relevant law, policy, and regulations. The potential differences in treatments within Ecological Response Units (ERUs) as indicated by activities associated with vegetation management specific to implementation of plan direction across all alternatives were used to consider effects from those activities to trail availability and conditions.

In 1995, the more comprehensive SMS replaced the VMS. The forest's scenic resources have been re-inventoried to comply with the new terminology and the newer system (see Landscape Aesthetics, A Handbook for Scenery Management, Agricultural Handbook Number 701).

In addition, the potential for effects to scenic resources by implementation of the alternatives for recommended wilderness and eligible wild and scenic rivers were also considered.

Effects Common to All Alternatives

Utility Corridors

The establishment and maintenance of utilities rights of way corridors on forest lands create varying extents of long-term modifications to the landscape. Powerline corridors maintain vegetation at a minimum height within the utility corridor to ensure reliable electrical service and human safety. These maintained utility corridors have the effect of degrading the scenic qualities of the viewshed. However, some negative effects to scenic values may be mitigated by best management practices.

The probable effects for construction of new or maintenance of existing utility corridors to existing landscape and visual quality would occur under all alternatives. Construction or maintenance of utility corridors could affect scenery by altering the appearance of the landscape from desired conditions, and include both short-term and long-term effects. Short-term effects may include the presence of maintenance equipment. Whether long- or short-term, degradation effects to scenic resources caused by the visibility and the unnatural appearance of cleared and maintained utility corridors on the landscape are likely to be most evident when they occur on hillsides and ridgelines or other areas where they are likely to be highly visible as contrasts to the surrounding natural landscape over a large area and from great distances.

Facilities and Level of Development

Developed recreation facilities on the forest are designed to complement and blend into the landscape. This is true of both Forest Service facilities and those facilities operated under the terms and conditions of special-use permits. The 1986 forest plan, along with national policies for developed recreation sites, have provided direction as to what visual quality objectives needed to be met for developed recreation facilities on the forest. Under the revised forest plan, the Scenery Integrity Objectives for these areas would be managed under SMS. Because of this similar guidance for recreation facilities provided under all alternatives, there are also no likely effects to scenic resources.

Mining

Mining activities could involve major landform alteration, as well as form, line, color and texture contrasts, resulting in degradation to scenic resources. Because this use of NFS lands in Gila NF would be similarly managed in alignment with law, policy and regulation, and their occurrence would not be affected due to specific plan direction, degradation to scenic resources that may occur on the landscape due to minerals management would be the same in all alternatives.

Permitted Grazing

Under all alternatives, scenic resources may be influenced by the existence of permitted commercial grazing on the landscape, with effects such as the visible presence of cattle congregating, and possible physical degradation in areas sensitive to change, such as visible trampling of vegetation, muddying or compaction of soils, and the presence of cattle feces. In most instances, these visible disturbances would only be visible in the immediate vicinity, and would not affect larger viewsheds.

Larger viewsheds may also include the visible presence of windmills, stock tanks, fences, and other grazing management infrastructure. These improvements are typically small and localized, and would have insignificant effects, or even contribute to scenic character of the landscape. Many forest visitors are accustomed to the presence these structures and features and consider them part of the traditional Western landscape that contributes to the sense of place and cultural identity of these region.

Timber Sales and Mechanical Vegetation Treatments of Restoration Projects

Implementation of plan direction under all alternatives will result in use of mechanical harvest methods and vegetation treatments that are likely to have some effects to scenic resources. These effects are common, but the amount and duration of mechanical harvest and restoration treatments, as well as settings in which they would occur, would vary by alternative due to the resource emphasis and management objectives of each.

During timber harvests and mechanical vegetation treatments there may be short-term and long-term adverse effects to scenic character of viewsheds that include locations where treatment are currently in progress or have recently occurred. Impacts are likely to be mitigated by best management practices under all alternatives, but likelihood and intensity of the occurrence of these effects will vary based upon the individual alternative objectives.

Effects of mechanical treatments could include significant short-term changes the character of the landscape that are not in alignment with desired conditions for scenic resources. Effects of vegetation treatments may include ground disturbance and the visible presence of stumps and slash. In the long-term, these treatments could help achieve desired visual quality objectives and make the area more resilient to uncharacteristic large-scale disturbance. Project design and best management practices could mitigate degradation of visual quality objectives in the short-term to the extent possible, and more effectively for the long term.

Prescribed Fire and Wildfires

The scope and intensity of effects to scenic resources due to the occurrence of fire, both prescribed and wildfires, would likely vary in magnitude and frequency of occurrence between the alternatives. However, the effects that are likely to occur are common, and could include the visible degradation to scenic objectives due to high-severity fire and post-fire flooding, debris flows, and the presence standing and fallen burned tree snags. These effects will likely be temporary in most cases, though they may be of longer durations of months to decades.

Uncharacteristic wildfire (natural and human-caused) has a greater potential to negatively impact scenic resources in the both short and long term.

Current trends indicate a likelihood for higher severity fire and flood events to occur in the foreseeable future, and with more frequent intervals. Typically, very large, high-severity wildfires cause greater damage to scenic qualities, and with a longer duration of effect, by altering the vegetation and natural appearance of the landscape (especially in non-fire-adapted ecosystems) outside of the normal range of variation. In contrast, localized patches of insect epidemics may cause tree mortality in a random pattern across a landscape level area. Common impacts from uncontrolled wildfires to scenic resource objectives likely to be experienced commonly across all alternatives could include temporary recreation area and trail closures during the incident and post-fire effects of infrastructure damage and visual impacts to the landscape.

Effects due to prescribed and resource benefit fire managed to restore fire-adapted ecosystems that are likely to be evident in the short-term include burned, blackened vegetation, and charred ground surfaces. Grasses and shrubs typically recover quickly, depending on when treatment occurs and moisture conditions during the growing season. In the long-term, prescribed fires and wildfires managed for resource benefit could increase the diversity of texture, color, vegetation size classes, and distribution across the landscape in fire-adapted ecosystems that are important for scenic resources. Fire retardant may also be used to protect values at risk but discolors the landscape and has the potential to impact scenery in the short term. Management in all alternatives will work to actively suppress uncharacteristic wildfire.

Eligible Wild and Scenic Rivers

Management of eligible wild and scenic rivers would provide additional levels of protection for the outstandingly remarkable values for which they were determined eligible. All alternatives include identification of the same eligible wild and scenic rivers identified by the current eligibility study, and direction for these to be appropriately managed in alignment with law, regulation, and policy. Effects to eligible wild and scenic rivers are common to all alternatives, and include the positive effect of protecting or enhancing scenic qualities within eligible river corridors until such time as they are designated by Congress, or are determined by a suitability study or direction by Congress to be managed for other forest uses.

Alternative 1 – 1986 Forest Plan

Visual Management System

Under alternative 1 the Visual Management System (VMS) would continue to be used to inventory, analyze, and monitor scenic resources, to determine visual quality objectives for consideration of scenic resources in all project planning and NEPA analyses. Implementation of this alternative would result in protection and enhancement of visual quality objectives by use of VMS.

However, VMS planning does not recognize or incorporate natural disturbance processes such as fire, insects, and disease. This may diminish the degree of the positive effects to scenic qualities by decision-making processes realized under SMS under all other alternatives. Because it accounts for these natural disturbance processes, decisions informed by SMS that would be more likely to result in management actions that would prevent or mitigate degradation of scenic qualities.

Timber Sales and Mechanical Vegetation Treatments of Restoration Projects

Implementation of plan direction in alternative 1 would not be updated to reflect identified need for change to mitigate possible negative consequences to scenic resources due to timber sales and/or restoration projects.

There may be short- and long-term affects to scenic character for persons recreating within and nearby to areas where treatments are currently in progress or have recently occurred, due to the SMS not being implemented by the forest and therefore not integrated into project-level planning under alternative 1.

Because the current plan does not contain direction to address relevant needs for change, there are likely short-term effects to the condition of scenic resources during mechanical vegetation harvest and restoration treatments due to visible slash piles, ground disturbance, decking of logs, and the presence of heavy machinery. These negative effects would be somewhat mitigated by best management practices. Long-term effects may include the unnatural appearance of vegetation due to the treatments, and residual effects of any ground disturbance not properly mitigated or slash and debris not appropriately disposed.

Prescribed Fire and Wildfires

There are probable effects to scenic resources with continued implementation of current plan direction in context of the occurrence of fire on the landscape, including both prescribed fires and unplanned wildfires. The occurrence, extent, and intensity of wildfire and the resulting effects to the scenic values would not be addressed under this alternative, because VMS planning does not recognize or incorporate natural disturbance processes such as fire.

Proposed Research Natural Areas

Alternative 1 carries forward the proposals for Largo Mesa and Agua Fria RNAs, which were originally proposed during development of the 1986 forest plan, despite the fact that the evaluation process conducted to support this revision effort found them ineligible for the RNA designation (see Appendix H: Documentation of the Research Natural Areas Evaluation Process). Although the quality of their contribution to scenic resources may be questionable, there is some level of protection to visual quality objectives within these areas under this alternative.

Eligible Wild and Scenic Rivers

Sixteen rivers totaling 231.3 miles were determined as eligible under the current plan revision eligibility study process. The current forest plan direction implemented under this alternative contains interim protection measures for all identified eligible river corridor(s) to maintain their free-flowing nature and outstandingly remarkable values until a congressional decision is made on the future use of the river and adjacent lands, or unless a suitability study concludes that the river is not suitable. The effects of implementation of this alternative would result in the preservation and enhancement of the free-flowing condition and ORVs of these eligible rivers that is also likely to also enhance and protect scenic resources within the eligible river corridors.

Effects Common to Alternatives 2 through 5

Scenery Management System

In 1995, the more comprehensive SMS replaced the VMS for use by the Forest Service in identifying and managing scenic resources. The forest's scenic resources have been re-inventoried to comply

with the new terminology and the newer system (see Landscape Aesthetics, A Handbook for Scenery Management, Agricultural Handbook Number 701). SMS recognizes and incorporates natural disturbance processes such as fire, insects, and disease, addressing a major shortcoming of VMS, and will result in management toward protection and enhancement of Scenic Integrity Objectives, resulting a higher quality of scenic resources across the forest.

Recommended Wilderness

Alternatives 2 through 5 include desired conditions and guidelines to enhance protection of wilderness characteristics of areas recommended for designation as wilderness. This direction is not addressed in the existing 1986 forest plan direction, because no areas were recommended as wilderness by that planning process. Recommendation of areas for congressional designation as wilderness would create a mandate for the forest to manage these areas to or enhance existing wilderness characteristics (apparent naturalness, outstanding opportunities for solitude or a primitive and unconfined type of recreation, manageability to protect wilderness characteristics, and other features of value).

By prioritizing protection of their wilderness characteristics, these recommended areas would be managed in many respects similar manner to existing, designated wilderness until a decision is made by Congress as to whether they are to be added to the National Wilderness Preservation System. Congress reserves to themselves the authority to designate wilderness through legislation; the agency role in this process is only to recommend areas that are suitable, and then to protect or enhance the characteristics that made them so.

Recommended wilderness areas would typically have minimal human impacts over the long term and would maintain high scenic integrity for recreational visitors. The recommended wilderness would increase visual quality on the forest through managing for wilderness characteristics.

Proposed Research Natural Areas and Proposed Botanical Special Management Areas

Although the list of special areas proposed in each alternative varies, the impacts to scenery for these areas are the same across alternatives. These additional management protections have the potential to further benefit visual quality and will be discussed specifically under each alternative.

Eligible Wild and Scenic Rivers

Sixteen river segments totaling 231.3 miles were determined as eligible under the current plan revision eligibility study process. The revised forest plan direction implemented under these alternatives contain interim protection measures for all identified eligible river corridor(s) to maintain their free-flowing nature and outstandingly remarkable values until a congressional decision is made on the future use of the river and adjacent lands, or unless a suitability study concludes that the river is not suitable. The effects of implementation of these alternatives would result in the preservation and enhancement of the free-flowing condition and ORVs of these eligible rivers that is likely to also enhance and protect scenic resources within the eligible river corridors.

Environmental Consequences Common to Alternatives 1, 2, and 5

Proposed Research Natural Areas

These alternatives carry forward the proposals for Turkey Creek and Rabbit Trap RNAs, which were originally proposed during development of the 1986 plan. The evaluation process conducted to support this revision effort found both areas remain eligible for the RNA designation. Management

of these areas for the protection and enhancement of the values for which they are recommended would likely also enhance and protect scenic resources within these areas as well.

Environmental Consequences Common to Alternatives 2 and 5

Proposed Botanical Areas and Rare and Endemic Management Areas

The Gila National Forest received a proposal from the Gila Native Plant Society to establish botanical areas based on the New Mexico Rare Plant Conservation Strategy (link) and Important Plant Areas identified within the strategy. The proposal focused on three general areas—Mogollon Mountains, Piños Altos, and Emory Pass—that have concentrations of plants that have been identified as rare and/or endemic to the Gila NF. The updated proposal from the Gila Native Plant Society with their suggested boundaries for botanical areas was incorporated into alternative 5 with a total of 150,590 acres. The forest-modified proposal was included in alternative 2 with a total of 68,171 acres to be managed as Rare and Endemic Vegetation Management Areas.

The plan components for both alternatives 2 and 5 are the same and focus on promoting values of rare and endemic plant populations, while providing opportunities for stakeholder engagement and education. Management of these areas for the protection and enhancement of the values for which they are recommended would likely also enhance and protect scenic resources within these areas, as well.

Alternative 2: Proposed Action

Prescribed Fire and Wildfires Timber Sales and Mechanical Vegetation Treatments of Restoration Projects

Alternative 2 emphasizes a combination of naturally ignited wildfire, prescribed fire, and mechanical treatments or thinning treatments; and while the negative effects to scenic resources that were described before for all alternatives will occur, they will be well mitigated by updated plan direction and best management practices and the implementation of SMS to replace VMS. Effects will also be reduced from levels expected in alternatives that emphasize either timber harvest and mechanical restoration or use of prescribed fire over use of the appropriate method for individual circumstances.

Recommended Wilderness

Alternative 2 includes the same desired conditions, standards, guidelines, and management approaches as alternatives 3, 4, and 5 that were developed to better protect wilderness characteristics in recommended wilderness that is not addressed in existing wilderness plan direction. This management direction to protect and enhance wilderness characteristics is also likely to protect and enhance scenic resources within all of the identified areas as well. Alternative 2 identifies 13 separate areas totaling 110,402 acres in the Gila National Forest as administrative recommendations for inclusion in the National Wilderness Preservation System.

Alternative 3

Prescribed Fire and Wildfires Timber Sales and Mechanical Vegetation Treatments of Restoration Projects

Alternative 3 emphasizes mechanical or thinning treatments, limits the use of fire, and concentrates predominantly on treating grassland and open-canopy woodlands. While the negative effects to scenic resources described before for all alternatives will occur, they will be predominantly effects from mechanical treatment rather than use of prescribed fire and the implementation of SMS to

replace VMS. Effects would also be concentrated in the alternative emphasis areas and would be anticipated to be elevated from levels expected in alternatives that balance use of timber harvest and mechanical restoration with use of prescribed fire appropriate for individual circumstances.

Recommended Wilderness

Alternative 3 includes the same desired conditions, standards, guidelines, and management approaches as alternatives 2, 4, and 5 that were developed to better protect wilderness characteristics in recommended wilderness that is not addressed in existing wilderness plan direction. This management direction to protect and enhance wilderness characteristics is also likely to also protect and enhance scenic resources within all of the identified areas as well. Alternative 3 identifies 26 areas totaling 130,012 acres in the Gila National Forest as administrative recommendations for inclusion in the National Wilderness Preservation System.

Consequences to Alternative 4

Prescribed Fire and Wildfires Timber Sales and Mechanical Vegetation Treatments of Restoration Projects

Alternative 4 emphasizes mechanical or thinning treatments, limits the use of fire, and concentrates predominantly on treating forested ERUs. While the negative effects to scenic resources described before for all alternatives will occur, they will be predominantly effects from mechanical treatment rather than use of prescribed fire and will be somewhat mitigated by the implementation of SMS to replace VMS. Effects would also be concentrated in the alternative emphasis areas and would be anticipated to be elevated from levels expected in alternatives that balance use of timber harvest and mechanical restoration with use of prescribed fire appropriate for individual circumstances.

Recommended Wilderness

Alternative 4 includes the same desired conditions and guidelines in alternatives 2, 3, and 5 that were developed to protect wilderness characteristics of recommended wilderness that are not addressed in existing wilderness plan direction. This management direction to protect and enhance wilderness characteristics is also likely to also protect and enhance scenic resources within all of the identified areas as well. Under this alternative, 17 areas totaling 72,901 acres are recommended for inclusion in the National Wilderness Preservation System.

Consequences to Alternative 5

Prescribed Fire and Wildfires Timber Sales and Mechanical Vegetation Treatments of Restoration Projects

Alternative 5 emphasizes the use of fire and limits mechanical treatments or thinning treatments, but allows for some mechanical or thinning treatments in the WUI. While the negative effects to scenic resources described before for all alternatives will occur, they will be predominantly effects from use of prescribed fire, and would be anticipated to be elevated from levels expected in the alternatives that balance use of timber harvest and mechanical restoration with use of prescribed fire as appropriate for individual circumstances. Effects will be somewhat mitigated by the implementation of SMS to replace VMS.

Recommended Wilderness

Alternative 5 includes the same desired conditions and guidelines in alternatives 2, 3, and 4 that were developed to protect wilderness characteristics of recommended wilderness that are not addressed in

existing wilderness plan direction. This management direction to protect and enhance wilderness characteristics is also likely to protect and enhance scenic resources within all of the identified areas as well. Under this alternative, 58 areas totaling 745,286 acres are recommended for inclusion in the National Wilderness Preservation System.

Cumulative Effects

Mining

The Gila National Forest and surrounding areas contain mineral resources, with past mining for metallic minerals and it is expected that mining of these minerals that will affect the scenic qualities of the surrounding area will continue throughout the life of the plan, and their presence on the landscape will likely cause continuing degradation to the scenic qualities of the area.

The area of Silver City and the Mining District (comprised of Bayard, Santa Clara, and Hurley) south of the forest is rich in copper from porphyry-copper and associated contact metamorphic (or skarn deposits). There are three large open-pit copper mines operated by Freeport-McMoRan Inc. with parts of two of them (Tyrone and Cobre) directly adjacent to the forest boundary. These mines are highly visible and affect the scenic qualities of much of the Gila NF area. There has been recent expanded mining activity at Hanover Mountain at the Cobre Mine and Little Rock Mine at the Tyrone Mine. While not immediately adjacent to the forest boundary, the Copper Flat mine in Sierra County is currently working through the permitting process with the responsible state agencies and the BLM.

The nearest coal fields to the Gila NF area are the Salt Lake and Datil Mountain Coal Fields located north of US Highway 60 in Catron County and the Engle coal field east of Interstate 25 in Sierra County. Most of the active coal mines found in New Mexico are in the northern half of the state, primarily in the San Juan and Raton basins.

Abandoned mine lands include known abandoned mines and/or mining-related hazards in need of reclamation or restoration. An abandoned and inactive mine land inventory conducted in the Gila NF in December 1998 identified 353 mine sites, some of which were located on private land.

Freeport McMorRan Inc. has been reclaiming a number of sites in the Burro Mountain and Santa Rita mining districts. This reclamation work has focused on regrading, covering, and seeding mining areas (often tailing and waste rock piles) that were no longer being used, which does mitigate some effects to scenic resources.

Saleable Mineral Materials

The Gila NF is an important source of salable minerals resources compared to the amount available on private, State, tribal and other Federal lands within the cumulative effects area. Efforts are underway to foster partnerships with local county governments through the opening of new gravel and aggregate sources on the forest to be used for road maintenance purposes including roads recently conveyed by the Forest Service to local governments. However, the effects of salable mineral materials activities would be relatively limited since this material is for road maintenance activities and not new road construction. Development and expansion of gravel pits and associated roads have effects to scenic resources throughout the Gila NF area.

Renewable Energy Installations (Windmills, Solar Panels)

Renewable energy installations such as windmills or large areas of solar panel development may affect scenic resources throughout the Gila NF area. There are no active or pending proposals for commercial wind energy or solar power facilities in the forest. Much of the future energy development would likely occur on the periphery of the forest or outside the forest boundary where development would be less costly. An increasing number of solar and wind facilities have been built in southwestern New Mexico along existing transportation and power transmission line alignments.

The Deming Solar Center opened in 2011 in Luna County to the south of the forest boundary. Similarly, the Macho Springs wind generation facility and photovoltaic solar project was completed in 2011 and 2014, respectively, and the Luna Solar facility opened in 2017. Several wind-generation developments are in planning phases, such as the Great Divide in southern Grant County and the Borderlands Wind LLC facility near Quemado on BLM land. Most of these renewable energy developments are far from the forest boundary. For the Borderlands wind-generation facility, which is directly adjacent to the forest boundary, the BLM will be analyzing potential impacts to visual resources.

Climate Conditions

The Southwest has recently experienced an extended drought, and climate predictions indicate drought conditions are likely to reoccur on a cyclical basis. Occurrence of extended droughts would directly affect water levels of the streams and lakes located within the Gila NF. As stream and lake levels decrease, scenic qualities associated with lakes and streams will be degraded by the lack of water they contain.

Herbicide-Use Environmental Consequences

The following discussion of environmental consequences addresses the effects of the herbicide-use alternatives on scenic resources of the forest.

Effects of Herbicide-Use Alternative A-No Action

This alternative would allow only limited herbicides and the noxious weed species as approved, based on the 2000 forest-level decision, and the current effects of invasive plants and their treatment to scenic resources would continue. Many current invasive species populations are located in areas where uses are concentrated and the ground is disturbed. With limited treatment options under this alternative, any current infestations are likely to continue to multiply, particularly in disturbed areas.

If invasive plants multiply throughout recreation areas and settings on the forest, they would replace native plants with invasive species. Where invasive species dominate, they would not appear ecologically natural, would likely be visually evident even to the casual observer, and may not be visually subordinate to the characteristic landscape. As invasive plants multiply, many areas of the forest would not meet the visual quality objectives set in either the 1986 or revised forest plans. This would result in degradation of visitor experiences dependent upon enjoyment of scenery described by visual quality objectives.

Effects Common to All Herbicide-Use Action Alternatives

All action alternatives include the use of manual removal and herbicide treatments as noxious weed control methods. Under implementation of each of these alternatives, there would be common effects to scenic resources as a result, although these effects will vary by their likely frequency, location, and magnitude across the alternatives, and this will be addressed separately in each.

Herbicide effects include short-term degradation of visual qualities caused by the use of dyes and the presence of treated dead and dying plants. However, herbicides have a high potential to improve long-term visual qualities by eliminating invasive species and restoring native plants to viewsheds. Dyes used with herbicides would fade within a few days. As vegetation dies from herbicide treatment, they wilt and turn brown, and the plants generally become smaller than surrounding native plants. In the fall, as vegetation turns brown, treated plants may not be as distinguishable from native plants, and by the following spring they could be unnoticeable.

Manual treatment methods could cause minor ground disturbance that could be visible in the immediate foreground may result in an unnatural look if parts of the plants remain on site. These treatments by themselves may only contain noxious weed populations and may need to be repeated unless other treatment methods are used, causing ongoing degradation to visual quality effects to persist. As a result, manual treatment methods may not be effective at improving long-term visual quality objectives of re-establishing native vegetation, and visual quality objectives may continue to be degraded.

With the use of both herbicide and manual removal treatment methods, the degree of visual effects is likely to depend on the size and density of the existing noxious weed infestation. Effects would likely occur in small patches, usually interspersed with patches of native plants, often occurring along roadsides, and treatments would not likely still be noticeable within several weeks. Larger patches may be present in open, dry areas. Broadcast spraying along system roads and other open areas could result in more concentrated, short-term degradation of scenic quality, but these locations are already altered by the invasive species themselves. Short-term impacts to visual quality by treatment of noxious weeds is very likely to be offset by improvement in long-term visual quality objectives by restoring native vegetation to affected areas.

Effects of Alternative B

The scope of the effects from this alternative would include all areas likely to be treated for noxious weeds and native vegetation for restoration and fuels reduction, and therefore effects to scenic resources described as being common to all alternatives would be likely to occur in these areas.

Effects of Alternative C

The effects from this alternative would not include any areas treated for native species, and therefore, the effects that are described as common to all alternatives are only likely to occur in areas that may be treated for noxious/non-native species.

Effects of Alternative D

This alternative would allow chemical treatment of native species, but would restrict herbicide applications to the urban interface. The effects that are described as common to all alternatives are only likely to occur in areas that may be treated for noxious/non-native species, and native re-sprouting woody species in the WUI.

Cumulative Effects

Cumulative effects for scenic resources are described together with sustainable recreation.

Cultural and Historic Resources

Affected Environment

The Gila National Forest (the plan area) contains archaeological resources that demonstrate human occupation and use for approximately the past 12,000 years. The occupation and use of the forest by Native Americans (American Indians) with Pueblo and Athabaskan ethnic affiliation and groups ancestral to these ethnic affiliations has occurred the entire time. Occupation and use of the forest by Euro-Americans and other peoples from the Old World occurred over the past 400 years. The plan area has been under the management of the United States Department of Agriculture, Forest Service beginning in A.D. 1906, or for a little more than 100 years. Native American, Hispanic, and Anglo-American traditional communities continue to use the forest for economic, social, and religious purposes.

The recreational, educational, cultural, and scientific values of the archaeological sites on the forest have been recognized as a recreational and scientific benefit that the forest can provide to the public. Archaeological sites within the Gila National Forest are a record of historic process and events important in the identity of local communities, the state of New Mexico, the region, and the nation. Contemporary uses of resources and characteristics of the plan area by Native American, Hispanic, and Anglo-American traditional communities are important to maintaining the identity of these communities. Cultural tourism is a significant component of the regional economy. Tourists are attracted by the nature and significance of archaeological resources and by the character of surrounding traditional communities. Archaeological sites contain a wealth of information for scientific researchers regarding ecological conditions and changes over the past twelve millennia, and human successes and failures in coping with these changes. This information is of value to managers making decisions regarding the contemporary ecological management of the forest. This information is also of value for educating the public about ecological sustainability. These resources remain important to descendant populations (Tribal and non-tribal), forest visitors, and our national heritage.

Of the 3.3 million acres encompassed by the Gila National Forest, roughly 12 percent (approximately 400,000 acres) have been inventoried to current standards. These inventory endeavors recorded 6,168 archaeological sites in the plan area. Of the total number of sites, eight have been formally listed in the National Register of Historic Places (NRHP)[a]. Approximately 33 percent of all cultural resources in the Gila National Forest have been recommended as being eligible for inclusion in the NRHP, and 7 percent of all resources have been recommended as being not eligible for inclusion in the NRHP. The eligibility of the remaining 59 percent of known cultural resources for inclusion in the NRHP is currently undetermined[b].

Analyses from the assessment report (USDA FS Gila NF 2017) demonstrate that the vast majority of these resources are located in areas below 8,000 feet in elevation; on gently sloping landforms with

[a] Cultural and historic resources can be divided into two, related categories: archaeological resources; and characteristics of historic and cultural importance to traditional communities. Historic properties are defined under Section 110 of the National Historic Preservation Act (NHPA) [16 U.S.C. 470(a)(1)(A) and (B)] and NPS Bulletin 15 (National Register of Historic Places Staff 2002) as objects, structures, buildings, and sites, and districts of the four aforementioned property types, that are listed or eligible for listing to the National Register of Historic Places (NRHP), based on their importance to local, regional, or national history. Thus, the term "historic properties" represents a specific designation for archaeological resources that are eligible for listing in the NRHP.

[b] The treatment of "undetermined' resources as if they are eligible for inclusion in the NRHP is a general practice for all projects in the Plan Area.

less than a 10 degree gradient; in either piñon-juniper woodland or ponderosa pine forest biotic provinces; within 200 meters of a stream; in areas modeled to be non-productive from a modern agricultural perspective; and on landforms classified as mountain tops/high ridges, canyon/deeply incised streams, U-shaped valleys, and/or local ridges/hills in valleys. Roughly 84 percent of all known cultural resources contain a prehistoric component. Of these, the majority date to the Early to Late Pueblo period or represent Late Archaic period occupations. The remaining 16 percent of all known cultural resources contain a historic component; of these, the majority date from New Mexico Statehood to recent times.

The distribution of cultural resource sites relative to the major vegetation and ecological communities aligns closely with their distribution across the forest. The three most common vegetation communities associated with archaeological sites are ponderosa pine forest, juniper woodland, and piñon-juniper woodland in order of occurrence. These vegetation communities are also the most prevalent types of vegetation across the forest. Most of the cultural resources in the plan area are found within the ponderosa pine forest vegetation type. The high proportion of archaeological sites in this vegetation community is the result of the majority of projects within the plan area were conducted in ponderosa pine forest areas for logging activities and fuels reduction projects.

Two broad classes of drivers with multiple stressors affect the management and preservation of cultural resources on the forest including ecological and socio-cultural drivers. Ecological drivers are natural processes such as erosion, flooding and soil movement that act upon the landscape with associated stressors such as drought, climate change, vegetative change, wildfire, and weathering. Sociocultural drivers include population change, tourism and criminal activities. Many cultural resource sites in the Gila NF have been negatively affected by past and ongoing activities. Cultural resources have been lost or damaged by past land management activities, including those dating from before national forest designation, from vandalism and visitor use, and as a result of natural events (for example, high-severity wildfire and erosion). Many activities were initiated prior to implementation of the National Historic Preservation Act (NHPA) of 1966, as amended. Data on current conditions and trends for archaeological resources can be examined from the recording and monitoring of cultural resources over the past 50 years. Overall, water erosion (including sheetwash erosion, rill erosion, drainage formation, and arroyo down-cutting) is the most prevalent impact observed at archaeological sites. Water erosion has been noted as impacting deposits at nearly one-third of all resources visited. Vandalism, a category that includes looting, the defacement of standing structures and other features (i.e., rock art panels), arson, and the collection of surface remains such as pottery sherds, arrow and spear points, and bottles was noted during roughly 16 percent of site visits.

Climate change has affected the degree of which stressors acts upon cultural resources. Drought is presumed to be driven by increasing temperature associated with climate change. Drought contributes to increased fire danger. Increased wildfire leads to soil instability and flooding. These stressors are interrelated with one contributing to the other in a feedback loop that ultimately leads to the potential for effects to cultural resources. Of these stressors, soil instability and flooding have the most potential to affect the condition of cultural resources. Cultural resources occur in and on soils. As soils become unstable and move the context of cultural resources on those soils deteriorates. Aside from stressors influenced by climate change, background geological processes such as erosion and weathering may affect cultural resources. By its very nature, the Southwest climate is arid, leaving large portions of the landscape exposed to the forces of nature. Open-air sites, rock art sites, and perishable sites can be affected by weathering factors such as wind and rain. The monsoon

phenomenon's frequent and violent storms often produce tremendous runoff that affects cultural resources by moving deposits or covering them with debris. Site formation processes are accelerated during monsoonal storms. Channel down cutting events, increased arroyo formation, and shifts in stream channel dimension or location have the potential to destroy or damage cultural resources located in the plan area.

Once the resource has been disturbed, damaged, moved, altered, or removed, nothing can recover the information that could have been gained through analysis, or replace the opportunity for individuals to understand and experience the site. Adverse effects have decreased over time because today, significant sites are typically identified during project planning, allowing for projects to be designed to avoid and mitigate potential effects before implementing an action.

The forest regularly engages volunteers and partnerships to help address both research and management concerns. Research projects involving universities, museums, Passport in Time (PIT) volunteers, and other Forest Service volunteers occur in the forest. Many of these projects address management concerns, such as erosion. A dedicated group of New Mexico SiteWatch volunteers serve as site stewards, monitoring changing site conditions and alerting the forest to significant changes in condition. These volunteers and partnerships provide a valuable service to the forest and represent a meaningful and lasting way for the public to contribute to and learn about our cultural resources.

Plan-Level Environmental Consequences

This section describes the effects of the proposed revised forest plan and alternatives on historic properties and cultural resources. Management of culture and history is an important part of Federal land management policy and practice. Preservation of these resources helps to give a sense of connection to modern people with those that have come before them through archaeological sites, historic properties, and sacred sites, among others. It is this resource that ties together the historic human use of the landscape and practices employed on it today. It tells the story of the changes in the environment and how humans benefited, impacted, or were otherwise affected by their utilization of the landscape and varying environmental conditions through time.

Most land and resource management activities have potential to affect cultural resources. Because most of the archaeological resources within Gila National Forest are surface or shallowly buried sites, sometimes with preserved wood, the greatest threats are from erosion and vandalism. The potential effects of individual actions on cultural resources will be evaluated under Section 106 of the National Historic Preservation Act and the National Environmental Policy Act. Adverse effects from planned undertakings are rare and will continue to be so under all alternatives. As such, the greatest threats to cultural and historic resources affected by programmatic planning are often those activities not initiated by agency actions: erosion, looting, vandalism, naturally ignited wildfire, and dispersed recreation (i.e., recreation outside of established recreation areas).

Methodology and Analysis

This section provides an assessment of the potential impacts each alternative could have to cultural resources and archaeology in the forest. The potential differences in treatments within Ecological Response Units (ERUs) as indicated by activities associated with vegetation management activities across alternatives were used to consider effects to cultural resources from those activities. In addition, the potential for effects to cultural resources based on differences between alternatives for roads management were also considered.

Assumptions

The assessment of potential effects to cultural resources and archaeology incorporated the following assumptions:

- The distribution of cultural resources inventory varies across ERUs.
- The number of sites within ERUs is representative only of sites that have been recorded within them during cultural resources inventory.
- Low inventory percentages in ERUs may not represent the actual potential for sites.

Effects Common to All Alternatives

All alternatives have plan components for the use of some degree of mechanical treatments and fire to treat vegetative ecosystems in the forest, with the intent to restore desired forest structure and function, and increase ecosystem resiliency. These treatments also serve to reduce the risk of uncharacteristic fire (often observed as large areas burned with exceedingly high severity) by reducing available fuels and decreasing the density of forests and woodlands. While these treatments have numerous effects on vegetation and the ecosystems in which they occur (see Vegetation and Fire sections), they would also have effects on cultural resources. Mechanical treatments impact cultural resources by compacting the ground in and around archaeological sites and by disturbing the distribution or arrangement of artifacts within the site leading to loss of site integrity and data. Machinery used to conduct mechanical treatments may also alter the physical properties of artifacts. These factors challenge our understanding of these areas and degrade qualities that make the sites eligible for inclusion on the National Register. Mechanical treatment of vegetation reduces the threat to structures, sites, and areas within the acres treated by reducing the likelihood of uncharacteristic wildland fire once treatment is completed. Tree roots growing through prehistoric architectural room blocks can damage and cause instability of walls and features. Carefully removing this vegetation (by hand thinning) would help to protect sites from this type of damage. Removal of vegetation adjacent to historic structures and sites susceptible to fire would also reduce their potential damage and loss from wildland and prescribed fire thereby preserving these types of sites for future public enjoyment, education, and research.

Treatments involving fire have the potential to expose cultural resources to heat and erosion, leading to degradation, and structural damage or loss. The cultural resources in the Gila NF have persisted through many fire cycles over time, and are generally not highly damaged by low-severity fire that moves quickly across the landscape. Lower severity fires can damage cultural resources by altering their chemical or physical properties, such as charring exterior surfaces or promoting faster decomposition rates. In some cases, lower severity fires can completely consume plant fibers, hair, or textiles ruining the important historical data they once held. High-severity fire can be devastating to cultural resources, especially for perishable and fire-sensitive items such as wood, material, basketry, hides, leather, and plant residues or seeds. These extreme temperatures completely destroy or alter the physical characters of artifacts, which significantly alters informational context. These fires also affect the potential for dating features in a historical context by either altering their physical composition as in the realignment of radiometric iron in hearths or the deposition of recent carbon in archaeological contexts with the potential for Carbon 14 dating. Furthermore, severe fire damages vegetation and ground cover, often leading to soil hydrophobicity, and thereby increasing erosion and water run-off that can move cultural materials from their origin, or increasing other disturbances like fire-killed tree fall.

Prescribed fire reduces the threat to structures, sites, and areas in the acres treated. Increased acreage of prescribed fires during optimal conditions can allow for fire that will not burn as hot as wildland fires and sites can be identified prior to implementation and protected (Buenger 2003). Wildland fire managed for resource benefit reduces the threat from uncharacteristic wildland fire for known structures, sites, and areas. Increased acres of wildland fire managed for resource benefit could reduce fuels and reduce the potential for impacts on heritage resources from unplanned wildfire. However, unknown or unrecorded heritage resources could be impacted by managed wildland fire. Until more inventory is completed, the impacts to these resources is not fully known. The Wildland Fire Decision Support System process can be used to manage the potential threat to known fire-sensitive structures, sites, and areas where there is a known high site density from wildland fire managed for resource benefit. This knowledge would direct the response so the impact to sites could be reduced (Ryan 2006). Finally, management actions associated with wildfire suppression can lead to effects to cultural resources including the construction of fire line through sites, burning of perishable materials resulting from suppression ignition and other effects associated with the suppression of wildfire. Fire suppression and burned area emergency response activities, such as dozer line construction, road improvements, watershed protection, and noxious weed treatment, could adversely affect structures, sites, and areas as an indirect effect of wildland fire. Not all effects from fire suppression and burned area emergency response can be mitigated through the 36 CFR 800.12 process, as immediate protection of life and property take precedence over resource protection.

All treatments can lead to some level of degradation of cultural resources and exposure to natural elements and vandalism. Most of the potential threats to known cultural resources can be avoided through project design and alternative mitigation measures would be used for different treatment activities. At a forest plan level the environmental consequences associated with all of the alternatives are similar in regards to potential effects to cultural resources. There are wide variations in some categories within the range of alternatives; however, in most cases the net potential for adverse effects to cultural resources is expected to be similar because all known (and unknown) sites within any given treatment area (regardless of the type of treatment or project) could be directly affected and/or indirectly affected in similar ways by project activities. For example, if there is more prescribed burning and less mechanical treatment in one alternative, and vice versa in another, they would have the same basic potential effects to cultural resources because all sites within the entire prescribed burn and mechanical treatment areas could potentially be directly affected by vehicles, personnel, or other equipment associated with either kind of activity. Cultural resources could also potentially be affected by direct implementation activities such as burning from fire or disturbance associated with timber felling, decking, and skidding. Additionally, indirect effects in the form of resultant erosion and deflation from vegetation loss or other ground disturbance associated with either prescribed burning or timber harvesting activities has the potential to adversely affect cultural resources.

All alternatives require proposed actions that have potential to affect cultural resources to be subject to NEPA and compliance with Section 106 of the National Historic Preservation Act, which involves a record search, most likely a cultural resource inventory, and development of appropriate avoidance and/or mitigation measures. Cultural resource inventories add to the general knowledge of forest cultural resources and this information provides better data for future project planning. In addition, it provides members of tribal and rural historic communities and the State Historic Preservation Office (SHPO) the opportunity to review and comment during the planning phase.

Sociocultural drivers include stressors primarily associated with human populations. Even in remote areas, visitors to the forest have the potential to negatively affect cultural resources. Dispersed recreation can be associated with impacts from ground disturbance, erosion, unauthorized collecting, and vandalism caused by motorized and nonmotorized recreation. Alternatively, recreationists may observe and report impacts on resources in remote areas and assist the forest in monitoring and protecting resources. The revised forest plan makes no changes to the Gila travel management plan and will not change effects to cultural and historic resources from dispersed motorized recreation. Structures, sites, and areas associated with motorized travel routes, are at elevated risk from surface disturbance and vandalism. Persons who do not obey travel management designations will travel on any passable route. Resources at greatest risk from ground disturbance, vandalism and unauthorized collecting are generally within a few hundred meters of motorized travel routes. Looting and vandalism destroy the integrity of cultural sites and threatens the preservation of cultural heritage. Visitation to cultural sites may also lead to the redistribution of artifacts which damages contextual information about the site.

Alternative 1 – 1986 Forest Plan

Under alternative 1 there would be no change to the process of managing cultural and historic resources in the Gila NF. The 1986 plan provides specific direction regarding management of cultural resources, including cultural resource inventory, site protection, enhancement and interpretation, and research with the intent to protect and avoid resource management activities that have potential to disturb and degrade cultural resources. Site protection, restoration, and maintenance would reduce the potential for adverse effects on historic properties from weathering, erosion, ongoing use or natural processes. Most of these elements are required by various laws, regulations, policies, and agreements, particularly the cultural resource protection compliance process specified by Section 106 of the NHPA. In 1987, a plan amendment in response to the Save the Jemez/State of New Mexico lawsuit added plan direction related to cultural resource preservation and integrity, interactions with the State Historic Preservation Office, and public interest and education.

The no-action alternative does not include direction regarding issues and mandates for cultural resource preservation and management that have arisen since the amendment in 1987. It also does not address management of collected artifacts and cultural items, nor the need to have them catalogued and curated in accordance with current standards. Specifically, the plan predates the passage of the Native American Graves Protection and Repatriation Act and the 1992 amendment to the NHPA, the latter of which called attention to procedures for the identification of traditional cultural properties. While the 1986 plan is devoid of direction regarding compliance with many recent laws and regulations that protect cultural resources, Gila NF archaeologists are cognizant of the latest regulations and ensure that their requirements are followed. Many of the objectives for cultural resource management in the 1986 forest plan have been accomplished, have become standard operating procedures, or are now irrelevant. The no-action alternative does not provide direction on managing resources in response to climate change.

Existing fuel loading and the continued high risk of an uncharacteristic high-severity wildfire could have a direct effect on cultural resources. In the event of an unplanned wildfire, the fire intensity would be higher and fire behavior would be more erratic and unpredictable. Cultural resources that have been burned over (with minimal or no damage) for hundreds or perhaps thousands of years as a part of the natural fire ecology, would have a high potential to be damaged or destroyed by a very high-intensity fire event. All sites would remain at risk from increased erosion associated with high-intensity fires and other post-fire impacts resulting in the degradation or loss of site integrity and site data.

Effects Common to Alternatives 2, 3, 4, and 5

On the forest, the Ecological Response Units correspond to vegetative communities that have specific desired conditions defined in the forest plan. Those ERUs having current conditions that are the most departed from desired conditions were given plan objectives for vegetation treatments to reduce the departure and return proper ecological function to these areas. Alternatives 2, 3, 4, and 5 are driven by a goal to provide for the restoration of a sustainable ecosystems with differing emphases on the methods used (fire and mechanical treatments) to accomplish restoration. While these vegetation treatments are ecologically beneficial, the treatments pose an increased potential to negatively impact cultural resources and artifacts (see Effects Common to All Alternatives section).

The primary intent of roads management associated with the action alternatives is to have a manageable system for public and administrative access. All action alternatives contain an objective for road decommissioning at 50 miles within 10 years of plan approval. A complementary management approach suggests the priority factors for decommissioning roads include redundant routes, routes causing severe erosion, routes built close to waterbodies, or having adverse impacts to water quality, or routes that impact at-risk species or cultural resources. Decommissioning motorized travel routes reduces the risk of ground disturbance, unauthorized collection and vandalism at structures, sites, and areas near those motorized travel routes.

The cultural resources present within the plan area have the potential to elucidate information on the varied lifeways of the region's inhabitants for the past 12,000 years. Such information could be used to address issues vital to the changing concerns of the nation by providing examples of how historic and prehistoric social groups adapted to changing socio-ecological conditions (i.e., climate change, sustainability, pan-regional interaction, etc.). Similarly, cultural resources throughout the forest are likely to increase in importance with respect to cultural tourism. These phenomena (increased research, increased tourism, and climate change) all have the potential to increase the risk of loss of archaeological resources.

All action alternatives include additional direction related to heritage resources and culturally significant traditional resources that would result in improved management and protection from incompatible activities. Through suggested management approaches establishing new partnerships with interested stakeholders, and maintaining existing ones, the Gila National Forest will be better able to reduce existing risks to cultural resources and mitigate new risks as they arise.

Alternative 2 – Proposed Plan

Alternative 2 objectives are to treat and restore a combination of grassland and open-canopy woodlands, and forest types that are departed from desired conditions. It calls for using all three treatment methods (managed naturally ignited wildfire, prescribed fire and mechanical) to maintain or move toward desired conditions across the forest. Alternative 2 proposes treating between 32,845 and 1,997,413 acres over a 10-year period to reduce fuels in a controlled and planned manner throughout many of the most departed vegetation communities across the forest. While future treatments under this alternative could pose direct and indirect risk (as previously described) to cultural resources, it is more likely that site degradation, loss of site integrity, and loss of site data could be reduced because protection measures (e.g., site avoidance, fuel reduction around structures, and lower intensity fire) can be designed and implemented when given the chance to plan and prepare fire-sensitive cultural resources (e.g., clear fuels around structures) prior to project initiation as opposed to uncharacteristic wildland fire.

Although legal requirements for compliance would be responsible for ensuring effects to cultural resources from prescribed fire are managed effectively, the potential exists for impacts on cultural resources from activities associated with vegetation management, especially as a result of non-compliance activities that degrade cultural sites. There may also be indirect effects associated with vegetation management using fire and mechanical treatments or thinning treatments.

The use of naturally occurring fire to accomplish vegetative objectives also requires some level of compliance with the forest's legal mandate. However, given the often urgent nature of suppression conflicting with need for the management of fire for resource benefit, there is some increased risk to cultural resources and archaeology through increased fire on the landscape. Even though this alternative incorporates more acres of fire than alternative 1, there would likely be less adverse effects due to the reduction of uncharacteristic fire risk through additional fuels treatments.

The development and use of temporary roads in support of restoration activities does pose a potential for negative effects to cultural resources. Damage caused by vehicles may include displacement and/or damage to artifacts, and loss of soils and vegetation, causing increased erosion. Increased access by temporary roads into the forest could also increase visitation to newly opened areas and have greater potential to adversely affect cultural resources.

To manage for the potential future conditions described in the affected environment section, the proposed plan implements a strategy that is flexible in design and where this flexibility includes feedback based on monitoring.

Alternative 3

Alternative 3 was developed to respond to issues by placing more emphasis on mechanically treating grassland and open woodland vegetation to maintain or move toward desired conditions for those vegetation types. The use of fire would be limited. It has no objective pertaining to the Ponderosa vegetation community, which has the highest frequency of identified cultural resources in the forest.

The mechanical treatment of at least 57,800 acres over a 10-year period increases the likelihood of negative effects occurring, especially in ERUs with some of the highest densities of cultural resources on the forest. The increase in new temporary road construction, to provide access for forest management activities increases the potential for cultural resources and archaeology to be affected under this alternative.

Although legal requirements for compliance would be responsible for ensuring effects to cultural resources from mechanical treatments or thinning treatments are minimized, the potential exists for cultural resources and archaeology to be affected from noncompliance activities and indirect effects associated with the movement of machinery across the landscape, that would degrade undiscovered cultural sites as machinery passes over and compacts the soil.

The use of fire in this alternative is limited (no more than 2,250 acres per decade using prescribed fire) enough that the potential for effects to cultural resources is reduced. The potential for an increase in effects resulting from the lack of treatment of fuels in vegetation types not prioritized by this alternative does have the potential to affect cultural resources resulting from high-severity fire.

Alternative 4

Alternative 4 was developed to respond to issues by placing more emphasis on mechanically treating forested/timberland vegetation to maintain or move toward desired conditions for those vegetation

types. These efforts would prioritize restoring forested vegetation that could also produce forest products, which contributes to local and regional economic sustainability. The use of fire would be limited. The ponderosa pine vegetation community has the highest frequency of identified cultural resources in the forest and would be one of the main vegetation community for restoration activities.

The mechanical treatment of at least 52,030 acres over a 10-year period increases the likelihood of negative effects occurring, especially in ERUs with some of the highest densities of cultural resources in the forest. The increase in new temporary road construction, to provide access for forest management activities increases the potential for cultural resources to be affected under this alternative.

Although legal requirements for compliance would be responsible for ensuring effects to cultural resources from mechanical treatments or thinning treatments are minimized, the potential exists for cultural resources and archaeology to be affected from noncompliance activities and indirect effects associated with the movement of machinery across the landscape, that would degrade undiscovered cultural sites as machinery passes over and compacts the soil.

The use of fire in this alternative is limited (no more than 16,620 acres per decade using prescribed fire) enough that the potential for effects to cultural resources is reduced. The potential for an increase in effects resulting from the lack of treatment of fuels in vegetation types not prioritized by this alternative does have the potential to affect cultural resources resulting from high-severity fire.

Alternative 5

Alternative 5 objectives are to treat and restore a combination of grassland and open-canopy woodlands, and forest types that are departed from desired conditions. It emphasizes using naturally ignited wildfire and prescribed fire with some mechanical treatments or thinning treatments in the wildland urban interface. The reduction in mechanical treatments or thinning treatments reduces the potential for effects to cultural resources and archaeology compared to alternatives 2, 3, and 4 with an emphasis on the protection of values at risk. The limitation of temporary road construction in this alternative for mechanical treatments or thinning treatments would reduce the potential for effects to cultural resources.

The treatment of between 157,500 and 1,899,700 acres over 10 years using naturally ignited wildfire and prescribed fire does increase the potential to affect cultural resources from activities associated with prescribed fire, fire suppression, and from the management of wildfire. As with alternative 2, the effects of prescribed fire are evaluated through the compliance process leaving noncompliance activities or indirect effects as having the highest potential to affect. The use of naturally occurring fire to accomplish vegetative objectives also requires some level of compliance with the forest's legal mandate; however, given the emergency nature of suppression and the urgency associated with the management of fire for resource benefit, there is an increased risk to cultural resources and archaeology.

Cumulative Effects

The cumulative effects timeframe for cultural resources is the next 10 to 15 years. The spatial extent includes the Gila NF and the local communities within and closely adjacent to the Gila NF boundary. Cycles of drought, fire, livestock grazing, timber harvest and fuelwood cutting, and road and trail construction and maintenance, have all caused varying degrees of cultural resource impacts in the past. None of these management factors have acted in isolation; rather it is the combination of these

management factors, historical and current, that are responsible for existing cultural resource conditions in most vegetation types.

Cultural resources can be affected by activities and natural processes that occur beyond the forest's boundaries or from private inholdings within the forest's boundaries. Private and public land uses within and outside the forest's boundary can disturb and remove soil and vegetation. This can increase erosion and runoff to stream and other waterbodies, both within and outside of the forest. Erosion and sedimentation also occur in association with roads under other jurisdiction and maintenance responsibility, including gully erosion both within and outside of the forest, which can destroy or damage cultural resources.

Climate change also poses the increased threat of erosion to cultural resources. As temperatures rise, vegetation communities are likely to be affected. Elevational shifts in vegetation communities and/or "extreme" fire events could lead to reduced canopy cover available to intercept precipitation and reduce raindrop impact energies and loss of vegetative ground cover. This loss of vegetative ground cover combined with more of the precipitation falling in higher intensity storms increases the risk of erosion. This erosion risk can lead to increased sediment delivery to stream channels and potentially altered flow regimes and stream channel dynamics such as degradation (i.e., downcutting) or aggradation. Channel down cutting events, increased arroyo formation, and shifts in stream channel dimension or location have the potential to destroy or damage cultural resources located in the broader area.

The availability of timber, forest and botanical products is likely to change in the future with predicted increases in frequency, duration and severity of drought conditions and a corresponding shift in natural disturbance regimes. Nevertheless, timber and fuelwood harvest are expected to remain economically and ecologically important over the life of the revised forest plan, which influences cultural resource management on the forest and surrounding areas.

A number of interpreted resources adjacent to the Gila National Forest provide information on the history of occupation of the area's inhabitants. These include the Fort Bayard National Historic Landmark, the Mogollon Mining district, the Gila Cliff Dwelling National Monument, the West Fork ruin near the Gila Cliff Dwellings, a number of sites along the Trail of the Mountain Spirits, the Santa Rita Mines, and the Geronimo Trail at Kingston. Archaeological sites are a major attraction for cultural tourism. Indeed, from 2008 through 2011, roughly 37,000 people on average visited the Gila Cliff Dwellings National Monument per year (Mitchell et al. 2014). Visitors to this and other interpreted cultural resources in New Mexico generated roughly $137 million for State and local governments, with the Gila Cliff Dwellings generating roughly $17 million alone (Thomas et al. 2015). Interpreted archaeological sites also afford an opportunity to educate children and the public at large about resources that are important to the traditional history of Native Americans, to the military history of the Nation, and to the history of the Nation's westward expansion.

Herbicide-Use Environmental Consequences

The following discussion of environmental consequences addresses the effects of the herbicide-use alternatives on cultural resources. Cultural resources are non-renewable archaeological and historic sites, consisting of structures, places, landscapes, and objects representing past human activities.

Analysis Methodology

This is a qualitative analysis. The Gila NF GIS Heritage Layers were used to help determine whether cultural resources are likely to exist within the areas of known noxious and invasive species populations.

Effects Common to All Herbicide-Use Alternatives

All of the alternatives authorize the use of some herbicides on some number of noxious weeds. Manual removal and herbicide treatments would be approved for noxious weed species forest-wide. Minor soil disturbance from manual removal may be expected where noxious weeds are found, as the current conditions indicate generally patchy distribution of noxious weeds in the Gila NF. Most of the treatments have low potential to affect cultural resources. In most instances, flagging and avoidance of sites will be the preferred mitigation measure. Future treatments may require additional consultation with the Forest Archaeologist/Tribal Liaison.

Indirect effects associated with heritage resources may have the potential for increased erosion rates within or near heritage resources resulting from the loss of canopy and ground cover, more likely from herbicide treatment of re-sprouting native oak and alligator juniper. Manual treatments of noxious weeds could cause minor soil disturbance potentially affecting cultural resources. Treatment of native woody species with herbicide may cause increased visibility of archaeological sites during and after treatment implementation, which could lead to increased looting. These effects are expected to be short term in nature and it is expected that vegetative cover would increase by the following season after treatments of native woody plants. Conversely, improvements in vegetation desired conditions and forage availability have the potential for increased cattle grazing within archaeological sites due to changes in vegetation communities and ground cover. However, herbicide treatments for noxious weeds would be patchy in nature and unlikely to cause a significant loss of ground cover.

Flagging and avoidance of archeological sites would prevent adverse effects to heritage resources for treatment implementation. Public notification and posting signs prior to herbicide treatment would alert the public and tribal members an area should be avoided for plant gathering. In the event new heritage resources are discovered during the implementation of any of the activities outlined above, work would cease in the area and a Forest Service archaeologist notified as to its presence. Work may resume in the area surrounding the newly identified archaeological site once appropriate treatment measures have been identified and consulted upon.

If organic compounds are present in the herbicides chosen for vegetation control, the herbicide could alter the chemical properties of archaeological deposits and may affect the research potential present within archaeological sites. This is especially so if the herbicide travels throughout the plants vascular system. There are certain classes of cultural resources that may be impacted by herbicide use, and therefore should be avoided. The forest is aware of traditional use plants and knows that local tribes and the public gather plants throughout the forest; however, no specific collection areas have been identified by the tribes. Because of this, these precautions should be taken:

Herbicide must not be sprayed within 100 feet of known rock art sites, caves, or rock shelters due to the possibility of perishable materials.

Prior to the implementation of herbicide treatments, forest staff will ensure timely public notification. Treatment areas will be signed to inform the public and agency personnel of herbicide

application dates and herbicides used. If requested, individuals will be notified in advance of spray dates.

Effects of Herbicide-Use Alternative A-No Action

This alternative would allow only limited herbicides and the noxious weed species as approved based on the 2000 forest level decision. Ongoing treatments would be covered under existing NHPA Section 106 consultations. With limited treatment options, invasive plants would continue to spread and compete with native plants. Alternative A could reduce the availability of native plants for American Indian and public use, which may jeopardize the forest's trust responsible to manage treaty and executive order resources in a sustainable manner for the Gila National Forest.

Effects of Herbicide-Use Alternative B-Proposed Action

Alternative B would authorize the use of manual removal and herbicide treatments for noxious weed species forest-wide. This alternative would also authorize the use of herbicide to control the density of native alligator juniper and evergreen oak species in order to accelerate progress toward desired conditions for vegetation communities and the WUI. Manual treatments involving minor ground disturbance are more likely to affect heritage resources than the use of herbicides. Manual treatments within the boundary of a heritage resource could affect the integrity of the site. Ground cover of any sort (e.g., invasives, grass, pine needle duff) tends to protect the surface of a site so extensive removal could leave a heritage resource open to the indirect effects of erosion or vandalism by exposure and public visibility. However, flagging and avoidance of heritage resources would mitigate adverse effects to heritage resources. The types of herbicide sprays and other treatment methods proposed are unlikely to affect heritage resources typically found on the forest. Public notification and posting signs prior to herbicide treatment would alert the public and tribal members an area should be avoided for plant gathering. While the herbicide use would already be NEPA authorized should this alternative be selected, the NEPA for a vegetation thinning project of native woody plants would include disclosure of the herbicide use, consultation with tribal governments, and the State Historic Preservation Office.

Effects of Herbicide-Use Alternative C

This alternative is identical to the proposed action in the way it addresses noxious weed treatments but does not include any treatment of native species. The effects from this alternative would not include any areas treated for native species, and therefore the effects that are described as common to all alternatives are only likely to occur in areas that may be treated for noxious/non-native species.

Effects of Herbicide-Use Alternative D

This alternative is similar to the proposed action for noxious and invasive plant species, but would restrict herbicide applications of native re-sprouting species to the urban interface. The effects that are described as common to all alternatives are only likely to occur in areas that may be treated for noxious/non-native species, and native re-sprouting woody species in the WUI.

Cumulative Effects

Cumulative effects refer to the impact of an action on the environment that results from the incremental impact of the action when added to other past, present, and reasonably foreseeable future actions. Since the National Historic Preservation Act was fully implemented in the 1970s, cultural resource surveys have been conducted and potential effects to cultural resources addressed through consultation between the Gila National Forest staff, State Historic Preservation Officer, the Tribes,

Advisory Council on Historic Preservation personnel, and interested members of the public. Future projects occurring on NFS lands will require appropriate compliance with National Historic Preservation Act including cultural resources inventories and evaluation of effects of the undertaking. If effects are identified, they will be addressed under the section 106 process of the act. Adverse effects will be minimized through avoidance or mitigation measures, as appropriate.

The greatest potential for cumulative impacts to heritage resources in the area come from the potential for increased erosion rates associated with decreased canopy and ground cover. The potential for direct and indirect impacts are so limited in intensity and scale that cumulative effects are unlikely due to the intensive nature of cutting, and herbicide application to the stumps of native re-sprouting oak and alligator juniper, that large-scale treatments are unlikely. As stated above, adverse effects will be minimized through avoidance or mitigation measures as appropriate. The cumulative effects to cultural resources on the forest, as a result of the herbicide use proposals, are unlikely.

Tribal Relations

Affected Environment

Federally Recognized Tribes

The Gila National Forest manages a great diversity of landscapes and sites that are culturally important sites and held sacred by federally recognized tribes. The Pueblos of Acoma, Laguna, Zuni, and Ysleta Del Sur, the Navajo Nation, the Hopi Tribe, the San Carlos Apache Tribe, the Ft. Sill Apache Tribe, the Mescalero Apache Tribe, and the White Mountain Apache Tribe recognize the lands managed by the Gila National Forest as part of their aboriginal or traditional use areas. Each group has their own history, traditions, and relationship to the land and to other groups. Many acknowledge contemporary use of these lands for traditional cultural and religious activities. Native communities have a vested interest in many locations which may be seen as still inhabited by the ancestors, have value as sacred places, or are important for other reasons. Therefore, tribes share an interest in how important natural and cultural resources in the Gila are managed.

The Gila has certain trust responsibilities and a unique legal relationship with federally recognized Indian tribes. Broadly defined, the trust doctrine requires the Federal Government to support and encourage tribal self-government and economic prosperity. The forest carries out its trust responsibilities under a variety of authorities to maintain a government-to-government relationship. This is achieved through consultation and engagement between federally recognized tribes and the Forest Service. The forest maintains a governmental relationship with the ten federally recognized tribes mentioned above, and routinely consults with these tribes on policy development, and proposed plans, projects, programs, and forest activities that have a potential to affect tribal interests or natural or cultural resources important to the tribes.

No tribally held land abuts the forest (figure 42). All government centers for tribes and pueblos are located over an hour from the forest by vehicle, with many over two hours from the forest boundary. The physical distance between the forest and tribal lands reduces the day-to-day use of the forest by Native peoples and poses a logistical challenge. However, these factors do not reduce the forest's importance as a traditional homeland and a significant and sacred place to tribal people.

Lands managed by the Gila National Forest have been used, and continue to be used, by many tribes for a variety of traditional cultural and religious activities. Over time, these activities have included, but are not limited to collection of plants, stone, minerals, pigments, feathers, soil, catching eagles, hunting game, and conducting religious pilgrimages to place offerings and to visit shrines and springs.

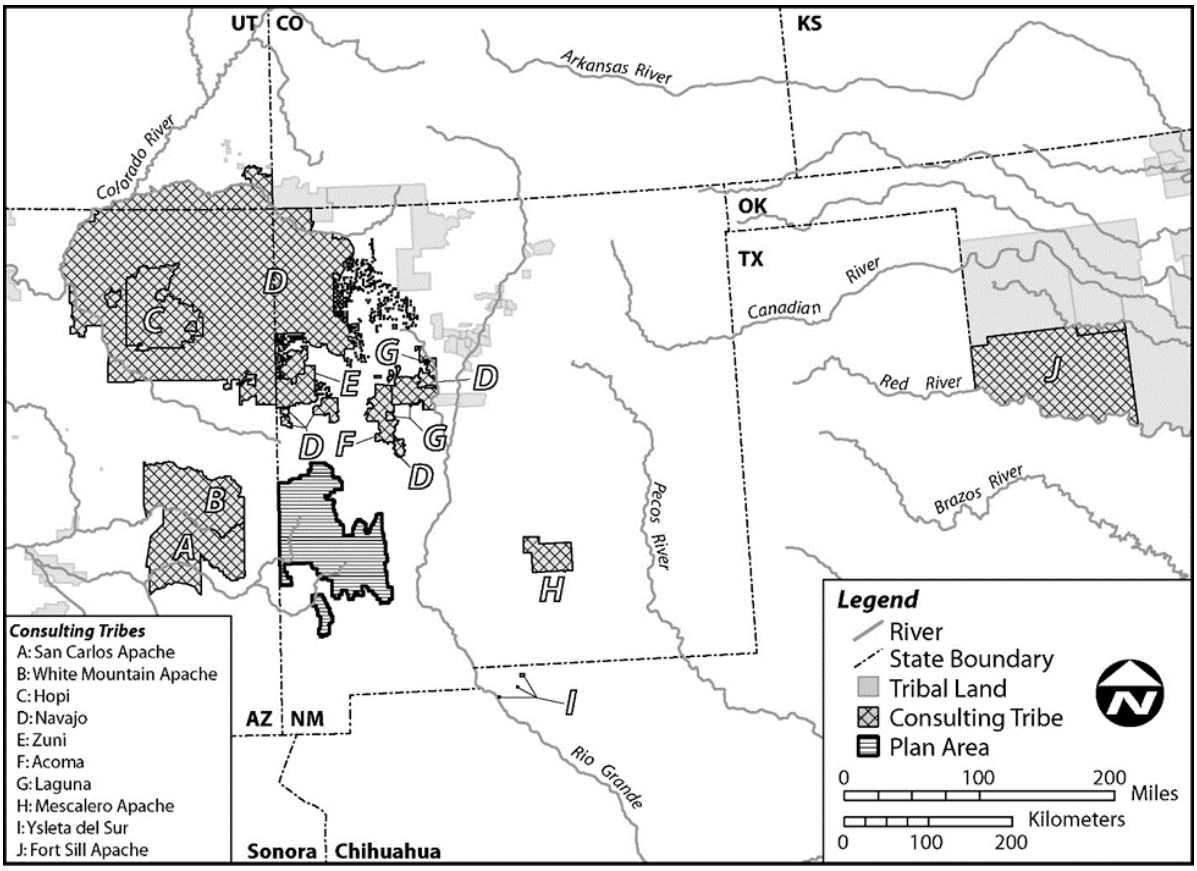


Figure 42. Location of the Gila National Forest (plan area) in relationship to consulting tribes

Although gathering forest products for personal, commercial, and ceremonial uses is limited to some extent due to distance, there is tribal use of and interest in forest products. Distance does not reduce the significance of the area in tribal memory, although it can make daily use less common. Zuni sources have identified at least 15 areas of importance for gathering and hunting. Tribal members from multiple groups have hunted in the forest. Firewood is a forest product that is of interest to tribal members for personal and ceremonial use. This includes juniper, piñon, oak, and ponderosa pine. However, due to travel distance, only a few groups have been known to collect these resources in the Gila NF. Collection of forest products for "special" uses seems more common than for heating. For example, there have been instances of tipi pole collection. There is use of the national forest for collecting forest products for traditional and cultural purposes. Some examples include soils/minerals, yucca, willow, cactus, grasses, osha root, Douglas-fir, ponderosa pine, and oneseed juniper. Due to distance, most tribal use of forest products in the Gila focuses on ceremonial, medicinal, or artistic products. The act of procuring certain products is a sacred activity, requiring preparation on the part of participants. Traveling to collect these materials can be a sacred activity with deeper meaning and importance to participants. Tribal forest product collection within the Gila NF boundaries helps maintain and reinforce sacred connections to the land for tribal individuals.

The issuance of firewood permits and free use permits or authorization letters to accommodate and facilitate tribal harvesting of forest resources is important for cultural and traditional uses and practices. Although the Forest Service has the ability, under a variety of authorities, to assure tribes access to sacred sites and privacy to conduct cultural activities, few tribes have exercised these rights

in the Gila NF. There have been few requests for temporary closure of areas through authorities such as the 2008 Farm Bill for these purposes. The forest is very responsive to tribal requests, and is working toward a consistent procedure to authorize the collection of forest products for ceremonial use.

Places and properties valued and used by the tribes for a variety of purposes have been identified on every district of the Gila NF. Properties can possess traditional cultural or religious significance for a number of reasons. Some of these reasons include locations with long-standing cultural use, locations of buried human remains repatriated under Native American Graves Protection and Repatriation Act, locations where ceremonial objects have been retired, locations of contemporary ceremonies, and locations where specific forest products are gathered for ceremonial use. Some locations such as shrines, springs, caves, and resource collection areas have long-standing and ongoing historical, cultural, and religious significance. In addition to specific noted locations, peaks and entire mountain ranges are frequently regarded as sacred, and viewed as an integral part of a tribe's cultural landscape.

Existing information regarding sacred sites is based on published sources as well as the results of project-level consultation conducted by the forest. To date, approximately 30 locations of cultural and religious significance have been identified forest-wide. The locations and ongoing tribal uses of sacred locations generally remains confidential in order to best protect these resources and their ongoing use. Under the National Historic Preservation Act (NHPA), some identified archaeological sites can be designated as traditional cultural properties. This designation has not been applied to all locations that tribes consider sacred. The forest, together with tribes, has formally documented one location as a traditional cultural property (a petroglyph site); it has been determined eligible for the National Register of Historic Places, though not formally nominated to the National Register in order to protect its anonymity. It is important that traditional practitioners have access to traditional cultural properties and other sites of spiritual or traditional significance and that they are afforded privacy to conduct ceremonies as requested.

Places of tribal importance have an integral relationship with a tribe's beliefs and traditional cultural practices, and are viewed as critical to the maintenance of a tribe's cultural identity and transmittal of their beliefs and practices. Practitioners sometimes engage in certain traditional activities that can only be conducted in a specific place. Tribes have expressed concern that as development continues in areas of tribal importance, it forces these individuals to alter their cultural activities, and in time, is seen as a cumulative impact to their cultural activities. Development does not always stop the cultural activities and practices, but is perceived to degrade the traditional practices and diminish their value.

Conditions and trends that are social and/or economic based are influencing tribal use of the forest and affecting areas of tribal importance. Some of these include: changes in adjacent land ownership and development of private lands affecting access; degradation of forest health and watershed conditions affecting plant collections; changing technologies and development interfering with traditional ceremonies, and recreation use contributing to conflicts with traditional practitioners.

Climate change is affecting the environment in multiple ways. Catastrophic floods, increased fire activity, species becoming less viable in their native ranges, and the expansion of invasive plants and animals have all been associated with climate change. Environmental degradation that occurs has the potential to change the character of sacred places and the availability of traditionally used resources. Traditionally used plants may shift range or become unavailable in some areas due to climate change; these changes can affect the availability of products desired by tribes. Forests, with large

land bases, may prove somewhat more resilient due to less environmental fragmentation and other factors, rendering Forests increasingly important sources of forest products for tribes. Impacts to specific sites will also have the potential to cause tribal concern as resources such as shrines, rock art, and sites where the ancestors still reside could be disturbed by fire or flood.

In recent years, there has been a greater emphasis on alternative forms of energy development such as wind, solar, and nuclear power. While many tribes support the development and use of wind and solar power, there is also recognition that these types of energy development result in a large footprint on the landscape, and often impact the viewshed.

Changes in telecommunication technology over the past century resulted in a proliferation of communication sites developed on the forest, most located on high points such as mountain tops. These constructed features are a mixed blessing for tribal communities. While communication sites make certain technologies readily available to all, they are perceived to cause impacts to the landscape, wildlife, and traditional tribal use of the land. For example, radio communication sites contain towers that can be seen for great distances, and if greater than 200 feet in height, will be lit at night per Federal Aviation Administration requirements. Those tribes that have expressed opposition to the development of new communication sites have encouraged co-location of communication infrastructure to the maximum extent feasible.

It is important that traditional practitioners have access to sites of spiritual or traditional significance and that they are afforded privacy to conduct ceremonies as requested. Cultural resources (e.g., archaeological sites) are often of importance to tribes and it is important that tribes are consulted regarding management of these resources, particularly when it comes to interpretation, excavation, and the treatment of human remains.

Plan-Level Environmental Consequences

Probable management activities related to alternatives are used to evaluate or predict short- and/or long-term effects to federally recognized tribes in the Gila NF. These management activities are evaluated in relation to their effects on the uniqueness and values of the people and tribal culture and the role the forest and forest management plays in supporting the cultural, social, religious, and economic values of federally recognized tribes.

Effects common to all alternatives

The Gila NF is bound by several legal obligations to maintain relations with tribes and managed resources of tribal importance; these include: the Archaeological Resource Protection Act, the American Indian Religious Freedom Act, the Native American Graves Protection and Repatriation Act, Executive Order 13007, Executive Order 13287, and the National Historic Preservation Act Sec. 106. Consequently, all alternatives would have the same effects on tribal relations: the process of respectful consultation would continue regarding tribal interests in the Gila National Forest ranging from land use, recreation, conservation, and commercial use of forest products, to traditional uses of forest resources and the preservation and ongoing use of sacred sites. Maintaining and developing government-to-government relationships with Tribes helps inform management of the forest, maintain communication lines, and build trust.

All alternatives keep the same road system. This road system influences the forest's ability to contribute to the social, cultural, and economic conditions within the forest and the broader landscape. The Pueblo of Acoma has expressed concern regarding dispersed motorized use of the forest and the proliferation of motorized trails and roads. They are concerned that too much

motorized use degrades watersheds, displaces plants, disturbs animals, and reduces the sense of solitude. They, and other tribes, have been supportive of the forest's efforts to regulate motorized travel via the Travel Management Plan.

Efforts were made during travel management planning to identify and address places of traditional and cultural significance, and ensure tribal access to those locations. Existing laws and regulations provide direction that authorizes forest officials to close areas for traditional purposes if requested by federally recognized tribes. Under that decision, there is a mechanism for authorizing access under certain circumstances including for traditional use. Forest access is provided for the acquisition of forest products such as fuelwood (juniper, piñon, oak, and ponderosa pine), soils/minerals, yucca, willow, cactus, grasses, osha root, Douglas-fir, ponderosa pine, oneseed juniper, and tipi poles. The issuance of fuelwood permits, and free use permits or authorization letters to accommodate and facilitate tribal harvesting of forest resources important for cultural and traditional uses and practices would continue. This access allows continued cultural and traditional uses of these products and helps maintain sacred connections to the land and sustain their traditional ways of life.

Plants used for subsistence, religious, medicinal, and other cultural purposes are important to federally recognized Tribes. While the plant species of importance vary between tribal communities, important ones are grasses, herbs, forbs, succulents, shrubs, and trees. Many of these important species fall in two categories: species that favor areas disturbed by fire and other activities and species that favor riparian areas. While individual plant species respond differently to specific types of disturbance, tribes support the use of fire as a disturbance source to encourage the availability, abundance, and sustainability of disturbance species. Wildfire managed for resource benefit and prescribed fire would be the most immediately productive for encouraging disturbance species. In areas subject to mechanical treatment, the availability of disturbance species would be anticipated to decline during, and immediately following, treatment, depending upon the volume of woody debris left on the landscape. However, mechanical treatment followed by prescribed burning would increase the availability and abundance of disturbance species after implementation was completed.

All alternatives feature a range of mechanical and fire techniques to reduce the risk of uncharacteristic fire (often observed as large areas burned with exceedingly high severity) by reducing available fuels and decreasing the density of forests and woodlands. These treatments will move vegetation to a condition that would improve the presence, condition, and availability of important species necessary for the practice of traditional activities within tribal communities. However, both fire and mechanical treatments can also have negative effects on tribal spiritual and cultural sites.

Mechanical treatments impact cultural resources by compacting the ground in and around archaeological sites and by disturbing the distribution, arrangement, or properties of artifacts within the site leading to loss of site integrity. Mechanical treatment also involves the construction of more temporary roads and mechanical treatment projects have more opportunity for public intrusion to collect fuelwood. Mechanized activities that increase noise have the potential to adversely affect solitude and privacy of tribal practices.

Non-mechanized treatments include planned (prescribed fire) and unplanned ignitions (wildfire) to address vegetation conditions. The cultural resources in the Gila NF have persisted through many fire cycles over time. Generally, low-intensity fires have not adversely impacted prehistoric sites that are not fire sensitive or composed of combustible material, and the forest would be managing for low to mixed fire severity depending on the operation goals. The effects from mixed-severity fires depend on the site type and the temperature and duration of heat on the ground surface. The use of

wildland fire could result in adverse impacts including prehistoric rock structures spalling apart from exposure to very high temperatures; ceramic material re-firing; obsidian artifacts melting (caused by high-intensity fire); site features undergoing accelerated erosion because of hydrophobic soils (caused from high-intensity and long duration fires); cultural features and structures being displaced or damaged by killed trees falling and uprooting the ground surface; creation of burned stump holes that result in erosion; and cultural materials being exposed to increased erosion and the potential for theft because of vegetation removal from the ground surface. Prescribed fire reduces the threat to structures, sites, and areas in the acres treated. Increased acreage of prescribed fires during optimal conditions can allow for fire that will not burn as hot as wildland fires and sites can be identified prior to implementation and protected (Buenger 2003). Wildland fire managed for resource benefit reduces the threat from uncharacteristic wildland fire for known structures, sites, and areas. However, unknown or unrecorded heritage resources could be impacted by managed wildland fire.

Access to visiting traditional cultural areas (e.g., collection areas, archaeological sites and traditional cultural properties) could be affected in the short term during implementation of restoration treatments with temporary closures of areas for health and safety. These restoration activities would result in a short-term decrease in the availability of plant species and other materials for traditional uses in the acres treated until implementation is complete. The availability of plant species that favor disturbance would increase in these areas once treatment activities have been completed. After restoration treatments are complete the temporary roads used to implement restoration projects would be restored to natural conditions after use. Restoring these temporary roads to natural conditions would result in a decrease in visitation by people from outside tribal and rural historic communities, helping to protect the privacy and confidentiality of many traditional or cultural practices in the forest. However, restoring these temporary roads to natural conditions could potentially remove access routes for traditional activities. Reduced roadways may negatively affect the lifeways of nearby tribes and historic communities by increasing the difficulty of accessing the forest, especially for the elderly or those unable to walk long distances.

All alternatives afford broad opportunities for Tribal members to experience solitude and privacy for traditional and cultural activities on the forest with significant amounts of backcountry opportunities currently without heavy visitation outside of hunting seasons. Located away from urban areas, hunting, backpacking, and camping represent important activities that are enjoyed by locals and bring visitors into the area. Improved recreation opportunities and experiences could result in increased access and visitation. Increased public visitation could result in more people accidentally intruding upon important cultural or sacred sites and increased vandalism (e.g., collecting artifact offerings, moving stones). While increased access is a positive in many ways for communities, the increase in visitation by people from outside tribal communities has the potential to disrupt the settings and privacy of traditional practices.

Impacts created by the presence of towers or any other highly visible anthropogenic objects, obstruct the “line of sight” from the physical location of the ceremony to a given location (e.g., a peak). This can interfere with the practitioner’s accuracy of diagnosis and proper treatment of patients. These visible impacts represent an intrusion to the traditional experience and the ability to properly conduct prescribed cultural practices. Visual and physical intrusions can alter, damage, or destroy the attributes of the place that are necessary for the traditional religious use or cultural purposes. The continued permitting and development of electronic facilities and mines on the forest, particularly on or near the higher mountains, affects the meditative atmosphere, quietness, and privacy necessary for traditional cultural activities. The additional vehicular traffic associated with the use, maintenance,

and/or expansion of these types of facilities can also intrude and interfere with traditional and religious practices.

Activities that limit or change the use and access of traditionally used resources, traditional cultural properties, or sacred sites would have adverse effects by altering or removing a specific traditionally used resource/setting or impacts the process and/or continuation of the ceremonial rite. Tribal input on individual projects and on general cultural concerns would inform projects and improve the protection of the settings and sites that support the traditional cultural practices of American Indians.

Alternative 1 – 1986 Forest Plan

The 1986 forest plan provides little direction or narrative about tribes and their interests. The current forest plan focuses on the identification and management of cultural resources but has no mention of traditional cultural properties and practices in the standards and guidelines. The forest has the ability, under a variety of authorities, to assure tribes access to sacred sites and privacy to conduct cultural activities. However, the current plan is not up to date with such post-1986 authorities as the Native American Graves Protection and Repatriation Act and the 1992 Amendments to the National Historic Preservation Act.

Alternative 1 does not recognize the inherent value and sensitivity of traditional cultural properties, nor does it provide for maintaining the security of information about such sites. These properties and sites are vulnerable to degradation by both natural processes (i.e., erosion and high-severity wildfire), and human processes (i.e., recreation and forest management activities), which could degrade or destroy their physical integrity and intrinsic cultural value. Historic properties are the major source of information regarding the history of human occupation of the plan area. In addition, the cultural importance of the land itself and the connection of local communities to that land are important parts of their cultural identities that could be lost if not recognized as needing protection from natural and human processes. Forest management that does not recognize and value the significance of forest lands and resources to the culture and social fabric of federally recognized tribes may contribute to the loss of the culture. The lack of additional protections to confidentiality and privacy surrounding traditional and cultural practices, could degrade these experiences for some groups or may expose these practices to unwarranted users of the forest. While the 1986 plan is devoid of direction regarding compliance with many recent laws and regulations related to tribal interests, Gila NF archaeologists are cognizant of the latest regulations and ensure that their requirements are followed.

The 1986 forest plan recognized that adjustment of landownership is needed to support resource management goals. It identified base in exchange lands totaling 9,580 acres and proposed to provide for expansion of communities as the need arose. It is very prescriptive in prioritization of parcels for landownership adjustment and does not consider cultural resources. Adherence to this list could narrow opportunities to work with local communities and tribal governments in addressing their expansion needs and public access to Federal land. In addition, some areas identified for acquisition by the existing forest plan are likely no longer relevant given completed land adjustments or changing priorities. Many access opportunities have been lost across private lands due to historic landownership patterns, changing private ownership conditions, and a lack of established, legally defensible access across private lands. Alternative 1 does not account for the current increasing residential development adjacent to the forest resulting in restricted public access across private property to NFS lands and forest products for traditional uses.

Land adjustments have the potential to adversely or positively affect the use and characteristics of cultural resources. Conveying cultural resources that are eligible or listed on the National Register

out of Federal ownership would be an adverse effect. Once the lands are transferred out of Federal ownership, the tribes would not be guaranteed the same rights of access and use of the traditional cultural properties or area for traditional purposes. Federal laws, executive orders, regulations, and Forest Service policy regarding American Indian rights and interests would no longer apply. Land adjustments may also potentially have a positive effect on cultural resources where newly acquired private lands would come under protection of Federal laws and management. Acquired private lands, including traditional cultural properties that were previously inaccessible to tribes, would be accessible for traditional proposes.

The no-action alternative does not provide direction on managing resources to develop adaptation and resiliency in response to climate change. Because of this, the quality and/or availability of forest products for traditional native uses may decline with the trends of more closed vegetation canopy conditions and uncharacteristic fire. Likewise, the natural resources that comprise sacred places and settings and traditional cultural properties may degrade because of climate-induced changes.

Effects Common to Alternatives 2, 3, 4, and 5

In all action alternatives, tribal relations and consultation would continue to follow the existing and ongoing guidance provided by Regional and Washington Office directives. Under a management approach focused on relationships, developing tribally specific memoranda of understanding would be encouraged. These memoranda of understanding would formalize work with American Indian tribes to understand community needs and build respectful, collaborative relationships, in order to achieve mutually desired conditions. The forest would work to better define shared goals and outcomes for tribal consultation and would emphasize consistent process and interactions with the tribes. As a result, the consultation process would be more meaningful for the tribes and the forest. Maintaining lines of communication between the Forest Service, tribes, communities, partners, and the public, helps improve relationships, collaboration, and shared interests.

Plan components recognize the importance of providing opportunities for privacy, maintaining confidentiality and protecting traditional resources of importance and access to sustain the traditional lifeways of federally recognized tribes. The guideline that consultation with tribes should occur at the early stages of project planning and design would encourage tribal perspectives, needs, and concerns, as well as traditional knowledge being incorporated into project design and decisions to reduce any unintended impacts to areas of tribal importance. These considerations would help minimize impacts to the physical and scenic integrity of places that the tribes regard as sacred sites, traditional cultural properties, or as part of an important cultural landscape.

In the forest, the Ecological Response Units correspond to vegetative communities that have specific desired conditions defined in the forest plan. Those Ecological Response Units having current conditions that are the most departed from desired conditions were given plan objectives for vegetation treatments to reduce the departure and return proper ecological function to these areas. Alternatives 2, 3, 4, and 5 are driven by a goal to provide for the restoration of a sustainable ecosystem with differing emphases on the methods used (fire and mechanical treatments) to accomplish restoration. Many tribes view large landscape scale restoration as a way to restore and enhance plant, water, and wildlife resources. There is an understanding from Tribes that a healthy functioning resilient ecosystem is a healthy sacred place. Restoring a sustainable ecosystem in the forest will also create an environment more conducive to the preservation and protection of traditional resources by stabilizing soils, improving vegetative cover and treating watersheds. Landscape restoration provides an opportunity for tribes and the Forest Service to work together toward common goals, and hear and incorporate tribal input into a broad range of activities.

Access to locations and materials for traditional purposes is addressed in plan components, with a desired condition for forest resources that are important for cultural and traditional needs, subsistence, and economic support to be available and sustainable for use by tribal and historic communities. Management activities and permitted uses would maintain riparian management zones in, or trending toward proper functioning condition. Moving riparian vegetation toward desired conditions would enhance the availability of plants that are collected by Native Americans for traditional uses. By providing sustainable forest resources, the forest helps to support traditional and cultural uses spanning centuries and contribute to local economies and livelihoods. The revised forest plan provides direction on managing resources in response to climate change as management approaches. It also incorporates strategies for managing the effects of natural disturbances resulting from climate change that can adversely affect forest natural resources. Because of this, the quality and/availability of forest products for native uses would be maintained. The direction would foster adaptation and resiliency in natural resources, and would benefit certain cultural resources.

All action alternatives identify criteria in a management approach for land acquisitions or exchanges without listing specific areas in the draft Plan. This would allow the forest to be flexible and to make determinations based on the current needs of the forest, local communities, and tribes. The criteria for land adjustments now include considerations for cultural resources. Lands desirable for acquisition would now include lands needed for the protection of significant historical or cultural resources when these resources are threatened or when management may be enhanced by public ownership. Federal land conveyances could include parcels that do not have significant recreational, cultural, or ecological value, and the transfer does not impact public access or resource management objectives. These land adjustment considerations help ensure long-term tribal access to sites to maintain and reinforce sacred connections to the land.

In all action alternatives, there is a plan guideline stating reconstruction and rehabilitation of existing roads should be emphasized over new road construction. Existing roads identified for reconstruction or rehabilitation would take into account those roads that provide access to properties of traditional importance, sacred areas, and traditional use areas. All action alternatives contain an objective for road decommissioning at 50 miles within 10 years of plan approval. A complementary management approach suggests that one of the priority factors for decommissioning roads include those roads having adverse impacts to cultural resources. Decommissioning motorized travel routes reduces the risk of ground disturbance, unauthorized collection and vandalism at structures, sites, and areas near those motorized travel routes although this could also hamper tribal members' ability to access areas of interest. Roads that would be decommissioned would require a site-specific NEPA decision and the management approach further encourages when developing the proposed action for a NEPA project, considering incorporating any decommissioning of roads within the project area that meet these decommissioning priority factors while involving affected stakeholders such as tribes. Another guideline states that special uses (roads, linear utilities, communications sites, etc.) should be consolidated/co-located whenever possible which will help minimize impacts to cultural and visual resources.

The continued emphasis on dispersed recreation in these alternatives as part of the forest's niche would likely result in increased numbers of forest visitors. Increases in visitation by people from outside tribal and rural historic communities has the potential to negatively affect traditional practices, through unexpected breaches in privacy or confidentiality. The new recreation opportunity spectrum classifies 16 percent of the Gila as primitive and 44 percent semi-primitive non-motorized, which indicates that some areas could provide solitude and privacy for federally recognized Tribes. All action alternatives identify new areas in the forest to recommend for wilderness designation.

Protection of wilderness values indirectly protects use of traditional cultural properties/sacred sites by eliminating certain management activities that have the potential to adversely affect them (e.g., mechanized treatments and uses, construction of roads and facilities), although there could be effects to tribal access explained more in detail under each individual alternative.

A desired condition of the draft plan is that the Gila provides a setting for educating tribal youth in culture, history, and land stewardship, and for exchanging information between tribal elders and youth. Another management approach seeks opportunities to develop, in collaboration with tribes, interpretive and educational exhibits or other media that focuses on the history of the lands managed by the Gila NF, which would provide the public with a greater understanding and appreciation of shared history, culture, and traditions while protecting confidential and/or sensitive information.

Alternative 2

Alternative 2 aims to restore a variety of grasslands, open woodlands, and forests using a combination of naturally ignited wildfire, prescribed fire and mechanical methods to maintain or move toward desired conditions. This blend would potentially increase the long-term productivity of traditionally used forest resources and availability of those resources across the landscape.

This alternative identifies new areas on the forest to recommend for wilderness designation. There are no known areas within the recommended wilderness for this alternative that have been identified to the forest as sacred or as gathering areas by tribal communities requesting motorized access for members particularly for older tribal members.

Effects Common to Alternatives 2 and 5

Alternatives 2 and 5 allow flexibility in the occurrences of both land acquisitions (e.g., purchases) and land conveyances (e.g., sale, exchange, or donation). Land acquisitions of private property are expected to continue to be easier to implement than land conveyances based on the authorities currently available leading to the Gila growing slightly over the life of the plan. This would shift slightly the amount of private property to Gila National Forest land, which would provide more potential for tribal access to important sites and collection areas formerly on private property. Newly acquired private lands would come under protection of Federal laws and management, and acquired private lands, including traditional cultural properties that were previously inaccessible to tribes, would be accessible for traditional proposes.

Effects Common to Alternatives 3 and 4

Alternatives 3 and 4 stipulate that land acquisitions (e.g., purchases) would be balanced over time with land conveyances (e.g., sale, exchange, or donation) so that no-net loss of private property in a county occurred. Since it is easier for land acquisitions to occur than land conveyances based on the authorities currently available, it likely that this will limit the amount of future land acquisitions (although purchased easements could provide access in some cases). As a result, non-Federal lands with important cultural resources could be developed instead of acquired and tribal access to important sites may be hindered.

Alternative 3

Alternative 3 places more emphasis on mechanically treating grassland and open woodland vegetation to maintain or move toward desired conditions for those vegetation types. These efforts would prioritize restoring understory vegetation that could be used as forage for livestock grazing, which contributes to local and regional economic sustainability. The use of fire would be limited.

The intensity of vegetative treatments in plan objectives for alternative 3 is greater and relies more heavily on the use of mechanical treatments. This intensive use of mechanical treatments may generate more wood products available to tribal members, but create more ground disturbance than some other alternatives leading to potential effects to traditional sites and access as described in the in the Effects Common to All Alternatives section.

This alternative identifies new areas in the forest to recommend for wilderness designation. Wilderness recommendations are avoided in areas identified as needing restoration in grassland and open woodland vegetation and providing access to traditional recreational, cultural, and historical uses of the forest. There are no known areas within the recommended wilderness for this alternative that have been identified to the forest as sacred or as gathering areas by tribal communities requesting motorized access for members particularly for older tribal members.

Alternative 4

Alternative 4 places more emphasis on mechanically treating forested/timberland vegetation to maintain or move toward desired conditions. These efforts would prioritize restoring forested vegetation that could also produce forest products, which contributes to local and regional economic sustainability. The use of fire would be limited. This alternative identifies more land suitable for timber production and would offer more wood products, which could be available to tribal members. The intensity of vegetative treatments in plan objectives for alternative 4 is greater and relies more heavily on the use of mechanical treatments. This intensive use of mechanical treatments may create more ground disturbance than other alternatives leading to potential effects to traditional sites and access as described in the in the Effects Common to All Alternatives section.

This alternative identifies new areas in the forest to recommend for wilderness designation. Wilderness recommendations are avoided in areas identified as needing restoration in forested vegetation or being suitable for timber production and providing access to traditional recreational, cultural, and historical uses of the forest. There are no known areas within the recommended wilderness for this alternative that have been identified to the forest as sacred or as gathering areas by tribal communities requesting motorized access for members particularly for older tribal members.

Alternative 5

Alternative 5 places more emphasis on use of wildland fire as a restoration tool to maintain or move toward desired conditions for a combination of grassland and open-canopy woodlands, and forest types. Mechanical treatments would be largely limited to the wildland urban interface. Riparian areas containing perennial streams or native trout populations or Mexican spotted owl would have an increased buffer from new construction or realignment of roads. This intensive use of fire treatments may intensify the effects from these types of treatments to traditional sites and access as described in the in the Effects Common to All Alternatives section.

This alternative identifies new areas on the forest to recommend for wilderness designation. This alternative does include one recommended wilderness area that is a tribal area of importance that is important to be accessed by motorized means by tribal members. Recommending this area could limit access for tribal elders to cultural or sacred sites who may not be able to easily walk to sites.

Cumulative Effects

The cumulative effects analysis timeframe for the tribal relations analysis is the next 10 to 15 years. Tribal relations in this country have been shaped by the history of interactions between the Federal

Government and tribes. Other national forests have solicited the tribes regarding their concerns and interests in forest management. Specific comments have been received by other national forests about concerns over increased development, impacts to resources from off-road travel, the environmental and cultural impacts of mining, and protection of agave.

Tribal access and use of the lands and resources now managed by the Gila National Forest, as well as the general landscape, have been altered over time due to a number of factors. The primary factor is the change in land ownership and jurisdiction. Historically, resources on the land were more widely available to tribes, and they had nearly unfettered access to these lands for hunting, acquiring construction material, gathering firewood, and collecting resources for food, medicine, and ceremony. There were often well-established travel routes between communities, and prescribed routes to specific locations of tribal importance. As the Spanish, Mexicans, and later the Americans moved into the area, recognition of land ownership became increasingly important. Access to and use of resources continued to change with the establishment of the national forest in the early 20th century, and the gradual progression of environmental policy, resulting in the passage of Federal laws and regulations, and greater Federal oversight. In some cases, access to culturally significant locations has been severely restricted or eliminated altogether in places where land has gone into private ownership.

The process of preparing for and travelling to an area to conduct traditional and cultural activities is often as significant as the activity itself. The construction of fences, installation of gates, and checkerboard land-ownership patterns, has contributed to complicating the tribes' ability to do resource collection and to visit areas of traditional cultural and religious significance. Land ownership can affect how tribes approach areas of tribal importance, and conflicts have been known to arise with landowners or with Forest Service personnel who are unfamiliar with tribal rights on NFS land. Ownership and development of private land has led to a greater reliance on national forests. Still, there is only limited use of the Gila National Forest by tribes for traditional, cultural and religious activities. Instead, they will opt, where they can, to obtain these resources on their own lands, or will travel to NFS lands that are closer to their reservations. When tribes do go to important places on national forests, their methods of travel and their activities often have to be adjusted for factors such as road development, fences, gates, mixed land ownership, and other permitted or recreational uses of forests.

Tribal members are concerned about the cumulative degradation of open spaces and the modification of cultural landscapes. Places of historical, traditional, and cultural significance to the tribes, whether or not they are identified as traditional cultural properties, and traditional forest product collection areas are located across these landscapes. Many of these traditional use areas are located on nontribal lands including State, Federal, and private lands. As with cultural resource sites, many of which are considered ancestral homes of tribal members, losses of traditional use areas and places of traditional importance has been high on developed private lands.

There are inholdings of private land within the forest. In some cases, these properties contain strategic and culturally significant features such as springs. Most of these lands have not been subdivided. However, development of subdivisions within or adjacent to the forest can create concerns for a variety of reasons including: changes to the visual characteristics of the landscape, construction of new transmission lines and other utilities in forest, concerns for wildlife, introduction of new species, degradation of watershed condition, increased fire risk, and when residents who live immediately adjacent to the national forest and/or wilderness areas establish informal trail systems for their personal use.

Evidence of past mineral exploration is still evident today on the forest and surrounding areas, and the Forest Service and other state agencies are working on mine reclamation of abandoned mines as funds are available. In the aftermath of the 2015 Gold King Mine wastewater spill originating in Colorado, and subsequent response of the Navajo Nation and other tribes in the region, there could be heightened tribal interest in the successful remediation of mines.

Every management decision that adversely impacts these places contributes to the cumulative loss of traditional cultural properties and traditional use areas across the region. The proposed plan provides for proactive management of known traditional cultural properties, important resources, and traditional use areas in the forest. Therefore, the proposed plan helps to offset the general loss of traditional cultural properties in the region by providing increased consideration for local forest resources.

Another major topic was opportunities for tribal youth to be exposed to the traditional lands that are now part of the Gila National Forest, either through educational activities (on the ground or virtual), through working with other researchers, or as employees. Programs are being established (by tribes with forest participation) which bring youth onto the forest to reconnect with traditional lands. The Gila NF entered into a three-year Collaborative Forest Restoration Project grant with the New Mexico Forest Industry Association. This grant provided job training and work (some in the forest) marking timber to the local Alamo Navajo. The desired conditions and collaborative management approaches would continue to encourage these types of efforts so that the Gila provides a setting for educating tribal youth in culture, history, and land stewardship, and for exchanging information between tribal elders and youth for a continuation of these practices.

Herbicide-Use Environmental Consequences

See the Cultural Resources Herbicide-Use Environmental Consequences.

Trails

Affected Environment

Introduction

The Gila National Forest's 1,927-mile designated motorized and non-motorized trail system provides a diversity of recreation opportunities and serves as a vital component of the forest transportation system, providing administrative access for installation and maintenance of range and wildlife infrastructure, commercial grazing management, fire lookouts, and fire management.

The existence of some current National Forest System trails actually precedes the establishment of the Gila NF. Current alignment of many system trails was influenced by accommodating terrain and attaining access or being near water resources. Because water availability is limited, system trails located near or to water resources tend to be popular, but recreational use may contribute to resource damage and flooding can be a health and safety concern.

Existing designated system trails are often characterized by steep grades, and are poorly aligned in a manner that creates resource damage and maintenance challenges due poor drainage and erosion. Improper trail design has necessitated the installation of numerous drainage structures on some trails to address erosion issues that require frequent maintenance.

Currently the Gila NF designated trail system consists of 179 miles of motorized and 1,752 miles of non-motorized trails (with 861 of the non-motorized miles within designated wilderness). According to NVUM survey results, the most popular recreation activity for visitors is hiking/walking. The Gila NF encompasses several large wilderness areas, numerous inventoried roadless areas, an abundance of undeveloped backcountry, and limited motorized access. Under current and projected funding of the trails program, it is likely that there are more miles of existing trail than that can be maintained by the forest.

There is growing popularity of adventure races and similar events such as boot camps, mud events and endurance races held under a special-use permit. The activities associated with these recreation events may include: running, bicycling, paddling, climbing, orienteering, and other activities that require endurance, strength and agility, and are generally limited to areas outside of designated wilderness and on forest system trails.

One such event that occurs in the Gila NF is the "Ride the Divide" mountain bike race. This race follows as close as possible to the alignment of the CDNST, and participants attempt to ride the entire length of the trail unsupported. Another recreation event is the "Tommyknockers 10" race that has occurred annually since 2016 within the Fort Bayard trail system near Silver City. This event is a 10-hour endurance mountain bike race that makes use of multiple trails to create a loop that participants complete as many laps as possible.

The Gila NF's Travel Management decision was released in June 2014, and implemented upon publication of the MVUMs for the Quemado, Reserve, Wilderness and Black Range districts in July 2017, and the Silver City and Glenwood Ranger Districts in January 2017. Under the travel management decision, the forest designated 175 miles of trail for motorized use, however travel management is a dynamic process allowing for additional miles to be designated or removed by future site-specific project planning.

Current Trail System Conditions

Trail conditions vary greatly throughout the forest. Often, because of limited funding and the necessity to prioritize maintenance, more popular trails are in the best condition. System trails that are the least used often have the greatest deferred maintenance issues. Trails that are rarely used or located in fire-affected areas have in some cases deteriorated to the point that they are difficult to locate and travel. Many trails are missing signs and existing signs may be illegible due to weathering.

Major disturbances such as high-severity wildfires and flooding have resulted in an accelerated rate at which trails are experiencing damage across the forest. While the Gila NF has prioritized maintenance of popular trails within the disturbed areas, secondary trails may not receive attention, contributing to maintenance backlog and further deterioration.

Another administrative challenge is an increasing trend of user-developed trails. User-developed trails are often created without taking into account vulnerable resources, and lack proper sustainable design to prevent erosion, and are susceptible to creating resource impacts. Addressing user-created trails affects the allocation of available funding and resources that would otherwise be dedicated to addressing maintenance backlogs to system trails.

Conflicts between Different User Groups

A trend of increasing conflicts has been observed between hikers, equestrian users, and mountain bikers on the Gila NF trail system. These types of conflict occur most commonly on forest system trails located near Silver City, and are becoming more frequent as trails receive increased visitation by a range of different uses. There is a commonly used concept and corresponding graphic known as the "yield triangle," which presents a right-of-way hierarchy consisting of bikers and hikers yielding to horses, and bikers yield to hikers (see figure 43). However, many users may be unaware of or are unwilling to abide by the yield triangle, which may contribute to occurrences of user conflicts. The increase in demand has also contributed to negative interactions between user groups, adversely affecting all trail users' recreation experiences. Examples include horses being spooked by dog walkers, and mountain bikers passing hikers at high speeds, creating a perception of unsafe conditions.

Figure 43. Trail courtesy "Yield Triangle" graphic typical of trail signage for multiple-use trails

Conflict between motorized and non-motorized recreationists has also been a trend, but is limited because there are relatively few areas where these activities overlap. However, there has been illegal motorized trail encroaching on sections of the CDNST where roads cross the trail.

National Scenic and Recreation Trails

The National Trails System Act of 1968 created a system of national scenic trails, national historic trails, and national recreation trails. National Scenic and Historic Trails are statutorily designated by Congress, and National Recreation Trails are administrative designations established by land management agencies.

The Gila NF administers segments of one national scenic trail (Continental Divide National Scenic Trail), and there are three national recreation trails (Catwalk National Recreation Trail, Sawmill Wagon Road National Recreation Trail, and Woodhaul Wagon Road National Recreation Trail) in the forest (figure 44).

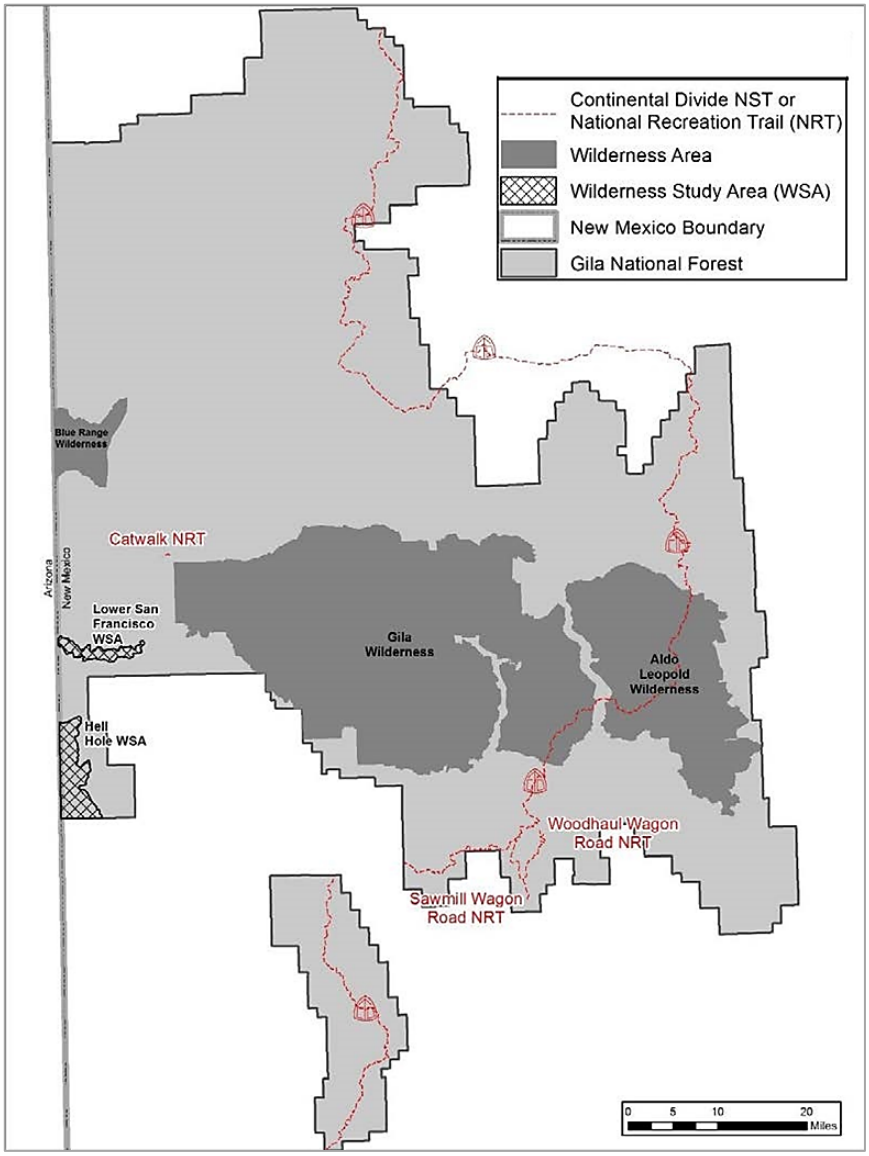


Figure 44. Location of the Continental Divide National Scenic Trail and the national recreation trails

Continental Divide National Scenic Trail

The entire CDNST closely follows its namesake continental divide from Canada to Mexico, spanning approximately 3,100 miles (USDA FS 2015h). It traverses the Continental Divide through portions of 20 national forests, 3 national parks, 1 national monument, 13 BLM field offices, and various State and private lands in the states of Montana, Idaho, Wyoming, Colorado, and New Mexico.

Congress designated the CDNST in 1978 to provide high-quality scenic, primitive hiking, and horseback riding opportunities, and conserving natural, historic, and cultural resources along the trail corridor. The intent of the trail pursuant to the National Trails System Act of 1968 is for non-motorized use. The trail navigates dramatically diverse ecosystems along the divide, such as alpine forests, mountain meadows, bare granite peaks, and high desert.

The Gila NF currently administers 254 miles of the CDNST, which is managed to be consistent with direction provided in The Continental Divide National Scenic Trail Comprehensive Plan (USDA FS 2009). The CDNST is one of the most renowned trails in the United States for its scenic beauty, recreational opportunities, elevation gains, and primitive character, making it a significant attraction for bringing hikers and other trail users to the Gila NF. Trail conditions of the CDNST vary throughout the forest, but tend to be better maintained than other system trails.

Recreational use of the CDNST includes day-hiking, backpacking, mountain biking, and horseback riding. While other types of uses may occur year-round, spring and fall are popular seasons for thru-hikers travelling north and south, respectively. Thru-hiking is a colloquial term for hiking a long-distance trail end-to-end within one hiking season. This may be accomplished in a single extended backpacking trip, or by a series of shorter excursions. Thru-hikes may also vary in scope. For example, a hike of the CDNST across the state of New Mexico, or even just the Gila NF in either single trip or series of hikes might be considered a thru-hike.

Sections of the CDNST pass through areas of the forest with limited water sources and the majority of the trail crosses remote regions of the forest, with long sections having limited road access, which limits resupply options for thru hikers and inhibiting visitor use overall. Some sections of the CDNST have been impacted by wildfires in the recent past, making it difficult to follow in some areas. Poor trail conditions, a desire minimize travel distance, access to water sources, and prohibition of mechanized travel through wilderness prompts some CDNST visitors to follow alternative routes.

The CDNST trail corridor currently makes occasional use of motorized routes as it passes through the forest, following open motorized trail for 2.4 miles and open motorized road for 30.9 miles. Motorized use within these shared rights-of-way is not in alignment with trail objectives and allowable uses under the legal designation of the trail. Public comments received have expressed concern that motorized use is incompatible with National Scenic Trail objectives, and detrimental to experiences of hikers and horseback riders on the CDNST. Specific areas identified included the Burro Mountains and Sapillo Campground, and motorized trespass on the trail has been an issue throughout the Quemado District. Future plans include moving the trail onto non-motorized routes when it becomes practicable, and as opportunities have occurred, trail routes have been realigned.

National Recreation Trails

The Forest Service designates national recreation trails to distinguish exemplary trails of local and regional significance and provide trail-based outdoor recreation activities in a variety of settings. The

Gila NF national recreation trails include the Catwalk National Recreation Trail, the Sawmill Wagon Road National Recreation Trail, and Woodhaul Wagon Road National Recreation Trail.

The Catwalk National Recreation Trail is a unique trail that consists of hanging walkways suspended from cliff walls within the canyon above Whitewater Creek. The Catwalk attracts significant numbers of visitors to the area, contributing to the local economy, and provides an important social connection to the forest. This trail is a "one of a kind" recreation experience and a unique opportunity for persons with disabilities, because its first half-mile is wheelchair-accessible and it travels deep into a mountain canyon.

Due to its location within a narrow canyon, the trail is inherently at-risk to flooding impacts, and has been damaged and rebuilt in the recent past. However, the most significant damage to the Catwalk was due to a 1,000-year flooding event when 10 inches of localized rainfall occurred within a 24-hour time period. Few trails can be engineered to withstand such an event, which also damaged many other trails in the area. The most recent Catwalk renovations were designed better than past efforts, and are expected to better withstand future flooding and provide improved visitor experiences—especially to disabled individuals.

The Wood Haul Wagon Road Trail and Sawmill Wagon Road Trail are both part of a larger system of trails near Silver City. The trails in this system are heavily used by hikers, mountain bikers, and equestrians, in part due to their close proximity to Silver City. The Aldo Leopold Youth Conservation Corps has adopted the trail maintenance for this area.

The Sawmill Wagon Road was an integral part of the original Fort Bayard Military Reservation in the late 1800s. Soldiers used the trail to transport fuelwood and construction timber from the high ponderosa pine forests of the Piños Altos Mountain Range to the military reservation. Currently, the trail is used by hikers, cyclists, and equestrians, and serves as one leg of various possible loops with several other connected trails. It connects to the north with the CDNST on the shoulder of Twin Sisters Peaks.

The Woodhaul Wagon Trail begins at the Fort Bayard Administrative Site, leading to a popular and historically significant feature of the trail known as the "Wagon Wheel Ruts," Soldiers used the wagon road to transport fuelwood and construction timber from the high ponderosa pine forests of the Piños Altos Mountain Range to the military reservation. The wagon wheel ruts are a result of the constant passing of mule and oxen drawn supply wagons hauling wood to the Fort Bayard Military Reservation. Eventually, the hard wagon wheels even cut into the volcanic cap rock, leaving a lasting testament to the historic significance of Fort Bayard.

Current Trail-Related Partnerships

The Continental Divide Trail Coalition partners with the forest to organize volunteers to assist with trail maintenance. Other options the forest has pursued include teaming with partner organizations, volunteers, and special-use permittees to assist with trail maintenance, including an "adopt a trail" program.

Plan-Level Environmental Consequences

Analysis Methodology

Assumptions:

- Current and projected future funding levels for trails are insufficient to address current and projected maintenance costs for a safe and high-quality forest motorized and non-motorized trail system, making the need for volunteers and partners a priority for a sustainable program.
- Stakeholder input during comment periods for the plan revision process regarding recreation have been dominated by consistent concerns about the continued availability and sustainability of trail opportunities in the Gila NF. It is assumed to be very likely that the availability and quality of trail-based recreation opportunities, both motorized and non-motorized, will continue to be a priority to forest visitors as well as area residents.
- Under all alternatives all motorized and nonmotorized forest system trails, including National Recreation Trails and the CDNST, will continue to be managed under current law, policy, and regulation for the continued values for which they were designated
- We anticipate visitor use to continue to grow based on the increased interest in the CDNST. Trail visitor use would not directly vary by alternative and visitor use management strategies may be used by managers in all alternatives to minimize impacts to the physical trail resource and social setting. The CDNST, as a national scenic trail designated by Congress, is prioritized in terms of maintenance.
- No existing motorized or nonmotorized trails will have a change in their designation status as a result of managing under the existing, or a revision of the current plan. These will instead be analyzed through updates to the Travel Management process and other site-specific project planning.

Analysis methodology consists of consideration of a diversity of information sources, including but not limited to, public input to the planning process, data from recent NVUM surveys, the updated ROS analysis, and institutional knowledge of forest staff. These were all considered in context of being in alignment with relevant law, policy, and regulations. The potential differences in treatments within Ecological Response Units (ERUs) as indicated by activities associated with vegetation management specific to implementation of plan direction across all alternatives were used to consider effects from those activities to trail availability and conditions.

Effects Common to All Alternatives

Effects Specific to the Continental Divide National Scenic Trail

Regardless of which alternative is implemented, the uses permitted on the CDNST and within the trail corridor will be in alignment with policy direction and legislative requirements. Because of existing law, policy, and regulation, under implementation of all alternatives, the CDNST will continue to be open to foot, horse, and generally closed to motorized travel. Where the CDNST corridor is located within designated wilderness, motorized use and mechanical transport are prohibited by statute. This will have the positive effects of the trail being managed for the purposes for which it was designated and directed to be managed by Congress, likely resulting in enhancement of the physical condition and settings of the trail to exist in an optimal condition for which it is intended, also providing for enhanced availability of the trail for use as well as enhanced enjoyment of trail related experiences by forest visitors.

Outside of designated wilderness, by law, policy, and regulation, motorized travel is not considered to be suitable within the CDNST corridor, except at designated crossings of the trail, or on interim routes along designated roads and motorized trails within the corridor. However, regardless of which alternative is implemented, opportunities will be taken to move the trail corridor away from motorized routes as they arise. Where there is continued overlap of motorized routes and the CDNST, non-motorized visitor experiences that the trail is intended to provide will be degraded, and the additional wear and tear of motorized uses will degrade trail conditions and impair the quality and availability of visitor recreation experiences.

By legislative and policy direction (though not explicitly by existing plan direction), under all of the alternatives desired conditions for the CDNST are to eventually move the entire length of trail corridor onto non-motorized routes when the opportunity arises. Under all alternatives, this application of law and policy will result in improvements to the quality of trail physical conditions and enhance the availability and quality of trail user experiences where trails are moved from alignment with motorized routes. However, under some alternatives, there is more explicit plan direction that will have a greater likelihood that such opportunities would be pursued. The possible increased effects under individual alternatives will be addressed separately and together where proposed direction is in common across multiple alternatives.

Uses that would be allowed within the trail corridor by implementation of all alternatives will include vegetation management, prescribed burning, wildfire suppression activities, permitted grazing, and utility projects. Use of existing roads and trails that are legally open to motorized and mechanized use may continue. Negative impacts from these allowable uses include degradation of the physical condition of the trail, possibly contributing to temporary loss of use of some sections of the trail, or temporary re-routing of users to other trails that may not provide as quality of an experience to trail users. This may also impair the quality and availability of desired recreation experiences for trail users.

In all alternatives, vegetation management for ecosystem restoration would be allowed in the CDNST corridor to retain the desired condition of a naturally appearing landscape. However, there could still be some, mostly short-term degradation to scenic qualities, decreased availability for use, diminished quality of recreation experiences, and a deteriorated or damaged physical condition of the trail. There would be variability to the magnitude of these effects, due to variability in plan direction and miles of trail included in recommended wilderness in each alternative, and so these effects will be addressed in the analysis of alternatives.

Fuel reduction treatments (such as mechanical treatments or thinning treatments) may result in short-term decreases in scenic quality due to cut vegetation, slash, and disturbed soils by implementing all alternatives, and could result in temporary degradation of the quality of trail user experiences. However, fuel reduction treatments could also result in more resilient forest conditions that are less likely to see occurrence of uncharacteristic wildfires. This will have long-term positive effects to CDNST objectives to minimize degradation of trail physical conditions, visitor experiences, and availability of the trail for use.

Energy corridor rights-of-way, communication sites, and wind towers have a high potential to affect scenic resources for a long duration, and could occur with implementation of all alternatives. Cleared rights-of-way generally contrast with the surrounding landscape, and could diminish the scenic quality objectives for the trail corridor, also degrading the visitor experience objectives of the CDNST.

Visitation and Conflict between User Types

Potential effects to trails due to increased use that are common to implementation of all alternatives include degradation to the quality of visitor experiences due to overcrowding in popular areas, potential resource damage from trampling of vegetation, compaction of soil, and erosion as a result of overuse of trails, and conflicts between incompatible trail user groups.

Increased visitation to the forest is one of the principal factors contributing to conflict among different user groups. As visitation numbers rise, the likelihood of user conflicts also increases under implementation of all alternatives. The risk associated with user conflicts on the forest trail system include impacts to trail conditions, and negative interactions between user groups, adversely affecting all trail users' recreation experiences. Examples of impacts to user experiences may include (but are not limited to) horses being spooked by dog walkers, and mountain bikers passing hikers at high speeds, creating an impression of unsafe conditions.

Another common conflict that is likely to occur, regardless of alternative implemented, is between motorized and non-motorized recreation, often due to illegal incursions by motorized users. Impacts that may result from illegal motorized incursions include increased user conflicts, impacts to the physical condition of trails not designed for motorized use, and damage to resources associated with the formation of user-created trails that may split off of the system trail.

Sustainability of Trail Opportunities

Regardless of which alternative is implemented, by current policy direction the forest will implement and update a Sustainable Recreation Action Plan. The implementation of this plan under all alternatives is likely to result in improvement of the provision and quality of trails-related recreation resources and opportunities due to the implementation of action items specifically developed (incorporating stakeholder input) for this purpose. The level of improvement that would be realized would vary between alternative 1 and alternatives 2 through 5 commonly, due to additional plan components implemented in the latter that provide supplementary direction likely to enhance the sustainability of the recreation program.

Facilities and Level of Development

The forest has many trails that have been heavily impacted by recent fires and floods; are in declining condition due to an increased backlog of deferred maintenance; and/or not properly designed to provide the desired services. Though the forest may be better equipped to mitigate these effects with updated plan direction, they are likely to be impacts to some extent regardless of which plan alternative is implemented.

The current trend observed in the Gila NF is increasing demand for services and levels of recreation use, in conjunction with flat or declining budgets and fewer staff. Regardless of which alternative is implemented, these factors will make it more difficult to maintain and operate all the existing trails system infrastructure to standard. Some forest system trails, particularly those in areas that recently experienced high-severity wildfire, will likely not be maintained to standard under implementation of all alternatives, negatively affecting the overall quality of their physical conditions, availability for use, and the experiences of trail users. There will be some variability to how extensive the deterioration of physical conditions of the trails are, and this will be addressed separately by analysis of alternatives and the alternatives with revised plan direction or level of effects in common.

Effects of a Forest Sustainable Recreation Action Plan, which will be implemented under any of the alternatives, may require closing underutilized trails, the planning and development of new sites,

and/or upgrading existing trails to meet user needs and desires. The current trail system needs to be assessed to create a more manageable trail system that better meets the needs of trail users while reducing the potential for user conflicts. Although a sustainable strategy would have negative localized effects to availability of trails for use if some trails are closed, the overall effect of a sustainable recreation strategy is likely to improve the trail physical conditions, availability for use, and user experiences on the remaining trails in the system.

Permitted Grazing

Under implementation of all alternatives, permitted livestock grazing would occur on many areas of the forest coincident with motorized and nonmotorized trail opportunities. The presence of cattle or the visible signs of grazing could have potential negative effects to recreation experiences of some forest trail uses, such as hiking, backpacking, mountain biking, and off-highway vehicle use. These effects could include uneasiness or displeasure created by the presence of cattle, which may also effect experiences of solitude by the presence of domestic animals in an otherwise isolated setting. There may also be conflicts with both motorized and non-motorized trail users when animals are blocking passage or present a collision hazard. This may degrade visitor safety and the quality and availability of desired recreation experiences for trail users. Other negative effects that could degrade the quality of visitor experiences may include visible evidence of grazing on the landscape, such as trampling of vegetation, compaction of soils, and the presence of cattle feces.

Timber Sales and Mechanical Vegetation Treatments of Restoration Projects

Implementation of plan direction under all alternatives will result in use of varied mechanical harvest methods and vegetation treatments that are expected to have some negative effects temporarily degrading trail conditions and opportunities. The amount and duration of mechanical harvest and restoration treatments, as well as settings would vary by alternative due to the resource emphasis and objectives of each, therefore affecting duration and intensity of negative effects to trail conditions and recreation experiences by alternative.

During timber harvests and mechanical vegetation treatments there will likely be degradation to the availability and quality of opportunities for solitude of trail users seeking those experiences due to the visible presence and sounds of motorized equipment. There will also be short- and long-term degradation to the quality of identified scenic character objectives and desired conditions, likely causing impaired availability and quality of recreation experiences for some trail users within and nearby to areas where treatments are currently in progress or have recently occurred.

There are also likely short-term physical degradation to trail physical conditions and their availability for visitor use due to mechanical vegetation harvest and restoration treatments causing physical damage to trails. This may also result in impairment to the quality (and availability) of desired recreation experiences for some visitors to the affected areas. These circumstances are likely to be mitigated by best management practices implemented by policy under all alternatives, but the likelihood of their frequency of occurrence and the intensity of the effects will vary based upon alternative objectives.

Probable positive effects to trail opportunities from mechanical treatments implemented under all alternatives include the likelihood of temporary and longer-term enhanced access to trails due to improved road physical conditions. This will likely occur due to probably road improvements and maintenance that would occur to facilitate vegetation harvest and treatment activities.

Prescribed Fire and Wildfires

Although unplanned wildfires are likely to occur regardless of which alternative is implemented, occurrence, extent, and intensity of wildfire and the resulting effects to the forest motorized and non-motorized trails program are not predictable across the alternatives. The amount and duration of prescribed fires, and the resulting effects to sustainable recreation, would vary by alternative according to the resource emphasis and objectives of each if implemented.

The scope and intensity of effects to recreation due to the occurrence of fire, both prescribed and wildfires, would vary by alternative, but are likely to include damage to the physical conditions of and impeded access to motorized and non-motorized trails due to post-fire flooding, debris flows, and burned tree snags. This would also result in impairment to the quality and availability of desired recreation experiences for forest visitors. These would likely have a greater magnitude of effect due to occurrence of wildfires than with prescribed fire, due to prior planning and best management practices in place to mitigate effects of prescribed burning. In both instances, effects are likely to be temporary, though in some cases, they may be of longer durations of months to decades.

Current trends indicate a likelihood for higher severity fire and flood events to occur in the future, along with more frequent occurrences of these events. There are many common impacts likely to occur from wildfires to trails. Some of the impacts that are more likely to be experienced commonly across all alternatives due to prescribed fires and wildfires include physical deterioration or destruction of the trail due to soil loss, erosion, debris flows that damage or bury the trails, and fallen trees blocking passage, and encroachment of nuisance vegetation. Short-term and long-term impacts to the accessibility for use of trails are likely to occur because of both safety concerns and usable condition of trails during and after prescribed fire and wildfire events, and by higher risk of flooding after they occur, degrading the quality of and impairing the availability of trail users' desired recreation experiences.

Emerging Recreation Trends that May Affect Future Trail Demand

There is a growing interest in adventure races and similar events such as boot camps, mud events and endurance races. The activities associated with these recreation events may include: running, bicycling, paddling, climbing, orienteering, and other activities that require endurance, strength and agility. Often, these events are authorized to be held on forest system trails under the terms and conditions of a special-use permit.

Recreation events have potential to disrupt and displace motorized users, mountain bikers, hikers and equestrians that may wish to use the trails when the event occurs. Even when trails are not closed for exclusive use by the event, other users may be disturbed by the high numbers of encounters with event participants over a short period of time with limited sight distance and passing zones on the trail.

There will be effects to the motorized and non-motorized trails program by these types of events that could occur under all alternatives. Most effects are likely to be short-term and likely to be caused by concentrated use and associated perceptions of crowding by the presence of relatively large groups within a limited area. These conditions may cause displacement of some forest visitors not participating in these organized events to use other trails located elsewhere in the forest though relatively short in duration, this amount of concentrated use may result in the degradation to the physical conditions of trails, also impairing the quality and availability of recreation experiences for visitors. In all instances, these effects to trail condition are likely to be either minor, temporary, or both, and in most cases could be mitigated by routine or supplementary maintenance actions.

Alternative 1 – 1986 Forest Plan

Effects Specific to the Continental Divide National Scenic Trail

The current forest plan does not contain components that specifically provide for improved administration of the CDNST corridor that are in alignment with applicable law, policy, regulation, and the mandated objectives and purposes of the trail. However, the trail is, and would continue to be, managed according to law, policy and regulation, by implementation of this alternative. But, because of the omission of this sort of specific plan direction, under implementation of this alternative there is a possibility management of the trail for could be less robust than if the direction was included in the plan. This could cause some degradation to the availability for use, quality of recreation experiences, and overall physical trail conditions compared to other alternatives.

Because the SMS would not be implemented under this alternative, updated guidelines would not be implemented requiring that management activities should be consistent with Scenic Integrity Objectives of High or Very High within the visible foreground of the trail. Scenery would instead continue to be managed according to the Visual Management System, which would be less effective at prevention of impacts to the scenic integrity of the trail under this alternative, or mitigating degradation of scenic qualities within the trail corridor. This could result in degradation of the scenic qualities for which National Scenic Trails were established by Congress, and therefore, causing degradation to the quality of trail users' recreational experiences associated with the availability and quality of scenic values.

Timber Sales and Mechanical Vegetation Treatments of Restoration Projects

Continued implementation of the 1986 forest plan direction under this alternative will result in use of varied mechanical harvest methods and vegetation treatments that are expected to have effects to trail conditions and opportunities. During timber harvests and mechanical vegetation treatments there will be adverse effects as have been previously described as occurring in common to all alternatives, and mostly similar to those that forest trails have experienced since implementation of this plan. Overall, these effects will be mostly temporary and minor, and general similar in scope to those that would occur with implementation of other alternatives.

Prescribed Fire and Wildfires

Over time, unplanned wildfires and the resulting effects to the forest trails program are not likely to diminish in occurrence or severity under this alternative, because the scope of forest restoration treatments may be inadequate to achieve desired conditions. This alternative is projected to increase the risk of high-severity fire over time in all watersheds, based on a net increase in closed-canopy conditions across the forest. Additionally, the effects to trails by agency-ignited prescribed fires would also be similar to those experienced under the 1986 plan since implementation, and are not likely to be reduced over time. Effects to trails by wildfires and prescribed fires due to implementation of this alternative would be generally those previously described for being common to all alternatives, and are likely to be of a similar or greater scale and frequency as have been experienced under the current implementation of the 1986 forest plan.

Recommended Wilderness

Because this is the "no action" alternative, and due to no new areas being recommended for wilderness designation by the 1986 forest plan, there are no effects to trails by recommended wilderness by implementation of this alternative. This includes the two existing congressionally designated wilderness study areas designated by Congress through the New Mexico Wilderness Act

of 1980; the 1986 plan recommends that these should not be included in the National Wilderness Preservation System.

Effects Common to Alternatives 2 through 5

Effects Specific to the Continental Divide National Scenic Trail

The revised forest plan components that would be implemented under these alternatives are those that by policy are applied to all NFS lands across the entirety of the CDNST. These will provide for improved administration of the CDNST corridor based on the applicable authorities and the nature and purposes of the trail. Because of inclusion of this plan direction, preservation or improvement to the availability for use, quality of visitor experiences, and physical condition across all action alternatives are likely to be more substantial.

Under these alternatives, the CDNST is identified as a Concern Level 1 feature in the SMS. Guidelines would be implemented requiring that management activities should be consistent with Scenic Integrity Objectives of High or Very High within the visible foreground of the trail.

Recommended Wilderness

Under implementation of any of alternatives 2 through 5, any land recommended to Congress for wilderness designation would be managed to maintain its wilderness characteristics, affecting both the methods used to construct and maintain non-motorized trails within the area, and the categories of uses for which the trails will be managed. Although plan direction for the management of trails within recommended wilderness is common to alternatives 2 through 5, the amount and location of lands recommended for designation, and therefore, the location and amount of trails affected, are not.

Common effects to non-motorized trails would be experienced by implementation of any of alternatives 2 through 5; however, the scale of these effects is variable across the alternatives, and so this will be addressed separately for each. This variability is due to the difference of which areas, and the size of overall acres recommended in each. Additionally, effects to recreation experiences of trail users in recommended wilderness due to implementation of these alternatives are addressed in the Sustainable Recreation section.

With implementation of any of these alternatives, maintenance of non-motorized trails in recommended areas would, except as allowed for by decision of the forest supervisor or authorized representative, be required to be completed using hand tools and administrative access would be made using non-mechanized and non-motorized means. This would positively affect management of trails that have lower development objectives by ensuring that their physical conditions match those identified for the trails.

Maintenance of non-motorized trails and other related infrastructure would continue within recommended wilderness under all of these alternatives, and only the methods for accomplishment of certain tasks would be different in some cases, in that use of motorized equipment (such as chainsaws and OHVs) may not be used. Therefore, there would likely be no impairment to trail physical conditions due to wilderness recommendation under these alternatives, only effects to the types of uses for which they are managed and the level of development they are maintained for under trail management objectives.

Implementation of these alternatives would likely result in changes to levels of development for some non-motorized trails due to being recommended for wilderness designation, though some trails

will be maintained at the same level of maintenance. Changes in levels of development would primarily only affect administrative actions, dictating a lower standard of maintenance, but not affecting whether non-motorized trails continue to be maintained to the determined standard.

However, changes to trail objectives due to wilderness recommendation may result in the exclusion of previously allowable uses such as mountain biking. This could impair the availability and quality of visitor experiences for mountain bike users who desire this recreation experience on trails that would be located within recommended wilderness. This may also affect overall forest trail system use patterns by increasing the occurrence of mountain biking on other system trails that have historically seen less of this type of use, possibly causing accelerated physical deterioration to occur, and necessarily requiring more frequent maintenance than may be needed without such concentrated mountain biking uses.

During public comments, the local organization known as the Silver City Cycling Group, as well as other individuals, identified 290 miles of non-motorized forest system trail that are used by mountain bikers with varying degrees of frequency. There is variability across the alternatives of how many miles of these identified trails would be included within recommended wilderness areas.

Existing motorized routes and motorized use trails were excluded during the Inventory and Evaluation steps of the wilderness recommendation process, therefore, current and future uses of motorized trails will not be altered under any of these alternatives due to wilderness recommendations. Any changes to existing or future development of motorized trails are not forest plan decisions, and will be addressed by modifications to the existing travel management decision or other project-level planning efforts.

Alternative 2

Timber Sales and Mechanical Vegetation Treatments of Restoration Projects

Implementation of revised forest plan direction under alternative 2 would result in use of varied mechanical harvest methods and vegetation treatments that are expected to affect trail conditions and opportunities. During timber harvests and mechanical vegetation treatments there would be adverse effects as have been previously described as common to all alternatives, but mostly occurring within these vegetation types. Overall, the previously described effects would be mostly temporary and minor, and generally similar in scope to those that would occur with implementation of other alternatives.

Prescribed Fire and Wildfires

Over time, effects from unplanned wildfire (especially high-severity fire) to the forest trails program are likely to gradually reduce over time under implementation of this alternative, but may be substantial initially, until eventually mechanical and prescribed fire treatments result in some progress being made toward desired conditions. Occurrence of prescribed fire would be more frequent under this alternative than the previous forest plan, resulting in more frequency and intensity of effects as well. These effects are also likely to diminish as the forest moves toward desired conditions. Effects to trails by implementing this alternative would the same as those previously described as being common for all alternatives, but over time are likely to be of a reduced scale and frequency as those that have historically occurred under implementation of the 1986 forest plan.

Recommended Wilderness

Recommendation of the areas identified for wilderness designation and plan direction to manage for protection of wilderness characteristics by implementing this alternative could affect trail objectives as previously described as being common to alternatives 2 through 5 by prohibiting mountain biking on 97 miles of non-motorized trail where it is currently allowed. This would include approximately 24 miles of trail identified by users as receiving consistent or occasional mountain biking use and six miles of the CDNST. However, 335 miles of non-motorized trails would remain open to mechanized transportation across the forest, including roughly 266 of the miles identified with consistent or occasional use by individuals and the Silver City Cycling Group.

Alternative 3

Timber Sales and Mechanical Vegetation Treatments of Restoration Projects

Implementation of alternative 3 would result in the use of varied mechanical harvest methods and vegetation treatments that are expected to have effects to trail conditions and opportunities, and are likely to occur primarily in grasslands and open woodland vegetation types. Effects could be of substantial magnitude and frequency within these vegetation types than by implementation of other alternatives. During timber harvests and mechanical vegetation treatments there will be the adverse effects as have been previously described as common to all alternatives, but mostly occurring within these vegetation types.

Prescribed Fire and Wildfires

Effects to motorized and non-motorized trails due to unplanned wildfires (especially high-severity wildfire) could likely be substantial with implementation of this alternative. Effects to trails would the same as those that have been previously described as being commonly occurring for all alternatives, but they are likely to be of greater scale and frequency, particularly within forested vegetation types, than implementation of alternatives that address forested ERU restoration to reduce the risk of the occurrence of high-severity wildfires.

Effects due to prescribed fire are the same those that were previously described as being commonly occurring for all alternatives, but would likely be of less magnitude and frequency in this alternative than others due to greater emphasis on mechanical treatments within grasslands and open-canopy woodlands, and corresponding de-emphasis of the use of prescribed fire.

Recommended Wilderness

Recommendation of areas for wilderness designation and updated plan direction to manage for protection of wilderness characteristics by implementation of this alternative could affect management objectives for some non-motorized trails as previously described as common to alternatives 2 through 5. This alternative would result in prohibiting mountain biking on 60 miles of trail where it is currently allowed. This would include less than 1 mile of trail identified by mountain bikers as receiving consistent or occasional use, and 5.65 miles of the CDNST. However, 289 miles of trail identified by users as receiving consistent or occasional use, and 372 miles of non-motorized trails will remain open to mechanized transportation across the forest.

Alternative 4

Timber Sales and Mechanical Vegetation Treatments of Restoration Projects

Implementation of revised forest plan direction under alternative 4 would result in use of varied mechanical harvest methods and vegetation treatments that are expected to have effects to trail conditions and opportunities as previously described for affecting all alternatives. Under alternative 4, these effects would likely occur primarily in forested vegetation types, and are likely to be substantially higher in magnitude and frequency of occurrence than the other alternatives.

Prescribed Fire and Wildfires

Effects of unplanned wildfires to the forest trails program could likely be mitigated under implementation of this alternative, particularly in forested vegetation types due to emphasis on mechanical restoration treatments. However, the reduction of risk of high-severity wildfire is not likely to be as significant as for alternative 2. Effects to trails would be the same as those that have been previously described as those being common for all alternatives, but are likely to be of a somewhat greater frequency and severity, particularly within forested vegetation types, than by implementation of alternative 2.

Effects due to prescribed fire are the same as those previously described as common for all alternatives, but would be of much less intensity and occurrence in this alternative because of the emphasis on mechanical treatments within forested vegetation, and de-emphasis of the use of prescribed fires in all forest types.

Recommended Wilderness

Recommendation of the areas identified for wilderness designation and updated plan direction to manage for protection of wilderness characteristics implemented by this alternative would affect trail objectives as previously described as common to alternatives 2 through 5 by prohibiting mountain biking on 15 miles of trail where it is currently allowed. This does not include any sections of the CDNST or trails identified by individuals or the Silver City Cycling Group as receiving occasional or consistent mountain biking use. However, all of the trails identified as receiving consistent or occasional mountain biking and 417 miles of non-motorized trails will remain open to mechanized transportation across the forest.

Alternative 5

Timber Sales and Mechanical Vegetation Treatments of Restoration Projects

Implementation of revised forest plan direction under alternative 5 would result in minimal application of varied mechanical harvest methods and vegetation treatments, because of its emphasis on allowing for natural processes to move toward desired conditions, and therefore, this alternative would be less likely to degrade trail conditions. During timber harvests and mechanical vegetation treatments that do occur, effects to trails would be those previously described as being common to all alternatives, but are most likely to occur within areas identified as a priority for WUI treatments, and in aggregate, will experience the least overall disturbance of all alternatives.

Prescribed Fire and Wildfires

Implementation of alternative 5 and its emphasis on natural processes should, as the state of the forest approaches desired conditions, result in a substantial reduction of risk of high-severity wildfires, with the resulting effects to the forest trails program substantially mitigated. However, in

the interim, as the forest moves toward these desired conditions, unplanned wildfires and associated effects may continue at levels recently experienced. Effects to trails would be the same as those previously described as being common for all alternatives, though they may likely be greater than other alternatives in the short term, and as desired conditions are approached, are likely to be of a lesser magnitude of disturbance.

Effects due to prescribed fire are the same those previously described as occurring for all alternatives, but would be of a higher intensity and occurrence in this alternative due to the emphasis on the use of prescribed fires in all forest types. These effects are likely to decrease as desired conditions are approached.

Recommended Wilderness

Recommendation of the areas identified for wilderness designation and plan direction to manage for protection of wilderness characteristics implemented by this alternative would affect trail objectives as previously described as common to alternatives 2 through 5 by prohibiting mountain biking on 207 miles of trail where it is currently allowed. This would include 87 miles of trails identified by individuals and the Silver City Cycling Group as receiving occasional or consistent mountain biking use and 56 miles of the CDNST. However, 225 miles of trails will remain open to mechanized transportation across the forest, including 203 miles of the trail identified as seeing consistent or occasional use by mountain bikers.

Cumulative Effects

Continental Divide National Scenic Trail

The cumulative effects analysis area for the CDNST corridor includes all lands the trail corridor passes through in the State of New Mexico. This area was selected because of ongoing and proposed activities on other national forests, adjacent State and BLM lands (such as renewable energy development and energy corridor developments), and private lands the trail traverses or that are adjacent to the trail corridor.

Along the full length of the CDNST, including the approximately 650 miles of the trail in New Mexico, future opportunities for motorized and mechanized trails within wilderness are prohibited by law. Future opportunities for motorized and mechanized trails outside of wilderness and over-snow motorized travel may be allowed within the corridor but would require design features to minimize the possibility of damage to the physical condition of the trail. On all lands that the CDNST crosses, included easements across private lands, future opportunities for motorized and mechanized trails will have similar considerations for minimizing the impacts of project proposals on the nature and purposes of the trail.

Increased visitor use on the CDNST within congressionally designated wilderness will likely trigger management actions by Federal land management agencies to protect wilderness resources. Visitor use management actions by agencies to limit impairment of the trail’s physical resources and social settings are likely to increase as a cumulative effect.

It is likely that actions for vegetation and fuels treatments will occur within the CDNST trail corridor outside of designated wilderness throughout the planning cycle. However, to be in alignment with forest plan direction, law, policy, and regulations, projects will be planned to ensure a naturally appearing and sustainable landscape. The likely vegetation and fuels treatments could result in short-term cumulative effects to scenic resources. More of the landscape, in the short term, would appear

to be in a moderately to slightly altered condition until the longer-term scenic integrity objective is achieved. In the long term, treatment activities may maintain or enhance scenic integrity; scenic character stability; and the ability to resist insects, disease, and large-scale wildfire.

Other trails

There are a number of recreation opportunities available adjacent to and nearby the Gila National Forest. The Gila Cliff Dwellings National Monument 1 mile loop interpretive trail, administered by the National Park Service, is located near the center of the Gila NF; and to the west of the Gila NF and across the border in the state of Arizona are the Apache-Sitgreaves NFs (commonly known as the A-S); and to the northeast are segments of the Cibola NF. Both of these forests offer many recreational opportunities similar to those found in the Gila NF. Differences from opportunities with these two nearby forests are the Gila NF has significantly larger wilderness areas and less development, while the Apache-Sitgreaves NFs tend to draw more visitors for snow-related activities. This cumulatively provides visitors to the area with a wider range and amount of recreational trail opportunities.

The Gila shares boundaries with the Apache Sitgreaves NFs along much of the Arizona-New Mexico state line, including 20 miles of trail that extends across both forests within the Blue Range Wilderness and the Apache Sitgreaves NFs managed Blue Range Primitive Area. The Apache Sitgreaves NFs has 1,244 miles of trail forest-wide, including 128 miles of motorized trails and 41 miles of trail identified for bicycle use in trail management objectives. Together, both forests' trail systems provide a greater number of miles and range of opportunities within a relatively close and adjacent location.

Although some of the southernmost units of the Cibola NF are near the Gila, the two forests do not share any common boundaries. There are 723 miles of NFS trails in the Cibola, including 189 miles of motorized trail and 49 miles identified for bicycle use that contribute to available opportunities in the larger surrounding area.

There are several New Mexico State Parks in the area surrounding the Gila NF that offer hiking and. including Elephant Butte State Park and Caballo Lake State Park. City of Rocks State Park offers camping and hiking opportunities. Although not large and extensive trail systems, these parks do contribute to the overall trail opportunities available in the Gila NF region.

A number of BLM-developed recreation sites in the Gila NF region offer hiking, camping, visitor center activities, and other opportunities. Additionally, many adjacent BLM lands (and New Mexico State Lands) allow both hunting and dispersed camping. The primary difference between many of these aforementioned areas (except for the Apache-Sitgreaves NFs) is that they feature a semi-arid desert environment with limited forested areas as compared to the Gila NF, contributing to the range of different opportunities available for visitors.

There are several National Wildlife Refuges administered by the USFWS located within the broader area, including the Bosque Del Apache (with approximately 27 miles non-motorized trails, 11 miles allow bicycle use, Sevilleta (with approximately 7 miles of non-motorized), and San Andres (no public trails, restricted public access). These refuges all provide excellent opportunities for wildlife viewing, including large bird migrations, enhancing opportunities for trail users also seeking to see wildlife.

Many of the trail opportunities adjacent to the Gila NF have a minimal impact on the demand for recreation services provided by the forest. In many instances, trail users in nearby or adjacent areas

use trails in the Gila, or that cross into the Gila as well. Many regional or adjacent recreation opportunities offer a different recreation experience (either in a different ecological setting or unique activity not offered in the Gila NF), which allows visitors to southern New Mexico to experience a variety of trail-related experiences in a diversity of available settings.

Currently, there are a number of efforts within the Gila region to connect city/county trails systems to the NFS trail system. Partner organizations and volunteer efforts contributors include Heart of the Gila, Backcountry Horsemen of America, the Continental Divide Trails Coalition, Outfitter/Guide special-use permit holders, Silver City Cycling Group, and individual volunteers. This contribution to maintenance and other trail management requirements will positively affect trails management, by preserving and enhancing the physical condition of the trails, resulting in enhanced visitor experiences by enhancing availability for use and enjoyment.

Trail-wide on the CDNST and throughout New Mexico, interest in recreation events for mountain biking is likely to continue with increases in permit applications for races and other special recreation events. These commercial recreation special-use permits are prohibited in designated wilderness and future wilderness designations would also prohibit that activity on many of the Forest Service trails in New Mexico. As demand for these types of events increases, other trails on NFS and BLM lands (outside of wilderness), are likely to see more recreation events permitted. This will likely result in increased availability for participation and satisfaction for visitors seeking these types of recreation activities.

Climate Conditions

The Southwest has recently experienced an extended drought, and climate predictions indicate drought conditions are likely to reoccur on a cyclical basis. Regardless of alternative implemented, as fire danger increases, restrictions may be put in place to reduce the risk of human-caused fires. Depending on the severity of conditions, restrictions typically range from a ban on open campfires to forest closures. These restrictions would limit access to trail settings and opportunities, degrading availability of trails for use and enjoyment of visitor experiences.

Extended periods of warm weather may also lead to a longer “summer” recreation season, starting earlier in the spring and extending later into the fall. A longer recreation season may necessitate the need to extend employment for seasonal staff, while incurring additional operation and maintenance costs. This could lead to a backlog of maintenance of trails and facilities, affecting recreation resources and opportunities by causing degradation of their availability and condition.

Under implementation of all alternatives, occurrence of extended droughts would directly affect available water sources for trail users. Across the forest, there is already limited water sources, and in many areas, the distance between water sources already places limits on opportunities for some trail users. The forest has experienced loss of previously reliable water sources from extended droughts, damages from wildfires, and a lack of maintenance to remote water developments. Loss of water sources causes safety hazards and degrades user experiences due to lack of reliable water and an increasing need to carry larger amounts over longer distances.

In addition to water sources, these same stressors affect water levels of the streams and lakes located within the Gila NF. As stream and lake levels decrease, trail experiences in these types of environments may become less available, and degrade the recreation experiences of trail users seeking this type of experience.

Roads

Affected environment

People from all over travel to and through the relatively remote Gila National Forest. Most start off on Federal, State and/or county roads, and eventually make their way onto connecting NFS roads. Once in the forest, users may choose to continue their journey on higher standard roads or transition to lower standard roads, where high clearance and/or four-wheel-drive vehicles are recommended. Several different agencies are responsible for keeping these roads open and safe for all users. Many of these roads serve as primary access for communities in and around the forest.

Forest Transportation System

The Forest Service uses a road maintenance management system to prioritize, plan, budget, schedule, and maintain NFS roads. Every NFS road is assigned road management objectives, which then help determine its maintenance level (ML). The Forest Service uses the road management objectives to describe the level of service provided by a specific NFS road. Several factors are considered when assigning maintenance levels: user safety, traffic volume, traffic speeds, road investment, user comfort and convenience, funding levels, etc. When roads are scheduled for maintenance, the maintenance performed should meet the maintenance criteria for the road's assigned ML. Maintenance levels range from 1 to 5. An ML 2 road provides the lowest level of service and an ML 5 is associated with roads providing the highest level of service. A road intended to move more traffic at a higher rate of speed would be assigned a higher maintenance level than a road maintained for high-clearance vehicles at much lower speeds.

ML 1 roads are closed to all vehicular traffic, but may require basic custodial maintenance to prevent damage to adjacent resources or to preserve the road for future resource management needs. Roads assigned to ML 2 through 5 may provide year-round or intermittent access. ML 2 roads, which are managed for high-clearance vehicles, account for the majority of the open NFS road miles. These roads typically do not receive a lot of traffic, but they provide motorized access to more acres of forest for various purposes (e.g., hunting, camping, access to trailheads, firewood gathering, recreational driving) than all of the ML 3 through ML 5 roads combined. No provision is made for user comfort, user convenience, and speed of travel. On the other hand, level 3 through 5 roads are passable to prudent drivers in passenger cars. Users can reasonably drive with expectations of predictable road conditions and can expect warning signs and traffic control devices meeting standards from the Manual on Uniform Traffic Control Devices when hazards are present.

Maintenance of NFS roads in the Gila NF occurs year-round. NFS roads on the north end of the forest (Quemado and Reserve RDs) are typically scheduled for maintenance during the warmer months to avoid the adverse conditions (frozen roadbeds, snow and other inclement winter weather) of the winter months. During the winter months, maintenance is performed on NFS roads on the southern end of the forest where temperatures are typically milder and conditions are more conducive. Flash floods from isolated thunderstorms, persistent monsoon rains, downed trees from the past winter or spring winds, and potholed pavement from freeze-thaw cycles are some of the maintenance challenges through the year. Emerging trends are the impacts of larger and more severe fires, and the subsequent monsoon rains that follow, leading to increased flooding, plugged culverts, gully erosion of cut and fill slopes, and roadway washouts.

Funding levels for road maintenance have significantly declined over the years. From 2011 to 2015, funding levels for road maintenance in the Gila NF saw an average reduction of 11 percent per year.

In 2015, the Gila NF road maintenance budget was $738,400. Since then, the annual road maintenance budget has stabilized. The forest is completing basic custodial maintenance (grading the road surface, maintaining ditch lines, select sign replacement, minor brushing of roadside vegetation, etc.) on approximately 300 miles (out of the 3,334 total miles) of the existing roads on an annual basis; approximately 75 percent of those miles are ML 3, 4, and 5 roads, and the remaining 25 percent are ML 2 roads. Approximately 80 percent of the 300 miles of maintained roads are the same and appear on the maintenance schedule every year. The forest has worked with local county agencies to clarify jurisdictional issues associated with roads passing through the Gila NF. The result is a transfer of nearly 400 miles of NFS roads to Catron and Grant Counties.

The majority of the roads that receive maintenance are not maintained fully, i.e., correcting all deficiencies to ensure the road and all its features are functioning properly. The annual maintenance needs are displayed in table 62. In comparing the table numbers to the 2015 road maintenance budget ($738,400), it is evident that there is a large discrepancy preventing the forest from fully maintaining the road system. Further, road maintenance budgets are not forecasted to increase in the foreseeable future, therefore continuing to make it difficult to provide basic custodial maintenance to the entire road system.

Table 62. Annual road maintenance needs by maintenance level

Maintenance Level	Miles	Annual Estimated Maintenance Needs $ per mile*	Total
2	2,932	$350	$1,026,200
3	251	$8,282	$2,078,782
4	129	$10,294	$1,327,926
5	22	$6,597	$145,134
Total	**3,334**		**$4,578,042**

*Annual Costs per Mile from “Identifying a Financially Sustainable Road System Spreadsheet Tool” (USDA FS 2006b)

The result of the forest’s inability to perform full maintenance is a maintenance backlog known as deferred maintenance. Examples of deferred maintenance include replacing culverts, cattle guards, surfacing, and signs based on their life cycle or only when needed, and removing all roadside vegetation encroaching into the roadway or only that which is limiting sight distances. An estimate of the current deferred maintenance for NFS roads in the Gila NF is $272,265,429. This number is expected to grow as funding levels continue to decline.

Bridges

The Gila NF has 12 road bridges as part of its transportation system. All but three of the forest’s bridges have been in service for 50 years or more. The forest recently replaced two bridges and rehabilitated a third, and has designs in place to replace another five structures when funding becomes available. Of the remaining four bridges, two are rated in “good” condition or better and the other two are rated to be in “fair” condition. None of the remaining four bridges is subject to load restrictions at this time. All 12 bridges are inspected every two years. Inspectors document all observed deficiencies and create a list of work items that are prioritized and corrected as funding permits. The funding source for minor bridge repair and maintenance is the same as funds available

for road maintenance. Funds for major work items, rehabilitation and bridge replacements are typically competed for at a regional level.

Travel Management

To address the concern about unmanaged OHV use, the Forest Service published final travel management regulations for use of motor vehicles on NFS lands on November 9, 2005. The Travel Management Rule (USDA FS 2005) requires that each national forest and grassland "provides for a system of National Forest System (NFS) roads, NFS trails, and areas on NFS lands that are designated for motor vehicle use...including the class of vehicle and time of year..." The Gila National Forest's Travel Management decision was released in June 2014. The decision was implemented when the motor vehicle use maps (MVUMs) for the Quemado, Reserve, Wilderness and Black Ranger Districts were published in July 2016, and the Silver City and Glenwood Ranger Districts in January 2017. Designated roads, trails, and areas open for motor vehicle use are identified in the Gila NF MVUMs. Consistent with the rule, motor vehicle use off designated roads, trails, and areas identified on an MVUM is prohibited in the Gila NF without written authorization. The Gila NF MVUMs currently identify 3,334 miles of NFS roads designated for public motorized use (table 63). Approximately 2,932 miles (88 percent) are ML 2. The remaining designated NFS roads (402 miles or 12 percent) are ML 3 to ML 5 and are managed for passenger car use.

Roads not selected as part of the designated public system can be used administratively or by written authorization (329 miles), or will be stored (908 miles) for future use or decommissioned. The future needs of these stored roads will be evaluated during future project planning. More information on travel management decision and implementation can be found at www.fs.usda.gov/detail/gila/home/?cid=STELPRDB5035773.

Table 63. Miles of Gila National Forest roads by maintenance level

Maintenance Level	ML2	ML3	ML4	ML5	Total
Miles	2,932 (88%)	251 (8%)	129 (4%)	22 (<1%)	3,334 (100%)

Plan-Level Environmental Consequences

Analysis Methodology

Probable management activities related to alternatives 1, 2, 3, 4, and 5 are used to evaluate or predict short- and/or long-term effects to roads in the Gila NF. To make broad comparisons between alternatives, this programmatic analysis uses:

- Plan objective for road decommissioning.
- The amount of vegetation that would be treated with fire (prescribed or managed) or by mechanical means (timber harvesting and thinning) based on the objectives identified for each alternative.
- Guidelines related to best management practices, wildlife species movement and connectivity, riparian areas, stream crossings, and emphasis on the existing road system.

Assumptions

This analysis also includes a number of assumptions about roads over the life of the plan:

- None of the alternatives has specific objectives, during the life of the plan, to construct new permanent motorized roads. Proposals for any new road development and the associated environmental effects will be considered through project-level planning.
- The level of forest visitation across all alternatives is anticipated to remain relatively constant.
- New motorized routes will not be constructed in designated wilderness areas, IRAs, and other areas with prohibitions on new motorized route construction.
- NFS roads no longer needed for current or future use will be decommissioned by such methods as re-contouring, ripping, and seeding, as appropriate, and will be analyzed on a project-level basis.
- Any changes to motor vehicle use maps would be made under a separate decision.
- Funding levels for road maintenance is expected to be relatively constant.

Effects Common to All Alternatives

All alternatives keep the same road system. This road system influences the forest's ability to contribute to the social, cultural, and economic conditions within the forest and the broader landscape. The Gila NF's transportation system is integral to allowing Forest Service personnel to access the forest to perform resource management activities (which contributes to the health of forest ecosystems) and supporting the many uses and opportunities enjoyed by the public. Roads allow access to gather firewood, hunt, fish, hike, and recreate. Local businesses and communities benefit from visitors who want to use the forest because they can safely access and experience the forest on NFS roads. Gaining access to the forest through roads is important for local residents to continue their traditional uses, which are integral in maintaining the social and cultural fabric of many forest communities.

All alternatives seek to provide safe, reasonable access for public travel, recreation uses, traditional and cultural uses, and land management and resource protection activities, as well as contributing to the social and economic sustainability of local communities. All alternatives strive for a forest road system that is well planned, managed, and maintained, so as not to harm ecological integrity or cultural resources and allow for continued enjoyment and use of the forest by many user groups. Unneeded roads are closed to motor vehicle use and naturalized to reduce impacts to ecological resources, especially watersheds, wildlife and fish habitat, and soil erosion. Construction of new roads is minimized in riparian areas.

Roads across the forest are important for access and fire management, and facilitate multiple uses, but can have potential negative ecological impacts. Infrastructure contributes to ecological sustainability when it is properly designed, integrated within the landscape, and well maintained. However, the Gila NF struggles to keep pace with the maintenance of its transportation system, given current road maintenance funding levels. Damage to the forest transportation system caused by fires and ensuing floods results in expenses above the annual road maintenance budget, thereby, reducing the amount of money available for standard road maintenance. Limited funding and workforce capacity to properly maintain all roads was identified as the biggest challenge to providing quality public access, which could negatively impact user experience and the opportunity to use and benefit from forest resources.

Roads can affect natural sediment and hydrologic regimes by altering stream flow, sediment loading, sediment transport and deposition, channel morphology, channel stability, substrate composition, stream temperatures, water quality, and riparian conditions in a watershed (USDA FS 2000). They

also provide a vector for the spread of invasive and noxious species and contribute to habitat fragmentation. Large increases in the amount of sediment delivered to the stream channel can greatly impair or even eliminate fish and aquatic invertebrate habitat and alter the structure and width of stream banks and adjacent riparian zone. The amount of sediment can affect channel shape, sinuosity, and relative balance between pools and riffles. Indirect effects of increased sediment loads may include increased stream temperatures and decreased inter-gravel dissolved oxygen (USDA FS 2000). Best management practices are often identified during project planning to prevent or mitigate potential adverse impacts to environmental quality.

The roads and trails indicator from the watershed condition classification describes the likelihood of altered hydrologic and sediment regimes in terms of road density, maintenance, and proximity to water attributes. Ratings of functioning properly indicate the hydrologic and sediment regimes are largely intact. Functioning at risk and impaired function ratings indicate moderate and higher likelihoods of alteration of hydrologic and sediment regimes. Between 64 and 67 percent of subwatersheds are functioning properly with respect to road density and proximity to water, while only approximately 12 percent are considered functioning properly with respect to maintenance. Roads near water not only have some of the highest maintenance requirements, but also the most immediate effects on riparian vegetation, channel shape and function, and sediment and hydrologic regimes.

After implementation of the Travel Management decision resulting in motorized travel being restricted to a designated transportation system, impacts to riparian ecosystems and watershed condition are expected to decline (USDA FS Gila NF 2013), although this implementation process (including education, outreach, and enforcement) will take time. As future projects include decommissioning of unneeded system roads and unauthorized roads, impacts will be further reduced. The forest's ability to conduct sufficient road maintenance is limited by budgets. Road maintenance in the Gila NF is of larger concern than road density. If the budget trends continue downward, so will soil and watershed conditions associated with the forest's road and motorized trail system.

Alternative 1 – 1986 Forest Plan

In alternative 1—the no-action alternative—management of transportation and forest access would continue under management area-specific goals, objectives, standards, and guidelines in the 1986 forest plan (as amended), which provides plan language to maintain the transportation system to support resource goals and assure user safety. The 1986 forest plan is quite prescriptive in road activities including miles constructed, reconstructed, and closed (determined by management area). Some areas identified for road activities by the existing forest plan could be no longer relevant, given completed work or changing priorities, which would not be an efficient use of limited maintenance funds. Some areas may not be considered important for road maintenance under the 1986 forest plan even though there could be current maintenance needs impacting important resources like water quality and riparian areas.

Effects common to Alternatives 2, 3, 4, and 5

All action alternatives contain an objective for road decommissioning at 50 miles within 10 years of plan approval. A complementary management approach suggests the priority factors for decommissioning roads include redundant routes, cause severe erosion, located near waterbodies, or have adverse impacts to water quality, at-risk species or cultural resources, or within IRAs that negatively affect roadless character. Roads that would be decommissioned would require a site-specific NEPA decision and the management approach further encourages when developing the

proposed action for a NEPA project, considering incorporating any decommissioning of roads within the project area that meet these decommissioning priority factors while involving affected stakeholders. Applying these criteria during project-planning over the long term would result in fewer high-risk, low-value roads, and generally reduced wildlife habitat fragmentation, sedimentation, vandalism and theft of archaeological sites, and noise disturbance to wildlife, while leaving a manageable system for public and administrative access to key areas of the forest.

Temporary roads, created to accomplish vegetation treatments or restoration activities, would be expected as part of all the action alternatives. Alternatives 3 and 4 emphasize mechanical treatments or thinning treatments as the preferred restoration method, while alternative 5 limits mechanical treatments or thinning treatments to the WUI. Use of NFS roads for access to treatment areas would result in increased traffic and greater variety of vehicles including heavy equipment. This would result in a need for more frequent road maintenance and possibly road improvements to accommodate this increased activity safely. Other short- and long-term effects include increased traffic conflicts with other users on NFS roads, changes to surface water flow paths and quantities, the loss of vegetation, soil disturbance and compaction, wildlife displacement and habitat fragmentation, decreased air quality due to dust and vehicle emissions, increased noise, increased risk of human-caused fires, and decrease in recreational opportunities due to temporary closures. These temporary roads would be restored to natural vegetative conditions following the cessation of work. The increased use of fire through prescribed burns and managing naturally ignited fires in alternatives 2 and 5 would result in more areas where roads are closed for public safety from fire and smoke. Road closures for fire management would temporarily potentially affect access for firewood, hunting, and other uses.

There is a guideline that road construction and maintenance should incorporate best management practices to minimize impacts to water quality. The guideline specifies FSH 2509.22 - Soil and Water Conservation Practices Handbook, FS-990A, but lists of other best management practices are also provided in management approaches in other sections of the revised plan (e.g., soils and water quality). These references and lists provide a resource to interdisciplinary team members during project planning to be able to consider the most applicable best management practices to prevent or mitigate potential adverse impacts to environmental quality. These best management practices include structural and non-structural protection measures to address potential detrimental changes in water temperatures, blockages of water courses, deposits of sediment in streams, streambanks, shorelines, lakes, wetlands and other bodies of water that are likely to seriously and adversely affect water conditions for beneficial uses or aquatic ecosystems.

There is a guideline that construction and maintenance of roads and trails should accommodate appropriate terrestrial and aquatic wildlife species movement and habitat connectivity. A complementary management approach suggests working with the New Mexico Department of Game and Fish and New Mexico Department of Transportation to identify any wildlife habitat needs, potential barriers to wildlife movement, and explore ways to mitigate these issues. This collaborative effort encourages sharing information and targeting site-specific wildlife connectivity issues during project planning or even regular maintenance. Another guideline in the riparian section states that new or redesigned stream crossings, such as bridges and culverts should be wide enough to at least pass the bankfull width unimpeded and incorporate aquatic organism passage design where appropriate. The riparian section guideline would make the new or redesigned stream crossings more sustainable to routine floods and decrease aquatic habitat fragmentation where appropriate. Although these considerations may result in more upfront expenses there could be less need for later maintenance or retrofitting.

There is a guideline that construction of new roads should be minimized in riparian areas, and another guideline in the riparian management section states that new construction or realignment of roads and motorized routes, recreation sites or other infrastructure should not be located within the 100-year floodplain, or within 300 feet of a riparian management zone. A complementary management approach suggests relocating roads away from floodplains, perennial stream channels, and riparian areas when opportunities and funding allow. This plan direction would over time reduce resource concerns regarding water quality, hydrologic function, fluvial geomorphology, and riparian conditions (as described above), but also reduce costs associated with reoccurring maintenance, which are higher in floodplain settings.

There is a guideline that reconstruction and rehabilitation of existing roads should be emphasized over new road construction. This plan component would decrease the effects associated with new road construction such as changes to surface water flow paths and quantities, the loss of vegetation, soil disturbance and compaction, and wildlife displacement and habitat fragmentation. Although there might be a loss of potential access to new areas if the emphasis is on existing roads and the access already provided. Emphasis on existing roads over new road construction would also help moderate the deferred maintenance backlog by minimizing additions to the transportation system, which the forest already struggles to maintain.

Through management approaches, all action alternatives encourage working with local and county governments, New Mexico Department of Transportation, and Federal Highway Administration on the planning, design, construction, and maintenance of highway corridors, which helps ensure contiguous road systems across multiple ownerships. Another management approach encourages stakeholders to provide specific feedback on the road system to assist with travel management implementation, and look for opportunities to resolve issues in an adaptive management approach. These management approaches encourage stakeholder collaboration in the iterative processes of the transportation system. By working with partners and other stakeholders, the forest would be better able to maintain roads and provide better access for forest visitors.

While these alternatives have varying amounts of recommended wilderness, none of the recommended areas in any alternative contains authorized public motorized travel. The recommended wilderness areas have plan direction that would disallow any new road construction, but most of these recommended areas are within IRAs that already contain restrictions on new roads.

Alternative 5

This alternative features a guideline where new construction or realignment of roads and motorized routes, recreation sites, or other infrastructure should not be located within the 100-year floodplain, or within 500 feet of riparian management zones containing perennial streams or native trout populations. So, this alternative has an increased 200-foot buffer of new construction or realignment of roads compared to the other action alternatives (500 feet compared to 300 feet) in cases of riparian areas containing perennial streams or native trout populations, which could slightly improve water quality for those affected areas.

Cumulative Effects

The plan provides a programmatic framework that guides site-specific actions but does not authorize, fund, or carry out any project or activity. Because the plan does not authorize or mandate any site-specific projects or activities (including ground-disturbing actions), there can be no direct effects. However, there may be implications, or long-term environmental consequences, of managing the forests under this programmatic framework.

The cumulative effects timeframe for the roads analysis is the next 10 to 15 years, and the spatial boundary includes the national forests adjacent to Gila NF; State and county roads that access and traverse the national forest; communities encompassed by the national forest; easements to access inholdings; Catron, Grant, Hidalgo, and Sierra Counties encompassing the national forest; and designated NFS highways in the Gila NF.

State and local government agencies with road management authority can be expected to continue to maintain their existing road network across the forest. Some changes such as widening, resurfacing, and bridge replacements are probable but are dependent on budgets and funding allocations. There is a continued likelihood of jurisdiction of NFS roads being passed to other public road agencies where they are agreeable. In doing so, the forest would continue to better align the road system with the available maintenance budget. Grant, Sierra, and Catron Counties have approved ordinances allowing off-highway vehicles to operate on roads owned and controlled by those counties which may increase the use of those vehicles in certain parts of the forest because there may be more connectivity of legal access. This increased use may be limited to the peripheral areas next to those communities with limited impacts on forest roads due to the low populations in those communities.

Change in ownership of private lands can result in continued requests for road access across NFS lands. Depending on the circumstances, these may be requests for forest or private road special-use authorization. Depending on the terms and conditions written into any new authorizations, opportunities for access to NFS lands may be created.

There is a trend of private ranches being subdivided, and portions being converted to other uses including residential development. This residential development can often occur near the forest boundary, as it is a desirable amenity for a piece of private property to be near or adjacent to the national forest. As communities grow and infill occurs, undeveloped lands and their open space values are converted to residential or commercial uses. In addition, the subdivision (fragmentation) of private parcels increases demands for access to the forest. Communities that have not planned for additional infrastructure needs would likely request acquisition of NFS lands for infrastructure. This may also trigger the need to acquire rights-of-way in places where informal public access is lost to development.

Climate change is projected to increase the frequency, severity and duration of droughts (IPCC 2007; Seager et al. 2007). While the region is expected to get drier, it is likely to see larger, more destructive flooding events. The variability in weather patterns may produce heavy precipitation in brief periods of time that can wash out roads and plug/blow out culverts. Extended drought may cause tree mortality (often via stress-induced insect and disease) and cause more hazard trees along roadways and waterways (leading to debris plugging drainage structures). More instances of wildfires may also create more wear and tear on roads from fire response. These effects may increase the maintenance needs upon already strained road maintenance budgets across jurisdictions. While the road/infrastructure damage is being repaired, routes may be temporarily closed causing reduced access and inconvenience to the public, and disrupted access for Forest Service personnel for management activities. These effects may also lead to the development of adaptive strategies (e.g., retrofit/relocate/upgrade infrastructure) and integration of climate change consideration into existing and future programs, projects, and planning processes for increased sustainability and resiliency (USDA FS 2018d).

Facilities and Infrastructure

Affected environment

The forest manages a variety of facilities for a variety of purposes to enable the Forest Service to fulfill its mission. These include administrative facilities (offices, warehouses, employee housing, and fire facilities), range facilities, and public recreational facilities (visitor centers, campground or picnic ground restrooms, storage buildings, etc.), and associated water and wastewater treatment systems.

Administrative Facilities

Much of the planning for facilities for the forest is guided by Facilities Master Plan, which is scheduled to be updated and revised regularly. Currently, the Facilities Master Plan is in the process of being updated, and this will reflect current vision and direction for facilities in the forest.

The Gila NF maintains a total of 264 non-recreation administrative buildings including all range facilities, which include range cabins and barns and are maintained by the permittee. Each structure receives a facility condition assessment by qualified personnel every five years. The inspections result in the documentation of all required maintenance needs. The result of comparing the required maintenance to the generated replacement value for each asset is a facility condition index. The facility condition index correlates to a facility condition rating of good, fair, or poor (table 64). A good condition rating is considered a site that is fully functional and pose little to no safety concerns to the public and agency personnel. With a good condition rating, there is room for improvements to the sites, but overall function of the site is acceptable. A rating of poor typically indicates the need for major repairs, replacement or decommissioning of the facility.

Table 64. Administrative buildings in the Gila National Forest, with their facility condition ratings

Ranger District	Number of Structures	Good	Fair	Poor
Supervisor's Office	50	24	7	19
Black Range	43	15	3	25
Quemado	43	22	5	16
Glenwood	35	14	3	18
Wilderness	35	16	2	17
Reserve	43	19	6	18
Silver City	15	8	1	6
TOTAL	264	118	27	119

Many of the facilities identified as being in poor condition are older buildings and many of those are range buildings (such as range cabins and barns), which are to be maintained by the permittee. The facilities budget for maintaining these buildings has not increased in recent years, leading to the significant deferred maintenance backlog. The deferred maintenance of administrative facilities in the Gila NF, excluding the leased property, is valued at over $7.3 million. With a limited budget to address all facility needs, prioritization of investment in maintenance occurs according to the following sustainability goals: (1) address existing or potential health and safety hazards, which may include demolition; (2) emergency repairs to restore serviceability of the building; (3) repair to existing building and utility system to prevent further damage and deterioration; (4) maintenance of

facilities to the objective service level; and (5) improvements to reduce maintenance and operation costs. Priority is given to more important facilities.

Recreation Facilities

The Gila NF has 33 developed campgrounds, which includes two group campgrounds. All campgrounds have vault toilets (see Wastewater Systems) and seven provide drinking water (see Drinking Water Systems). The forest also manages a horse camp with water for stock and corrals. There are 9 interpretive sites, 5 observation / vista areas, 6 picnic sites, 5 boating facilities, and 98 developed trailheads, all with some type of development. Eleven sites have horse corrals (2 campgrounds, 7 trailheads, 1 interpretive site, 1 horse camp), while 5 different sites have a total of 10 pavilions.

The majority of recreation facilities are considered to be in good condition (table 65). A couple of sites are currently closed due to damages from wildland fires and/or flooding. Other sites have some sort of seasonal closure or restrictions due to time of year and threat of flooding (e.g., monsoon season). There has been a significant amount of rehabilitation work at several recreation facilities affected by large wildland fires. Rehabilitation efforts have resulted in improved conditions, compared to the previous ratings before the fire impacts.

Table 65. Recreation buildings in the Gila National Forest, with their facility condition ratings

Ranger District	Number of Structures	Good	Fair	Poor
Supervisor's Office	0	0	0	0
Black Range	7	6	1	0
Quemado	26	16	6	4
Glenwood	16	14	0	2
Wilderness	54	28	5	21
Reserve	16	12	2	2
Silver City	25	20	5	0
TOTAL	144	96	19	29

Drinking Water Systems

The Gila NF has 15 drinking water systems—7 systems serve recreational facilities and 8 serve administrative sites. Many of the drinking water systems were developed or improved during the 1990s and early 2000s, and currently range from good to poor condition. However, each drinking water system still must meet water quality and system operation standards according to its classification type. The administrative sites include the Grant County Airport, Kingston Administrative area, Beaverhead Administrative area, Luna Administrative area, Glenwood Administrative area, Wilderness Administrative area, Negrito Administrative area and Fort Bayard Administrative area. The remaining administrative sites (Quemado, Reserve and Silver City Administrative sites) are served by municipal water systems. Recreation sites include Quemado Lake, Catwalk, Lake Roberts, Gila Visitor's Center, Willow Creek, Snow Lake and Little Walnut.

Due to shrinking budgets, current plans for the water systems are to correct and maintain these systems to a good condition rating and discourage installation of any new water systems. Testing and

sampling of water systems are up to date and in compliance and will continue to do so until systems are properly decommissioned.

Wastewater Systems

The Gila NF manages one lagoon wastewater system near the Gila Cliff Dwellings National Monument, which receives all sewage pumped from the nearby area (vault toilets, RV dumps, etc.), and multiple leach field / septic type wastewater systems. The Gila NF also ties into four municipal septic systems. There are 104 vault toilets in the Gila NF as well as 18 pit toilets.

The majority of the vault toilets in the forest were installed in the 1970s and 80s, but have been replaced by newer vault model toilets in the last 20 years as part of campground reconstruction projects. Vault toilets are an all-inclusive system, which contains both the building and the belowground vault for wastewater. Currently, 73 vault toilets are in good condition, 14 are fair, and 17 are in poor condition. The approximate replacement value for one vault toilet is $40,000. Replacement of the 17 poor condition units would cost around $680,000. Over time, we will seek to replace the 17 poor rated (older) vault toilets with new model vault toilets or equivalent.

The deferred maintenance of septic/wastewater systems in the Gila NF currently is estimated at $300,000. Once a septic tank/leach field system fails, it must be entirely replaced. Since wastewater is an important health and safety issue, funding for future administrative wastewater projects would be a priority.

Dams

The Gila NF has three large earthen dams forming lakes located within the plan area. The Snow Lake Reservoir and Quemado Lake Reservoir are located entirely on NFS land and the Lake Roberts Reservoir has some of the backwaters located on NFS land; however, none of the dams are owned or maintained by the Gila National Forest. The New Mexico Game and Fish Department maintains all three dams mentioned, and current inspection reports show that while there are some operation and maintenance issues, the dams are in “satisfactory” condition. All three of these lakes have been separately permitted for use by “special-use permit.”

Aviation

There are four airstrips located in the forest that receive semi-regular maintenance (Beaverhead, Negrito, MeOwn, and Jewett Mesa) by the forest. These airstrips provide access for emergency services, fire management operations, burned area emergency response actions, and other administrative activities of the Forest Service. These airstrips are also considered open for general public use and receive occasional recreational use. Two other airstrips are located in the Gila NF, but are under special-use permit to Catron County (Reserve and Glenwood). All the airstrips located in the Gila NF are considered “primitive” according to the Airstrip Classification matrix (USDA FS 2012b), with the exception of Reserve, which is developed. Pilots are reminded that it is their responsibility to check Federal Aviation Administration Notices to Airmen (NOTAMS), the Aeronautical Information Manual, Federal Aviation Administration flight service stations, and current airstrip conditions from the airstrip manager before conducting any flight operations.

Other Infrastructure

In addition, the Gila NF has various range infrastructure including fences, corrals, cattle guards, and assorted types of water developments including; springs, wells, windmills, solar pumps, pipelines, water storage tanks, and water troughs. Range infrastructure such as water developments also benefit

different species of wildlife. Many of these improvements related to livestock management were constructed years ago and are in states of disrepair or now obsolete. Many times new permittees inherit these through the waiver of permits and are faced with heavy and costly workload to repair or possibly remove improvements. Through the process of range analysis, improvements are inventoried to assess condition and efficacy. Improvements no longer needed are then scheduled for removal as time and funding will allow. New improvements or those that are still necessary for livestock management are constructed or maintained through a cost share partnership between the Forest Service and the livestock grazing permittees as part of their grazing permit. Vacant allotments on the forest pose a challenge to maintenance of infrastructure as many improvements such as fences, corrals or water developments have been abandoned since removal of the livestock. Those improvements such as water developments that continue to benefit wildlife are prioritized and maintained as funding allows. Any new range infrastructure proposed for livestock and/or wildlife is coordinated through the district range staff, permittees, and line officers in the Gila NF, and then taken through the proper NEPA analysis for implementation.

Other wildlife infrastructure includes trick tanks and drinkers for wildlife, fish barriers, fishing piers, floating docks, boat ramps, fish habitat enhancement structures, and fish cleaning stations the Forest Service maintains. The fish barriers are located throughout the forest and require little to no maintenance. Additional fish barriers may be considered pending recommendations and consultation between the Forest Service and the New Mexico Department of Game and Fish. All other fishing type infrastructure is also typically a joint effort as coordinated between the Forest Service and the New Mexico Department of Game and Fish.

Plan-Level Environmental Consequences

Analysis Methodology

Probable management activities related to alternatives 1, 2, 3, 4, and 5 are used to evaluate or predict short- and/or long-term effects to facilities infrastructure in the Gila NF. In order to make broad comparisons between alternatives, this programmatic analysis uses:

- Guideline for sustainable design and emerging technology
- Guideline for facility repurposing or decommissioning if no longer utilized as intended
- Guideline for adaptive reuse of historic properties while respecting and maintaining historic design
- Management approach using facilities master plan, sustainable recreation plan, recreation site analysis, and other long-term planning documentation

Effects Common to All Alternatives

The majority of management direction affecting administrative facilities, recreation facilities, dams, and water and wastewater systems in the Gila NF would not change under any alternative. The facility master plan would be reviewed and updated annually as necessary to reflect management needs. Facilities generally provide an environment free from recognized hazards for people, while avoiding or minimizing negative impacts to natural and cultural resources. Potable water systems, where provided, serve the public or administrative needs while complying with current standards. The recreation facilities provide cultural ecosystem services through recreation opportunities, scenic vistas, and enjoyment with nature.

The maintenance requirements across the portfolio of assets is increasing, with much of the preventative maintenance (annual and/or cyclic activities) becoming deferred. The accumulation of deferred maintenance leads to deterioration of performance, increased costs to repair, and a decrease in asset value. A lack of preventive maintenance increases the risk of major unplanned repairs or replacements.

Alternative 1 – 1986 Forest Plan

Under alternative 1, management of facilities infrastructure would continue under the facilities and developed recreation management area goals, objectives, standards, and guidelines in the 1986 forest plan (as amended). Alternative 1 provides plan direction to maintain facilities in safe and operable conditions, but does not put an emphasis on sustainable facilities management that manages facilities to standard and considers repurposing or closing facilities that are no longer utilized as intended or are no longer required to meet Forest Service or user needs. Under current and projected funding levels the forest cannot adequately maintain all of its facilities; this alternative does not provide management direction that would improve this condition. If this trend continues, it is likely that some of the infrastructure will deteriorate beyond repair, which will force decisions on consolidation and possibly relocation. Further degradation of facility condition with potential increased risks to human health and safety, or even inconsistent or haphazard repurposing or decommissioning of facilities across the forest, may also impact historical resources and create lost opportunities for adaptive reuses. This alternative does not encourage incorporation of emerging technologies and sustainable concepts into facility design, maintenance, and renovation so benefits from energy and water conservation may not be realized.

Unplanned closure of administrative facilities as a result of unsafe structures could result in a loss of services to local communities. Community members would have to travel further to go to a district office for permits or to address issues with local staff. Communities may feel they are less appreciated or receive less support from the Forest Service. Negative economic and social contributions would result from having to hastily close recreation sites, because funds are inadequate to provide appropriate maintenance to keep sites safe for human use. Closures would reduce or limit opportunities to access and gain enjoyment of recreational resources and experiences. Damage or the failure of key recreation infrastructure (e.g., wastewater systems) could pollute water sources and could affect the drinking water of communities or water used for agricultural purposes.

Effects common to Alternatives 2, 3, 4, and 5

All action alternatives (2, 3, 4, and 5) include plan components that require adherence to scenic integrity objectives, discourage construction in hazardous or environmentally sensitive areas, and encourage incorporation of emerging technologies and sustainable concepts into facility design, maintenance, and renovation. These measures would improve energy efficiency, conserve water and other natural resources, improve functionality and ensure consistency with the scenic character of the Gila National Forest. Techniques such as use of energy star appliances, xeriscaping and rain harvesting are to be employed for new technology energy savings while selecting of colors for buildings and fences may be used to blend with the surrounding environment.

As the workforce and mission services continue to evolve, existing infrastructure may become obsolete from the originally designed purpose and will require the forest to look at adaptive reuses, multi-uses, and other ways to address accumulating deferred maintenance. Adaptive reuse of historic properties would be pursued when appropriate; maintenance and renovations would respect and maintain historic design so no important historic features are lost. Facilities no longer used as

intended would be repurposed to accommodate a new use or be decommissioned to minimize maintenance backlog and infrastructure deterioration, and to protect public safety and health.

The action alternatives provide guidance (through a management approach) to consult the facilities master plan, sustainable recreation plan, recreation site analysis, and other long-term planning documentation to understand how specific infrastructure will be maintained, modified, or removed from service in alignment with broader guidance in the revised draft plan. By reducing the maintenance backlog and investing in facilities infrastructure that is necessary to meet the Forest Service mission, a higher level of maintenance could be maintained for the remaining facilities given current and projected funding, which would increase the longevity, safety, and functionality of those facilities.

Recreation infrastructure (i.e., campgrounds, and toilet facilities) allow for recreation opportunities, which support communities directly (e.g., outfitter guide jobs) and indirectly (e.g., increased tourism in community lodges, shops, and restaurants). The action alternatives also contain guidance (through a management approach) to consider recreational aviation activities and access to airstrips and Forest Service lands for recreational purposes when developing projects for recreation and infrastructure and encourage volunteers and partners to assist with the maintenance of backcountry airstrips where appropriate. This could led to increased maintenance activity at these airstrips; improving their condition and fostering increased recreational aviation activities.

Cumulative Effects

The cumulative environmental consequences are spatially bounded by an area larger than the Gila NF's proclaimed boundary. This analysis of cumulative effects considers foreseeable activities over the next 10 to 15 years. The Gila National Forest is not the only agency that likely is dealing with insufficient maintenance funding and degrading infrastructure. The National Park Service, Apache-Sitgreaves NFs, BLM, New Mexico State Parks, and New Mexico Department of Game and Fish have developed recreation sites in the broader area. A common trend observed among visitors to southern New Mexico is that when visiting their planned destination, they discover other recreation opportunities found within the area managed by various agencies. The draft revised plan provides language to work with partners and communities to collaborate on projects and programs that would potentially provide funding for planning and implementation which could lead to facilities infrastructure that is adequately maintained especially for popular and unique destinations/activities, which would continue facilities in these areas to be available for public access and use. However, there may also be future conversations area-wide on the decommissioning of certain infrastructure that is redundant with opportunities found in adjoining areas or sites that do not receive many visitors, which could reduce the availability of facilities in some areas.

Reduction in funding has necessitated the need to focus all dollars on infrastructure that meets Forest Service goals, mission and objectives. Previous facilities such as roadside rest stop areas, which are typically more of a highway department function, were previously owned and maintained by the Forest Service. In addition, the forest has maintained other facilities such as those supporting the Gila Cliff Dwellings National Monument. In response to limited funding, the forest may need to redirect funding more toward maintenance and support of forest missions, which, in turn, will reduce opportunities to support infrastructure that are directed toward other agencies' missions.

Land Ownership, Use, and Access

Affected environment

The Gila National Forest is composed of land proclaimed as Forest Reserve land by numerous presidential proclamations, executive orders and laws through the years, along with lands that have been acquired from private or other governmental owners. The Gila National Forest is one of the largest national forests in the Nation, occupying approximately 3.3 million acres. Federal ownership within the forest is mainly consolidated as a large whole unit with the exceptions of some communities and other large and small tracts of private land located within the forest. The Gila National Forest also administers the portion of the Apache National Forest[c] that is located in New Mexico (figure 45), as well as designated Federal lands owned by the Veteran's Administration that are part of Fort Bayard[d]. The forest shares boundaries with other Federal, State, and private lands such as the Gila Cliff Dwellings National Monument, administered by the National Park Service, and the BLM.

Land Ownership

The Gila NF is located in the southwestern corner of New Mexico within the counties of Catron, Grant, Hidalgo, and Sierra. Table 66 displays land ownership within these counties (Headwaters Economics 2015). The majority of the Gila NF land area resides in Catron and Grant Counties. The forest comprises approximately 46 percent of Catron County and 34 percent of Grant County. With the combination of other federal, State, and Tribal lands, only 26 percent of Catron and 39 percent of Grant County is privately owned. The amount of the Gila NF within Sierra County (13 percent) and Hidalgo County (0.4 percent) is less significant although only 25 percent and 42 percent is privately owned in these counties, respectively, due to significant holdings by other Federal and State agencies.

[c] The Gila National Forest combined with the New Mexico portion of the Apache National Forest are managed as one national forest. The use of "Apache National Forest" is only referred to when it is necessary to describe its location within a legal manner.

[d] The land has remained in the control of the Department of Agriculture with the exception of some sales to the State of New Mexico and adjacent community of Santa Clara.

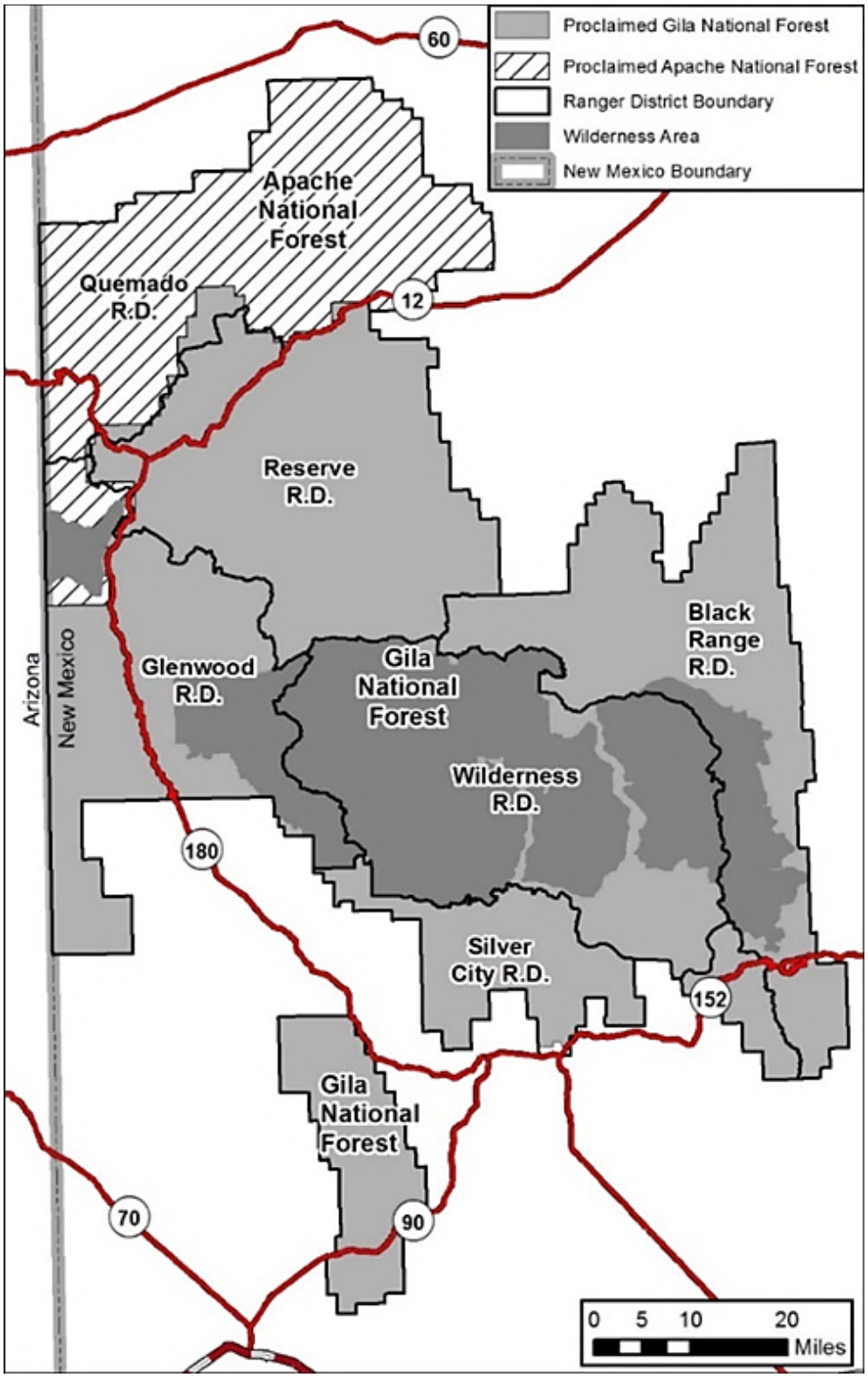


Figure 45. Proclaimed Gila and Apache National Forests that are administered by the Gila National Forest along with the current district boundaries

Table 66. Land ownership (percentage) in the counties that include the Gila NF

	Catron County	Grant County	Hidalgo County	Sierra County	County Region	U.S.
Private Lands	25.5	38.6	42.1	25.3	31.3	58.7
Conservation Easement	0.1	0.0	0.8	0.0	0.2	0.6
Federal Lands	62.7	47.4	41.6	63.2	55.6	28.8
Forest Service	49.5	33.9	3.5	13.9	29.5	8.4
Gila NF	45.9	33.9	0.4	13.2	27.4	<0.01
Cibola NF	3.6	0.0	0.0	0.7	1.5	<0.01
Coronado NF	0.0	0.0	3.1	0.0	0.6	<0.01
BLM	13.2	13.4	38.1	28.8	21.4	11.1
National Park Service	0.0	0.0	0.0	0.0	0.0	3.4
Military	0.0	0.1	0.0	19.3	4.4	1.1
Other Federal	0.0	0.0	0.0	1.3	0.3	4.7
State Lands	11.5	14.0	16.3	11.4	12.9	8.4
State Trust Lands	11.5	14.0	16.3	10.5	12.7	1.9
Other State	0.0	0.1	0.0	0.9	0.2	6.6
Tribal Lands	0.3	0.0	0.0	0.0	0.1	4.0
City, County, Other	0.0	0.0	0.0	0.0	0.0	0.2

Counties containing Federal lands have historically received a percentage of the revenues generated by the sale or use of natural resources on these lands. A steep decline in Federal timber sales on national forests during the 1990s significantly decreased revenues received by counties from the Forest Service. Federal land payments are payments made by the Federal Government to state and local governments to compensate for non-taxable Federal land within their borders. In the area of influence, the Forest Service makes contributions through both appropriations and revenue sharing via various programs, such as the appropriated Payment in Lieu of Taxes (PILT), and revenue sharing programs, such as the Secure Rural Schools program.

PILT are Federal payments to local governments that help offset losses in property taxes due to nontaxable Federal lands within their boundaries. PILT payments help local governments fund operations, such as emergency services and road maintenance. Payments are made annually for tax-exempt Federal lands administered by the BLM, National Park Service, U.S. Fish and Wildlife Service, Forest Service, and for Federal water projects and some military installations. Payments to counties are based on population, receipt sharing payments, and the amount of Federal land within a county

Boundary Issues

Boundary problems in the Gila National Forest have generally resulted from the remoteness, terrain, and associated accessibility of the forest area. All original survey work for township and range lines ceased in the early 1900s. Very few of the corners from the original surveys were able to be located. Lack of well-established boundary corners and markers adjacent to and within the forest during the homestead period has resulted in boundary line disputes as new surveys with better technology are completed. Independent resurvey authority is used today by the BLM and by Forest Service surveyors to fix problem areas.

Many of the corners that define the Gila National Forest boundaries need to be established or re-established. Some of these corners are missing due to substandard original surveys that have yet to be addressed by the forest, while others are missing due to natural and human forces. In addition to the backlog of land boundaries to be defined, none of the administrative boundaries such as wilderness area boundaries have been surveyed and posted by a licensed Forest Service surveyor on the ground. Most of these administrative boundaries have been signed and posted by Forest Service employees that are not surveyors or under the direction of a surveyor, therefore these posted lines should be considered unofficial and for maintenance purposes only. These boundary issues have resulted in title claims and encroachments.

Land Use

Land use describes the activities to which the land is devoted, such as residential, commercial, industrial or agricultural uses usually described for private lands, and current land allocations and the uses permitted for NFS lands, such as grazing, mining, recreation, administration, etc. There are often several land uses occurring simultaneously on many areas of the Gila NF. The land base of the Gila NF is composed of a vast multi-dimensional terrain having a wide variety of resources. Within this land base there is a multitude of ownerships, as well as many resources to be shared, used, and enjoyed by the mix of private land residents and forest visitors. The goals and objectives of the forest are to continue to provide its resources for public use and enjoyment without harming the integrity of the area or its resources.

Currently, 2.6 million acres of the 3.3 million acres of the Gila National Forest are managed for livestock grazing. Other uses such as mining and timber harvesting occur on smaller scales while hunting and recreation uses are widespread, but can have localized impacts. Resources are protected from land uses via evaluation through NEPA or special-use permit processes to ensure the continued integrity of the affected forest resources. Many times potential impacts can be mitigated through forest plan components, best management practices and other permit or project conditions.

Special Uses

Special uses are those primarily conducted by a single individual, a small group of people, a corporation, a university or another government agency that has a particular need to occupy and use a portion of the forest without harming the integrity of the land base. These uses are authorized on a temporary or term basis. Some authorizations may be issued to a corporation for a use that may directly benefit the public (e.g., powerline, ski resort). The issued authorization has terms and conditions to help ensure that the use stays within the guidelines of laws, regulations, and policies governing management of NFS lands.

In order for a special-use permit to be issued, a review process is conducted including an environmental review to ensure that the proposed special use meets laws, regulations, and policies, and protects resource integrity. Providing adequate biological assessments and evaluations, cultural resource clearances and engineering assessments and designs for permits involving ground-disturbing activities are the responsibility of the special-use applicant.

Cost recovery fees are required[e] for work conducted by the Forest Service for review and analysis of a special-use application and resource reports. These fees are for the cost of forest workers and

[e] Some special uses are exempt from cost recovery.

specialists who are needed to study and evaluate the special-use proposals. An assessment of the amount of time to accomplish the task is determined and assessed to the proponent of the project.

Special-use authorizations are written permits, term permits, leases, or easements that authorizes use or occupancy of NFS lands, and specifies the terms and conditions under which the use or occupancy may occur. The Forest Service divides the management of special uses into two categories: recreation special uses and non-recreation (i.e., lands) special uses. The Gila National Forest has issued hundreds of special-use permits related to lands. These authorizations include irrigation ditches, weather instrument locations, communication sites, access roads, electric transmission and distribution utilities, and scientific research among many others.

The direct and indirect value and influence of NFS lands for delivering goods and services is critically important to the public at local, regional, national, and even international levels. Utility corridors accommodate high-pressure natural gas pipelines for industrial, commercial, and domestic purposes; high-powered transmission lines provide for interstate transfer of electricity; as well as distribution lines for power delivery to local homes and businesses. Communication sites accommodate rapidly evolving wireless technology, while at the same time providing critical radio communication for safety and security needs.

There are currently 18 designated communication sites located in the forest that are compatible for low power administrative, government, and/or commercial electronic communication use. No sites are currently identified in the forest as suitable for high power commercial communication installations, which are typically high power radio and television broadcasters. Communication site plans are being developed by the Gila NF at sites with the most users. These plans facilitate the administration of the area, and once an analysis of the type of use within the area has been conducted, updates and new uses are easier to get approved.

Access

While there are thousands of miles of NFS and other roads (county, State, other Federal) in the Gila NF, there are some access issues, primarily associated with private inholdings in the forest. The sprinkling of parcels of private land along major travel ways and water corridors can make access to desirable areas of the Gila NF sometimes difficult to obtain. The Gila NF lacks rights-of-way across some private lands and may not have a feasible alternative to accommodate a new route around the private land due to topography, current land designations, and/or funding. The Gila is looking to acquire easement/permits across private land for public access where possible.

For most of the history of the Forest Service, access methods to areas of the forest were mainly a product of the need, desirability, terrain, and cost of construction. Roads were initiated by use across the land, usually in a route that was the closest distance from point to point in good terrain. Sometimes these routes crossed over other parcels of private land to get to the final destination. At the time, there usually was not a problem with a particular road crossing other parcels of private land without a document of authorization, easement or right-of-way. This is no longer the case. It is now commonplace for owners of private property to restrict public travel across their parcel of ownership. Because of this change, the Forest Service is behind in acquiring legal easements for many of the NFS roads and trails, which are currently routed across parcels of private land. This issue is especially prevalent on the Black Range District.

Historically, many landowners have been willing to provide access to public hunters and recreationists across their private lands. Personal relationships were established, and respect for

private property was demonstrated. Unfortunately, this traditional access has diminished as changing patterns of landownership have eroded the personal relationships between landowners, hunters, and recreationists. Landowners now often perceive recreationists as trespassers who are disrespectful of their private property rights, or sometimes lack an understanding of simple courtesies like closing gates and not scaring livestock. Many access opportunities have been lost across private lands due to historic landownership patterns, changing private ownership conditions, and a lack of established, legally defensible access across private lands. Inadequate access to public lands impacts a wide range of outdoor recreation activities, including hunting, hiking, camping, viewing scenery and wildlife, horseback riding, fishing, wilderness area use, and mountain biking. People want to use their public lands and are becoming sensitive to restrictions on that ability.

Reasonable access to private land is a right granted by the Alaska National Interest Lands Conservation Act (ANILCA 1980), which applies to other states besides Alaska. However, this right only applies to a private inholding (i.e., a parcel of private land completely surrounded by NFS land). The manner in which access is provided to a private inholding is a discretionary management decision, and is based upon the individual case circumstances.

Plan-Level Environmental Consequences

Analysis Methodology

Probable management activities related to alternatives 1, 2, 3, 4, and 5 are used to evaluate or predict short- and/or long-term effects to management of Gila NF lands including land adjustments, boundary management and encroachment issues, and lands special uses. In order to make broad comparisons between alternatives, this programmatic analysis uses:

- Annual survey and boundary posting objectives
- Methods available for land adjustments between alternatives
- Management approaches for land adjustments
- Management areas related to utility corridors

Assumptions

This analysis also includes a number of assumptions about the lands and lands special uses programs over the life of the plan:

- The Forest Service has the personnel and funding capacity to screen, process, and manage special uses and land adjustments.
- Community and public needs for services will continue.
- The population of New Mexico will continue to grow and be dependent on electricity. Consumers will continue to demand reliable electricity. The economy will fluctuate over time and influence the rate of utility corridor development.
- The emphasis of the lands program will remain on consolidating the forest's land base for easier management—not shrinking or transferring the Federal estate to private parties or other jurisdictions.
- It continues to be easier for land acquisitions to occur than land conveyances.
- The Payment in Lieu of Taxes program continues in its current form.

Effects Common to All Alternatives

Since the forest was created, there have been numerous land transactions, which have added and subtracted portions of the land area, via land exchanges, purchases, donations and sales. Parcels of private land have been acquired by the forest in the past via donation, purchase and exchange (trade), and these opportunities still will occur to some degree. Acquisition of some of these private parcels can be helpful in achieving a desired forest landownership pattern that enhances public access, supports resource management goals, addresses fragmentation, and reduces future management costs. For example, acquisitions of specific properties may expand access opportunities for the general public in areas of the national forest which may have been extremely difficult to reach in the past. Acquisition of particular private inholdings may assist in recovery efforts of threatened and endangered species. Conversely, the sale or disposal of forest land can assist communities in moving toward community objectives such as area for expansion or other municipal purposes.

With approximately 69 percent of the area owned by Federal and State governments, the multi-county area of Catron, Grant, Hidalgo, and Sierra counties often lacks private land within and adjacent to existing communities for expansion and sustainability. Because so little of the multi-county area is in private ownership, land ownership has a strong influence on social, economic, and ecological conditions. The tax base in these counties is very limited, due to the lack of private land that is able to be developed and a relatively small, static population. At the same time, the counties are often responsible for providing services to their residents over large geographic areas, which strains their resources. Any changes, particularly acquisition of private land by public land management agencies, could appear to influence the counties' revenue. However, Payments in Lieu of Taxes (PILT) could offset some of these losses.

The Federal Government makes payments to State and local governments to compensate for non-taxable Federal land within their borders (e.g., Payment in Lieu of Taxes-PILT). Although some entities would like to see the formula for compensation adjusted, this formula is not under the jurisdiction of the forest plan. Dependency on these transfers exposes local services to changes in Federal policy and spending decisions.

This area's unique land ownership pattern also acts as a draw for hundreds of thousands of visitors to the Gila NF each year. Visitors generate tourism and recreation-related jobs, and provide tax revenue for local governments. Expanding recreational uses both within and near the forest has the potential of affecting adjacent private lands via trespass or resource damage.

Alternative 1 – 1986 Forest Plan

Alternative 1—the no-action alternative—allows land ownership adjustments as needed to support resource management goals. Acquisition of fee lands via purchase are limited to lands within classified wilderness, benefiting threatened and endangered species, and high value recreation lands. The 1986 forest plan is quite prescriptive in prioritization of parcels for landownership adjustment even listing exact parcels desirable for acquisition, which complicates negotiations and property valuation. Adherence to this list could narrow opportunities to work with local communities in addressing their expansion needs and public access to Federal land. In addition, some areas identified for acquisition by the existing forest plan are likely no longer relevant given completed land adjustments or changing priorities. Some important resources may not be considered important for acquisition under these criteria even though it may be highly valued for certain resources, like riparian corridors or water resources. As a result, these important resources associated with these non-Federal lands may not be considered for a land adjustment case and could be lost to private development under alternative 1 as they would not be consistent with criteria for acquisition.

Effects common to Alternatives 2, 3, 4, and 5

All action alternatives (2, 3, 4, and 5) would identify criteria for acquisitions or exchanges without listing specific areas in the draft plan. This would allow the forest to be flexible and to make determinations based on the current needs of both the forest and of local communities. There would also be management emphasis to work with local communities to understand their community expansion needs, conserve open space and water, and retain access to NFS lands. Meeting the needs of local communities for increased forest access would reduce user conflicts and enhance satisfaction in public ownership of NFS lands. Having a continuous land base has ecological benefits, such as providing quality wildlife habitat and connectivity, protections for at-risk species, and maintaining naturally appearing landscapes.

Parcels identified for disposal and exchange are typically those that have become difficult to manage because surrounding ownership conditions have changed, or the lands no longer represent forest characteristics or qualities. These are often former administrative sites, isolated tracts, or scattered parcels, and rarely impact access for public use or administration. The disposal or exchange of these sites would help allocate resources to other areas of the forest that were more useful or productive. The action alternatives would also encourage cooperation with counties or local communities to identify lands to be included or excluded from consideration of future land exchanges. For instance, the forest has sold land to enable community development such as the Glenwood Elementary School and Fort Bayard Veterans Administration Hospital.

There would be continued efforts to consolidate land ownership within the forest boundary and establish new rights-of-way, where needed, to benefit both private landowners and Federal land management. The purchase of small isolated inholdings within the forest would simplify management activities and streamline public access. The need to acquire rights-of-way for road and trail access is reduced with a consolidated land pattern. For instance, the forest recently acquired a small private property parcel that crossed NFS Road 141 without an established right-of-way that could have blocked recreational and commercial access to a large portion of the forest.

There was concern about being involved early in land adjustments and continued support for community needs is addressed in all the action alternatives. As a result, local governments, congressional representatives, all parties affected (for example, permittee in the case of a potential loss of acreage), and adjacent landowners are informed about land adjustment proposals, leases, and easements and their justification early enough to be able to provide meaningful feedback on the proposal. This increases trust in the Forest Service's lands program and results in greater potential for successful implementation of land adjustment cases.

The action alternatives provide direction to maintain the forest's boundary by annual survey and posting of the property boundary, and would provide specific targets for encroachment/trespass case resolution. Annual survey and boundary posting objectives would be based on available staffing and funding. Carrying out the objectives would lessen boundary location errors by both the Forest Service employees and private parties, which would also reduce encroachment/trespass cases.

The action alternatives also establish utility management areas. The utilities management area includes special-use authorizations for linear corridors that provide for those private uses of NFS lands that are necessary to serve a local, regional, or national public benefit such as reliable electric, natural gas, water and communication networks. A special-use permit or easement authorizes uses and corridor width within the utilities management area. Each utility corridor is encouraged to be developed and used to its greatest potential in order to reduce the need to develop additional

corridors. Using existing utility corridors helps avoid additional negative impacts including habitat fragmentation; cultural resource impacts, altered vegetation which can lead to soil and water cycle disruption, soil compaction and erosion, and degraded water quality; noise; and risk of uncharacteristic fire.

Effects common to Alternatives 2 and 5

Alternatives 2 and 5 allow flexibility in the occurrences of both land acquisitions (e.g., purchases) and land conveyances (e.g., sale, exchange, or donation). Appropriations for land and interests in land purchases have always been extremely limited and highly competitive. From 1996 to 2019, the forest has acquired 3,557 acres. In that same time period, the forest conveyed approximately 684 acres. Based on the authorities available, it is easier for land acquisitions to occur than land conveyances (see more details on this in the next section). With regional consolidation of the lands program and the permanent reauthorization of the Land and Water Conservation Fund, these patterns are expected to continue under these alternatives, which leads to the forest growing slightly over the plan implementation period. This would shift slightly the amount of private property to NFS land, and therefore, some of the property that was previously generating tax revenue for counties (often at the lower agricultural rate) would be now included in the PILT formula to compensate counties for this now non-taxable Federal land within their borders.

Effects common to Alternatives 3 and 4

Alternatives 3 and 4 stipulate that land acquisitions (e.g., purchases) would be balanced over time with land conveyances (e.g., sale, exchange, or donation) so that no net loss of private property in a county occurred. This would keep the amount of private property and Gila National Forest acres relatively constant, and maintain tax revenue from private property taxes and PILT funds would continue to compensate counties for non-taxable Federal land within their borders. The authority to sell NFS lands has very limiting requirements, so land exchanges and Small Tracts Act cases would be the primary conveyance methods. Land exchanges are becoming more infrequent as the transaction costs continue to rise (which the proponent is often responsible for) and the time for the completion of a transaction to occur can be many years. Since it is easier for land acquisitions to occur than land conveyances, based on the authorities currently available, it is likely that this will limit the amount of future land acquisitions (although purchased easements could provide access in some cases). As a result, non-Federal lands with important resources could be developed instead of acquired. This development of non-Federal land could cause new utility corridors, access restrictions (or at least continue them), possible changes to forest visitors' recreation experience and contact frequency with others, and impacts to forest resources like wildlife habitat and scenery on NFS lands surrounding the development. If the Gila National Forest is limited in its ability to acquire land, willing sellers may have to look elsewhere for interested buyers, which may limit their options for buyers and increase the length of time to sell their property.

Cumulative Effects

The cumulative environmental consequences are spatially bounded by an area larger than the Gila NF's proclaimed boundary, generally the area immediately adjacent to the forest. Development patterns within this expanded area influence landownership adjustment cases, boundary issues, and the demand for use and occupancy of NFS lands (special uses). This analysis of cumulative effects considers foreseeable activities over the next 10 to 15 years.

While the State of New Mexico's population has grown steadily over the last few decades and is expected to continue to increase in the future, the population of the surrounding four-county area

(Catron, Grant, Hidalgo, and Sierra) is expected to hold relatively constant for the next two decades (UNM-BBER 2014). Where there is in-migration of new arrivals, they tend to be retirees from the baby-boomer generation attracted by environmental amenities, such as scenery and recreation opportunities, and lower costs of living (UNM-BBER 2007). There is a trend of private ranches being subdivided, and portions being converted to other uses including residential development. These private ranches when intact contribute to local economic diversity, scenery, local culture, and community vitality. This residential development can often occur near the forest boundary it is a desirable amenity (often reflected in the real estate listing and sale price) for a piece of private property to be near or adjacent to the national forest. This conversion to residential development can also have implications for the Gila NF including growth of the wildland-urban interface (and the cost of protecting homes from wildfires), the spread of invasive plants onto the Gila NF, the loss of access to public lands for recreation, the loss of wildlife habitat and wildlife movement corridors that cross private-public land boundaries, and the potential for conflict among user groups (Headwaters Economics 2015).

It is now common to have a large number of homes, second homes, and vacation homes bordering public lands in the western United States. Since wildfire is a natural disturbance on western public forests, these homes are especially vulnerable to the risk of wildfire, and are considered within the WUI. Prolonged drought over the past 15 years has increased the risk of more severe and intense wildfire. Catron, Grant, Hidalgo, and Sierra Counties each have county wildfire protection plans, which seek to manage residential growth in WUI areas, promote partnership and collaboration, and identify and prioritize hazardous fuels reduction areas. Six percent (1,726) of the homes found within the four-county area are located in WUI areas. In recent years, the Gila NF has planned and implemented many projects that specifically decrease the risk of wildfires within these areas (e.g., prescribed burning and mechanical treatments to reduce fuels). As more people live or work in the WUI, fire management becomes more complex and the costs to reduce fire risk, manage wildfires, and protect human lives and homes have risen sharply in recent decades (Stein et al. 2013).

As private properties, especially inholdings change from rural or undeveloped land to subdivisions or higher density uses, encroachment into NFS land becomes more frequent, resulting in resource impacts and land survey needs. As communities grow and infill occurs, undeveloped lands and their open space values are converted to residential or commercial uses. This growth would likely result in continued pressures to maintain NFS lands for their open space values. This may also trigger the need to acquire right-of-way in places where informal public access is lost to development. In addition the subdivision (fragmentation) of private parcels increases demands for utilities and access to the forest such access roads, communication and power lines, and water conveyance structures for irrigation or domestic water uses. Communities that have not planned for additional infrastructure needs would likely request acquisition or use of NFS lands for infrastructure.

Cumulatively, continued development along the forest boundary tends to move the Gila NF away from desired conditions of natural open space adjacent to communities. As further development occurs, residential encroachments onto the national forest are expected to occur more frequently and degrade wildland character and other resource values. Working with other governmental partners on ordinances and plans could reduce potential impacts to forest resources.

All communities adjacent to the Gila recognize the open space and recreational values the forest provides. Still, there will likely continue to be tradeoffs of resource values in the forest as a result of expanding communities and their needs. There will also likely continue to be tension between the desires to retain forest lands near communities and the need to provide land for infrastructure that

serves the expansion of those communities. Local collaboration expectations with communities and their desire for open space may result in localized exchanges. There have been discussions on how to create a connector trail from Western New Mexico University in Silver City to the CDNST in the Gila NF. The Town of Silver City Trails and Open Spaces Plan (2002) includes a goal and action items to develop an area-wide trail system providing connectivity between neighborhoods, commute destinations, and open spaces including the Gila NF.

Minerals

Affected Environment

Introduction

The Forest Service recognizes mineral and energy resources are fundamental to the Nation's well-being and, as policy, encourages the exploration and development of these resources on lands it is authorized to manage. The agency's role in managing mineral and energy resources is to provide reasonable protection of surface resources while allowing use of the land for operations authorized by U.S. laws. The Forest Service itself generally does not initiate exploration or development of mineral or energy resources. Rather, proposals for access to, exploration for, and development of mineral/energy resources are driven by external parties and market forces.

There are four types of mineral and energy resources in the Gila NF:

1. **Locatable:** Locatable minerals are those that may be "located" with a mining claim under the General Mining Law of 1872 (Act of May 10, 1872 (17. Stat. 92; 30 U.S.C. 28)), as amended. Locatable minerals include the hardrock minerals mined and processed for metals (for example: gold, silver, copper, zinc, tin, and some types of non-metallic minerals), and rare earth elements, plus some "uncommon variety minerals." The Mining Law of 1872 grants U.S. citizens the right to prospect and explore for minerals on lands open to mineral entry. The right of reasonable access for exploration and development of locatable mineral is guaranteed. The Forest Service can require reasonable protection of surface resources and compliance with other Federal laws (e.g., Clean Water Act, Clean Air Act, Endangered Species Act, Archaeological Resources Protection Act, etc.), but cannot deny a request to explore and develop the minerals on NFS lands.
2. **Salable**: Also known as mineral materials, salable minerals include common variety mineral materials such as petrified wood, common varieties of sand, rock, stone, cinders, gravel, pumice, clay, most building stone, and other similar materials. These minerals are most commonly used as building, landscaping, and construction materials. The Forest Service has the authority to dispose of, or allow for public use and sale, these materials on public lands through a variety of discretionary methods.
3. **Leasable**: According to the Mineral Leasing Act of 1920, as amended, leasable minerals include coal, phosphate, potassium, oil, oil shale, gas, and sodium resources that occur on public domain lands. The Mineral Leasing Act was amended to include minerals associated with lands acquired by the United States and, by the Geothermal Steam Act of 1970, to include geothermal resources. These minerals are typically disposed of through leases issued by the BLM after the Forest Service provides the appropriate stipulations. Development can only occur after site-specific NEPA analysis for each proposed development. Leasing decisions are not part of this forest plan revision.
4. **Renewable energy**: Includes wind energy, solar arrays, hydroelectric dams, and biomass utilization. The Forest Service has the authority to permit construction of renewable energy facilities and infrastructure under special-use permits.

Locatable minerals

The Gila National Forest contains mineral resources, with metallic ores concentrated in the mountainous portions of the region often as a result of interactions between hydrothermal (hot water) solutions with host rock during volcanic activity (North and McLemore 2005). Past mining for metallic minerals has primarily produced gold, silver, copper, lead, manganese, zinc, iron, and tin. Historically, the concentrations of metallic ores found throughout in the area helped lead to populating the region as a whole. Over a hundred years ago, the mountain regions of the forest were the focus of intense prospecting and mining. These areas often experienced a major population growth and then a rapid decline, once the ore prices dropped and the mining boom ended.

Mining of metallic minerals is a supply and demand type of market prone to significant commodity price fluctuations. The forest to this day experiences cycles of mineral interest when prices of metals increase nationally. The deposits of minerals within the context area of the forest are distributed in a number of known mining districts (figure 46). Future demand for locatable minerals will likely occur in and around these mining districts. Table 67 lists the mining districts in the context area with past production and future potential. As shown in the table, most of the districts are not presently active. Any one particular mineral may or may not have high enough concentrations to facilitate an active mining operation. Economic feasibility is dependent upon many different situations, including concentration of the ore body, form of the chemical nature of the ore, value of the ore, access availability, location of a smelter or processing plant capable of processing the type of ore available, etc.

The area of Silver City and the Mining District (comprised of Bayard, Santa Clara, and Hurley) south of the forest is rich in copper from porphyry-copper and associated contact metamorphic (or skarn deposits). There are three large open-pit copper mines operated by Freeport-McMoRan Inc. with parts of two of them (Tyrone and Cobre) directly adjacent to the forest boundary. Freeport-McMoRan Inc. is the largest employer in Grant County, NM. However, when production is cut back due to the low prices of the metal on the world market, employment suffers due to resulting layoffs. Currently, the copper extracted from the ore bodies is being shipped all over the world with China currently being one of the main purchasers of the metal.

There are no active uranium mines or exploration projects in the Gila NF. Uranium occurrences are primarily found in the White Signal, Black Hawk, Tyrone, and Telegraph mining districts in the Burro Mountains (McLemore 1983). A few mines from these mining districts produced some limited uranium ore in the 1950s (McLemore 1983).

Rare earth minerals, which contain rare earth elements, are needed for cell phones, televisions, computers, iPods, video games, wind turbines, hybrid/electric cars, and solar panels. The Burro Mountains in the Silver City Ranger District encompass a number of mining districts (Black Hawk, Gold Hill, Telegraph, and White Signal) with rare earth elements consisting of Proterozoic alkaline rocks and pegmatites (McLemore 2015). Currently, no proposed plan of operations to mine for rare earth minerals has been received by the forest.

Table 67. Significant metal deposits in the context area, by mining district, based on past production and known resources. From McLemore (2005)

Mining District	Mine or Deposit	Year of Initial Production	Year of Last Production	Estimated Cumulative Production	Is There Future Potential	Significant Commodities
Bayard		1902	1969	>$60,000,000	no	gold, silver, copper, lead, zinc
Burro Mountains	Tyrone, Little Rock, Niagra	1879	present	>$2,000,000,000	yes	gold, silver, copper, lead, fluorite
Chloride	St. Cloud	1879	1988	$20,000,000	possible	silver
Chloride Flat	Boston Hill, Chloride Flat	1871	1946	$13,000,000	no	gold, manganese, iron
Fierro-Hanover	Cobre, Hanover Mountain, Continental	1889	1980	>$2,000,000,000	yes	gold, zinc, copper, iron
Georgetown		1866	1985	$3,500,000	no	silver
Hillsboro	Copper Flat, Mesa del Oro	1877	1982	$8,500,000	yes	copper, molybdenum, gold, silver
Kingston		1880	1957	$6,600,000	no	silver
Lordsburg		1870	1999	>$60,000,000	yes	gold, silver, copper, lead
Mogollon		1875	1969	>$25,000,000	possible	gold, silver
Piños Altos	Piños Altos	1860	1997	>$11,000,000	yes	gold, silver, copper, lead, zinc
Santa Rita	Chino	1801	present	>$2,000,000,000	yes	copper, gold, silver
Steeple Rock	Carlisle, Center, Jim Crow, Summit	1880	1993	$10,000,000	yes	gold, silver
Taylor Creek		1919	1969	$7,500	no	tin

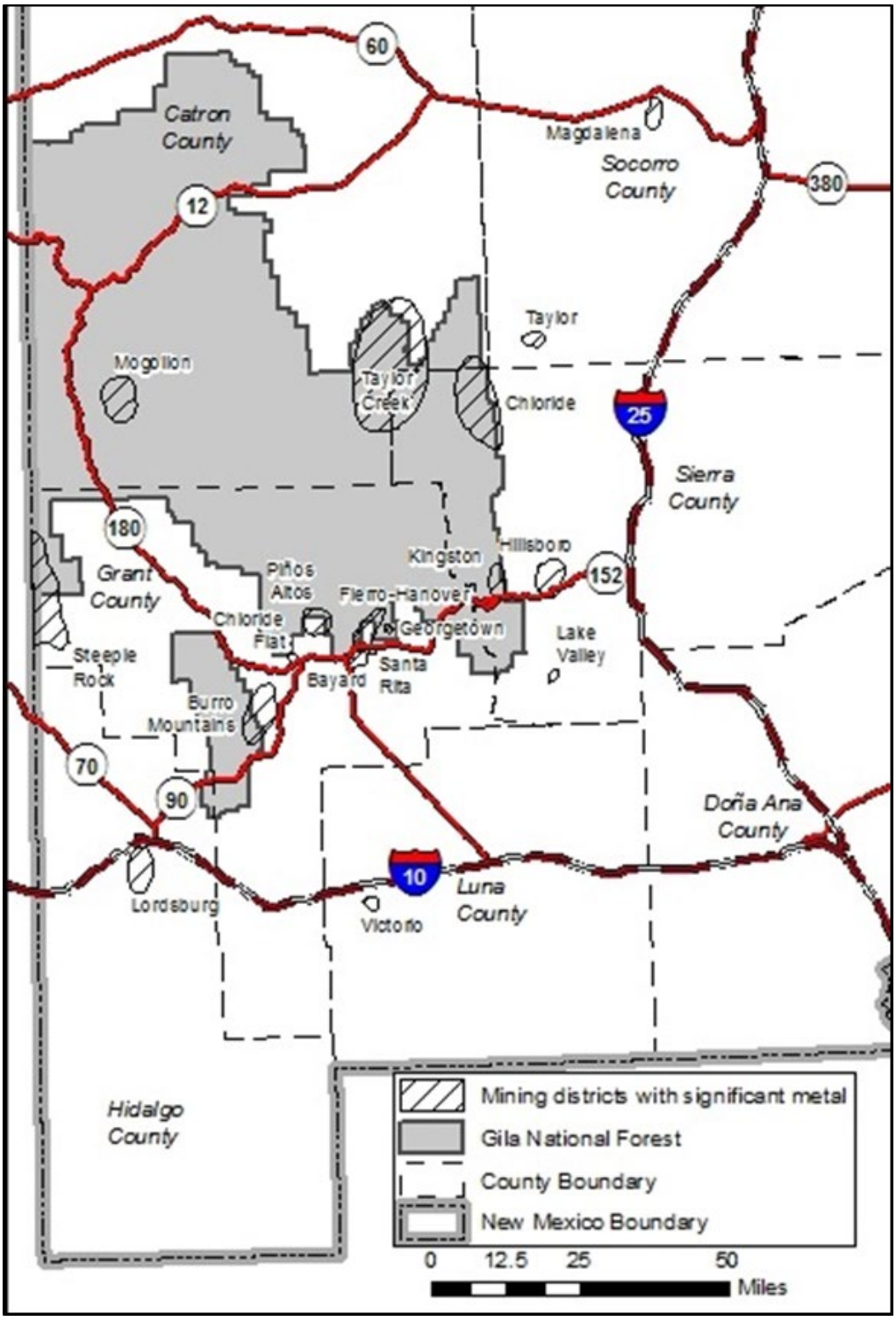


Figure 46. Mining districts in southwestern New Mexico with significant metal deposits

A mine in the forest supplies high-quality silica rock. Most of the material is used locally at the cooper mines, principally as packing and riprap for drainage, transportation, and other infrastructure features for mining-related acid transport facilities. The high-silica rock is invulnerable to degradation in acidic environments because acids do not react to silica (quartzite). Silica content in

excess of 90 percent SiO_2 in surface mine-able quantities is relatively rare, particularly near populated areas that are close to markets specific to the commodity. Production figures have varied over the years but it is around 1,500 to 2,000 short tons per year. Most of the material is used locally at the copper mines.

Abandoned mine lands include known abandoned mines and/or mining-related hazards in need of reclamation or restoration. An abandoned and inactive mine land inventory was conducted in the Gila NF in December 1998. This inventory identified 353 mine sites, of which, some were inaccessible and some were located on private land.

Saleable Minerals

Deposits of common variety minerals, including sand, gravel and rock are found throughout the forest and are concentrated in the drainages. According to data collected by the Forest Service, the only saleable materials currently removed directly from the forest are crushed stone and construction sand and gravel. Between 2011 and 2013, an average of 16,305 short tons of crushed rock and 370 short tons of construction sand and gravel were removed from the forest.

Leasable Minerals

Leasable minerals (i.e., coal, oil, natural gas) within the forest have historically been minimal to no development. There is no current development, extraction or use of this form of mineral material from the forest. Companies have conducted test drilling and seismic analysis of the subsurface for non-renewable energy resources in various locations of the forest throughout the years. There are currently no oil and gas exploration surveys or production or leases (active or pending) in the forest. There are currently no coal production or leases (active or pending) in the forest.

Areas in the Gila NF have been classified as low to moderately favorable for geothermal energy (DeAngelo and Williams 2010). Several hot springs are directly used for recreational purposes. The Gila has two identified Known Geothermal Resource Areas (KGRA) and a couple of areas identified for noncompetitive lease applications. Under the Final Environmental Statement Geothermal Leasing completed in 1978 (USDA FS Gila NF 1978), these areas were identified as the Gila Hot Springs Known Geothermal Resource Area and the Lower Frisco Known Geothermal Resource Area. The final decision restricted areas available for leasing to a small area of the San Francisco Hot Springs Known Geothermal Resource Area and lands west of the community of Glenwood. New Mexico. No proposed action has been taken on this potential resource in this area.

Renewable Energy

Renewable energy resources include photovoltaic (solar), wind, hydropower, and biomass. There is currently little to no renewable energy production in the forest; although, the potential for solar, wind, and biomass energy sources does exist. However, costs (labor, transportation, infrastructure construction) and logistics to use these resources may be a limiting factor for development.

Small-scale photovoltaic installations are currently used at numerous Gila NF sites. These installations are used to pump water for livestock, to provide power for communication sites, and to power fire lookout towers and campground host sites. Additional Forest Service site photovoltaic installations can be expected to comply with policy (FSM 2170.3). On-site photovoltaic generation is expected to continue and increase by Gila NF users. On-site use of windmills for pumping water is expected to continue.

There are no active or pending proposals for commercial wind energy or solar power facilities in the forest. Development of these renewable resources may be limited due to the lack of infrastructure to any current potential site locations. Electric transmission lines would have to be built to connect the sources to a power grid. To be economical, the potential areas would probably need to be located along existing power transmission line alignments. The forest is not positioned in the direct path of transcontinental or multi-state connection routes for energy and transportation so much of this development would likely occur on the periphery of the forest or outside the forest boundary. Some of this is due in part to the topography or mountain ranges in the forest.

There is no Federal Energy Regulatory Commission licensed hydroelectric power generation in the forest.

There is one biomass plant adjacent to the Gila NF at the old Fort Bayard Medical Center, which consists of a commercial scale wood-chip boiler system to produce steam and heat. This 150-horsepower steam boiler was designed to annually consume 1,000 tons of wood thinned from the forest (NM EMNRD 2007). However, this system has been idle since the new Fort Bayard Medical Center replacement facility was constructed, because it was unable to cost-effectively heat the new facility, compared to conventional gas systems (Ecosphere 2013).

Plan-Level Environmental Consequences

Methodology and Analysis

Probable management activities related to all alternatives are used to evaluate or predict short- and/or long-term effects to mining and minerals in the Gila NF. These management activities are evaluated in relation to their effects on reclamation of mining activities, new mining claims, common minerals, and energy development. To make broad comparisons between alternatives, this programmatic analysis uses:

- Mining standards and guidelines related to reclamation activities.
- Utilities management area plan direction
- Amount of recommended wilderness and eligible streams with “wild” classification including lands that could be withdrawn from mineral entry through potential designation by Congress.

None of the alternatives has specific objectives to construct new energy infrastructure or develop areas for mining or energy during the life of the plan. Proposals would be considered as they arise through project-level planning.

Effects Common to All Alternatives

Under all alternatives, decisions regarding mineral and energy activities in the Gila NF would align with law, regulation, and policy, and would be consistent with plan decisions for other resource areas to the extent possible. The Gila NF would continue to coordinate with the Mining and Minerals Division of the New Mexico Energy, Minerals, and Natural Resources Department, Mining Environmental Compliance Section of the New Mexico Environment Department, and the BLM on operational and closure requirements.

Under all alternatives, mineral activities may have environmental consequences on some resources in the short term and long term. Short-term environmental consequences could include increased human activity, such as motorized traffic, noise from equipment, temporary roads, ground disturbance during exploration activities, and construction of the authorized facilities, transmission

lines, and/or mines. Long-term environmental consequences could include operation and maintenance of the authorized facilities over the life of the facility. Operation and maintenance activities may include increased human activity and noise, motorized vehicle traffic, or additional ground disturbance. The effects of these short- and long-term consequences could include increased traffic conflicts with other users on NFS roads, changes to surface water flow paths and quantities, the loss of vegetation, soil disturbance and compaction, wildlife displacement and habitat fragmentation, decreased air quality due to dust and vehicle emissions, increased noise, increased risk of human-caused fires, and decrease in recreational opportunities. Extractive mineral activities that alter the landscape would most likely encumber scenery, other uses, and ecological processes on NFS lands for the foreseeable future. Standards and guidelines in the 1986 forest plan and draft plan lessen these environmental consequences by requiring mitigation measures to protect resources affected by mineral operations, including scenery.

Over the long term, the greater public and communities benefit from services provided by mineral activities. The potential benefits of energy and mineral production include having the raw materials necessary to sustain the quality of life we all enjoy, gravel and landscaping rock to meet the requests of the public, domestic sources of energy to increase national energy security, local employment, royalties paid on the minerals support Federal and state programs, and state and county taxes are paid by operators. These benefits have the effects of providing employment opportunities to the local population, attracting a suite of labor and technical employees to the community with often higher wages than other employment sectors, and increased economic activity due to purchases of goods and services. However, communities whose economies rely solely on mining activities are sensitive to price fluctuations of those commodities.

It is the desire of the national forest to eliminate known and potential hazards relating to abandoned mine lands. The former release of contaminates into the environment from historical mining activities pre-dating environmental regulations is known as a “legacy” issue. While some mines have interesting historical and educational features, many abandoned mine lands contain minerals like arsenic, cadmium, copper, lead, mercury and zinc which can cause human health and environmental hazards (e.g., water quality impairments) as well as other physical safety hazards (USDA FS MGM 2012). The Forest Service’s Abandoned Mine Lands program identifies mine features posing a danger to the public, which are prioritized and identified for closure or remediation. The classification as “abandoned” applies when there are no entities or individuals left operating the mining activity or who have financial ties to the mine. The significance of this classification is that for most abandoned sites there is no money from the original operators available to clean up the sites. Although occasionally a responsible party can be found to contribute funds toward cleanup, the major burden falls on the Forest Service to finance cleanup and remediation. The number of problems within the forest is vast and it will take many years and a lot of money to complete all of the work that is needed. To avoid the future occurrence of abandoned mine lands, all Plans of Operation now incorporate a Reclamation Plan, which is usually accompanied by a financial bond.

Under all alternatives, the Gila NF would continue to have an active salable mineral materials program, and demand for these resources is expected to continue. There is no indication that the quantity of materials sold would significantly increase under currently available projections.

In all alternatives, 807,740 acres or 24 percent of the Gila NF is withdrawn from mineral development. Congressionally designated wildernesses (three areas totaling 792,584 acres) are withdrawn from mineral entry as part of their governing law. A number of administrative and recreation sites have also been previously withdrawn from mineral entry totaling 12,660 acres.

Research natural areas (1 area of 2,496 acres) are withdrawn from mineral entry and mineral leasing, and mineral materials and locatable minerals extraction are not allowed. These withdrawals from mineral entry protect the unique characteristics and qualities for which these areas were designated. Eligible wild and scenic rivers with wild classifications are not withdrawn from the mining or mineral leasing laws. Protective management requirements for eligible river areas are subject existing laws and agency guidance until Congress acts[f].

The construction of commercial-scale coal, oil, gas, solar, wind, geothermal, or hydroelectric facilities on the forest would be unlikely under any of the alternatives. The likelihood of requests for construction of additional power lines to transmit power generated off-forest across the Gila NF would be equally likely under any of the alternatives.

Alternative 1 – 1986 Forest Plan

Alternative 1 has plan language that directs that management of minerals and mining comply with applicable laws and regulations and in doing so minimize impacts to other surface resources. Continued management under the 1986 forest plan (as amended) does not limit the ability to access forest minerals and mining activities. The 1986 forest plan has standards and guidelines related to visual resources and recreation sites, but does not set any standards or guidelines to better manage and reduce potential impacts to other resources. This plan direction has the effect of maintaining the assigned visual quality category with more restrictions on activities (e.g., limiting surface occupancy for leases) from being visually evident and contrasting with the natural character (form, line, color, texture) of the landscape in higher visual quality areas.

Effects common to Alternatives 2, 3, 4, and 5

In all action alternatives, there are standards and guidelines that ensure reclamation of mineral areas to mitigate resource impacts and return the land to a planned use, which is consistent with the overall land use of the area. Throughout the proposed plan, standards and guidelines in resource sections for scenery, watershed, soils, cultural resources, vegetation, and wildlife resources emphasize sustainable management and effects mitigated during projects, which would include mineral projects. This plan direction would guide mineral activity across the forest, minimizing negative environmental effects (as discussed above in effects common to all alternatives), while promoting beneficial effects (as discussed above in effects common to all alternatives).

The proposed plan for all action alternatives includes a standard for recommended wilderness that no structures, improvements, and developments will be constructed or provided within recommended wilderness except those improvements associated with valid existing rights. These and other standards and guidelines for recommended wilderness are intended to maintain or improve wilderness characteristics until Congress acts one way or another on the recommendation. Active mining claims would be considered valid existing rights. The Forest Service does not have the legal authority to prohibit mining activity in recommended wilderness, as its establishment does not automatically result in a mineral withdrawal and mineral rights constitute property rights. Any parts of the recommended wilderness areas that have active mining claims at the time of recommendation or designation or both could see mineral development and the associated impacts described in effects common to all alternatives. The parts of the recommended wilderness areas without active mining claims would be managed to prohibit future development and the associated impacts to wilderness characteristics. If Congress designated these areas as wilderness, they would eventually be

[f] Designated wild and scenic rivers with wild classifications are withdrawn from mineral entry; however, there are no designated wild and scenic rivers in the Gila NF at this time.

withdrawn from mineral entry. This could create an incentive for mining claim holders to develop their claim before any designation from Congress.

The new eligible wild and scenic rivers with wild classifications that flow through established mining districts are: Mineral Creek (Mogollon mining district), San Francisco River (San Francisco mining district), and Gila River – Middle Box (Telegraph mining district). Approximately 2.5 miles of the Mineral Creek eligible wild and scenic river flow through the Mogollon mining district although this reach is upstream of all the private inholdings and historic mines in the area, and is mostly in the inventoried roadless area. The San Francisco River flows through the San Francisco mining district although there was never any reported production from possible placer activities (McLemore 2017). The Gila River flows through the Telegraph mining district although the last production was in 1951 (McLemore 2017), and the mining activities primarily occurred in vein deposits mostly outside the river corridor. The Mogollon mining district has possible future development (McLemore 2005) while the Telegraph and San Francisco are unknown. Anticipated effects to mineral and energy development would be something to consider in a future suitability study, but currently appears to be minimal due to the reasons discussed above.

In all action alternatives, plan direction for scenery, wildlife, riparian, archaeology, and traditional and cultural ways of life may make it complicated to determine a new route for power transmission lines within the Gila NF to minimize impacts to those resources, which may delay the development of commercial energy generation and the associated effects, including beneficial effects. The Utilities Management Area includes special-use authorizations for linear corridors that provide for those private uses of NFS lands that are necessary to serve a local, regional or national public benefit such as reliable electric, natural gas, water and communication networks. The Utilities Management Area features linear areas up to approximately 1,000 feet wide (as determined by the special-use permit; local distribution lines would be less than this width) to accommodate existing utility facilities and related access for maintenance and repair, and to accommodate co-location of new utilities. There is a guideline that each utility corridor should be developed and utilized to its greatest potential in order to reduce the need to develop additional corridors, and where possible, existing corridors should expanded as needed rather than creating additional corridors. This plan direction concentrates some of the energy infrastructure activities (and their associated effects – see discussion in the effects common to all alternatives) in existing linear paths while alleviating other areas from infrastructure development. This co-location may increase costs to the utilities since it might be a longer route along the established corridor than a more direct new route. Although there might be a point where co-location is no longer economically feasible, and a new route might be justified, which is one reason this plan direction was designed as a guideline and not a standard.

In New Mexico's rural communities, fuelwood (firewood) obtained from NFS lands is often the only source of heat for homes, and is a form of very small-scale renewable energy. Plan direction for forest product availability, including personal firewood permits, would continue to be made available as discussed in the forest products and rural historic communities sections. The level of this activity is expected to remain constant across all alternatives and for the life of the plan. Therefore, fuelwood supply from the forest would remain the same and would continue to support the cultural use, as well as provide the means for local and rural populations to heat their homes in winter. Fuelwood use, while culturally important, would not substantially diminish wood products forest-wide, and is therefore unlikely to have any effect on the likelihood or scale of any commercial biomass activity.

Alternative 2

In addition to the withdrawn areas in all alternatives, alternative 2 would have an additional 116,477 acres of restrictions on development within recommended wilderness management areas except where such activities are allowed pursuant to valid existing rights. There are some recommended wilderness areas within mining districts such as Chloride, Kingston, Mogollon, and Taylor Creek. As shown in table 67, these mining districts have not seen mining activity since the 1980s, and are rated as a "no" or "possible" for potential future development, and the recommended wilderness areas contain no active mining claims. There is also a recommended wilderness area within the Carpenter minor mining district. The possibility of withdrawn acres (if later designated) is the third highest of all alternatives, but represents a negligible impact on mineral development, because the potential for economically feasible mineral development within the remaining recommended areas is low and the areas are difficult to access which affects cost and economic viability of any proposed mine. The recommended wilderness areas also contain nine abandoned mines, none of which are identified as a priority, and are mostly classified as raw or experimental prospects according to the New Mexico Mineral Industry Locator System.

Alternative 3

In addition to the withdrawn areas in all alternatives, alternative 3 would have an additional 124,735 acres of restrictions on development within recommended wilderness management areas except where such activities are allowed pursuant to valid existing rights. There are some recommended wilderness areas within major mining districts such as Chloride, Kingston, Mogollon, and Taylor Creek. As shown in table 67, these mining districts have not seen mining activity since the 1980s, are rated as a "no" or "possible" for potential future development, and the recommended wilderness areas contain no active mining claims. There are also some recommended wilderness areas within other minor mining districts including Carpenter and Wilcox. The possibility of withdrawn acres (if later designated) is the second highest of all alternatives, but represents a negligible impact on mineral development, because the potential for economically feasible mineral development within the remaining recommended areas is low. The recommended wilderness areas also contain 32 abandoned mines, none of which are identified as a priority, and are mostly classified as raw or experimental prospects according to the New Mexico Mineral Industry Locator System.

Alternative 4

In addition to the withdrawn areas in all alternatives, alternative 4 would have an additional 73,171 acres of restrictions on development within recommended wilderness management areas except where such activities are allowed pursuant to valid existing rights. There are some recommended wilderness areas within major mining districts such as Kingston and Taylor Creek. As shown in table 67, these mining districts have not seen mining activity since the 1960s, are rated as a "no" for potential future development, and the recommended wilderness areas contain no active mining claims. There are also some recommended wilderness areas within other minor mining districts including Hermosa, San Francisco, Tierra Blanca, and Wilcox. The possibility of withdrawn acres (if later designated) is the fourth highest of all alternatives, but represents a negligible impact on mineral development, because the potential for economically feasible mineral development within the remaining recommended areas is low. The recommended wilderness areas also contain five abandoned mines, none of which are identified as a priority.

Alternative 5

In addition to the withdrawn areas in all alternatives, alternative 5 would have an additional 758,463 acres of restrictions on development within recommended wilderness management areas

except where such activities are allowed pursuant to valid existing rights. There are some recommended wilderness areas within major mining districts such as Burro Mountains, Chloride, Kingston, Mogollon, Piños Altos, Steeple Rock and Taylor Creek. As shown in table 67, some of these mining districts are rated as a "yes" for potential future development, and the recommended wilderness areas contain 558 active mining claims. There are also some recommended wilderness areas within other minor mining districts include Blackhawk, Carpenter, Cora Miller, Fleming, Hermosa, Malone, San Francisco, Telegraph, Tierra Blanca, and Wilcox. This possibility of withdrawn acres (if later designated) is the highest of all alternatives, and could limit future mineral development, because the potential for economically feasible mineral development within the remaining recommended areas is moderate. The recommended wilderness areas also contain 80 abandoned mines, 1 of which is identified as a priority, which may restrict future reclamation activities.

Cumulative Effects

The cumulative effects timeframe for the minerals and energy analysis is the next 10 to 15 years. The spatial extent includes the Gila NF and the local communities within and closely adjacent to the Gila NF boundary. The demand for minerals and energy resources in the Gila NF is influenced by external factors such as the economy and public demand for these resources, as well as nearby construction and development. These factors and past trends are considered in evaluating cumulative effects for minerals and energy.

There is a perception by some stakeholders that the forest has not done enough to promote mineral and energy development although many times commodity prices, other market or regulatory forces, and deposit characteristics play larger roles than Forest Service management. The primary drivers for mineral and energy development is regional, national, and global economic factors including supply and demand, technical factors, and political decisions. These factors determine whether commercial renewable energy development is economically viable, and whether oil and natural gas (fossil fuels) remain the primary fuels for electrical generation.

The Gila NF and surrounding areas contain mineral resources, with past mining for metallic minerals primarily producing gold, silver, copper, lead, manganese, zinc, iron, and tin. It is expected that mining these minerals will continue to be a supply and demand type of market prone to significant commodity price fluctuations. Future demand for locatable minerals (primarily copper) will likely occur in and around known mining districts when prices of metals increase nationally. Mining is an important industry in southwestern New Mexico with established active mines immediately adjacent to the forest boundary at the Cobre and Tyrone mines operated by Freeport McMorRan Inc. There has been recent expanded mining activity at Hanover Mountain at the Cobre Mine and Little Rock Mine at the Tyrone Mine. While not immediately adjacent to the forest boundary, the Copper Flat mine (THEMAC Resources) in Sierra County is currently working through the permitting process with the responsible state agencies and the BLM. Freeport McMorRan Inc. has been reclaiming a number of sites in the Burro Mountain and Santa Rita mining districts. This reclamation work has focused on regrading, covering, and seeding mining areas (often tailing and waste rock piles) that were no longer being used. These reclamation activities redirect stormwater runoff, prevent water infiltration and potential groundwater contamination, and reduce windblown tailings.

Most of New Mexico's uranium reserves, and virtually all past production, are in northwestern New Mexico (Bland and Scholle 2007). As global demand and prices have increased, there has been renewed interest from the private sector in uranium mining in New Mexico using conventional and

in-situ leaching methodologies although this interest is predominantly focused in northwestern New Mexico (McLemore et al. 2013).

The deposits of rare earth elements in the forest are considered to be uneconomic to mine under current conditions, but changing markets and the regulatory environment could change the economic feasibility; so an increase in mining might occur. According to McLemore (2015), pegmatites in New Mexico are usually too small to be currently mined for rare earth elements, but residual placers from the pegmatites could have future potential.

The demand for the saleable materials (gravel, stone, and clay), the relative remoteness of the area where they exist, and the local economy dictate whether there may have value and demand for any particular rock commodity. Generally, external demand for mineral materials is related to population growth as construction occurs to accommodate growth. Based on population projections, the trend for salable minerals is expected to remain level. The Gila NF is an important source of salable minerals resources compared to the amount available on private, State, tribal and other Federal lands within the cumulative effects area. Efforts are underway to foster partnerships with local county governments through the opening of new gravel and aggregate sources in the forest to be used for road maintenance purposes including roads recently conveyed by the Forest Service to local governments. This would increase the effects to other resources (as discussed in the effects common to all alternatives section). However, the effects of salable mineral materials activities would be relatively limited since this material is for road maintenance activities and not new road construction.

Most leasable minerals (i.e., coal, oil, natural gas) within the cumulative effects area have historically been minimal to no development. The Zuni Uplift and San Agustin Basin plays (or prospects) in Catron County have low and moderate potential, respectively, for oil and gas (URS 2003). The currently producing oil and gas basins in New Mexico are located well outside of the cumulative effects area primarily in the San Juan and Permian Basins. Limited understanding of the oil dynamics of the Zuni Uplift and San Agustin Basin plays represent a high level of risk to private companies under current market conditions (URS 2003). If market demands for oil and/or gas change substantially, more exploratory activity might occur in these areas in the future.

The nearest coal fields to the cumulative effects area are the Salt Lake and Datil Mountain Coal Fields located north of US Highway 60 in Catron County and the Engle coal field east of Interstate 25 in Sierra County. Most of the active coal mines found in New Mexico are in the northern half of the state, primarily in the San Juan and Raton basins.

In 2013, New Mexico's first utility-scale geothermal power plant came online in the Animas Valley in Hidalgo County south of the forest in an area classified as being highly favorable for geothermal energy. In contrast, areas in the Gila NF have been classified as low to moderately favorable for geothermal energy (DeAngelo and Williams 2010). Issues limiting large-scale use of geothermal energy are water rights, limited power transmission capability, markets, Federal regulatory requirements, and a lack of government incentives (Fleischmann 2006). Significant additional geothermal energy development and associated environmental effects within the cumulative effects area in the near future are unlikely, although direct use of geothermal energy does occur on a small scale for things like facility heating (including greenhouses) and recreational hot springs.

Renewable portfolio standards, which require utilities to produce or procure a minimum amount or percentage of their electricity from renewable energy sources, exist in New Mexico and other western states, and have contributed to increased renewable energy development statewide. There was a bill passed in the 2019 state legislature that will require that New Mexico get all of its energy

from carbon-free sources by 2045, which could amplify interest in renewable energy. There is currently little to no renewable energy production in the forest; although, the potential for solar and wind energy sources does exist in the cumulative effects area. However, the potential areas would probably need to be located along existing power transmission line alignments. Recently proposed regional transmission corridors (SunZia and Southline) designed to transport electricity to western power markets have been located outside the forest boundary, likely due to topography. Much of the future energy development would likely occur on the periphery of the forest or outside the forest boundary where development would be less costly.

An increasing number of solar and wind facilities have been built in southwestern New Mexico along existing transportation and power transmission line alignments. The Deming Solar Center opened in 2011 in Luna County to the south of the forest boundary. Similarly, the Macho Springs wind-generation facility and photovoltaic solar project was completed in 2011 and 2014 respectively, and the Luna Solar facility opened in 2017. There are a number of wind generation developments that are in planning phases such as the Great Divide in southern Grant County and the Borderlands Wind LLC facility near Quemado on BLM land. Most of these renewable energy developments are far from the forest boundary, which lessens any potential effects. For the Borderlands wind-generation facility, which is directly adjacent to the forest boundary, the BLM will be analyzing potential impacts to visual resources, cultural resources, threatened and endangered species, wildlife habitat connectivity, tribal interests, and establishment and spread of noxious or invasive plant species from equipment brought in from other locations.

The future of biomass energy in the forest faces limitations. The current market demand for biomass heat is diminished due to the relatively low price of natural gas. If market conditions change, the biomass systems may become economical to operate (Ecosphere 2013). There is no Federal Energy Regulatory Commission licensed hydroelectric power generation in or off forest in the cumulative effects area.

Designated and Management Areas

Affected Environment

Introduction

Several areas in the Gila NF require different management from the forest-wide plan components. These areas are identified as designated areas and management areas. A management area represents a management emphasis for an area or several similar areas on the landscape. Designated areas in the Gila NF represent identified exceptional areas that have distinct or unique characteristics that previously warranted special designation.

Designated Areas

Designated areas have specific management direction to maintain their unique characteristics and are important ecologically and socially for the exceptional values they offer. Official designations of areas are established by statute (statutorily designated areas or often called congressionally designated areas) or by administrative processes (administratively designated areas).

Designated areas provide some level of protection for the values they were designated for and can play a role in conserving biodiversity and facilitating connectivity. In addition, designated areas can provide important social and economic services, including significant recreational and scenic opportunities, places to connect with nature and/or history, provide places for research, and contribute to the local tourism industry.

Every national forest has areas that contain special, exceptional, or unique values. Many of these areas meet the criteria to be considered special places and can be designated special status. This status can be on a national, regional, or local scale. Designated areas are specific areas or features within the plan area that have been given a designation to maintain its unique special character or purpose. Designation of these areas undergoes rigorous scrutiny and study that can last years, depending on individual circumstances.

Designated areas within the Gila NF by type of designation include:

Statutorily Designated Areas

- Three wilderness areas
- Two wilderness study areas
- One national scenic trail

Administratively Designated Areas

- 29 inventoried roadless areas
- One research natural area
- Two scenic byways
- Three national recreation trails
- Critical habitat for two threatened and four endangered species, as well as proposed critical habitat for three threatened species

Management Areas

- Thirteen areas recommended wilderness areas
- Sixteen eligible wild and scenic rivers segments (eligibility is completed administratively, official designation is completed through statute)
- Four proposed research natural areas
- Proposed botanical areas
- Proposed rare and endemic plant management areas
- Utility corridors
- Wildland-urban interface

Statutorily Designated Areas

See stand-alone sections for wilderness and wilderness study areas following the designated and management area analysis, and the section for Continental Divide National Scenic Trail within the trails section.

Administratively Designated Areas

See the stand-alone section on inventoried roadless areas following the designated and management area analysis and the section on national recreation trails in the comprehensive trails section. Designated research natural areas and critical habitat are analyzed within the subsections that follow.

Management Areas

See the stand-alone sections for recommended wilderness areas and eligible wild and scenic rivers that follow the Designated and Management Areas analysis. Proposed research natural areas, botanical areas and rare and endemic plant management areas are analyzed in the subsections that follow.

Research Natural Areas

Forest Service research natural areas (RNAs) are designated for the purpose of permanently protecting and maintaining natural conditions for the conservation of biological diversity, conducting non-manipulative research and monitoring, and fostering education.

Included in this RNA network are:

- High-quality examples of widespread ecosystems
- Unique ecosystems or ecological features
- Rare or sensitive species of plants and animals and their habitat (USDA FS RMRS 2016)

RNAs are managed to maintain the natural features for which they were established and to maintain natural processes. Because of the emphasis on natural conditions, they are excellent areas for studying ecosystems or their component parts and for monitoring succession and other long-term ecological change. The Gila NF has one established research natural area, the Gila River RNA.

The Gila River RNA was established in 1972, and consists of 402 acres in the northern Burro Mountains in the Silver City District. The area provides a well-developed example of the riparian ecosystem in New Mexico, and provides habitat for rich and unique birdlife. Two hundred thirty-one

species of birds, 43 percent of the bird species verified in NM, have been detected in the adjacent Gila River Bird Area (Shook 2015). Some of these species are at the northern edge of their natural range in southwestern New Mexico.

Federal or State threatened or endangered species using the area include bald eagle, common black hawk, peregrine falcon, Gila woodpecker, southwestern willow flycatcher, Bell's vireo, and Abert's towhee (Shook 2015). The Gila River in the Cliff-Gila Valley (including the Gila River RNA) is an important habitat area for native fish, including endangered loach minnow and spikedace.

The Burro Mountains are known to be rich in copper, and to the north and along the east side of the Gila River, near the location of the RNA, there are existing mineral claims. Because of this possible conflict with mining, the research natural area was located below the optimum habitat for the birds and riparian vegetation and withdrawn from mineral entry. However, none of these mining claims in the immediate vicinity of the RNA have been developed into operational mines.

Less than an hour drive from Silver City, an area referred to colloquially as the Gila Bird Area, just north of the RNA, is becoming popular for recreational uses such as hiking, birdwatching, river access, and dispersed camping. However, most of these activities take place near the access road.

Recreational use within the boundaries of the RNA is light, although there is a developed trail that travels 3 miles from the end of the bird area and passes through the RNA. This trail may be in conflict with policy and current plan direction for this designation by introducing a source of human-caused environmental disruptions.

Cross-country motorized travel in this area has been restricted since 1986. The riparian area is closed to grazing. Noxious plant species remain a threat. Populations of noxious plants, such as yellow star thistle, have been documented upstream. A restoration project in the Gila River Bird Area was completed in the early 1990s, which restored over 100 acres of dense riparian area (Boucher et al. 2003), and likely improved the connectivity of the riparian habitat at the RNA.

Scenic Byways

The National Scenic Byways Program is administered by the U.S. Department of Transportation, Federal Highway Administration. The program was established to help recognize, preserve, and enhance selected roads throughout the Nation. The U.S. Secretary of Transportation recognizes and designates scenic byways based on one or more intrinsic qualities—archaeological, cultural, historic, natural, recreational, or scenic (DOT FHA 1995).

Two designated national scenic byways exist in the forest—the Trail of the Mountain Spirits makes a loop through the southern half of the forest, while the Geronimo Trail traverses areas of the eastern part of the forest including a large area outside the forest boundary (figure 47). The primary visitor uses of the scenic byways are driving for pleasure, cycling, sightseeing, birdwatching, and visiting developed recreation sites. Most of the national scenic byway roads in the Gila NF are managed and maintained by the New Mexico Department of Transportation.

The Trail of the Mountain Spirits National Scenic Byway consists of a 93-mile loop (with an out-and back route to the Cliff Dwellings) connecting Silver City, the Gila Cliff Dwellings National Monument, Sapillo and Mimbres valleys, the mining district, and many points of interest in between. This route is also used during the Tour of the Gila, an annual multistage international cycling competition. The alignment it follows through the national forest consists of State Highways 15 and

35. The Trail of the Mountain Spirits receives moderate use year-round, from visitors and local commuters.

The Geronimo Trail National Scenic Byway, designated in 2005, begins in Truth or Consequences, New Mexico. From there, one can explore the northern route (82 miles) or southern route (56 miles). Each route ties together many charming locales and traverses life zones from the creosote and cholla-swept sands of the Chihuahuan Desert, to the piñon-juniper woodlands and ponderosa forests of the Gila National Forest. The routes through the national forest are State Highway 152 to San Lorenzo along the southern route, and State Highways 52 and 59 to the Beaverhead workstation along the northern route. The North Star Mesa Road (NFS Road 150) is listed as a "side trip," connecting the two routes to form a loop, but a 4-wheel-drive vehicle and knowledge of road conditions are needed. The portions of the forest along the byway receive low (northern route) to moderate (southern route) use year-round by visitors.

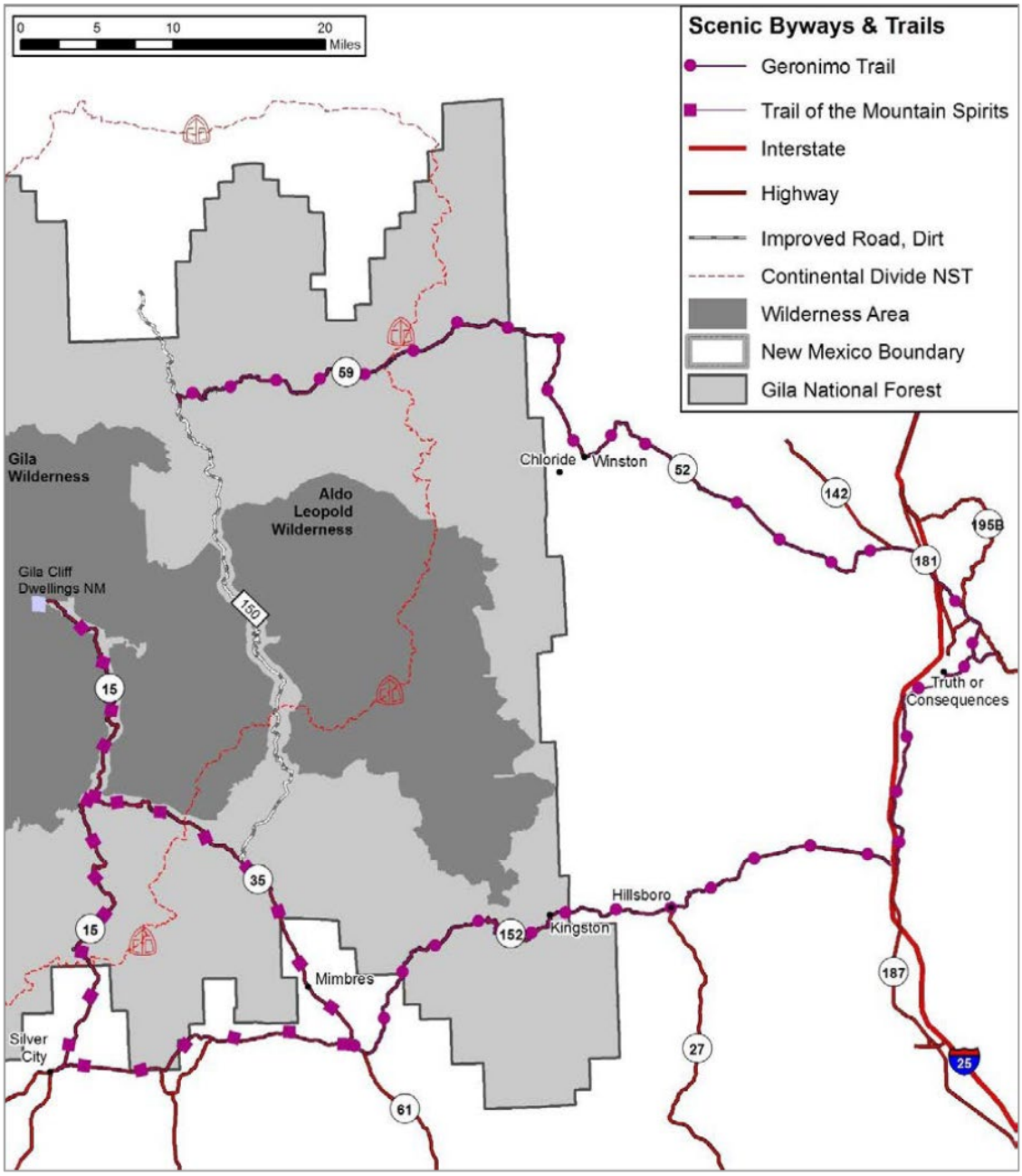


Figure 47. Scenic byways and trails in the Gila National Forest

A National Scenic Byway corridor management plan provides guidance and direction for conservation and enhancement of the byway's intrinsic qualities and promotion of tourism and economic development.

The Trail of Mountain Spirits Corridor Management Plan (Trail of the Mountain Spirits Scenic Byway Committee 2004) supports efforts to strengthen volunteer participation, explore alternative sources for project funding, increase membership, leverage business support, and identify project managers for the implementation and completion of byway projects. Among the implementation

items included in the plan are providing interpretive materials and media, protecting an archeological site adjacent to the byway, and promoting and marketing regional tourism.

The Geronimo Trail National Scenic Byway has a Corridor Management Plan (Geronimo Trail Advisory Committee 2008) and it strives to showcase and preserve the byway corridor area for its historic multi-cultural heritage and natural resources. Some of the goals of the plan are to market the byway as a unique tourism opportunity, develop interpretive signs and other amenities along the byway, ensure services provided along the route meet travelers' needs, and preserve the byway's resources so the route is a sustainable tourist and recreation attraction. The city, county, state, and Federal agencies with management responsibilities along the byway work in concert with the Geronimo Trail Advisory Committee to achieve these goals.

Designated Critical Habitat for Threatened and Endangered Species

Critical habitat (USDI FWS 2015c) is defined under the Endangered Species Act as a specific geographic area that contains features essential for the conservation of a threatened or endangered species and that may require special management and protection. Critical habitat may include an area that is not currently occupied by the species, but will be needed for its recovery. Critical habitat does not preclude activities within its borders; however, conservation of the habitat for the identified species is an important consideration when planning or allowing activities in these areas.

The USFWS has analyzed species needs and designated critical habitat within the Gila NF boundary for the Mexican spotted owl (*Strix occidentalis lucida*), southwestern willow flycatcher (*Empidonax traillii extimus*), Chiricahua leopard frog (*Lithobates chiricahuensis*), Gila chub (*Gila intermedia*), spike dace (*Meda fulgida*), and loach minnow (*Tiaroga cobitis*). There is also proposed critical habitat for the narrow-headed garter snake (*Thamnophis rufipunctatus*), Northern Mexican gartersnake (*Thamnophis eques megalops*), and yellow-billed cuckoo (*Coccyzus americanus*). Table 68 displays the area of critical habitat in the Gila NF by species.

Table 68. Critical habitat acres in Gila National Forest, by species

Species	Acres
Chiricahua leopard frog	2,488
Gila chub	764
Loach minnow	11,673
Mexican spotted owl	1,122,802
Narrow-headed gartersnake (proposed)	52,430
Northern Mexican gartersnake (proposed)	8,717
Southwestern willow flycatcher	1,547
Spikedace	9,968
Yellow-billed cuckoo (proposed)	1,680

Plan-Level Environmental Consequences

Analysis Methodology

This section provides an assessment of the potential impacts that implementation of each alternative could have to designated and special management areas in the forest.

Assumptions

- Under all alternatives, existing designated areas will continue to be managed under current law, policy, and regulation for the continued preservation and ecosystem services for which they were designated
- No existing designated areas will have a change in their designation status as a result of managing under the existing or revision of the current plan.

Analysis methodology consists of consideration of a diversity of information sources, including but not limited to, data from recent NVUM surveys, the updated ROS analysis. The potential differences in treatments within Ecological Response Units (ERUs) as indicated by activities associated with vegetation management activities by implementation of plan direction across all alternatives were used to consider effects from those activities.

Effects Common to all Alternatives

Designated and special management areas provide some level of protection for the values they were designated for. This allows regulating services, such as storage of carbon, water filtration, climate regulation etc. to function with some level of protection. For example, designated areas often provide high-quality water, soil, and air resources (DellaSala et al. 2011).

Designated or special management areas can play a role in conserving biodiversity and facilitate connectivity (Loucks et al. 2003). In addition, they can provide important social and economic services, including significant recreational and scenic opportunities, places to connect with nature and spirit, and contribute to the local tourism industry (Rasker 2006). They may also offer the ability to connect with history and provide places for research.

Fish and Wildlife Management

Under implementation of all alternatives, new habitat improvements for fish and wildlife would only be created, or existing improvements maintained within designated areas when they are in alignment with levels of development for the designation, do not degrade the values for which the area was designated to provide and protect, or due to requirements of legislation. Thus, fish and wildlife management in designated areas would maintain the values and services provided for by the particular designation. Since management activities can still occur within designated areas in all alternatives, there may be impacts within the areas that will be analyzed in depth at the project level. Impacts from noise, smoke creation, or other visual disturbances are possible depending on the activities being conducted. Also, since these activities will not degrade the areas and be aligned with the levels of development for the designation, these activities should minimally affect the management areas depending on the scope and nature of the activity.

Level of Development

Because management of designated areas under all alternatives would be conducted in alignment with law, policy, and regulation, any new or existing structures would meet the applicable provisions or desired conditions for that area. Since construction of new structures and maintenance of existing structures can still occur within designated areas in all alternatives, there may be impacts within the areas that will be analyzed in depth at the project level. Impacts from noise or other visual disturbances are possible depending on the location and timing of construction or maintenance of the structures Also, since these activities will be aligned with law, policy, and regulations that would meet the applicable provisions or desired conditions for that particular area, these activities should

minimally affect the values of the management areas depending on the scope and nature of the activity.

Permitted Grazing

Permitted grazing of livestock would only occur within designated areas where it is allowable, and would be in alignment with the management requirements of law, policy and regulation for that area. However, the presence of cattle could impair the recreation experiences of some visitors seeking experiences specific to those areas where grazing occurs. This may include activities such as hunting, fishing hiking, backpacking, and equestrian use. These effects may include uneasiness or displeasure with the presence of cattle, and impaired experiences of solitude due to the presence of domestic animals in a particular desired setting. There may also be conflicts when animals are blocking passage or presenting a collision hazard, negatively affecting visitor safety. There will not be any effects within designated areas where grazing is not permitted.

Prescribed Fire, Wildfires, Timber Sales and Mechanical Vegetation Treatments of Restoration Projects

Under all alternatives, fire management activities would continue with appropriate measures and best management practices to protect designated areas, and fire suppression of human-caused wildfires would serve to minimize the potential negative effects of degradation to the values for which the area was designated to provide and protect. Suppression of wildfires occurring under weather and fuel conditions that do not support movement toward desired conditions would benefit designated areas.

Prescribed and naturally ignited fires managed for resource benefit could enhance progress toward desired conditions and enhance and protect the identified values of designated areas by reducing fuel loading to acceptable levels, and restoring the natural role of fire. However, impairments to air quality, visual aesthetics, and water quality could occur, though in most instances it is likely be short term in duration.

Typically, the types of impacts from large, high-severity wildfires are more significant than those for prescribed fires and naturally ignited fires managed for resource benefit, and may be of a much greater magnitude of damage with a significantly longer duration of effects. Impacts from severe wildfires to facilities and trails within designated areas where they are permitted may be experienced across all alternatives, and could include temporary area and trail closures during the incident and post-fire effects of infrastructure damage. Areas within and surrounding large fires typically experience more intense and frequent flooding. Other impacts/damages include landslides, dead trees falling on or within facilities and trails, encroaching nuisance vegetation, erosion, extended closures due to hazardous conditions, silting in of water sources, and fish kills.

Emerging Recreational Trends that May Affect Future Recreation Demand

There is a growing interest in adventure races and similar events such as boot camps, mud events and endurance races. These events are usually held under a special-use permit by “for profit” organizations, although some are conducted as fundraisers. The activities associated with these recreation events may include: running, bicycling, paddling, climbing, orienteering, and other activities that require endurance, strength and agility. Because these activities will generally occur only within designated areas where they are allowable and in alignment with relevant designated area values, management objectives, law, policy, and regulation, they are unlikely to cause degradation of the qualities, values, and features for which these areas are designated or identified for management. They could, however, enhance the quality and availability of recreation experiences

for visitors seeking them, and augment the values of areas where they are appropriate for or are inherently a quality for which the designation or management of the area is identified.

Any of these recreation events can impact any number of resources from wildlife and archaeology to timber resources and trails in different ways, such as noise, increased human presence, and litter or refuse disposal. Effects to resources and management areas will be analyzed in depth during project-level analysis to ensure alignment with relevant designated area values. Management areas should be minimally impacted since only activities in alignment with relevant designated area values, management objectives, law, policy, and regulation would be allowed.

Statutorily Designated Areas

See separate sections for wilderness, and wilderness study areas, and for the Continental Divide National Scenic Trail within the trails section.

Administratively Designated Areas:

See the separate section for inventoried roadless areas and the section on national recreation trails under the trails section.

Gila River Research Natural Area

Under all alternatives, the Gila River RNA would continue to be required to be managed in alignment with relevant law, policy, and regulation for its designated purpose It will continue to protect and maintain natural conditions, conserve biological diversity and provide opportunities for education, monitoring and non-manipulative research.

Recreational use within the boundaries of the RNA is light, although there is a developed trail that travels 3 miles from the end of the bird area and passes through the RNA. This trail may be in conflict with policy and current plan direction for this designation by introducing a source of human-caused environmental disruptions. Continued maintenance and use of this trail may result in degradation to the values for which the area is designated and managed, primarily due to the likelihood that non-native invasive plant species could be introduced into the area by recreational trail users.

Cross-country motorized travel in this area will continue to be restricted under all alternatives. The riparian area within the RNA will continue to be closed to grazing. The Gila River Bird Area has received restoration treatments that were completed in the early 1990s, restoring over 100 acres of dense riparian area (Boucher et al. 2003). Under all alternatives, the Gila River Bird Area will continue to contribute connectivity of the riparian habitat at the RNA. This will have the effect of protecting and enhancing natural conditions within the RNA.

Designated Critical Habitat for Threatened and Endangered Species

Under all of the alternatives, it will continue to be the jurisdiction of the USFWS to analyze and designate Critical habitat (USDI FWS 2015c) defined under the Endangered Species Act for the conservation of a threatened or endangered species and that may require special management and protection on all Federal lands, including the Gila NF.

Critical habitat does not preclude activities within its borders; however, conservation of the habitat for the identified species is an important consideration when planning or allowing activities in these areas. Management of the forest under the current or a revised forest plan will not hinder the management of designated critical habitat in any way, although there may be short-term adverse

effects to the habitat itself of various management actions that may be taken. For example, thinning and burning in uplands adjacent to loach minnow critical habitat shortly before spawning may cause an increase in sedimentation and render gravel beds unusable for egg laying that year. However, this may be offset by the long-term benefit of the area being less likely to sustain uncharacteristic wildfire and long-term adverse effects would be minimized.

Although there may be short-term adverse effects to critical habitat through forest management projects implemented under any current or revised plan, projects will follow the most recent guidance in current recovery plans, and in consultation with USFWS, to minimize any long-term adverse effects to critical habitat to provide for conservation and ultimately recovery of threatened and endangered species.

National Scenic Byways

Under all of the alternatives, the National Scenic Byways Program will continue to be administered by the U.S. Department of Transportation, Federal Highway Administration for their intended purposes to recognize, preserve, and enhance selected roads throughout the Nation. The primary visitor uses of the Scenic Byways are likely to continue to be driving for pleasure, cycling, sightseeing, birdwatching, and visiting developed recreation sites.

The Trail of the Mountain Spirits National Scenic Byway is expected to continue to receive moderate use year-round by visitors from outside the region and by local commuters. The Geronimo Trail National Scenic Byway located within the forest are likely to continue to receive low (northern route) to moderate (southern route) use year-round by visitors. A National Scenic Byway corridor management plan will continue to provide guidance and direction for conservation and enhancement of each byway's intrinsic qualities and promotion of tourism and economic development.

It is expected that most of the national scenic byways in the Gila NF will continue to be managed and maintained by the New Mexico Department of Transportation. This will likely result in the scenic and other values for these roads were designated to continue to be protected or enhanced, which is also likely to result in the protection or improvement of the availability and quality of visitor experiences related to national scenic byways.

Alternative 1 – 1986 Forest Plan

Proposed Research Natural Areas

Alternative 1 carries forward the proposals for Largo Mesa and Agua Fria RNAs, which were originally proposed during development of the 1986 forest plan, despite the fact that the evaluation process conducted to support this revision effort found them ineligible for the RNA designation (see Appendix H: Documentation of the Research Natural Areas Evaluation Process). This degrades the quality of the region’s RNA network. Alternative 1 also contains plan direction for fire management that requires fire suppression in designated and proposed RNAs. This is contrary to the protection and management standards established in Forest Service manual direction (FSM 4063.3), which identifies the maintenance of natural conditions and processes as the prime management consideration. This plan direction leads to the loss of natural conditions and processes within designated and proposed RNAs, which further degrades the quality of the region’s RNA network.

Effects Common to All Action Alternatives

Designated and Proposed Research Natural Areas

The action alternatives remove plan direction requiring a strict fire suppression policy in RNAs. This provides management the discretion to consider weather and fuel conditions and determine if a particular fire would help maintain natural conditions and processes in these areas over the long term, or if a loss of the characteristics for which they were deemed eligible for designation could occur.

Effects Common to Alternatives 1, 2, and 5

Proposed Research Natural Areas

These alternatives carry forward the proposals for Turkey Creek and Rabbit Trap RNAs, which were originally proposed during development of the 1986 plan. The evaluation process conducted to support this revision effort found both areas remain eligible for the RNA designation. Although the riparian communities it contains are already well represented in the RNA network, it also contains upland vegetation communities that fill needs identified in a region-wide inventory and assessment (see Appendix H: Documentation of the Research Natural Areas Evaluation Process). This proposal improves the representativeness and quality of the regional RNA network, contributes to education and non-manipulative research opportunities, and provides for maintenance and improvement of natural conditions and processes.

Similarly, Rabbit Trap fills identified needs in vegetation communities where natural processes have been substantially altered across most of the area they occupy in the Southwest (see Appendix H: Documentation of the Research Natural Areas Evaluation Process). Areas meeting RNA eligibility requirements for these vegetation communities are rare in the region and this proposal provides quality representation for those communities. This is a substantial contribution to education and non-manipulative research opportunities and provides for the maintenance and improvement.

Effects Common to Alternatives 2 and 5

Proposed Botanical Areas and Rare and Endemic Management Areas

The Gila National Forest received a proposal from the Gila Native Plant Society to establish botanical areas based on the New Mexico Rare Plant Conservation Strategy (link) and Important Plant Areas identified within the strategy. The proposal focused on three general areas: Mogollon Mountains, Piños Altos, and Emory Pass that have concentrations of plants that have been identified as rare and/or endemic to the Gila NF. The updated proposal from the Gila Native Plant Society with their suggested boundaries for botanical areas was incorporated into alternative 5 with a total of 150,590 acres. The forest-modified proposal was included in alternative 2 with a total of 68,171 acres to be managed as management areas called Rare and Endemic Vegetation Management Areas.

The plan components for both alternatives 2 and 5 are the same and focus on promoting values of rare and endemic plant populations while providing opportunities for stakeholder engagement and education. Effects to rare and endemic species within these management areas include trampling along trails and roads from foot and motorized vehicle traffic, collection, and misidentification or accidental mortality through herbicide use. No new motorized routes will be constructed within the proposed areas and maintenance on existing routes will minimize ground disturbance outside existing road prism and associated drainage features. Designated camping areas will be delineated in

the proposed areas that are located outside of designated wilderness and should include educational, interpretive signage. Additionally, the use of non-selective herbicides or herbicides that may have activity on rare and endemic plant species will not occur in the proposed areas unless it is to control or eradicate noxious weed species, and other integrated pest management efforts have failed or are not likely to be successful. If such herbicide use is necessary, mitigation plans to avoid accidentally spraying or trampling mortality to rare and endemic species populations will be developed and implemented. The plan components would have the effect of benefiting rare and endemic plants by bringing an awareness to their value, but also to other species that occur within them that could potentially be impacted by human disturbance through trampling along roads, trails, or in dispersed camping areas, as well as any accidental mortality from herbicide use. The incorporation of these management areas in these alternatives would encourage partnership opportunities for increased survey and knowledge of rare and endemic plant locations, distribution, and life history to help inform management. On the negative side, new infestations of noxious weeds may not be treated in the most efficient or effective manner, fuelwood gathering and dispersed camping may be restricted or limited to certain areas.

Alternative 2 – Proposed Action

Proposed Rare and Endemic Management Areas

The Gila NF proposes establishing the three identified proposed botanical areas described in Appendix I, along with the acreages and plan components identified in the forest-modified proposal, as Rare and Endemic Vegetation Management Areas in in alternative 2. Under alternative 2, the proposed botanical areas will not be recommended as designated areas with the decision for the Gila NF Revised Forest Plan, but will be established as management areas. The draft desired conditions, standards and guidelines, and management recommendations will be associated with and managed for within the management areas. The acreages for the three areas in alternative 2 are: Mogollon Mountains (45,029), Piños Altos Range (6,198), and Emory Pass (16,944).

The planning team modified the boundaries of the three proposed botanical areas to enable easier identification of boundary locations by following natural or human-made landmarks, avoiding surrounding private property, and also encompassing only the highest density of rare and endemic plant species. These modifications have the effects of improving the feasibility of boundary identification in the field, avoiding potential conflicts with private property, and focusing management efforts on areas with the highest density of rare and endemic species especially species of conservation concern.

The type of management area selected for this alternative represents a management emphasis for an area or several similar areas on the landscape. This management area would be implemented with the finalization of the revised forest plan and approval of the forest supervisor. Since management areas are established administratively in the land management planning process, no additional NEPA or designation processes would be necessary after the forest plan revision process. These management areas would be part of the Gila NF management direction until the next plan revision cycle.

See appendix I for more details on the botanical area evaluation process.

Alternative 5

Proposed Botanical Areas

The Gila NF proposes establishing the three identified proposed botanical areas described in appendix I, along with the acreages identified in the proposal brought forth by the Gila Native Plant Society, and plan components as developed by the Gila NF planning team. Identifying and recommending official designated botanical areas as well as the acreages identified in the proposal made by the GNPS will be included in alternative 5. The acreages for alternative 5 are: Mogollon Mountains (98,510), Piños Altos Range (20,930), and Emory Pass (31,150).

The boundaries of the three proposed botanical areas were generated by drawing polygons around clusters of rare and endemic species. However, these polygons did not consider boundary locatability in the field and private property concerns. As drawn, these boundaries would be difficult to locate in the field because they do not follow natural or human-made features, and would make their effective management more ambiguous. The boundaries also encompassed non-Forest Service lands including private property, which are outside of Forest Service jurisdiction. This can cause landowners to become upset thinking we are trying to dictate the management of their private property and may see it as a taking. The more expansive boundaries do capture slightly more plant diversity, some of which are not species of conservation concern, which could provide some additional management, research, and education attention to those species.

The type of management area selected for this alternative was a proposed designated area (i.e., botanical area) to maintain its unique special character or purpose. Official designation of botanical areas are established by administrative processes of the Federal executive branch. For botanical areas the forest supervisor recommends, the regional forester may designate areas less than 100,000 acres, and the Secretary of Agriculture designates areas of 100,000 acres or more. The proposed botanical areas would be treated as management areas until there was a decision on designation. The proposed botanical areas would require additional analysis for this type of designation that may affect the limited capacity of resource specialists in the forest, and take more time to get through the approval process. However, once established the designation continues until a subsequent decision by the appropriate authority removes the designation, which could mean that, if designated, the botanical areas may be present for a longer time (i.e., multiple planning cycles).

See appendix I for more details on the botanical area evaluation process.

Cumulative Effects

In addition to the specially designated areas found within the Gila NF, there are specially designated areas managed by other government agencies near and adjacent to the forest. These areas add recreation values, scenic values, wildlife opportunities, and other resources values complementing those of the Gila National Forest.

See the separate sections on wildlife and botanical resources cumulative effects; wilderness and recommended wilderness for cumulative effects of nearby and adjacent wilderness and similarly managed areas;, and the eligible wild and scenic rivers section for cumulative effects of designated, eligible, and suitable wild and scenic rivers.)

National Park Service

Gila Cliff Dwellings National Monument is a 533-acre National Park Service-administered designated area surrounded by NFS lands (including the congressionally designated Gila Wilderness)

managed by the Gila National Forest. Gila Cliff Dwellings National Monument offers visitors the opportunity to visit interpreted archeological sites originating from the Mogollon culture (see Cultural and Historic Resources).

From 2008 through 2011, an average of 37,000 people visited the monument per year (Mitchell et al. 2014). Many of these same visitors also likely recreated in the Gila NF as well, including visiting one of many scenic overlooks, developed campgrounds, trails, and interpretive signs along the way.

The Gila Visitor Center located near the monument is operated jointly by the National Park Service and the Forest Service. The revised management plan for the Gila Cliff Dwellings National Monument will be finalized soon (Hugh Hawthorne 2015). The national monument and Gila National Forest designated and special management areas are likely to mutually contribute to and complement each other's' similar missions of preservation of natural resources and recreational and other benefits to area visitors.

Bureau of Land Management

The 840-acre Gila Middle Box Area of Critical Environmental Concern is immediately adjacent to the Gila NF. Areas of critical environmental concern are areas "where special management attention is required...to protect and prevent irreparable damage to important historic, cultural, or scenic values, fish and wildlife resources or other natural systems or processes" 43 U.S.C. § 1702(a). This area of critical environmental concern shares similar goals, objectives, and administrative mandates, with national forest critical habitat and proposed critical habitat for threatened and endangered species, proposed botanical areas, and proposed Rare and Endemic Management Areas. These similar management areas are likely to complement each other providing the protection and enhancement of these resources and availability and quality of visitor experiences and traditional uses throughout the Gila NF region.

State of New Mexico

The State of New Mexico has several areas near the Gila National Forest that are designated for public outdoor recreation use and for wildlife habitat. The State also has historical markers distributed throughout all of the assessment area counties. The recreational sites, state parks, and wildlife areas located near or in the forest plan assessment area are listed below:

<u>Recreational Sites and State Parks</u>

- Caballo Lake State Park
- City of Rocks State Park
- Elephant Butte State Park

<u>Wildlife Areas</u>

- Glenwood State Fish Hatchery
- Heart Bar Wildlife Area
- Mimbres River Tract
- Quemado Lake
- Snow Lake
- Lake Roberts

- Bill Evans Lake
- Bear Canyon Reservoir

The Gila NF works in partnership with all of these State and Federal agencies to maintain communication and seek shared management objectives. These areas, along with Gila NF designated and special management areas with similar goals, objectives, and management direction are likely to complement each other in protecting and enhancing resources and the quality and availability of visitor experiences and traditional uses throughout the Gila region.

Climate Conditions

The Southwest has recently experienced an extended drought, and climate predictions indicate drought conditions are likely to reoccur on a cyclical basis. As fire danger increases, restrictions may be put in place to reduce the risk of human-caused fires. Depending on the severity of conditions, restrictions typically range from a ban on open campfires to forest closures. These restrictions limit access to Gila National Forest designated and special management areas and the previously described non-Forest Service but similarly managed area opportunities.

Extended periods of warm weather may also lead to a longer "summer" recreation season, starting earlier in the spring and extending later into the fall. A longer recreation season may necessitate the need for additional staffing, while incurring additional operation and maintenance costs for all of these similarly managed areas.

Extended droughts directly affect available water sources for hikers. Across the Gila National Forest region, there is already limited water sources, and in many areas, the distance between water sources limits the opportunities for trail users. The area has experienced loss of previously reliable water sources from extended droughts, damages from wildfires, and a lack of maintenance to water developments. Loss of water sources may impose limitations to user experiences to Gila NF designated and special management areas and other similarly managed areas across the Gila region due to lack of reliable water and an increasing need to carry larger amounts over longer distances.

In addition to water sources, these same stressors affect water levels of the streams and lakes located within the Gila NF. As stream and lake levels decrease, the diversity of recreational opportunities in these Gila NF and similarly managed areas are likely become more limited. This circumstance could result in concentrated use of streams that continue to have flowing water conditions, and adds pressure to streamside trails. The flow rate, along with depth, can determine the quality of fishing, navigability by watercraft, and suitability for swimming or bathing in hot springs. At lakes, decreasing lake levels affect access along shorelines, practical utility of boat ramps, and may result in lower visitation numbers. Again, these effects are likely to be common to both Gila NF designated and special management areas, as well as the previously identified and similarly managed areas within the region.

Other Effects

Public perception toward new land designations is generally mixed with a certain percentage of the population that is for new designations because they feel it is good for the environment, tourism, or any number of reasons they feel it may be beneficial. Others are against new land designations because there is a feeling that certain activities will be prohibited or a general feeling of a loss of freedoms they once enjoyed.

These management areas can provide a setting where scientific study can enable us to gain a better understanding of ecological function of areas with minimal disturbance in separate geographic areas. This information is useful to inform management decisions on forest lands as well as provide information for surrounding land ownerships as well. These areas also aid in conserving species, increasing solitude, or providing a diversity of recreational opportunities, all of which could increase visitation or user satisfaction.

Wilderness

Affected Environment

Introduction

The concept of preserving certain public lands in a natural and wild state as wilderness was first applied in 1924 with the administrative designation of the Gila Wilderness, which the Chief of the Forest Service approved at the urging of conservation pioneer Aldo Leopold. The Gila Wilderness was the first designated wilderness in the world, and later became a part of the National Wilderness Preservation System when Congress passed the Wilderness Act of 1964. The Wilderness Act also established the National Wilderness Preservation System in order to:

> *"...secure for the American people of present and future generations the benefits of an enduring resource of wilderness."*

The Wilderness Act of 1964 (the Act) provides the legal definition of wilderness for congressionally designated wilderness areas for Federal land management agencies:

> *"A Wilderness in contrast with those areas where man and his own works dominate the landscape, is hereby recognized as an area where the earth and its community of life are untrammeled by man, where man himself is a visitor who does not remain."*

Prior to passage of the Act, wilderness was an administrative designation that could be applied or removed by the decision of an agency official. Through passage of the Wilderness Act, Congress reserves the authority to itself to designate wilderness, assigning the Forest Service (through the Secretary of Agriculture) responsibility for evaluating and recommending areas that are suitable to be included in the National Wilderness Preservation System.

The agency is also legally mandated to protect such recommended areas to preserve their wilderness characteristics. Although they are similar terms, wilderness characteristics differ from wilderness character in that wilderness characteristics are the conditions that may qualify areas for consideration as designated wilderness. On the other hand, wilderness character applies only to areas that have been designated, and represents the combination of biophysical, experiential, and symbolic ideals that distinguish how wilderness is managed all other lands.

The Wilderness Act mandates the management of designated wilderness by preservation or enhancement of the five qualities of wilderness character:

- **Untrammeled** – or being free from modern human control or manipulation
- **Natural** –the natural condition of the land, its plants, wildlife, water, soil, air and ecological processes
- **Undeveloped** – retaining primeval character and influence, and without permanent improvements or human occupation
- **Outstanding opportunities for Solitude or Primitive and Unconfined Recreation**
- **Other Features of Value**, which are only managed where they exist, and may be of ecological, geological or other features of scientific, educational, scenic, or historical significance

The Blue Range and Aldo Leopold Wilderness Areas were also added to the National Wilderness Preservation System with passage of the New Mexico Wilderness Act of 1980. Together, these three wilderness areas comprise a Gila wilderness complex that totals approximately 792,584 acres, or 24 percent of the entire Gila National Forest (table 69 and figure 48).

Table 69. Current Gila National Forest congressionally designated wilderness areas

Name:	Current Area Size	Years of Designation
Gila Wilderness	559,688 acres	1924 Administrative Gila Wilderness 1964 Congressional Designation
Aldo Leopold Wilderness	203,797 acres	1924 Administrative Gila Wilderness 1933 Administrative Black Range Primitive Area 1980 Congressional Designation
Blue Range Wilderness	29,099 acres	1933 Administrative Blue Range Primitive Area 1980 Congressional Designation
Total Gila NF Wilderness:	**792,584 acres**	----

The Gila National Forest fills a distinctive wilderness niche within the Southwest region, consisting of large, mostly contiguous wilderness areas, which is similar to the concept expressed in Aldo Leopold's pioneering vision of how the Forest Service should preserve the Gila as the first designated wilderness. "By 'wilderness,'" he wrote, "I mean a continuous stretch of country preserved in its natural state, open to lawful hunting and fishing, big enough to absorb a two weeks' pack trip, and kept devoid of roads, artificial trails, cottages, or other works of man."

If considered within a larger regional landscape that includes Arizona's Blue Range Primitive Area, which is mandated by law to be managed as wilderness, these areas may also be considered part of a greater Gila/Blue Range wilderness complex consisting nearly a million acres.

According to the most recent Forest Service NVUM data (table 70), annual wilderness use for the Gila National Forest currently at an estimated 34,000 site visits per year, or approximately 6.4 percent of total annual site visits. This represents an increase of annual wilderness visitation ion the forest from 18,000 site visits in 2016, or approximately 89 percent, from the 2006 NVUM survey. National forest site visits differ from total national forest visits and are represented by a higher total number, because multiple site visits may occur during a single visit. For example, in a single forest visit, an individual may stay overnight at two different developed campgrounds (2 individual site visits), picnic at a day use developed site (1 individual site visit) and then spend 3 days backpacking in the Aldo Leopold Wilderness (1 individual site visit).

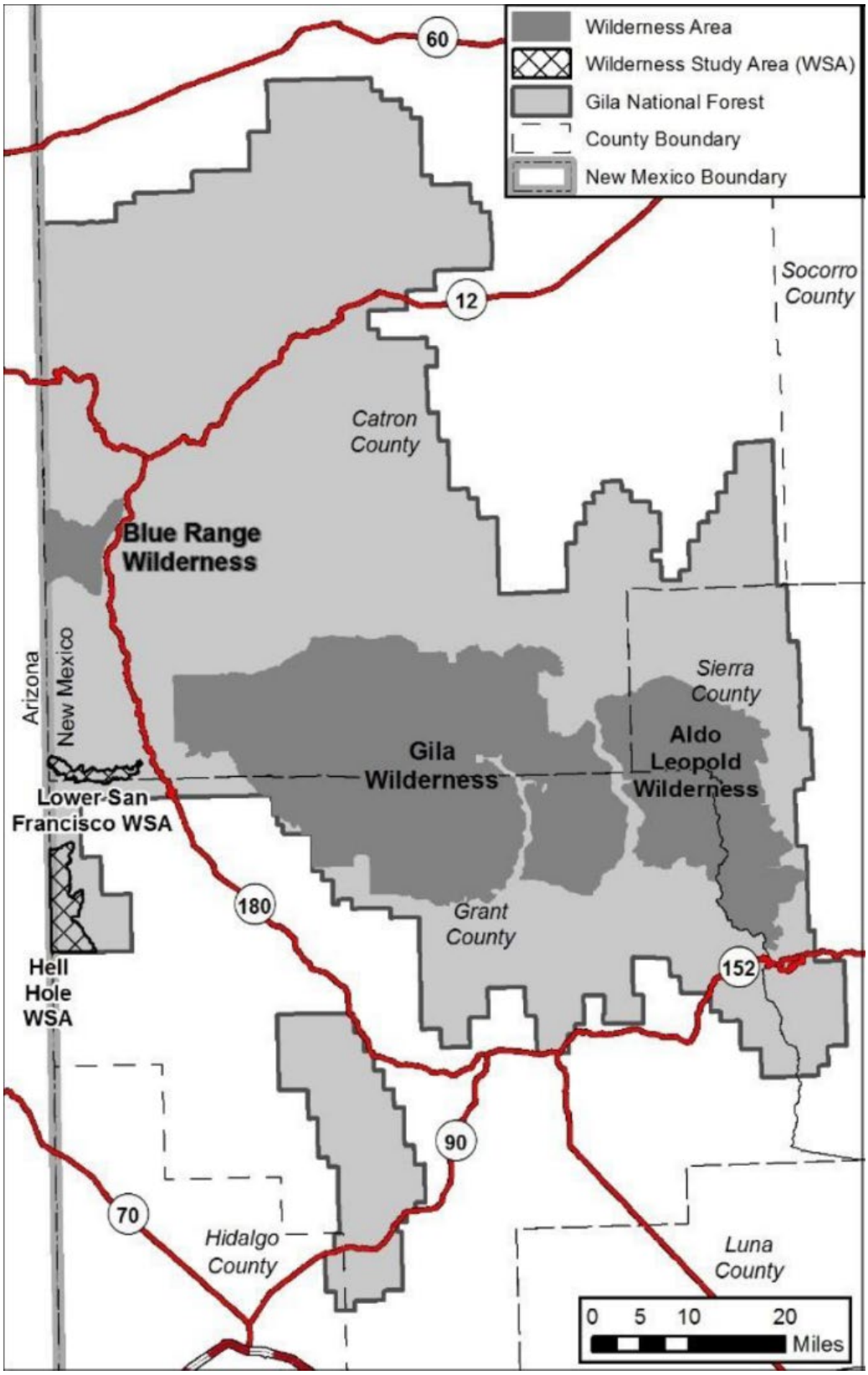


Figure 48. Existing designated wilderness and wilderness study areas

Table 70. Gila National Forest wilderness visitation

NVUM Survey Year	2006	2011	2016
Total Gila National Forest Site Visits	452,000	699,000	528,000
Total Wilderness Site Visits	18,000	21,000	34,000
Percent of Overall Site Visits to Wilderness	4.0%	3.0%	6.4%
Percent Increase of Wilderness Site Visits from 2016	--	61%	89%
Overall Gila National Forest Visits	305,000	514,000	390,000

Characteristics common to all of the Gila NF's wilderness areas

- Popular wilderness recreation activities include hiking, backpacking, horseback riding, camping, hunting, fishing, and wildlife viewing.
- Designated wilderness is managed to provide opportunities to seek solitude in a natural appearing and primitive setting.
- Current use of the wilderness in the forest is generally regarded to be relatively low in comparison to wilderness areas located in closer proximity to large metropolitan areas.
- Occasional intrusions by motorized vehicles have sometimes occurred where the boundaries of wilderness areas feature gentle terrain and open vegetation. Implementation of the travel management decision may help reduce motorized trespass and protect wilderness character.
- There is significant backlog of trail maintenance, particularly within recent fire-affected areas creating issues with erosion, concentrated use to unaffected trails and locations, and user-created trails, which may impact wilderness character.
- Although most commercial uses are prohibited, outfitter-guide use is permitted under the Wilderness Act. However, sufficient outfitter-guide program oversight is essential to ensure compliance with the terms of special-use permits that serve to protect wilderness character.
- The sights and sounds of military overflights are outside of Forest Service control and jurisdiction, but have been locally controversial and are known to have a negative effect on opportunities for solitude in wilderness across the forest.
- The 1986 forest plan mandates the management of the wilderness resource for quality wilderness experiences and to protect and preserve the unique wilderness character of each wilderness area. The plan provides a number of standards and guidelines for the purpose of achieving this desired condition.
- The 1986 forest plan also provides direction for allowing wildfire to be managed for resource benefit within wilderness. Managing fires for resource benefit can be challenging due to public concerns, adjacent private land issues, and the effects of fuel loading, slope, aspect, terrain, and/or seasonality on fire intensity.
- By agency policy prescribed (agency ignited) fire may only be used in wilderness for fire management objectives, such as to reduce the threat of wildfires affecting private property, and to reduce the likelihood of high-intensity wildfires outside the natural range of variability.
- The 1986 forest plan provides the following management direction specific to wilderness areas
    - ♦ Maximum group size of 25 persons and/or 35 head of pack and saddle stock

- Organized recreation events either competitive or non-competitive (for example: runs, games, trail endurance events, etc.) will not be allowed within designated wilderness areas
- To meet the requirements of law, policy and regulation, the forest must complete a Minimum Requirements Analysis (MRA) before taking any management action within congressionally designated wilderness. An MRA determines the tool, equipment, device, force, regulation, or practice necessary to accomplish wilderness management objectives with the least impact to wilderness character. The tool most commonly used to conduct an MRA is the Minimum Requirements Decision Guide.

Gila Wilderness

On June 3, 1924, at Aldo Leopold's recommendation to the Chief of the Forest Service, the Gila became the world's first designated wilderness area. Initially an administrative designation, the Gila was included in the Wilderness Act of 1964 as included among the first congressionally designated wilderness areas. The distinction of being the world's first designated wilderness, combined with a close association to the legacy of renowned conservationist Aldo Leopold gives the Gila Wilderness (the Gila) prominence as a national and international destination. However, the Gila is also a draw for visitors who seek a primitive natural experience, regardless of its renown in the history of wilderness preservation.

At 559,688 acres in size, the Gila is New Mexico's largest wilderness, accessed by an extensive system of trails. The eastern portion of the Gila Wilderness consists of high mesas, rolling hills, and deep canyons with vegetation consisting of piñon and juniper woodland and some grassland areas. Ponderosa pines dominate the central part of the area, with sheer cliffs rising above the Gila River. The west and southwest locations feature high mountains and spruce-fir forests, principally within the Mogollon Range, with elevations up to 10,895 feet at Whitewater Baldy. The headwaters of many important rivers and creeks originate in the Gila Wilderness.

The Gila receives the bulk of wilderness-specific recreational use that occurs in the forest, mostly during the early spring through late fall. Popular recreation activities within the Gila Wilderness include backpacking, day hiking, horseback riding, horse and mule packing, and big game hunting.

Visitation is generally light, with minimal user conflicts, with occasional periods of high use at popular areas including the East, Middle, and West Forks of the Gila River near Gila Cliff Dwellings National Monument. The popularity of these areas may be attributed to their proximity to water sources and trailheads providing convenient access to the wilderness.

When water levels in the rivers are sufficient, rafting and kayaking is a popular use of the stretch of the Gila River between Grapevine Campground to Mogollon Box.

The Gila Cliff Dwellings National Monument (administered by the National Park Service) is a popular destination, and many visitors to the monument also visit the wilderness. This contributes to higher visitation to the Gila Wilderness during summer months.

Grazing and grazing improvements are authorized under the 1964 Wilderness Act, and grazing continues within the Gila Wilderness. Significant grazing reductions occurred forest-wide in the 1950s, and then again in the 1990s. Since then, grazing numbers within the Gila Wilderness have remained fairly stable, with some decline in recent years. A number of grazing allotments within the Gila Wilderness are currently in non-use status, or being grazed at less than current administratively permitted numbers.

Range management within the Gila Wilderness includes maintenance to improvements such as fences, water developments, and corrals. To mitigate visual effects from fences and structures, efforts are made to locate them away from trails and popular areas. When possible, materials, colors, and designs are used that blend with the surroundings and minimize impacts to visitor experiences.

Non-native species are treated to mitigate potential impacts to the natural quality of wilderness character, particularly in riparian/aquatic areas where they often outcompete native species. The short-term e effects to the untrammeled by treatment activities are considered against long-term positive effects to the natural quality of wilderness character in the Minimum Requirements Analysis process.

The Gila NF routinely partners with the New Mexico Game and Fish Department and USFWS on a variety of habitat improvement and other management activities within the Gila Wilderness. These activities are first analyzed by a Minimum Requirements Decision Guide and found to have minimal impact to wilderness character in comparison to positive effects. These projects may create short-term disruptions in location-specific areas that affect opportunities for solitude.

The ecological condition of the Gila Wilderness is variable by location and may be dependent on many factors. During periods of prolonged drought, decreased water levels in streams, springs, and rivers within the wilderness have been observed. These conditions may limit recreational opportunities, affect wildlife, impact aquatic species, and vegetative health, increase susceptibility to insect and disease outbreaks and increase likelihood of high-intensity wildfire outside historic variability.

Fire management activities within the Gila Wilderness include fire suppression and management of naturally ignited fires for resource benefits. The forest has trended toward managing naturally ignited fires when conditions are favorable within wilderness since the 1970s.

During recent years, there have been several large wildfires within the Gila Wilderness. The majority of these have occurred in the central and western portions of the area. Many fires within the Gila burn in a mosaic pattern, with lower severities where past fires occurred and higher severity where there has been less fire activity.

The Gila Wilderness is the only class 1 airshed within the Gila National Forest. Air quality is currently very high, demonstrating minimal pollution-related impacts. Significant distances from major urban areas contribute to the higher air quality and minimal impacts light pollution. Implementation of many prescribed fire projects are timed for wind conditions favorable to have minimal impacts to the class 1 airshed.

Aldo Leopold Wilderness

The 203,797-acre Aldo Leopold Wilderness (colloquially known as The Aldo) is New Mexico’s third largest wilderness, and encompasses the crest of the rugged Black Range Mountains and many steep, narrow valleys thousands of feet deep. The Aldo is widely regarded as being most probably New Mexico's "wildest” wilderness, because combined with a respectable size and challenging terrain, it also receives relatively light use, providing challenging recreation experiences with excellent opportunities for solitude. Visitors to the Aldo often report not encountering any other visitors during their entire time in the wilderness.

Only the narrow corridor of NFS Road 150 separates the Aldo from the even larger Gila Wilderness, creating a greater Gila wilderness complex. Prior to construction of Road 150, the area that is now

the Aldo was included within the original administratively designated Gila Wilderness, and after being separated by the road was also administratively preserved as the Black Range Primitive Area until Congress later legislatively designated wilderness and re-named it for Aldo Leopold.

The ridgeline of the Continental Divide follows the crest of the Black Range, and therefore, it also features one of the most remote sections of the CDNST. Hiking and backpacking are the major recreational activities of visitors to the Aldo, but scarcity of water discourages some potential visitors, as most streams and springs are seasonal and unreliable. Hunting is also popular within the Aldo, although the rugged terrain and limited access points are limitations.

Access points into the Aldo may be challenging due to its remote location, and many trailheads may only be accessed by forest roads that require high clearance vehicles and require hiking several miles before entering the wilderness boundary. Difficult access is likely a contributing factor to the lower visitation numbers in comparison with the neighboring Gila Wilderness. The majority of visitors to the Aldo stay for multiple days, also likely due to the remoteness of the area.

Existing or potential management activities have occurred within the Aldo. As with all management actions in wilderness, these activities are first analyzed with a Minimum Requirements Decision Guide to determine the minimum tool or action that must be used to accomplish wilderness management objectives. These have included such actions as native fish reintroductions within Diamond Creek, South Diamond Creek, and Animas Creek. Impacts to wilderness character from these activities were analyzed to be balanced by more long-term, and mitigated by use of primitive tools and pack stock to accomplish the work. Trail maintenance and maintenance of fences and range improvements also occurs, but is with primitive tools, and most range infrastructure is located away from popular trails.

Environmental disturbances include drought, insect and disease outbreaks, and fire. The wilderness has experienced trends of increased length and severity of droughts in recent years, including average measures of snowpack and monsoonal moisture events below historic averages. The snowpack has also melted earlier in the spring than has been historically observed.

In the past decade, an outbreak of bark beetles affected large stands of ponderosa pine throughout the Aldo, which elevated the risk of wildfire. As many of the standing dead trees fell, fuel loading increased, raising the potential of higher severity wildfires occurring. Since the mid-1990s, the Aldo has experienced a number of large wildfires, the majority in mixed conifer and ponderosa pine stands on the crest of the Black Range. The Silver Fire of 2013 included a substantial area of the southern Aldo, with a considerable portion burning at high severity.

Blue Range Wilderness

The Blue Range Wilderness (the Blue) is the smallest wilderness in the Gila NF at 29,099 acres, but is located immediately adjacent to the Blue Range Primitive Area (199,505 acres) of the Apache-Sitgreaves NFs in Arizona. The Blue is located in the northeast part of the Blue Range Mountains it is named for, and halved by the Mogollon Rim, the dramatic southernmost edge of the Colorado Plateau.

Six trails are located in the Blue, two of which are accessed from the primitive area on the Arizona side of the boundary. All of these trails are challenging to navigate, and there are very few dependable water sources available within the area. There is minimal visitation to this area, offering excellent opportunities for solitude. However, many visitors seeking solitude instead to visit the Gila, Aldo or the primitive area, because of better trails and water sources.

There is a permitted powerline located immediately adjacent to the wilderness boundary, affecting wilderness character where it is visible in a small part of the overall area. There are semi-precious minerals (including agate, bytownite, chalcedony, labradorite, hypersthene, and rhyolite) at relatively accessible locations within the Blue, with some visible ground disturbance caused by concentrated gathering and removal of minerals by amateur rock-hounds. There have also been occurrences of motorized intrusion at lower elevations and milder terrain located on the eastern and southern wilderness boundaries.

Ecological conditions are currently within a late seral successional regime due to a lack of natural disturbances occurring within the area. The Blue has not experienced any disturbance, such as large fires or insect and disease outbreaks during recent decades. Periods of drought have affected the wilderness, reducing water levels and flow rates, impacting vegetation and wildlife, and limiting already scarce water sources for visitors.

Plan-Level Environmental Consequences

Analysis Methodology

This section analyzes the potential consequences for implementation of forest plan direction each alternative to congressionally designated Wilderness in the Gila NF.

Assumptions

- Under all alternatives, the forest will continue to apply Forest Service Wilderness Stewardship Performance (or any subsequent management direction policy) for management of designated wilderness.
- Visitor use information specific to each wilderness is not available. The best available science for wilderness visitation, the national visitor use monitoring information, is collected for the entire Gila NF and is not aggregated to the individual wilderness area level.
- Activities popular with wilderness visitors are known to include (but are not limited to) hiking, backpacking, horseback riding, hunting, fishing, and wildlife viewing. The amount and regularity of these uses varies by individual wilderness, with the Gila Wilderness seeing the most overall recreational uses, and the Blue Range Wilderness the least. It may also vary by location within each wilderness. Many of these activities correspond with visitors' opportunities to seek solitude in a natural, primitive setting.
- Current visitation to designated wilderness in the Gila NF is considered relatively low as compared to other wilderness areas located proximate to large metropolitan areas. However, each wilderness features popular trails and specific locations that may experience temporary periods of high use, with recognized associated impacts to resources and the solitude aspect of wilderness character.
- Significant numbers of intrusions by motorized vehicles have been known to occur in all three wilderness areas, documented primarily where moderate terrain and light vegetation cover intersects the boundaries of wilderness areas. Implementation of the travel management decision (including a prohibition of cross-country travel and designation of motorized routes) is likely to reduce motorized trespass in designated wilderness.
- There is a significant backlog of trails maintenance across the forest, and particularly within recently fire-affected areas of the Gila and Aldo Leopold Wildernesses. These conditions are

known to contribute to resource damage from erosion, concentrated use in previously unaffected areas, and user-created trails, also negatively affecting wilderness character.

- Although most commercial uses are prohibited within congressionally designated wilderness, Outfitter-Guide use is permitted to the extent allowable by law. Outfitter-guide program oversight is needed to ensure compliance with the terms of special-use permits intending to protect wilderness character, including adhering to Leave No Trace outdoor ethics practices and educating clients regarding wilderness values.
- Managing wildfires for resource benefit in wilderness is important for protecting and enhancing wilderness character, but is often a challenge due to public perceptions toward fire, adjacency to private land, and the cumulative effects of fuel loading due to past suppression of fire, slope, aspect, terrain, and seasonality to fire severity.
- Use of prescribed fire presents challenges dealing with fuel loadings, threatened and endangered species restrictions, and timing. Although wilderness resource benefits may be a positive secondary effect, by agency policy prescribed (agency ignited) fire may only be used in wilderness for fire management objectives (i.e., to reduce the possibility of future wildfires moving onto adjacent private property, or to reduce fuel loading and the likelihood of high-intensity wildfires outside the natural range of variability).
- Organized recreation events either competitive or non-competitive (for example: runs, games, trail endurance events, etc.) are by law, policy, and regulation not allowed within designated wilderness areas.
- To meet the requirements of law, policy and regulation, the forest must undertake Minimum Requirements Analyses (MRA) prior to any management action within congressionally designated wilderness. MRA is a process to determine the least impactful tool, equipment, device, force, regulation, or practice to wilderness character and values, but necessary to achieve wilderness management objectives. The analysis tool that is used by policy direction to conduct an MRA process is known as the Minimum Requirements Decision Guide.

Analysis methodology consists of consideration of a diversity of information sources, including but not limited to, data from recent NVUM surveys, the updated ROS analysis, the current plan revision wilderness recommendation process, and institutional knowledge of forest staff in all program areas. The potential differences in treatments within Ecological Response Units (ERUs) as indicated by activities associated with vegetation management activities by implementation of plan direction across all alternatives were used to consider effects to wilderness character and resources from those activities.

Also considered; Shelby and Heberlein (1986) developed the following guidelines that are useful for informing analysis of appropriate group size limits in wilderness from a social (wilderness character quality of opportunities for solitude) rather than a physical condition perspective (wilderness character qualities of naturalness, undeveloped, untrammeled):

Decide which type of recreation experience to provide - *in this instance, to preserve or enhance wilderness character, particularly the quality of opportunities for solitude within Gila National Forest Wilderness*

Define this experience with specificity, using parameters such as appropriate numbers of encounters - *in this instance, a determination of what the maximum number of persons and head of riding and pack stock are encountered in a group at one time*

Decide who should make these decisions (who the relevant groups are). Decisions about use limits, made for individual areas, will enhance the experiences of some and eliminate opportunities for others - *In this instance, the relevant groups are wilderness visitors seeking solitude, and those seeking experiences in a group setting. Group size limits are implemented by forest supervisor direction for the purpose of being in alignment with Wilderness Act mandate to preserve opportunities for solitude.*

Effects Common to all Alternatives

Wilderness Character

Wilderness provides numerous ecosystem services, including preservation of natural systems and providing opportunities for solitude and primitive and unconfined recreation for visitors. However, there are environmental effects within wilderness from many sources that may result from implementation of any of the alternatives. The four previously defined qualities of wilderness character are considered for effects, and a fifth that is only a concern where it occurs:

1. Untrammeled;
2. Naturalness;
3. Undeveloped;
4. Outstanding opportunities for solitude or a primitive and unconfined type of recreation; and
5. Other features of ecological, geological, scientific, educational, scenic, or historical value.

Other environmental effects that impact the integrity of the natural systems in wilderness include air pollution from outside sources, interruption of natural functioning ecosystems by fire suppression, and threats to native plant species from the spread of noxious weeds from sources outside wilderness.

All alternatives acknowledge the need for wilderness patrols, wilderness rehabilitation of impacted resources, and provision of wilderness education. These management actions, if followed as recommended by either the 1986 or the revised forest plan under alternatives 2 through 5, would have a positive effect by resulting in the restoration, protection, or enhancement of wilderness character.

In all alternatives, the existing designated wilderness acres remain the same as current, barring legislative action by Congress to designate additions or new stand-alone wilderness areas. Because direction for wilderness management is mandated by law, regulation, and agency policy, management actions would be as intended by congressional direction of the Wilderness Act. Management direction of all alternatives would preserve and protect wilderness character, though there is a slight variation in the degree of positive effect between the exiting 1986 forest plan and the revised plan direction under alternatives 2 through 5. There would be no significant negative effect anticipated to wilderness character by implementation of any of the alternatives.

Fish and Wildlife Management

Under implementation of all alternatives, new habitat improvements for fish and wildlife would only be created, or existing improvements maintained in congressionally designated wilderness when they are identified as the minimum action necessary to maintain characteristics by a Minimum Requirements Analysis (MRA) or due to requirements of legislation. Fish stocking in wilderness

would be restricted to reestablishment or maintenance of indigenous threatened, endangered or native species.

Any actions undertaken in designated wilderness for the benefit of fish and wildlife management under implementation of all of the alternatives would first be analyzed and approved by an MRA. Due to the nature of the objectives of the MRA process, approved actions are likely to have only short-term or non-existing negative effects. In most instances, these effects will consist of temporarily degrading the untrammeled quality of wilderness character because of purposeful manipulation of natural processes, conditions, and by increasing the level of development within the area. However, because the MRA process by design facilitates selection of management actions for long-term benefits to wilderness character (and the other purposes of wilderness identified by the Wilderness Act), probable overall long-term positive effects have are likely to offset short-term negative impacts. Long-term positive effects could include restoration or improvement of the natural quality of wilderness character, as well as reducing frequency or outright eliminating the occurrence of future management actions that would impair untrammeled or natural conditions or increase levels of development.

Visitation

The current trend observed in the Gila NF is an increasing demand for services and levels of recreation use, in conjunction with flat or declining budgets and fewer staff. These factors make it increasingly difficult to maintain and operate the existing recreation and trails program infrastructure to standard. Recreation facilities, particularly older sites, may no longer align with the capacity or use for which they were originally designed.

The current level of visitation to Gila National Forest congressionally designated wilderness is considered to be at manageable levels. NVUM survey results also indicate a small, but perceptible trend of visitor use shifting from developed sites to congressionally designated wilderness, and this trend is likely to continue regardless of the forest plan alternative.

Potential impacts common to all alternatives that could occur due significant increase of visitation to designated wilderness include impairment of visitor experiences due to overcrowding, possible degradation to wilderness character quality of opportunities for solitude, the experience of being alone and removed from civilization. Increased visitation may also result in degradation of the quality of visitor experiences due to conflicts arising from competition for use of campsites, trails, and use of other specific locations. Resource damage from increased use could impair the quality of naturalness, and necessary management actions taken to rehabilitate or prevent additional impacts may cause deterioration to undeveloped and untrammeled qualities. Degradation of these wilderness characteristics and agency actions to correct them may have additional negative effects to the quality and availability of wilderness visitor experiences.

Installations and Level of Development

Although by law facilities and other structures are in most instances prohibited, there are exceptions, including historic structures, range infrastructure, facilities associated with valid existing rights, exceptions granted by special provisions by law, and those necessary to manage the wilderness for the purposes outlined within the Wilderness Act and subsequent legislation.

Because of the provisions that accompany any new or existing structures must be in alignment with the requirements of law, regulation, and policy, under all alternatives' levels of development will have none to very small degradation of overall wilderness character. There may be variation to the

degree of positive effect seen by being in alignment with law, regulation and policy between alternative 1 and alternatives 2 through 5, due to updated direction included in the revised plan. Development of the revised plan direction was informed by Need for Change process from the existing 1986 forest plan. This clarified plan direction could increase the likelihood that management actions will meet legislative and policy objectives.

The most common installations within Gila National Forest wilderness are forest system trails and signs. Low-development trails are appropriate within designated wilderness for visitor safety, facilitation of recreational use (one of the purposes of wilderness under the Wilderness Act), resource protection (concentrating and directing travel away from fragile resources) and to provide for administrative access. Trails and signs are installed, constructed, and maintained to the lowest levels of development possible to minimize impacts to wilderness character.

Sufficient plan direction is provided under all of the alternatives for management of installations within wilderness as directed by the Wilderness Act and subsequent law, regulation, and policy. Adequate plan direction implemented under all alternatives is likely to result in protection or even enhancement to wilderness character, wilderness visitor safety, and wilderness experiences. However, there is variability to the quality, clarity, and currency of the direction that would be implemented.

Effects due to the presence of installations are common to all alternatives, though they could vary as described by alternative, including degradation to the wilderness qualities of undeveloped, natural, solitude, and untrammeled. However, in all instances effects will be primarily localized to the area where the improvement is located, and in most cases will not substantially degrade the overall wilderness character of the area unless in aggregate improvements are of high levels of development, high in numbers, are prevalent across the landscape, and commonly encountered.

Permitted Grazing

Permitted grazing of livestock is mandated to continue where it previously occurred within designated wilderness by the Wilderness Act, subsequent wilderness legislation, the Congressional Grazing Guidelines for Wilderness, policy, and regulation. However, the existence of range infrastructure and the presence of domestic livestock may have negative effects to qualities of wilderness character. Law, policy, regulations, and the Congressional Grazing Guidelines for Wilderness all provide management guidance to mitigate these negative effects.

The existence of range infrastructure, the visible effects of grazing, and the presence of cattle on the landscape under all alternatives could negatively affect wilderness character. These effects are common, and would not vary by alternative. The presence of cattle or the visible signs of grazing could impair the recreation experiences of some wilderness visitors, including activities such as hunting, fishing hiking, backpacking, and equestrian use. These effects may include uneasiness or displeasure with the presence of cattle, and impaired experiences of solitude due to the presence of domestic animals in an otherwise solitary setting. There may also be conflicts when animals are blocking passage or presenting a collision hazard, negatively affecting visitor safety.

Other effects to wilderness character may include visible evidence of grazing on the landscape, such as the visible presence of cattle congregating in scenic environments, visible trampling of vegetation, muddying or compaction of soils, and the presence of cattle feces. Any of these visible disturbances could also have the effect of making some areas unusable for some recreation uses. They may also affect wilderness areas by requiring additional maintenance, repairs, and associated costs.

Prescribed Fire, Wildfires, Timber Sales and Mechanical Vegetation Treatments of Restoration Projects

Under all alternatives, fire management would continue with appropriate measures and best management practices to protect wilderness character, and fire suppression of all human-caused wildfires would serve to minimize the potential negative effects of degradation of wilderness character. In emergency situations, mechanized equipment and motorized transport, use of helicopters, air tankers and other aircraft may be approved by the forest supervisor or regional forester. These actions would likely result in impairment of both wilderness character and visitor experiences that are dependent upon it, and leave evidence of human intervention, although best management practices and rehabilitation efforts would help to reduce those impacts afterward. Suppression of uncharacteristic fire would benefit wilderness character by preventing degradation to apparent naturalness by the occurrence of fire severities outside the known historic range of variability.

Naturally ignited fires, when allowed for resource benefit, would benefit wilderness character by reducing fuel loading to acceptable levels, and maintaining fire-dependent vegetation. Negative impact to air quality, visual aesthetics, and possibly water quality within wilderness would be short-term. Negative impacts from degradation to air quality, visual aesthetics, and possibly water quality within recommended wilderness would be short term in most instances.

Reduction of hazardous fuels by use of prescribed fire could affect wilderness character due to undesirable changes in vegetation types, impacts to visitor experiences, water quality, and wildlife habitat. This would result in degradation to wilderness character qualities of naturalness, opportunities for solitude or a primitive and unconfined recreation, and untrammeled by human intervention. However, there may be positive effects by allowing naturally ignited fires to play their natural role in the ecosystem, which may serve to preserve or even enhance naturalness and untrammeled qualities.

Typically, impacts from large, high-severity wildfires are the same but may cause greater damage with a longer duration of effect than prescribed fires. Impacts from severe wildfires to authorized wilderness facilities and trails that may occur across all alternatives include temporary area and trail closures during the incident and post-fire effects of infrastructure damage. Areas within and surrounding large fires typically experience more intense and frequent flooding. Other impacts/damages include landslides, dead trees falling on or within facilities and trails, encroaching nuisance vegetation, erosion, extended closures due to hazardous conditions, and silting in of available water sources.

Prescribed burning for fire management purposes and managing wildfires to meet resource objectives are allowable in wilderness, but because restrictions to protect wilderness character would limit the use of motorized and mechanized equipment and mechanical restoration treatments, they are unlikely to have any effects under implementation of any of the alternatives.

Emerging Trends

There is a growing interest in adventure races and similar events such as boot camps, mud events and endurance races. These events are usually held under a special-use permit by “for profit” organizations, although some are conducted as fundraisers. The activities associated with these recreation events may include: running, bicycling, paddling, climbing, orienteering, and other activities that require endurance, strength and agility. It is prohibited by the Wilderness Act, policy, and regulation for these events to be held within congressionally designated wilderness.

However, there could still be effects to wilderness by these trends under all alternatives, including impaired visitor experiences due to crowding caused by displacement of visitors from areas were organized events occur, resulting in degradation of solitude experiences, and potential conflicts between visitors due to competition for use of preferred locations. Other effects could include physical degradation to trails and dispersed recreation sites by short-term increased occupancy of large groups of people within a limited area. Positive effects include increased enjoyment of experiences by visitors to whom they are desirable and enjoyable experiences.

Alternative 1 – 1986 Forest Plan

Wilderness Character

Under implementation of alternative 1, existing forest plan direction is likely to continue to protect and maintain wilderness character within designated wilderness. Opportunities for solitude and primitive and unconfined recreation are likely to be maintained, and no new permanent developments or human occupancy would be authorized. Natural ecological processes and disturbances would continue to be the primary forces affecting the composition, structure and patterns of vegetation. This would most likely result in the protection, and in some cases even enhancement, of wilderness character under implementation of this alternative.

However, although general management direction intended to protect the qualities of wilderness character exists in the current plan, it is not as specific as the guidance developed for the updated plan in alternatives 2 through 5. Some guidance for wilderness management in alternative 1 would remain strictly prescriptive, and therefore, would not be in alignment with current law, regulation, and policy without amending the existing forest plan. This shortcoming was identified during the Need for Change process. This flaw could serve to mitigate the intended protection or enhancement of wilderness character absent making amendments to the 1986 forest plan.

Group size limits and length of stay restrictions would continue at current levels for the objectives of managing visitor use and maintaining opportunities for solitude. This would mitigate degradation of naturalness and low development due to compaction or muddying of soils, trampling of vegetation, the presence of user-developed fire rings and campsite furniture, or management activity undertaken to mitigate these conditions.

The 1986 forest plan specifically restricts group size in the wilderness to 25 persons and/or 35 head of pack and saddle stock, which is a significant enough size at the maximum end of the limit that it could have the effect of decreasing opportunities for solitude and increasing the likelihood of perceived crowding by some visitors in popular places and on some trails. Additionally, this static number in plan direction does not allow for adjusting restrictions due to changes in conditions without the need for amending the forest plan. Maintenance of trails and facilities would be completed using hand tools only and access would be made using non-mechanized and non-motorized means.

Group Size Limits in Wilderness

To protect the wilderness characteristic of opportunities for solitude or primitive and unconfined recreation, the 1986 forest plan contained group size and length-of-stay limits in wilderness. There was no plan direction for outfitter guides in wilderness regarding backcountry behavior (e.g., traveling techniques, Leave No Trace principles, etc.).

1986 Forest Plan Standard:

- Maximum group size will be limited to 25 persons and/or 35 head of pack and saddle stock.

Group size limits and length of stay restrictions would continue at current levels of 25 persons and/or 35 head of pack and saddle stock with the intention of meeting objectives of managing visitor use and maintaining opportunities for solitude. This restriction could somewhat mitigate degradation of qualities of naturalness and level of development resulting from compaction or muddying of soils, trampling of vegetation, the presence of user-developed fire rings and campsite furniture, or management activity undertaken to mitigate these conditions. However, such a permissive group size restriction is not likely to be as effective at mitigating these impacts as group size limits that would be implemented within alternatives 2 and 5.

The existing 1986 forest plan group size restriction is likely not sufficient to mitigate degradation of opportunities for solitude for some users. This is especially true for visitors for whom it is an important component, or the primary motivator of their wilderness experience. This could be particularly problematic in instances where groups encountered by other visitors consist of the fully allowable size of persons and pack and saddle stock. This permitted group size could increase the likelihood of the effect of perceived crowding by some visitors in popular locations and on some trails, and degrade experiences of visitors with all levels of expectation for solitude. Additionally, this prescriptive, static number in plan direction does not allow for adjusting restrictions due to changes in conditions without the need for amending the forest plan and would require undertaking a separate planning process consisting of an environmental analysis as required by the National Environmental Policy Act. In all likelihood, this would result in a significant window of delay between detection of a need for adjustment, such as indication that degradation to wilderness character, physical resources, or visitor experiences is occurring. This delay could greatly exacerbate the impacts and result in significant and long-lasting impacts to wilderness character, physical resources, and visitor experiences as a result.

Group sizes as large as 25 persons and 35 head of pack and saddle stock could also result in degradation of the quality of visitor experiences due to conflicts arising from competition for use of campsites, trails, and use of other specific locations. Additional effects of this competition for use may be physical damage such as soil compaction, muddying, damage to vegetation and an increased level of development due to creation of additional user-developed campsites and social trails in popular areas. Resource damage could impair the quality of naturalness, and necessary management actions taken to rehabilitate or prevent additional impacts may cause deterioration to undeveloped and untrammeled qualities. Degradation of these qualities of wilderness character and agency actions to correct them may have additional negative effects to the quality and availability of wilderness visitor experiences.

The prescriptive, static number contain in the 1986 forest plan direction does not allow for adjusting restrictions due to changes in conditions without the need for amending the forest plan and would require undertaking a separate planning process likely consisting of an environmental analysis as required by the National Environmental Policy Act. This could impact the workload capacity of forest recreation and special uses staff, causing degradation to the ability to sufficiently administer other aspects of the recreation special uses program. This may impair the ability of special-use permit holders with both existing and proposed operations to conduct authorized special uses in the forest.

Effects Common to Alternatives 2 Through 5

Alternatives 2 through 5 include updated desired conditions and guidelines that are likely to enhance protection of certain aspects of wilderness character that are not addressed in existing 1986 forest plan direction as identified by the plan revision Need for Change process. This will also likely protect and enhance the availability and quality of visitor experiences dependent upon the presence of wilderness character.

Group Size Limits in Wilderness

To protect the wilderness character, in particular the quality of opportunities for solitude, the preliminary draft revised plan contained revised and adaptable group size and length-of-stay limits in wilderness. This direction includes a prescribed, default group size limit to be implemented for persons and riding and pack stock; this direction also allows for adjustment of these default group sizes to be increased or decreased in response to changing conditions at the forest supervisor's discretion.

Revised Plan Standard Implemented by the Alternatives:

- The forest shall establish and enforce group size limits. The default group size limit shall be 15 persons and 25 head of riding and pack stock. Exceptions to group size limits may only be granted by written permission of the forest supervisor or designated agent, including when approved as terms and conditions of special-use permits on a case-by-case basis, groups that agree to mitigation terms and demonstrate a high proficiency for Leave No Trace Ethics, for fire management activities, and all emergencies involving health and safety. Changes shall be made to the default group size limits for any individual wilderness when approved by the forest supervisor, and informed by recommendations from analysis of effects to wilderness character completed by an interdisciplinary team.

In a historical review of relevant research, Cole (2001) found that most wilderness visitors preferred infrequent encounters with a low density of visitation, and that experiencing more encounters than they expected diminished their experiences. Although it was also concluded that the degree of effect is relatively small, and should be considered in the context that "density affects the nature of the experience more than the quality of the experience." However, regardless of the degree of effect to overall visitor experiences, this does still reflect that there is a degradation that occurs to the wilderness character quality of opportunities for solitude. In order to be in alignment with legal mandates of the Wilderness Act, management of the area must be for the preservation or enhancement the opportunities for solitude that the area possessed at the time of designation.

Under this alternative, the proactive establishment of a default group size limit immediately upon implementation of the forest plan would likely result in the prompt and efficient establishment of an enforceable forest order, which could greatly mitigate any potential impairment to physical resources and wilderness character. Such an enforceable group size limit would avoid having very large groups for large events or festivals within designated wilderness or recommended wilderness rather than other forest locations more appropriate for such events. Degradation caused by such large groups to wilderness character, physical resources, and social experiences could be of significant magnitude, and long-lasting, and challenging to rehabilitate within wilderness.

Because of the direction of the revised plan standard that allows for adjustments to group size limits at the forest supervisor's discretion, changes made to wilderness group size limits of persons would

not require a formal plan amendment in addition to the accompanying environmental analysis as required by the National Environmental Policy Act.

There could be impairment to visitor wilderness experiences, including degradation of current levels of quality and availability for outstanding solitude, due to the default group size limit being insufficient for being too permissive or restrictive; however plan standard language does allow for the default number to be adjusted at the forest supervisor's discretion, and informed by recommendations derived from an analysis of effects to wilderness character completed by an interdisciplinary team (adaptive management).

Impacts due to a restrictive group size limit could affect those visitor experiences that rely upon larger groups, resulting in degradation of the experiences of visitors seeking these types of experiences. However, this type of use would still be available outside of designated wilderness, and so would most likely merely be displaced to where it would not be a concern to wilderness character. For wilderness-dependent experiences, impacts to group experiences could be mitigated by adjustment of the group size limit by discretion of the forest supervisor, when conditions warrant, as stated previously. Effects to wilderness character by a restrictive group size limit would in most instances generally tend to be positive, by resulting in protection or even enhancement of the wilderness qualities of naturalness, undeveloped, untrammeled, and opportunities for solitude and primitive and unconfined recreation.

Potential impacts due to either temporary or longer-term absence, or implementation of an insufficiently restrictive group size limit for designated wilderness may include impairment of visitor experiences due to overcrowding, possible degradation to the wilderness character quality of opportunities for solitude, or the experience of being alone and removed from civilization. Particularly vulnerable would be the experiences of solitude in settings first preserved as wilderness by Aldo Leopold.

Group size limits implemented by these alternatives may mitigate or prevent degradation of the quality of wilderness dependent, and Gila-specific, visitor experiences due to conflicts arising from competition for use of campsites, trails, and use of other specific locations. These mitigated or prevented effects could include physical resource damage that may impair the quality of naturalness, and the need for management actions to rehabilitate or prevent additional impacts, also causing depreciation to undeveloped and untrammeled qualities.

Because under these alternatives special uses administrators may experience less impairment to their workload capacity, there could also be a greater likelihood they could address authorization-related concerns, issues, and changes in a timelier manner. This could also result in enhancement of the ability of special-use permit holders to conduct authorized special uses in the forest, therefore, also enhancing the availability and quality of visitor recreation experiences in all forest areas.

Groups that demonstrate sufficient proficiency for Leave No Trace Ethics are unlikely to see any negative effects to current business operations that are in alignment with mandates of the Wilderness Act, other laws, policy, and regulations, because of the allowance in plan direction for exceptions to group size limits to be granted in this context by written permission of the forest supervisor or designated agent. This includes groups that are clients of outfitter-guides operating under a special-use authorization.

Management approaches for wilderness include suggested guidance for applying exceptions to group size limits. This guidance is intended to inform the development of the terms and conditions of

special-use authorizations and operating plan for outfitting and guiding within federally designated wilderness and recommended wilderness areas.

Under this alternative, plan direction implemented would also be in alignment with the legal mandate of the Wilderness Act in context of exceptions to the general prohibition of commercial uses in wilderness. The exception in the act only allows for such uses to be permitted to the extent necessary for activities that are proper for realizing the recreational or other wilderness purposes of the areas. This has a positive effect to management of wilderness by the Gila National Forest according to the mandates and purposes of the Wilderness Act, ensuing compliance with law, policy, and regulation, as well as the mandates for protection and enhancement of wilderness character, physical resources, and wilderness visitor experiences.

Effects Common to Alternatives 3 and 4

Group Size and Length-of-Stay Limits in Wilderness

Language Included in the description for the Gila Wilderness for these Alternatives:

- This contiguous wilderness is sufficiently vast to support extended wilderness expeditions lasting two weeks or more.

Included in the desired conditions for the Gila Wilderness for these Alternatives:

- Private users and special-use permittees including non-profit outdoor education programs are able to run extended backcountry expeditions that further the mission and purpose of Wilderness.

Revised Plan Standard Implemented by these Alternatives:

- The forest shall not establish and enforce group size limits within wilderness unless need is determined based upon adaptive management. Should the Gila NF ultimately decide that establishing a group size limit is necessary, it should assign a number that accommodates existing operations.
- Outfitter-guide permit holders shall not operate under exceptions to plan standards and guidelines regarding group size and length-of-stay limits. Wilderness expedition and outdoor education for outfitter-guide use shall be consistent with the forest's standards, guidelines, and desired conditions.

Revised Plan Guideline Implemented by these Alternatives:

- Outfitter-guide operating plans should include appropriate wilderness practices, follow Leave No Trace principles, and incorporate awareness for wilderness values into their guide trainings and client interactions. If other management strategies are ineffective, group size limits may be established in the operating plan where needed to meet management goals. Outfitters who demonstrate an ability to preserve and respect the wilderness may have less restrictive group size limits.

Included in Revised Plan Wilderness Management Approaches for these Alternatives:

- Group size limits, where established, may be adjusted to meet desired conditions for wilderness.

By not providing default numbers of persons and animals upon implementation of plan direction under these alternatives, the forest would not proactively establish group size limits enforceable by a forest order. Any establishment of wilderness group size limits enforceable by a forest order would

require undertaking a separate planning process consisting of an environmental analysis as required by the National Environmental Policy Act.

This plan direction would be reactive rather than proactive in fulfilling requirements of law, policy, and regulation for protection of wilderness character. Impacts will already have occurred prior to analysis informing the need for management action, and therefore effects are likely to be more extensive and of duration than with a default group size that may be adjusted by adaptive management. This approach would also result in a significant window of delay between detection of the need and the establishment of group size limits. This delay could greatly exacerbate the magnitude of impacts associated with absent of restrictions that may result in significant and long-lasting impacts to wilderness character, physical resources, and visitor experiences.

Large numbers of people in non-commercial, informal gatherings, celebrations, or other events commonly choose to congregate on public lands, including the Gila National Forest. These gatherings often transpire without prior notification to forest staff, and depending on individual circumstances, also may not be subject to other size restrictions due to being a non-commercial use. Absent group size restrictions, these groups may choose to gather within designated wilderness or recommended wilderness rather that within other locations that would be more appropriate for such occasions. The potential impacts of oversized groups or events in concentrated locations to wilderness character, physical resources, and social experiences could be of substantial magnitude, and be both long-lasting and challenging to mitigate within designated wilderness.

Effects to visitor experiences may be those general to all wilderness experiences, but may also be specific to the Gila National Forest. Currently there are high-quality opportunities to experience solitude in wilderness areas on the forest that are often not available in many other well-known, and heavily visited wilderness areas. This experience is enhanced for many visitors by the historic context of Gila being the location of the world's first designated wilderness, and the legacy of Aldo Leopold.

Potential impacts due to absence of a group size limit, or implementation of an insufficiently restrictive limit for designated wilderness could include impairment of visitor experiences due to overcrowding, degradation to the wilderness character quality of opportunities for solitude, or the experience of being alone and removed from civilization. Impacts to experiences of solitude may be of more significance to visitors with high expectations for the settings historically preserved as wilderness by recommendation of Aldo Leopold. However, mitigation of these effects are possible under these alternatives, because group sizes could be implemented or adjusted when informed by adaptive management. The positive effects of these mitigations may be significantly diminished by the likelihood of substantial delays to implementation when need is determined, absent a default restriction, as stated previously.

Insufficient restrictions on group sizes may also result in degradation of the quality of wilderness dependent, and Gila-specific, visitor experiences due to conflicts arising from competition for use of campsites, trails, and use of other specific locations. Resource damage from large groups could impair the quality of naturalness, and necessary management actions taken to rehabilitate or prevent additional impacts may cause additional deterioration to undeveloped and untrammeled qualities. Degradation of these qualities of wilderness character and agency actions to correct them may have additional negative effects to the quality and availability of wilderness visitor experiences.

Effects to wilderness character by a restrictive group size limit would generally be positive, by resulting in protection or even enhancement of the wilderness qualities of naturalness, undeveloped,

untrammeled, and opportunities for solitude and primitive and unconfined recreation due to mitigation or prevention of negative effects due to absent or overly permissive group size restrictions.

Outfitter-guides, or other non-commercial groups are unlikely to see negative effects to their operations or trips by implementation of these alternatives. However, plan direction under this alternative does not include the specific direction that the forest supervisor (or authorized agent) may grant groups exemptions to size restrictions when they demonstrate proficiency with Leave No Trace outdoor ethics and agree to use best management practices to mitigate potential impacts. Absence of this language could result in services that would otherwise be in alignment with law, regulation and policy including exemptions to commercial use by the wilderness act, to not be authorized.

Because there would be no plan direction for a practicable protocol to ensure prior engagement with any large groups to facilitate education on low-impact practices, the effectiveness of emphasis on education to reduce impacts is likely to be insufficient to meet objectives for desired conditions.

The group size approach analyzed under these alternatives would accommodate outfitter-guide special-use authorizations within wilderness. However, if it was determined at some future time that changed conditions would merit consideration of implementing group size limits, this circumstance could potentially affect the workload capacity of forest recreation and special uses staff, causing degradation to their ability to administer other aspects of the recreation special uses program. This may impair the ability of special-use permit holders to conduct authorized special uses in the forest. This may also degrade the availability and quality of visitor recreation experiences for outfitter-guide provided services.

Cumulative Effects for Wilderness, Wilderness Study Areas, Recommended Wilderness, and Inventoried Roadless Areas

Cumulative effects to wilderness, wilderness study areas, recommended wilderness, and inventoried roadless areas are very similar, and are therefore, all covered here to avoid repetition. Reasonable and foreseeable actions on NFS and other adjacent lands include vegetation management, mining, recreation use, and reduction of fuels in the wildland-urban intermix. These actions could degrade the wilderness character quality and wilderness characteristic of opportunities for solitude, depending on how close and pervasive the actions are, although typically just sights and sounds within the wilderness (or similarly managed area) itself are considered when determining effects to wilderness character, wilderness characteristics, or similar values.

In addition to the designated and management areas managed as, or similar to, wilderness found within the Gila NF, there are similarly managed areas managed by other government agencies near and adjacent to the forest. These areas add recreation values, scenic values, wildlife opportunities, and other resources values complementing those of the Gila National Forest.

Apache-Sitgreaves National Forests

In 1933, the Secretary of Agriculture proclaimed that the Blue Range Primitive Area, at that time located on the Apache National Forest in Arizona and New Mexico, should be managed for primitive uses to maintain the wildness of that area, and administratively designated it as a Forest Service Primitive Area. In 1971, the President of the United States forwarded a recommendation by the Forest Service for a Blue Range Wilderness in New Mexico and Arizona to Congress, who acted in 1980 on a portion of it, designating the Blue Range Wilderness in New Mexico, located on the portion of the Apache National Forest now administered by the Gila NF. The remaining Blue Range Primitive Area in the Apache-Sitgreaves NFs (A-S NF) is the last designated primitive area in the

NFS, all others having been designated as wilderness by Congress through the Wilderness Act of 1964 and other subsequent wilderness legislation.

The remaining Blue Range Primitive Area, along with presidential recommendation additions from the 1971 recommendation to Congress, together total 199,505 acres, and by law, agency policy, and the 2015 Apache-Sitgreaves Revised Forest Plan continue to be managed with the same mandate as congressionally designated wilderness to protect wilderness character . The Gila NF borders the Blue Range Primitive Area along the Arizona/New Mexico state boundary for approximately 8 miles of adjoining designated Blue Range Wilderness and 7 miles of non-wilderness NFS lands on the New Mexico side.

During their forest plan revision effort, the Apache Sitgreaves NFs deferred the decision whether to recommend the Hells Hole, Nolan, and Mother Hubbard potential wilderness areas (a total of 26,023 acres) for wilderness designation until the Gila NF completes its potential wilderness evaluation and forest plan revision (USDA FS A-S NFs 2014a). These potential wilderness areas are composed of IRAs that straddle the Arizona/New Mexico state boundary, partially located in both the Gila and Apache-Sitgreaves NFs. The Hells Hole, Nolan, and Mother Hubbard potential wilderness areas continue to be managed to protect wilderness characteristics until a decision is made during the Gila NF forest plan revision process as to whether these areas will be recommended for wilderness designation (USDA FS A-S NFs 2014a).

The Lower San Francisco IRA located in Arizona on the Apache-Sitgreaves NFs lies to the west of the Lower San Francisco WSA and IRA located in New Mexico. As part of their forest plan revision, the Apache Sitgreaves NFs evaluated (West Blue/San Francisco Potential Wilderness58 PW-03-01-052; USDA FS A-S NFs 2012), but did not recommend as wilderness the Lower San Francisco IRA located in Arizona (USDA FS A-S NFs 2015). Instead, these areas will now be managed as Natural Landscape management areas under the A-S NF Revised Plan. These are generally undeveloped areas that are natural-appearing and provide primitive and semi primitive recreation opportunities. Management activities are allowed but are primarily focused on ecosystem restoration. This management area includes most of the IRAs that were identified in the 2001 Roadless Area Conservation Rule. IRAs are managed to protect and conserve their roadless character.

Bureau of Land Management

BLM wilderness study areas (WSAs) are BLM-managed lands that possess wilderness characteristics of manageable size, naturalness, and outstanding opportunities for solitude or primitive and unconfined recreation giving them eligibility for inclusion in the National Wilderness Preservation System by Congress.

Congress directed the BLM in 1976 to evaluate all lands managed by the agency for the presence of wilderness characteristics. BLM lands found to have wilderness characteristics were identified as WSAs. This designation identifies areas for Congress to consider designating as wilderness through passage of legislation. The BLM is required by law to manage these areas for protection of their wilderness characteristics until such time as Congress decides to designate or direct they be managed for other uses.

BLM WSAs contain undeveloped Federal land retaining its primeval character and influence, without permanent improvements or human habitation, and managed to preserve its natural conditions. WSAs are not included in the National Wilderness Preservation System until Congress passes wilderness legislation.

On BLM-managed lands, a WSA is a roadless area that has been inventoried (but not designated by Congress) and found to have wilderness characteristics as described in Section 603 of the Federal Land Policy and Management Act of 1976 and Section 2(c) of the Wilderness Act of 1964. Wilderness Study Area characteristics:

- Size – roadless areas of at least 5,000 acres (20 square kilometers) of public lands or of a manageable size;
- Naturalness – generally appears to have been affected primarily by the forces of nature rather than human activity;
- Opportunities – provides outstanding opportunities for solitude or primitive and unconfined types of recreation.

BLM manages WSAs under the National Landscape Conservation System to protect their value as wilderness until Congress decides whether to designate them as wilderness. Wilderness bills often include so-called "release language" that eliminates WSAs not selected for wilderness designation.

Some WSAs are managed in the same manner as wilderness areas; however, the rules for other WSAs permit activities that are generally excluded from wildernesses. For example, some WSAs allow mountain bikes and off-road vehicles.

The 7,161-acre Apache Box WSA, located on BLM-managed, is contiguous for one mile of the southern boundary of the Hell Hole WSA, located on NFS lands managed by the Gila NF.

Another BLM-administered unit, the Hoverrocker WSA, is located west of the Hell Hole and Apache Box WSAs (figure 49). The Hoverrocker WSA is a 22-acre area that remained after the adjacent Arizona portion was released from wilderness review in 1990, but continues to be managed as a WSA in New Mexico pending congressional action.

The BLM Continental Divide WSA consists of 68,671 acres, encompassing parts of Pelona Mountain and a portion of the Continental Divide National Scenic Trail. This WSA is adjoins non-wilderness lands Gila NF manages for two miles.

All three of these BLM WSAs await congressional action, by either designating the area as wilderness or releasing it to be managed by the agency for other purposes. The WSAs are managed to protect wilderness qualities, so as not to impair the suitability of such areas for wilderness designation by Congress, according to the appropriate resource management plan and BLM Manual 6330 – Management of BLM Wilderness Study Areas.

The 840-acre Gila Middle Box Area of Critical Environmental Concern is immediately adjacent to the Gila NF. Areas of critical environmental concern are areas “where special management attention is required...to protect and prevent irreparable damage to important historic, cultural, or scenic values, fish and wildlife resources or other natural systems or processes” 43 U.S.C. § 1702(a).

Population growth is likely to cause an increase in the recreation use of the Gila NF, including an increase in use within wilderness and similarly managed areas. The effects of urbanization and population growth on the amount of wilderness and similar area visitation and resource conditions are likely to be gradual and to extend well beyond the planning period. Increased recreation use could negatively impact wilderness character, wilderness characteristics, or similar qualities, particularly opportunities for experiencing solitude and the apparent naturalness of the landscape. Examples of potential effects include the possibility of increased crowding, soil compaction or erosion, and threats to native plant species from the spread of noxious weeds from sources outside

the wilderness. These may result in degradation to the wilderness character, wilderness characteristics, or similar qualities of these areas, also impairing the availability and enjoyment of visitor experiences that are dependent upon them.

However, all wilderness and similarly managed lands in the area also complement each other by cumulatively contributing to the availability and quality of wilderness and similar to wilderness settings and opportunities, enhancing the availability and quality of wilderness character, wilderness characteristics, and similar values across the Gila NF area. This effectively makes available across a large portion of the landscape a large and mostly contiguous complex of wilderness and similar managed lands extending into eastern Arizona. This type of wildlands complex is unique to the southwest region. This wildlands complex also serves to enhance the availability and quality of recreation experiences for visitors to the area that are dependent upon wilderness character, wilderness characteristics, and similar settings and opportunities.

Climate Conditions

In recent years, the region has experienced an extended drought, and drought conditions are projected to reoccur on a cyclical basis. Regardless of alternative implemented, as fire danger increases, restrictions may be put in place to reduce the risk of human-caused fires. Depending on the severity of conditions, restrictions typically range from a ban on open campfires to forest closures. These restrictions would negatively affect visitor access to wilderness settings and opportunities.

Occurrence of extended droughts would directly affect available water sources for wilderness visitors. Across the forest, there is already limited water sources, and in many areas, the distance between water sources limits the opportunities for users. The forest has experienced loss of previously reliable water sources from extended droughts, damage from wildfires, and a lack of maintenance to remote water developments. The effects associated with the loss of water sources is impairment to user experiences because of lack of reliable water and need to carry larger amounts of water over longer distances.

In addition to water sources, these same stressors affect water levels of the streams within wilderness and similar areas. As stream levels decrease, the diversity of recreational opportunities become more limited. This results in concentrated use of watercourses that continue to have flowing water conditions, and adds pressure to streamside resources. The flow rate, along with depth, can determine the quality of fishing, navigability by watercraft, and suitability for swimming or bathing in hot springs. Decreasing water may result in lower visitation numbers and impaired availability and quality of desired recreation experiences in wilderness and similarly managed areas.

Herbicide-Use Environmental Consequences

The following discussion of environmental consequences addresses the effects of the herbicide-use alternatives on wilderness and similarly managed lands such as IRAs.

Effects of Herbicide-Use Alternative A-No Action

The no-action alternative would not authorize or initiate any new actions for treating noxious plants or the use of additional herbicides beyond what is currently covered under project-level planning decisions. By law, congressionally designated wilderness is managed to protect the qualities of wilderness character, which are untrammeled, natural, undeveloped, opportunities for solitude or a primitive and unconfined type of recreation, and other features of value (which do not have to be present for wilderness designation, but are protected where they exist). This alternative would not

approve new invasive plant treatments within designated wilderness, and the current effects of invasive plants and their treatment to wilderness character would continue. Existing noxious weed populations are often located where recreation use is concentrated and the ground is disturbed. Without treatment, any existing noxious weed infestations are likely to continue to multiply, particularly in disturbed areas.

If invasive plants multiply throughout wilderness, they could replace native plants with invasive species. Where invasive species dominate, they are not likely to appear natural, and be visually evident even to the casual observer. If noxious weeds multiply, this could result in degradation to the wilderness character quality of apparent naturalness. Any existing infestations of noxious weeds along roads adjacent to wilderness boundaries and at trailheads are likely to facilitate introduction of new populations in wilderness, similarly degrading wilderness character, scenery and therefore degrading the quality and availability of wilderness experiences dependent upon apparent naturalness.

Effects Common to All Herbicide-Use Action Alternatives

All of these alternatives include the use of manual removal and herbicide treatments as invasive and noxious weed control methods. Under implementation of each of these alternatives, there will be common effects to wilderness character and resources as a result, although these effects will likely vary in frequency, location, and magnitude across the alternatives and this will be addressed separately in each.

Any use of herbicides in designated wilderness always results in some level of degradation to the wilderness quality of being untrammeled. There may also be impacts to the wilderness qualities of natural and undeveloped, due to visible presence of dyes and dead and dying plants. However, use of herbicides also have a high potential to significantly preserve or improve wilderness character in the long-term by eliminating invasive species and restoring native plants. Once this occurs, impacts to untrammeled quality will no longer exist. Dyes used with herbicides would fade and be gone within a few days, keeping their effects short-term. As plants die from herbicides, they wilt and turn brown, and the plants generally become smaller than surrounding native plants. In the fall, as native plants turn brown, treated plants may not be as distinguishable from native plants, and by the following spring could become unnoticeable. This will result in a greater overall improvement to wilderness character qualities of natural and undeveloped.

Under most circumstances, treatment of invasive and noxious weeds will only occur in designated wilderness when herbicide use is approved by regional forester or designated agent. This approval informed by a minimum requirements analysis determination that it is the minimum action or tool required to manage the area in alignment with the Wilderness Act of 1964. By policy direction, minimum requirements analyses will be performed by use of the Minimum Requirements Decision Guide, or subsequent mandated analysis methodology. In most instances, a minimum requirements analysis determination that herbicide is the appropriate minimum tool will be because its application would result in a long-term benefit to overall wilderness character offsetting a relatively short-term degradation to the wilderness untrammeled quality.

The likelihood of frequency of occurrence and the magnitude of effects to wilderness character due to use of herbicide to treat noxious weeds varies due to differences in criteria between these alternatives, and so will be addressed separately within each. However, the effects that will occur are common, and include short-term degradation to wilderness character due to impacts to the untrammeled quality, which may also result in short-term degradation to visitor experiences affected

by visible trammeling of conditions. Positive long-term effects include improvement of overall wilderness character by enhancement of the natural quality, which will improve visitor experiences dependent upon apparent naturalness long after the negative effects of trammeling no longer exist.

Some manual treatment methods will result in ground disturbance that could degrade the wilderness character qualities of natural, undeveloped, and untrammeled. Minor soil disturbance may be expected in small areas where noxious weeds are found, as the current conditions indicate generally patchy distribution of noxious weeds in the Gila NF. These types of treatments by themselves may only temporarily contain noxious weed populations, and may need to be recurring unless other treatment methods are used, resulting in persistent effects to untrammeled conditions. As a result, manual treatment methods may not be effective at re-establishing native vegetation, and wilderness character could continue to be degraded.

Because manual treatments often require multiple treatments annually, impacts to wilderness character would occur over extended periods of time. However, this effect is mitigated because dead and dying plants are not visually evident by the end of the growing season.

Under all treatment methods, the degree of effects to qualities of wilderness character is likely to depend on the size and density of the treated noxious weed infestation. Effects would likely occur in small patches interspersed with native vegetation, and treatments are not likely to be noticeable within several weeks. Larger patches may be present in open, dry areas. Backpack spraying over significantly sized areas could result in more concentrated short-term degradation of wilderness character, but these areas are already negatively affected by the presence of noxious weeds. Short-term impacts could be offset by improvement in long-term improvement of wilderness character by restoring native vegetation.

Solitude and primitive recreation experiences may be degraded, and wilderness visitors may be inconvenienced by the presence of warning signs, noise, smells, and possibly the temporary loss of availability for use by some areas being temporarily closed. These short-term wilderness character and visitor use impacts, usually a few days in duration, are likely to be offset by long-term restoration of native plant populations, resulting in benefits to the quality of wilderness character and to improved visitor experiences. Other social impacts may include degradation or the loss of availability of use of some wilderness locations due to visitors being uncomfortable or fearful of the perceived health effects of herbicides.

Effects to human health are covered in Social and Economic Conditions section.

Effects of Alternative B

The effects from this alternative would include all areas likely to be treated for noxious weeds, except native vegetation for restoration and fuels reduction would not be implemented in wilderness areas. The effects that are described as common to all alternatives are only likely to occur in areas that may be treated for noxious/non-native species.

Effects to Alternative C

The effects from this alternative would not include any areas treated for native species, and therefore the effects that are described as common to all alternatives are only likely to occur in areas that may be treated for noxious/non-native species.

Effects of Alternative D

This alternative would restrict herbicide applications for woody re-sprouting species to the urban interface, which under most circumstances is not likely to be applicable to areas within congressionally designated wilderness. The effects that are described as common to all alternatives are only likely to occur in areas that may be treated for noxious/non-native species.

Cumulative Effects

Cumulative effects resulting from treatment of noxious/invasive weeds under the proposed action would be the enhanced protection of non-infested wilderness and similarly managed lands and preservation of intact plant communities, which would enhance wilderness character, wilderness characteristics, or other similar management objectives, throughout the greater Gila region.

The design features and plan components listed here, along with other plan direction would be integrated into any treatments carried out in Wilderness and similarly managed lands. Chemical methods of pest control will only be used when physical or cultural methods are unlikely to be successful. Where herbicide use is deemed appropriate, application of design features and plan direction would mitigate any long-term effects of herbicide use. These include: minimizing or eliminating direct or indirect negative effects to non-target plants, animals and water quality by following the label and consulting the risk assessment. Before application, site-specific soil characteristics, slope, surface drainage patterns, proximity to surface water and local water table depth to determine the appropriate herbicide formulation, application timing and method, and if there is a need for buffers. Where herbicide is likely to be delivered to surface waters, only herbicides registered for aquatic would be used.

Wilderness Study Areas

Affected Environment

Introduction

The New Mexico Wilderness Act of 1980 designated the Hell Hole and Lower San Francisco River WSAs (figure 49). The act also directed the Gila NF to review and determine if these areas possess wilderness characteristics, and analyze and determine their suitability for recommendation by Congress as designated wilderness. The 1986 Gila Forest Plan evaluated the areas for wilderness suitability, as directed, and did not recommend either be designated as wilderness.

Until such time that Congress acts on this recommendation, the New Mexico Wilderness Act of 1980 and forest plan direction mandate that the WSAs be managed to maintain existing wilderness characteristics. However, no baseline monitoring data have been collected for wilderness character within these WSAs.

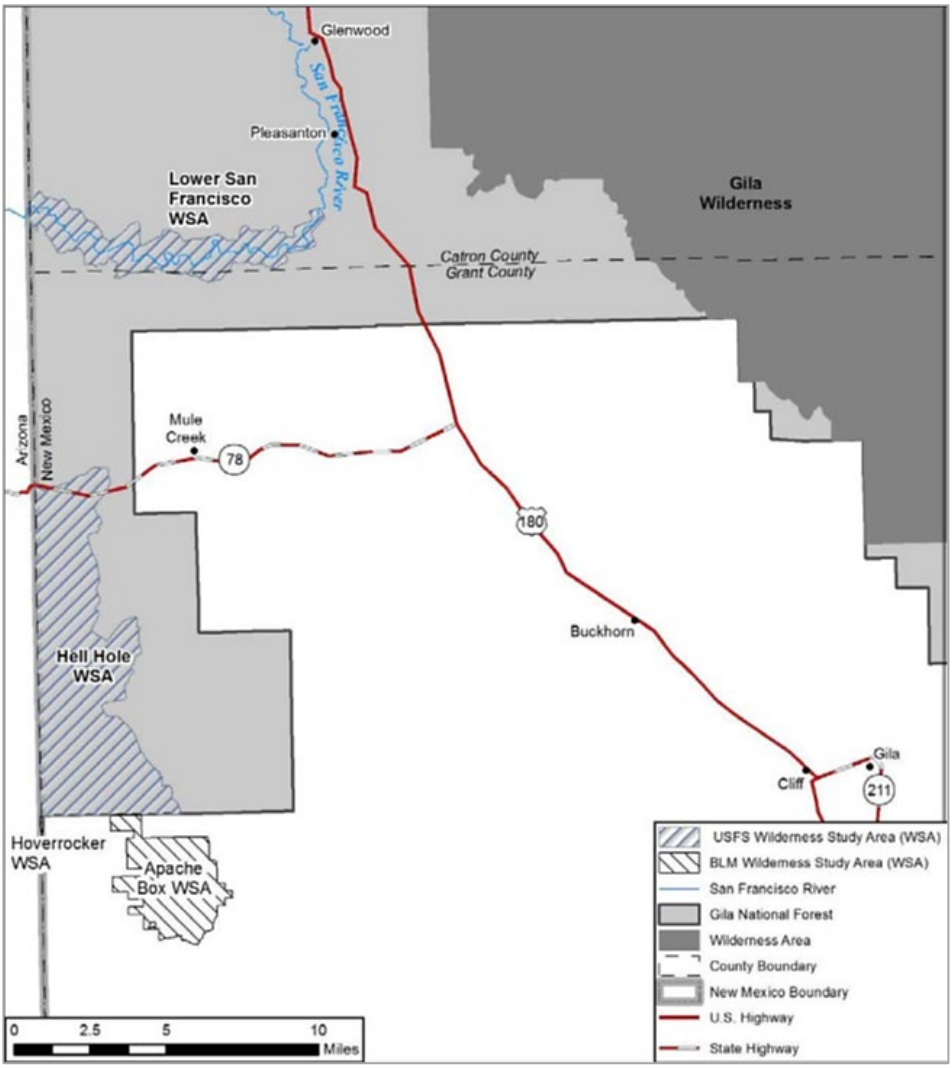


Figure 49. Wilderness study areas in the Gila National Forest

Each national forest undertaking forest plan revision under the 2012 Planning Rule is required to complete a process of identifying and evaluating lands that may be suitable for inclusion in the National Wilderness Preservation System (hereafter referred to as process), and determine whether to recommend any of the evaluated lands to Congress for wilderness designation. Congress reserves the authority to designate wilderness through legislation. Forest Service Handbook 1909.12 Chapter 70 provides direction and guidance for the four-step process to be completed as one part of the larger Plan Revision effort.

Because both WSAs were not acted upon by Congress to either designate or release them for other forest management, they have been reconsidered within the new forest planning cycle initiated by the current plan revision process. Each area met the criteria for being included in the broad and inclusive inventory of lands that may possess wilderness characteristics; therefore, they were also evaluated for the levels of wilderness characteristics that they possess.

The Gila NF staff analyzed all areas that possess wilderness characteristics, including the WSAs that may be suitable for inclusion in the National Wilderness Preservation System (see appendix F). Regardless of whether or not the responsible official (forest supervisor) recommends the WSAs to Congress for wilderness designation, the areas would continue to be managed as WSAs to maintain their wilderness character until Congress provides direction through legislation for their future management.

Hell Hole Wilderness Study Area

The 18,860-acre Hell Hole WSA is located south of the settlement of Mule Creek, New Mexico and its west boundary follows the state line between Arizona and New Mexico. State Hwy 78 bounds the area to the north, and a county road from Mule Creek south to the forest boundary forms the eastern boundary of the WSA.

The landscape of the south portion of Hell Hole is dominated by deep, rugged canyons, rocky peaks, and steep cliffs. The northern part of the WSA is primarily rolling hills. Vegetation varies greatly throughout the area with elevation and aspect. The presence of ponderosa pine in the WSA is somewhat unusual, as it is rather scarce in surrounding areas. The area lends itself to a variety of primitive recreation activities. The degree of difficulty and variety of conditions found in the WSA provide an adequate level of challenge regardless of user's skills. Current recreation activities are primarily hunting and viewing scenery and wildlife. There are no developed recreation sites or designated trails within the area. The present and expected future level of use of this area is low.

There are few internal roads in the Hell Hole WSA—most roads associated with this area are on the perimeter. The Travel Management decision (USDA FS Gila NF 2014b) reduced the total number of roads and mileage of roads, and prohibited cross-country travel. Traces of the undesignated routes will likely remain visible for a long time, especially those occurring on steep slopes subject to erosion and poor plant establishment.

The ecological condition of the WSA is similar to that of the Blue Range Wilderness. There have not been any large-scale disturbances within the WSA. Under the current ecological classification system used in this assessment, all of the Fremont Cottonwood/Oak riparian Ecological Response Unit acres in the Gila NF are located within this WSA. Non-native species may be present, but no surveys have been conducted in the area.

Lower San Francisco Wilderness Study Area

The 8,800-acre Lower San Francisco WSA is located west of U.S. Highway 180 near the town of Glenwood, New Mexico, and extends to the Arizona/New Mexico state line. The area is somewhat narrow and winding, tending to follow the rim of the river gorge. The Travel Management decision (USDA FS Gila NF 2014b) eliminated existing motorized routes within the WSA along the river to reduce the impacts to riparian and aquatic resources, but maintained public access via Big Dry Creek, with parking and camping opportunities available near the San Francisco River. There is also non-motorized access into the area from a trail that leads down into the gorge from a developed trailhead located west of U.S. 180 south of the WSA boundary.

Popular recreation activities in the WSA include hiking, picnicking, fishing, and hunting. In spring or during heavy monsoon rain seasons when the river is high enough, rafting and kayaking sometimes occur. Boaters typically put in above the San Francisco Hot Springs south of Glenwood and take out of the river at Martinez Ranch on the Apache Sitgreaves NFs in Arizona. The San Francisco River within the WSA is designated as critical habitat for both the loach minnow and spikedace. The native fishery within this reach of river has been severely degraded due to the dominance of nonnative species (J. Monzingo pers. obs.). Known infestations of saltcedar (*Tamarix* spp.) are scattered throughout the river corridor from the confluence of Whitewater Creek downstream to the Arizona border (K. Brown pers. obs).

The Tucson Electric Power powerline right-of-way is located in the Lower San Francisco WSA, and is periodically maintained under terms and conditions of a special-use permit, which includes helicopter access, use of roads, and vegetation management, all of which may be audible or visible to the recreating public.

Plan-Level Environmental Consequences

Analysis Methodology

Assumptions

- The existing, congressionally designated wilderness study areas are included in the forest plan revision process of identifying and evaluating lands that may be suitable for inclusion in the National Wilderness Preservation System, and determine whether to recommend any of the evaluated lands to Congress for wilderness designation. This process is described in detail in appendix F.
- Congress reserves the authority to designate wilderness through legislation.
- The Gila NF will continue to manage both WSAs designated by the 1980 New Mexico Wilderness Act to protect their wilderness characteristics until Congress provides additional direction by either designating these areas as wilderness, or by releasing them to other forest uses.

Analysis methodology consists of consideration of a diversity of information sources, including but not limited to, the Forest Service Planning Handbook 1909.12, Chapter 70, the completed inventory maps, evaluation report, and analysis step process documentation;, data from recent NVUM surveys; stakeholder input; and institutional knowledge of forest staff in all program areas. The potential differences in treatments within ERUs, as indicated by activities associated with vegetation management activities, by implementation of plan direction across all alternatives were used to consider effects to wilderness character and resources from those activities.

Effects Common to All Alternatives

Wilderness Characteristics

Under all alternatives, the Hell Hole and Lower San Francisco WSAs would continue to be managed to protect their wilderness characteristics, in alignment with direction of the 1980 New Mexico Wilderness Act. By prioritizing protection of their wilderness characteristics, these wilderness study areas would be managed in many respects similar manner to existing, designated wilderness until a decision is made by Congress as to whether they are to be added to the National Wilderness Preservation System. Congress reserves the authority to designate wilderness through legislation; the agency role in this process is only to recommend areas that are suitable, and protect or enhance the characteristics that made them so.

Because of these management requirements, implementation of any of the alternatives would have the positive effect of protecting or enhancing the wilderness characteristics of both WSAs. Protection of wilderness characteristics would have the effect of the areas continuing to be manageable as wilderness, making them suitable for inclusion in the National Wilderness Preservation System should Congress elect to designate them by passage of legislation.

Management of WSAs as directed under all alternatives would also result in many positive effects to the experiences of visitors seeking a wilderness-type of experience, such as protecting or improving upon solitude and the quality of primitive and unconfined recreation settings.

There will be positive direct effects of implementing any of these alternatives to the lands within the WSA boundaries that would include maintaining or improving soil, hydrologic, and atmospheric conditions prevailing at the time of recommendation.

The existing naturalness, uniqueness and representative ecosystems of these recommended wilderness areas would be maintained. Natural ecological processes would continue, including plant succession. Larger blocks of undeveloped land and reduction in open road density in wilderness study areas would favor area-sensitive and disturbance-sensitive species, thereby enhancing wilderness characteristics of apparent naturalness. Water quality and air quality should remain high. Evidence of human influence over natural conditions would not increase, and would instead diminish over time. However, under some circumstances there may be restoration of degraded conditions in wilderness study areas, such as non-native invasive species eradication or control. There may be some instances where visual and experiential contrasts between WSAs and forest lands managed for other uses would increase. Collectively, all of these outcomes would result in positive effects to the preservation and enhancement of the wilderness characteristics possessed by each area, as well as positive effects for the enjoyment of visitors seeking wilderness type experiences of solitude, primitive recreation, and a natural setting absent the influence of human intervention. Again, due to variances of which and how many areas are recommended, there is variation to the extent of the effects by alternative.

Non-motorized dispersed recreation activities such as hiking, horseback riding, camping, fishing, and hunting would continue experience positive effects because they would be enhanced by a setting with wilderness characteristics protected or enhanced as has been detailed.

Although varying levels of mineral development and its associated impacts to wilderness characteristics may occur in WSAs, Federal oil or gas leases or other Federal leasable minerals are currently non-existent in the Gila NF. Because it would in all likelihood result in detrimental effects to wilderness characteristics, administrative use of mineral materials would not be allowed. The

effects of the presence of mineral extraction and exploration include negative physical impacts to resources and degradation of wilderness characteristics by digging, earthmoving, removal of vegetation, and use of mechanical equipment, also resulting in degradation to the quality and availability of wilderness-type experiences to visitors to these areas.

Fish and Wildlife Management

New habitat improvements for fish and wildlife would only be created, or existing ones continue to be maintained, in WSAs when they are identified as the minimum action necessary to maintain characteristics by a minimum requirements analysis or due to requirements of other legislation. Therefore, any of these actions analyzed and approved by a minimum requirements analysis under any of these alternatives are likely to have only short-term or no negative effects, and no probable overall long-term positive effects to wilderness characteristics. Negative effects from wildlife improvement projects would include temporary degradation to wilderness characteristics of apparent naturalness and opportunities for solitude during physical construction work on habitat improvements.

Permitted Grazing

Because plan direction would place no restrictions or changes to existing grazing management by wilderness recommendation, by implementing any of these there would be no changes to existing operations. Grazing being permitted within WSAs is in line with congressional direction in the Wilderness Act, subsequent legislation, the Congressional Grazing Guidelines for Wilderness, Forest Service regulations and agency policy.

Regardless of the allowance for continued grazing, the existence of both range infrastructure as well as the visible effects of grazing and the presence of cattle on the landscape under all alternatives does have negative effects to wilderness characteristics.

The presence of cattle or the visible signs of grazing could have potential negative effects to recreation experiences of some WSA visitors, negatively impacting enjoyment of activities such as hunting, fishing, hiking, backpacking, and equestrian use. These effects may consist of uneasiness or displeasure created by the presence of cattle, which could also affect experiences of solitude by the presence of domestic animals in an otherwise isolated setting. There may also be conflicts when animals are blocking passage or present a collision hazard, negatively affecting visitor safety.

Other effects to WSA visitor experiences may include visible evidence of grazing on the landscape, such as the visible presence of cattle congregating in riparian areas and other scenic or environments susceptible to degradation, visible trampling of vegetation, muddying or compaction of soils, and the presence of cattle feces. Any of these visible disturbances could also have the effect of making some areas, campsites, or sections of trails unusable for some recreation uses. They may also affect the WSAs by requiring additional maintenance, repairs, and associated costs.

However, if WSAs are designated by Congress as wilderness, implementation of applicable wilderness law, regulation, and policy would then be required. The Congressional Grazing Guidelines for Wilderness would be mandated, and although limited motorized use would be permitted where warranted on a case-by-case basis, overall effects to wilderness character would be mitigated in these newly designated areas by comparison to effects of grazing to wilderness characteristics during their status as WSAs.

Visitation

Current visitation to the Gila NF is considered to be at manageable levels. Potential impacts common to all alternatives that may occur due to any significant increases of visitation above current levels include negative effects to visitor experiences due to overcrowding in some recommended wilderness areas, potential damage to wilderness characteristics from overuse, and conflicts between users.

NVUM survey results indicate a trend of visitor use increasing to congressionally designated wilderness, and this trend is likely to both continue and also apply to many areas recommended for designation, especially the more scenic areas with existing trail access. Potential negative effects common to that are associated with increased visitation include degradation of wilderness characteristics, including visitor experiences due to effects to opportunities for solitude.

The impacts of increased visitation within WSAs include degradation of visitor experiences dependent upon wilderness characteristics. Actual or perceived overcrowding can affect visitor perceptions of solitude, or the experience of being alone and removed from civilization. Resource damage from increased use can affect the apparent naturalness, and necessary management actions to rehabilitate or prevent additional impacts may affect undeveloped qualities and manageability to protect wilderness characteristics.

Facilities and Level of Development

In WSAs, limited administrative motorized equipment use d for fire management, emergencies involving human health and safety, or by written permission of the forest supervisor or designated agent would be allowed until Congress acts upon the agency's recommendations to either return the area for other forest uses, or add it to the National Wilderness Preservation System. This would have positive effects in the form of enhancement to visitor safety, fire management, and the physical condition and availability for use of trails and other settings for recreation use when permission is granted for motorized administrative trail restoration following fire or other catastrophic damage. However, such administrative actions would at least temporarily impact wilderness characteristics of apparent naturalness and opportunities for solitude due to the sights and sounds of motorized equipment, also degrading visitor experiences dependent upon wilderness characteristics.

Absent permission by the forest supervisor or authorized agent to address special circumstances such as catastrophic fire damage or post-fire flooding, and if any areas recommended should subsequently be designated by Congress as wilderness, maintenance of trails and infrastructure would be required to be accomplished using hand tools and administrative access would only be made using non-mechanized and non-motorized means, unless a minimum requirements analysis determines appropriate action otherwise. This would not result in degradation of trail physical conditions, availability of use, or enjoyment by visitors in most instances because the required maintenance tasks would still be accomplished using hand tools and tradition skills. It is possible in circumstances of extreme disturbances that affect a large number of trails all at once that restoration work could be delayed by requirements to use non-motorized equipment. In most cases the use of primitive tools would have positive effects to the continued institutional training and experience with traditional wilderness skills. By not using motorized equipment, wilderness characteristics of recommended wilderness would be enhanced.

Prescribed Fire, Wildfires, Timber Sales and Mechanical Vegetation Treatments of Restoration Projects

Fire management would continue with appropriate measures and best management practices to protect wilderness characteristics of WSAs. Fire suppression of all human-caused wildfires would serve to minimize the potential negative effects of degradation of wilderness characteristics. In emergency situations, mechanized equipment and motorized transport, use of helicopters, air tankers and other aircraft may be approved. These actions would impact wilderness character and visitor experiences and leave evidence of human intervention, although best management practices and rehabilitation efforts would help to reduce those impacts afterward. Suppression of uncharacteristic fire would benefit wilderness characteristics by preventing degradation to apparent naturalness by the occurrence of fire intensities outside the known historic range of variability.

Naturally ignited fires, when allowed for resource benefit, would benefit WSAs wilderness characteristics by reducing fuel loading to acceptable levels, and maintaining fire-dependent vegetation. Negative impact to air quality, visual aesthetics, and possibly water quality within WSAs would be short term.

Reduction of hazardous fuels can have negative effects to WSA wilderness characteristics in the form of undesirable changes in vegetation types, impacts to visitor experiences, water quality, and wildlife habitat. However, it can also provide positive effects by reducing fuel loadings to acceptable levels and allowing naturally ignited fires to play their natural role in the ecosystem.

Typically, impacts from large, high-severity wildfires may cause greater damage with a longer duration of effect. Impacts from wildfires to WSA facilities and trails that may occur across all alternatives include temporary area and trail closures during the incident and post-fire effects of infrastructure damage. Areas within and surrounding large fires typically experience more intense and frequent flooding. Other impacts or damages include landslides, dead trees falling on or within facilities and trails, encroaching nuisance vegetation, erosion, extended closures due to hazardous conditions, and silting in of available water sources.

Because the restrictions imposed on WSAs to protect wilderness characteristics would limit the use of motorized and mechanized equipment and mechanical restoration treatments, these are unlikely to have any direct effects under alternatives 2 through 5. Prescribed burning for fire management purposes, and managing wildfires to meet resource objectives are allowable in recommended wilderness, and therefore would also have no negative effects related to WSA wilderness characteristics.

Motorized Access and Motorized Recreation

Changes to the forest transportation system would be as a result of updates to the current Travel Management decision or other project-level planning. Implementation of all analyzed alternatives would provide for existing and future access to the forest recreation resources and opportunities to continue.

Under all alternatives, motorized vehicle access to the forest, both for motorized recreation and to access for other recreation pursuits, would continue to be designated and managed in accordance with the forest-wide travel management process implemented by the Travel Management Rule, and is not a forest plan decision. Therefore, there would be no effects to motorized access and motorized recreation by the management of WSAs under any alternatives.

Emerging Trends

There is a growing interest in adventure races and similar events such as boot camps, mud events, and endurance races. These events are usually held under a special-use permit by "for profit" organizations, although some are conducted as fundraisers. The activities associated with these recreation events may include: running, bicycling, paddling, climbing, orienteering, and other activities that require endurance, strength and agility.

Because races and recreation events are not consistent with protection of wilderness characteristics, they are not likely to be permitted within WSAs. However, there could be effects to wilderness characteristics due to such activities occurring in adjacent or nearby areas. There may also be effects associated with temporary, increased visitation due to displacement from areas where the events are being held. Negative effects of these outcomes could include degradation of resources that cause a corresponding degradation to wilderness characteristics, and negative impacts to visitor enjoyment of recreation experiences due to perceived crowding caused by displacement of visitors from race events, and negative perceptions of degraded wilderness characteristics.

Alternative 1 – 1986 Forest Plan

This is the no-action alternative that analyzes effects if no changes were made to the previous forest plan (as amended); consequently the Hell Hole and Lower San Francisco WSAs areas would not be recommended as wilderness. However, both areas would continue to be managed to protect their wilderness characteristics as required by the New Mexico Wilderness Act of 1980. Protection of wilderness characteristics would result in the WSAs continuing to be manageable as wilderness, making them suitable for inclusion in the National Wilderness Preservation System, should Congress elect to designate them by passage of legislation.

Effects Common to Alternatives 2 through 5

Alternatives 2 through 5 include desired conditions and guidelines to enhance protection of wilderness characteristics of areas recommended for designation as wilderness; unless and until Congress provides direction otherwise, this plan direction will also be applied to both wilderness study areas, regardless of whether they are recommended to Congress for designation, in alignment with previously described direction of the 1980 New Mexico Wilderness Act.

Because of these management requirements, and the included plan direction that would facilitate it, implementation of any of alternatives 2 through 5 would have the positive effect of protecting or enhancing the wilderness characteristics of both WSAs. Protection of wilderness characteristics would have the effect of the areas continuing to be manageable as wilderness, making them suitable for inclusion in the National Wilderness Preservation System, should Congress elect to designate them by passage of legislation.

Effects Common to Alternatives 4 and 5

Recommended Wilderness

Under alternatives 4 and 5, the Lower San Francisco River WSA is part of 14,746 acres (alternative 4) and 21,018 acres (alternative 5) of evaluated area G6 that is recommended to Congress for inclusion in the National Wilderness Preservation System. Under these alternatives, the additional acres surrounding the WSA would be managed for the protection and enhancement of their wilderness characteristics, which could enhance wilderness character of the existing WSA. This would increase the overall area (including both the WSA and recommended addition) that would be

managed to limit development, and could protect or enhance opportunities for solitude or a primitive and unconfined recreation. Together, these areas would be managed in a similar manner as designated wilderness to maintain their wilderness characteristics, resulting in continued and expanded wilderness recreation opportunities for hikers and equestrians and enhanced backcountry camping opportunities.

Effects of recommending the surrounding area as wilderness include enhancement of the wilderness character of the existing, WSA. Any existing ML 1 roads in recommended areas adjacent to existing WSA that is not cherry-stemmed from recommended boundaries would be rehabilitated or allowed to gradually deteriorate and return to a natural state.

On some occasions, there may be restoration of damaged resources in the recommended wilderness (such as non-native invasive species eradication or control) surrounding the WSA. Visual and experiential contrasts between recommended wilderness and other national forest lands would likely enhance wilderness characteristics in the adjacent designated WSA.

If the recommended area including the Lower San Francisco WSA should subsequently be designated by Congress as wilderness, maintenance of trails and infrastructure would be then be required to be accomplished using hand tools and administrative access would be made using non-mechanized and non-motorized means under most circumstances, unless a minimum requirements analysis determines otherwise. This would not result in degradation of trail physical conditions, availability of use, or enjoyment by visitors in most instances, because the required maintenance tasks would still be accomplished. It is possible in circumstances of extreme disturbances that affect a large number of trails all at once that restoration work could be delayed by requirements to use non-motorized equipment. In most cases, the use of primitive tools would have positive effects to the continued institutional training and experience with traditional wilderness skills. By not using motorized equipment, wilderness character of designated wilderness would be enhanced.

Alternative 5

Recommended Wilderness

Alternative 5 includes both the previously mentioned G6 evaluated area recommended at 21,018 acres, and the 19,623 G7 evaluated area, including the Hell Hole WSA. Effects to WSAs by recommendation to Congress for inclusion in the National Wilderness Preservation System are the same as those described previously and in the section for Recommended Wilderness for all forest lands recommended.

Cumulative Effects

Cumulative effects for wilderness study areas, recommended wilderness, and inventoried roadless areas are analyzed with cumulative effects for congressionally designated wilderness.

Herbicide-Use Environmental Consequences

The following discussion of environmental consequences addresses the effects of the herbicide-use alternatives on recommended wilderness and wilderness study areas.

Effects of Herbicide-Use Alternative A-No Action

This alternative would allow only limited herbicides and the noxious weed species as approved based on the 2000 forest-level decision, and the current effects of invasive plants and their treatment

to wilderness characteristics within recommended wilderness and WSAs would continue. Many current invasive species populations are located in areas where uses are concentrated and the ground is disturbed. With limited treatment options under this alternative, any current infestations are likely to continue to multiply, particularly in disturbed areas.

If invasive and noxious weeds multiply throughout WSAs, they would replace native plants with invasive species. Where invasive species dominate, they likely would not appear natural, would be visually evident even to the casual observer, and may not be visually subordinate to the characteristic landscape. As invasive plants multiply, many areas of recommended wilderness and WSAs would likely see degradation to the wilderness characteristic of apparent naturalness. Any current infestations of invasive species along roads and at trailheads are likely to facilitate introduction of new populations in recommended wilderness and WSAs, similarly degrading wilderness characteristics, and therefore, degrading the quality and availability of wilderness-type experiences dependent upon apparent naturalness.

Effects Common to All Herbicide-Use Action Alternatives

All of these alternatives include the use of manual removal and herbicide treatments as invasive and noxious weed control methods. By implementing each of these alternatives, there would be common effects to the wilderness characteristics of recommended wilderness and WSAs as a result, although these effects will vary by their likely frequency, location, and magnitude across the alternatives and this will be addressed separately for each.

Use of herbicides by implementation of any of these alternatives could result in degradation to the wilderness characteristic of apparent naturalness, due to visible evidence of dyes and the presence of dead and dying plants. However, use of herbicides has a high potential to improve long-term wilderness characteristics by eradicating and restoring native vegetation. Dyes used with herbicides would fade and be gone within a few days. As plants die from herbicides, they wilt and turn brown, and the plants generally become smaller than surrounding native plants. In the fall, as native plants turn brown, treated plants may not be as distinguishable from native plants, and by the following spring could be unnoticeable.

However, this type of treatment will generally only occur in recommended wilderness and WSAs when herbicide use is informed by a minimum requirements determination that it is the minimum tool required to manage the area in alignment with the New Mexico Wilderness Act of 1980 and the 2012 Planning Rule. In most instances, a minimum requirements analysis determination that herbicide is the appropriate minimum tool necessary will be benefit to overall wilderness characteristics outweighing a relatively short-term impact.

The likelihood of frequency and magnitude of effects from use of herbicide to wilderness characteristics varies due to differences in application criteria between the alternatives, and that will be addressed separately by each. However, the effects are common across the alternatives, and include short-term degradation to apparent naturalness, which may also result in short-term degradation to visitor experiences. Positive long-term effects include improvement of overall wilderness characteristics by enhancement of the apparent naturalness of the area, which will also improve visitor experiences long after short-term negative effects cease.

Some manual treatment methods cause ground disturbance that could affect the wilderness characteristic of apparent naturalness. Minor soil disturbance may be expected in small areas where noxious weeds are found, as the current conditions indicate generally patchy distribution of noxious

weeds in the Gila NF. Manual treatments may result in an unnatural appearance if parts of the plants remain on site. These treatments by themselves may only contain noxious weed populations, and may need to be repeated unless other treatment methods are also used, causing degradation to apparent naturalness to persist. Manual treatment methods may not be effective, and wilderness characteristics could continue to be degraded.

Because manual treatments often require multiple treatments annually, impacts of ground disturbance to wilderness characteristics would be extended over a greater period of time. However, this could be somewhat mitigated in comparison to herbicide use, because dead and dying plants will not be visually evident by the end of the growing season.

Under all treatment methods, the degree of effects to wilderness characteristics would depend on the size and density of the treated invasive plant infestation. Effects would primarily occur in small patches interspersed with native vegetation, and treatments would not likely be noticeable for more than several weeks. Larger patches may be present in open, dry areas. Backpack spraying over significantly sized areas could result in concentrated short-term degradation of wilderness characteristics, but these areas are already negatively affected by the presence of noxious weeds. Short-term impacts could be offset by long-term improvement of wilderness characteristics by restoration of native vegetation.

Solitude and primitive recreation experiences may be degraded and recommended wilderness or WSA visitors may be inconvenienced by treatments through the presence of warning signs, noise, smells, and possibly short-term area closures degrading availability of areas for use. These short-term wilderness characteristics and experiential impacts, usually a few days in duration, could be offset by long-term restoration of native plant populations, improving wilderness characteristics and visitor experiences. Other social impacts may include the degradation or loss of availability for use for visitors uncomfortable or fearful of the perceived health effects of herbicides. Effects to human health are covered in Social and Economic Conditions section.

Effects of Alternative B

The effects from this alternative would include all areas likely to be treated for noxious weeds, except native vegetation for restoration and fuels reduction would not be implemented in recommended wilderness and WSA areas. The effects that are described as common to all alternatives are only likely to occur in areas that may be treated for noxious/non-native species.

Effects of Alternative C

The effects from this alternative would not include any areas treated for native species, and therefore, the effects that are described as common to all alternatives are only likely to occur in areas that may be treated for noxious/non-native species.

Effects of Alternative D

This alternative would restrict herbicide applications for woody re-sprouting species to the urban interface, which under most circumstances is not likely to be applicable to areas within congressionally designated wilderness study areas, and recommended wilderness. The effects that are described as common to all alternatives are only likely to occur in areas that may be treated for noxious/non-native species.

Cumulative Effects

Cumulative effects to WSAs are described under Wilderness Cumulative Effects along with other similarly managed areas.

Recommended Wilderness

Affected Environment

Introduction

Currently, no recommended wilderness areas in the Gila NF have been carried forward from previous planning cycles. The 1986 forest plan declined to recommend two wilderness study areas (WSAs) that were designated by Congress in the 1980 New Mexico Wilderness Act and studied by the forest as directed to determine their suitability for inclusion in the National Wilderness Preservation System.

For more information on Gila NF WSAs, see the Wilderness Study Areas section.

Inventory and Evaluation for Wilderness Characteristics, Analysis by Alternative, and Recommendation

Each national forest undertaking forest plan revision under the 2012 Planning Rule is required to complete a process of identifying and evaluating lands that may be suitable for inclusion in the National Wilderness Preservation System and determine whether to recommend any of the evaluated lands to Congress for wilderness designation. Congress reserves the authority to designate wilderness through legislation. Forest Service Handbook 1909.12 Chapter 70 provides direction and guidance for the four-step process to be completed as one part of the larger Plan Revision effort:

1. **Inventory** to identify all National Forest System lands in the plan area that may have wilderness characteristics as defined in the Wilderness Act
2. **Evaluation** of the wilderness characteristics possessed by the lands identified in the inventory step of the process
3. **Analysis** of the evaluated areas that are determined to be potentially suitable for inclusion in one or more alternatives as part of the forest plan revision NEPA process
4. **Recommendation** of any lands determined by the forest supervisor (responsible official) that should be included in the National Wilderness Preservation System. Only Congress may designate wilderness

The Gila NF has undertaken this process as a part of the overall plan revision process. In the inventory step of the process, 100 areas totaling 1,271,576 acres met the criteria for being carried forward to the Evaluation of wilderness characteristics. During the evaluation, 63 areas totaling 827,475 acres were found to have some level or wilderness characteristics. The ranking for the level of wilderness characteristics each area possessed is one of many factors considered during the analysis of plan alternatives.

Of the areas in the Gila NF that were inventoried and evaluated for wilderness characteristics, all contained part or all of a number of the IRAs designated under the 2001 Roadless Area Final Planning Rule. See the section on IRAs for more information on IRA designation.

For a complete description of the overall process steps and results, see Appendix F – Documentation of the Wilderness Inventory and Evaluation Process. Any areas that are to be recommended to Congress for inclusion in the National Wilderness Preservation System by the responsible official

(forest supervisor) will be identified in the Record of Decision for the Revised Forest Plan Final Environmental Impact Statement (FEIS).

Plan-Level Environmental Consequences

Analysis Methodology

Assumptions

- The Gila NF staff evaluated areas that may be suitable for inclusion in the National Wilderness Preservation System (see appendix F for process documentation). Based on this information, the planning team considered alternatives with varying amounts of recommended wilderness.
- Areas recommended for wilderness designation would be managed as to maintain their wilderness characteristics until they either added to the National Wilderness Preservation System or directed to be managed for other uses by congressional action.
- The completed evaluation report is just one factor that will inform the forest supervisor's selection of which areas, or modified areas, are to be analyzed in each of the forest plan revision environmental impact statement (EIS) alternatives.
- Public comments will also be an important consideration for the analysis, modification, and inclusion of recommended areas in the proposed action alternative. Justification for any evaluated area not included and analyzed in any of the alternatives will be included in the EIS.

Analysis methodology consists of consideration of a diversity of information sources, including but not limited to, the Forest Service Planning Handbook 1909.12, Chapter 70, the completed inventory maps, evaluation report, analysis step process documentation, data from recent NVUM surveys, stakeholder input, and institutional knowledge of forest staff in all program areas. The potential differences in treatments within ERUs as indicated by activities associated with vegetation management activities, by implementation of plan direction across all alternatives, were used to consider effects to wilderness character and resources from those activities.

Alternative 1 – 1986 Forest Plan

This is the no-action alternative that analyzes effects if no changes were made to the previous forest plan (as amended); consequently, no new areas would be recommended as wilderness, and therefore, there is no need to develop analysis criteria for this alternative. Additionally, it should be noted that under the 1986 forest plan, both the Hell Hole and Lower San Francisco River WSAs were not recommended to Congress to be designated as wilderness, and so are not recommended to Congress for designation as wilderness under this alternative.

Environmental Consequences Common to Alternatives 2 Through 5

Wilderness Characteristics

Alternatives 2 through 5 include desired conditions and guidelines to enhance protection of wilderness characteristics of areas recommended for designation as wilderness. This direction is not addressed in existing 1986 forest plan direction, because there were no areas recommended as wilderness by that planning process. Recommendation of areas for congressional designation as wilderness would create a mandate for the forest to manage these areas to or enhance existing wilderness characteristics (apparent naturalness, outstanding opportunities for solitude or a primitive

and unconfined type of recreation, manageability to protect wilderness characteristics, and other features of value).

By prioritizing protection of their wilderness characteristics, these recommended areas would be managed in a manner similar to existing, designated wilderness until Congress determines whether they are to be added to the National Wilderness Preservation System. Congress reserves the authority to designate wilderness through legislation; the agency role in this process is only to recommend areas that are suitable, and then to protect or enhance the characteristics that made them so.

Because of these management requirements, and the included plan direction that would facilitate it, implementation of any of alternatives 2 through 5 would have the positive effect of protecting or enhancing the wilderness characteristics of all areas recommended. Protection of wilderness characteristics would have the direct effect of the areas continuing to be manageable as wilderness, making them suitable for inclusion in the National Wilderness Preservation System should Congress elect to designate them by passage of legislation.

Management of areas as recommended wilderness as directed under all alternatives would also result in many positive effects to the visitor experiences of visitors seeking a wilderness-type of experience, such as improving upon solitude and the quality of primitive and unconfined recreation settings. However, the number of acres, and therefore, the actual magnitude of these positive effects will vary by alternative, and will receive individual consideration by alternative in this analysis.

There will be positive effects of implementing any of these alternatives to the lands within the recommended area boundaries of that alternative that would include maintaining or improving soil, hydrologic, and atmospheric conditions prevailing at the time of recommendation. The existing naturalness, uniqueness and representative ecosystems of these recommended wilderness areas would be maintained. Natural ecological processes would continue, including plant succession. Larger blocks of undeveloped land and reduction in open road density in areas recommended for wilderness designation would favor area-sensitive and disturbance-sensitive species, thereby enhancing wilderness characteristics of apparent naturalness. Any existing roads in recommended wilderness would have been closed at the time of the inventory, evaluation, analysis and recommendation process; following recommendation they will either be rehabilitated, or allowed to gradually return to a natural state. Water quality and air quality should remain high. Evidence of human influence over natural conditions would not increase, and would instead diminish over time. However, under some circumstances there may be restoration of degraded conditions in recommended wilderness, such as non-native invasive species eradication or control. There may be some instances where visual and experiential contrasts between recommended wilderness and forest lands managed for other uses would increase. Collectively, all of these outcomes would result in positive effects to the preservation and enhancement of the wilderness characteristics possessed by each area, as well as positive effects for the enjoyment of visitors seeking wilderness type experiences of solitude, primitive recreation, and a natural setting absent the influence of human intervention. Again, due to variances of which and how many areas are recommended, there is variation to the extent of the effects by alternative.

Non-motorized dispersed recreation activities such as hiking, horseback riding, camping, fishing, and hunting would continue experience positive effects because they would be enhanced by a setting with wilderness characteristics protected or enhanced as has been detailed.

Research (Wilderness Society 2004; Bowker et al 2005; Rasker et al. 2013) indicates that there are likely economic benefits to surrounding communities due to nearby areas being designated by

Congress as wilderness, and that there is no evidence that it causes a loss of local employment (Duffy-Deno 1998). Recommended wilderness could be beneficial to the creation of employment related to visitation, including visitor services such as lodging, food and providing other amenities. However, to what extent, if any, wilderness recommendation in the Gila could have to local economies is not foreseeable.

Although varying levels of mineral development and its associated impacts to wilderness characteristics may occur in recommended wilderness under some alternatives, Federal oil or gas leases or other Federal leasable minerals are currently non-existent in the Gila NF. Administrative use of mineral materials would not be allowed because they would impair the wilderness characteristics that must be protected or enhanced by legal mandate. The effects of the presence of mineral extraction and exploration within recommended wilderness include negative physical impacts to resources and degradation of wilderness characteristics by digging, earthmoving, removal of vegetation, and use of mechanical equipment, also resulting in degradation to the quality of wilderness-type experiences to visitors to these areas.

Congressionally Designated Wilderness

Under alternatives 2 through 5, some areas either directly adjacent to, or near existing wilderness would be recommended to Congress for designation as wilderness. The areas recommended, as well as the size and boundary orientation for individual areas, varies widely by alternative. The effects to existing, designated wilderness by areas managed as recommended wilderness are common, but vary by location and degree by alternative due to the variation of actual areas recommended, as well as their size and boundary orientation by alternative. The draft plan direction for recommended wilderness would protect the values that make the area suitable for wilderness designation. Management strategies for recommended wilderness may affect recreation opportunities and experiences within these areas.

Recommended wilderness would be managed for protection of the wilderness characteristics (apparent naturalness, opportunities for solitude or a primitive and unconfined type of recreation, manageability to protect wilderness characteristics, and other features of value where they exist) that they possess at the time of recommendation. Because of this, these areas would be managed very similar to designated wilderness until Congress makes a final determination as to whether the areas are to be added to the National Wilderness Preservation System.

Areas of existing, designated wilderness that experience visitor use impacts to resources and wilderness experiences could see a reduction of such degradation as a result of increased availability of settings for wilderness-type uses available across a larger area. These impacts may include visible damage such as trampling or denuding of vegetation, compaction and muddying of soils and riparian areas, and excessive establishment of campsites and development of fire rings by visitors. Recommendation of areas for wilderness designation may attract use that would otherwise occur in designated wilderness, dispersing use across a larger area and reducing the visibility and prevalence of use impacts, also resulting an increase in wilderness visitor satisfaction.

Recommending areas adjacent to existing designated wilderness could enhance wilderness character of the existing area, because even without congressional designation, the recommended addition would be similarly managed to protect its wilderness characteristics. This would increase the overall area (including both the wilderness and recommended addition) managed to limit development, and protect or enhance opportunities for solitude or a primitive and unconfined recreation. These recommended areas would be managed in a similar manner as designated wilderness to maintain

their wilderness characteristics, resulting in continued and expanded wilderness recreation opportunities for hikers and equestrians and enhanced backcountry camping opportunities.

Connectivity for native wildlife and vegetation would likely be substantially enhanced between the large protected areas in the Gila NF by the increased size of the existing wilderness complex under implementation of these alternatives. Such habitat connectivity is important to maintaining wildlife corridors and bird migration routes within these relatively undeveloped areas, as well as similar areas to the west in Arizona. The increased connectivity could benefit species richness and abundance, and have positive effects to wilderness characteristics by preserving and enhancing naturalness within the recommended areas.

Direct effects of recommended wilderness include enhancement of the wilderness character of the immediately adjacent existing, wilderness areas, though this will vary in significance by alternative. Any existing ML 1 roads in recommended areas adjacent to existing wilderness not cherry-stemmed from recommended boundaries would be closed and rehabilitated, or allowed to return to natural state.

On some occasions, there may be restoration of damaged resources in the recommended wilderness (such as non-native invasive species eradication or control) adjacent to existing wilderness. Visual and experiential contrasts between recommended wilderness and other national forest lands would positively affect wilderness character in the adjacent designated wilderness areas.

If any areas recommended should subsequently be designated by Congress as wilderness, maintenance of trails and infrastructure would be then be required to be accomplished using hand tools and administrative access would be made using non-mechanized and non-motorized means under most circumstances, unless a minimum requirements analysis determines otherwise. This would not result in degradation of trail physical conditions, availability of use, or enjoyment by visitors in most instances, because the required maintenance tasks would still be accomplished. It is possible in circumstances of extreme disturbances that affect a large number of trails all at once that restoration work could be delayed by requirements to use non-motorized equipment. In most cases, the use of primitive tools would have positive effects to the continued institutional training and experience with traditional wilderness skills, which would result in positive effects to maintaining wilderness character in wilderness. By not using motorized equipment, wilderness character of adjacent and nearby designated wilderness would also be enhanced.

Fish and Wildlife Management

New habitat improvements for fish and wildlife would only be created, or existing ones continue to be maintained, in recommended wilderness when they are identified as the minimum action necessary by a minimum requirements analysis or similar process to analyze the effects to wilderness characteristics. Fish stocking in these areas would be restricted to reestablishment or maintenance of indigenous, threatened, endangered or native species. Therefore, any of these actions analyzed and approved by a minimum requirements analysis under any of these alternatives are likely to have only short-term or no negative effects, and no probable overall long-term positive effects to wilderness characteristics. Negative effects from wildlife improvement projects would include temporary degradation to wilderness characteristics of apparent naturalness and opportunities for solitude during physical construction work on habitat improvements.

Permitted Grazing

Because plan direction under alternatives 2 through 5 would place no restrictions or changes to existing grazing management by wilderness recommendation, by implementing any of these there would be no changes to existing operations. Grazing being permitted within recommended wilderness is in line with congressional direction in the Wilderness Act, subsequent legislation, the Congressional Grazing Guidelines for Wilderness, Forest Service regulations and agency policy.

Regardless of the allowance for continued grazing, the existence of both range infrastructure as well as the visible effects of grazing and the presence of cattle on the landscape under all alternatives does have negative effects to wilderness characteristics. These effects are common, although the actual areas that would be managed for protection of wilderness characteristics would vary by alternative.

The presence of cattle or the visible signs of grazing could have potential negative effects to recreation experiences of some forest visitors, negatively impacting enjoyment of recreational activities such as hunting, fishing, hiking, backpacking, and equestrian use. These effects may consist of uneasiness or displeasure created by the presence of cattle, which could also affect experiences of solitude by the presence of domestic animals in an otherwise isolated setting. There may also be conflicts when animals are blocking passage or present a collision hazard, negatively affecting visitor safety.

Other effects to recommended wilderness visitor experiences may include visible evidence of grazing on the landscape, such as the visible presence of cattle congregating in riparian areas and other scenic or environments susceptible to degradation, visible trampling of vegetation, muddying or compaction of soils, and the presence of cattle feces. Any of these visible disturbances could also have the effect of making some areas, campsites, or sections of trails unusable for some recreation uses. They may also affect the recommended wilderness areas by requiring additional maintenance, repairs, and associated costs.

However, if any recommended areas are designated by Congress as wilderness, implementation of applicable wilderness law, regulation, and policy would then be required. The Congressional Grazing Guidelines for Wilderness would be mandated, and although limited motorized use would be permitted where warranted on a case-by-case basis, overall effects to wilderness character would be mitigated in these newly designated areas by comparison to effects of grazing to wilderness characteristics during their status as recommended wilderness.

Visitation

Current visitation to the Gila NF is considered to be at manageable levels. Potential impacts common to all alternatives that may occur due to any significant increases of visitation above current levels include negative effects to visitor experiences due to overcrowding in some recommended wilderness areas, potential damage to wilderness characteristics from overuse, and conflicts between users.

NVUM survey results indicate a trend of visitor use increasing to congressionally designated wilderness, and this trend is likely to both continue and apply to many areas recommended for designation, especially the more scenic areas with existing trail access. Some recommended wilderness areas may be more difficult to access, and would be less likely see a change in visitation. Potential negative effects common to alternatives 2 through 5 that are associated with increased visitation include degradation of wilderness characteristics, including visitor experiences due to effects to opportunities for solitude.

The impacts of increased levels of visitation within recommended wilderness include degradation of visitor experiences dependent upon wilderness characteristics. Actual or perceived overcrowding can affect visitor perceptions of solitude, or the experience of being alone and removed from civilization. Resource damage from increased use can affect the apparent naturalness, and necessary management actions to rehabilitate or prevent additional impacts may affect undeveloped qualities and manageability to protect wilderness characteristics.

Facilities and Level of Development

In all recommended wilderness areas, limited administrative motorized equipment use will be allowed for fire management, emergencies involving human health and safety, or by written permission of the forest supervisor or designated agent would be allowed until Congress acts upon the agency's recommendations to either return the area for other forest uses, or add it to the National Wilderness Preservation System. This would have positive effects to visitor safety, fire management, and the condition and availability for use of trails and other settings for recreation use when permission is granted for motorized administrative trail restoration following fire or other catastrophic damage. However, such administrative actions would at least temporarily impact wilderness characteristics of apparent naturalness and opportunities for solitude due to the sights and sounds of motorized equipment, also degrading visitor experiences dependent upon wilderness characteristics.

Maintenance of trails and infrastructure would be in some instances be accomplished using hand tools and administrative access would mostly be accomplished using non-mechanized and non-motorized means, unless it may be accomplished without impairment to wilderness characteristics. This would not result in degradation of trail physical conditions, availability of use, or enjoyment by visitors in most instances because the required maintenance tasks would still be accomplished. In most cases, the more frequent use of primitive tools would have positive effects to the continued institutional training and experience with traditional wilderness skills. In instances were maintenance tasks or administrative access is accomplished without the use of motorized equipment, wilderness characteristics of recommended wilderness would likely be better preserved or enhanced.

Prescribed Fire, Wildfires, Timber Sales and Mechanical Vegetation Treatments of Restoration Projects

Fire management would continue with appropriate measures and best management practices to protect wilderness characteristics of recommended wilderness. Fire suppression of all human-caused wildfires would serve to minimize the potential negative effects of degradation of wilderness characteristics. In emergency situations, mechanized equipment and motorized transport, use of helicopters, air tankers and other aircraft may be approved by the forest supervisor or regional forester. These actions would impact wilderness character and visitor experiences and leave evidence of human intervention, although best management practices and rehabilitation efforts would help to reduce those impacts afterward. Suppression of uncharacteristic fire would benefit wilderness character by preventing degradation to apparent naturalness by the occurrence of fire intensities outside the known historic range of variability.

Naturally ignited fires, when allowed for resource benefit, would benefit recommended wilderness characteristics by reducing fuel loading to acceptable levels, and maintaining fire-dependent vegetation. Negative impact to air quality, visual aesthetics, and possibly water quality within recommended wilderness would be short-term.

Reduction of hazardous fuels can have negative effects to recommended wilderness characteristics in the form of undesirable changes in vegetation types, impacts to visitor experiences, water quality, and wildlife habitat. However, it can also provide positive effects by reducing fuel loadings to acceptable levels and allowing naturally ignited fires to play their natural role in the ecosystem.

Typically, the impacts from large, high-severity wildfires may cause greater damage with a longer duration of effect. These impacts from wildfires to recommended wilderness facilities and trails that may occur across implementation of all alternatives include temporary area and trail closures during the incident and post-fire effects of infrastructure damage. Areas within and surrounding large fires typically experience more intense and frequent flooding. Other impacts or damages include landslides, dead trees falling on or within facilities and trails, encroaching nuisance vegetation, erosion, extended closures due to hazardous conditions, and silting in of available water sources.

Because the restrictions imposed on recommended wilderness to protect wilderness characteristics would limit the use of motorized and mechanized equipment and mechanical restoration treatments, these are unlikely to have any direct effects under alternatives 2 through 5. Prescribed burning for fire management purposes, and managing wildfires to meet resource objectives are allowable in recommended wilderness, and therefore, would also have no negative effects related to recommended wilderness.

Motorized Access and Motorized Recreation

Changes to the forest transportation system would be as a result of updates to the current Travel Management decision or other project-level planning. Implementation of all analyzed alternatives would provide for existing and future access to the forest recreation resources and opportunities to continue, although there would be variables affecting the short-term quality and availability of motorized access between alternatives.

Under alternatives 2 through 5, motorized vehicle access to the forest, both for motorized recreation and to access for other recreation pursuits, will continue to be designated and managed in accordance with the forest-wide travel management process implemented by the Travel Management Rule, and is not a forest plan decision.

Recommended wilderness would not result in reduced motorized vehicle access for mobility-impaired individuals due to elimination from consideration during the inventory and evaluation steps of the process of areas currently open to motorized use under the travel management decision. However, use of wheelchairs (as defined in the Americans with Disabilities Act) will be allowed in recommended wilderness.

Mechanized Recreation

Because of management requirements to protect wilderness characteristics, implementation of any of these alternatives would also result in decreased access for some wilderness non-conforming activities that would be prohibited in areas recommended for addition to the National Wilderness Preservation System. A decrease in opportunities for mountain biking would likely cause this activity to be displaced to other areas, but would not have negative or positive effects to recommended wilderness. Prohibition of all types of mechanized transportation would however maintain or enhance wilderness characteristics of the area, and enhance the experiences of visitors seeking a wilderness recreation experience.

Magnitude and location of these negative effects will vary because of differences of which areas and corresponding trails between each alternative. See the sections on Trails and Sustainable Recreation for a more detailed analysis of impacts to recreation in the form of mountain biking due to recommended wilderness by alternative.

Climate Conditions

The Southwest has experienced an extended drought, and climate predictions indicate drought conditions are likely to reoccur on a cyclical basis. As fire danger increases, restrictions may be put in place by the forest to reduce the risk of human-caused fires throughout the forest, including within recommended wilderness. Depending on the severity of conditions, restrictions typically range from a ban on open campfires to forest closures. These use restrictions will limit access to recreational settings and opportunities, resulting in negative impacts to visitor experiences when they occur. These impacts will occur regardless of the alternative implemented, but will be more pronounced in the context of specifically affecting recommended wilderness in direct correlation to how many areas and acres are recommended, therefore will be variable across the difference of recommended areas by alternative.

Emerging Trends

There is a growing interest in adventure races and similar events such as boot camps, mud events and endurance races. These events are usually held under a special-use permit by “for profit” organizations, although some are conducted as fundraisers. The activities associated with these recreation events may include: running, bicycling, paddling, climbing, orienteering, and other activities that require endurance, strength and agility.

Because races and recreation events are not consistent with protection of wilderness characteristics, they will not be permitted within recommended wilderness by implementation of plan direction under alternatives 2 through 5. However, there may be effects to wilderness characteristics due to such activities occurring adjacent or nearby to recommended wilderness. There may also be effects associated with temporary, increased visitation due to displacement from areas where they are being held. Negative effects of these outcomes could include degradation of resources that cause a corresponding degradation to wilderness characteristics, and negative impacts to visitor enjoyment of recreation experiences due to perceived crowding caused by displacement of visitors from race events, and negative perceptions of degraded wilderness characteristics.

Recreation Special Uses

Outfitter-guiding will continue to be allowed in all areas recommended as wilderness under these alternatives. The amount of acres available for wilderness-compatible outfitter-guide provided services would increase across all alternatives, though the locations and number of overall acres varies by alternative. This could disperse this type of use, potentially reducing impairment of wilderness characteristics and the quality and availability of wilderness character-dependent visitor experiences, and possibly providing new location-dependent experiences.

Possible effects may also include improved opportunities for solitude at existing, high-use locations for outfitter-guided activities. This would result in preservation of or enhancement of the availability and quality of wilderness-dependent visitor experiences. However, increased interest in visiting newly recommended areas could also result in to opportunities for solitude and resource damage due to increased use. Resource damage could include muddying or compaction of soils, trampling and other damage to vegetation, and degradation of physical trail conditions.

Alternative 2 – Proposed Action

Alternative 2 includes the same desired conditions, standards, guidelines, and management approaches as alternatives 3, 4, and 5 that were developed to protect wilderness characteristics in recommended wilderness. Alternative 2 also identifies 13 separate areas totaling 110,402 acres (table 71) in the Gila NF as administrative recommendations for inclusion in the National Wilderness Preservation System. The recommended areas in this alternative are all located immediately adjacent, or near existing designated wilderness area boundaries to enhance the Gila NF niche of large, mostly contiguous, wilderness complexes.

The criteria for recommended wilderness in alternative 2 strive to inform the forest supervisor's decision of which inventoried and evaluated areas to recommend by balancing consideration of all relevant issues. These include, but are not limited to, stakeholder concerns, and the forest's resource management niches of dispersed recreation, traditional uses, and ecological restoration.

Table 71. Recommended wilderness – alternative 2

Recommended Area	Acres
B10-ALDO LEOPOLD ADDITION NORTHEAST	8,381
B11-ALDO LEOPOLD ADDITION SOUTHEAST	944
B14-ALDO LEOPOLD ADDITION CARBONATE CREEK	2,819
B1a-ALDO LEOPOLD SECO ADDITION	4,724
B1c-ALDO LEOPOLD SECO ADDITION	48
G12-GILA WHITEWATER ADDITION	1,960
G1-MINERAL CREEK	16,538
QG1-NOLAN NORTH	6,718
RG1-ASPEN MOUNTAIN	19,053
W3-ALDO LEOPOLD ADDITION WEST	1,110
W4-ALDO LEOPOLD ADDITION MCKNIGHT CANYON	11,094
WB1-TAYLOR CREEK	10,012
WSB1-RABB PARK	27,002
Alternative Total Acres	**110,402**

The Gila NF fills a distinctive wilderness niche in the Southwest region, consisting of large, mostly contiguous wilderness areas, similar to Aldo Leopold's original vision when he recommended to the Forest Service that the Gila be preserved as wilderness. "By 'wilderness,'" he wrote, "I mean a continuous stretch of country preserved in its natural state, open to lawful hunting and fishing, big enough to absorb a two weeks' pack trip, and kept devoid of roads, artificial trails, cottages, or other works of man."

Effects that were described previously as common to all alternatives, but variable by alternative due to differences in which areas and total acres recommended would be primarily to areas either directly adjacent or in close proximity to existing wilderness and similarly managed areas.

Wilderness Characteristics

The areas recommended for wilderness designation under this alternative are located immediately adjacent or are oriented in proximity to existing designated wilderness boundaries. This alternative criterion is for the purpose of recommended areas to enhance the Gila NF niche of large, mostly

contiguous, wilderness complexes. By serving as additions to an existing wilderness or by being part of a closely oriented wilderness complex with similar management objectives, the recommended wilderness areas will have a higher magnitude of positive effects to existing wilderness than stand-alone areas recommended by other alternatives. These positive effects include enhancement of both wilderness characteristics in the recommended areas, and wilderness character within existing wilderness, contributing to the purposes of wilderness as directed by the Wilderness Act, subsequent wilderness legislation, policy and regulations. This will also positively influence the availability and quality of the wilderness experiences of visitors to those areas.

Areas recommended for wilderness designation would be managed by plan direction implemented under this alternative in a manner to maintain or enhance wilderness characteristics. Implementation of this plan direction will result in positive effects of continued and expanded availability and quality of wilderness recreation opportunities for hikers and equestrians and enhanced backcountry camping opportunities across the area boundaries.

Little or no mineral development or its associated impacts to wilderness characteristics would be expected under this alternative due to exclusion of most areas with known valid existing rights in and likelihood of future minerals development. The effects of the presence of mineral extraction and exploration within recommended wilderness include negative physical impacts to resources and degradation of wilderness characteristics by digging, earthmoving, removal of vegetation, and use of mechanical equipment, also resulting in negative impacts to the quality of wilderness-type experiences to visitors to these areas.

Connectivity for native wildlife and vegetation would likely be substantially enhanced between the large protected areas in the Gila National Forest by the increased size of the existing wilderness complex under implementation of this alternative. Such habitat connectivity is important to maintaining wildlife corridors and bird migration routes within these relatively undeveloped areas, as well as similar areas to the west in Arizona. The increased connectivity could benefit species richness and abundance, and have positive effects to wilderness characteristics by preserving and enhancing naturalness within the recommended areas.

Congressionally Designated Wilderness

The areas recommended by this alternative are all located either immediately adjacent to, or area oriented in close proximity to existing designated wilderness for aligning with the alternative criteria of enhancing the Gila National Forest niche of large, mostly contiguous, wilderness complexes.

Of the overall acres recommended in this alternative, 58,082 acres would be additions to existing wilderness areas, including 56,122 acres added to the Aldo Leopold Wilderness, and 1,960 acres added to the Gila Wilderness, but no additional acres added to the Blue Range Wilderness. Effects described as being common to alternatives 2 through 5 would be applicable to those areas or portions thereof that lie adjacent and in close proximity to these recommended areas.

Alternative 3

Alternative 3 includes the same desired conditions, standards, guidelines, and management approaches as alternatives 2, 4, and 5 that were developed to better protect wilderness characteristics in recommended wilderness. Alternative 3 also identifies 26 areas totaling 130,012 acres (table 72) in the Gila NF as administrative recommendations for inclusion in the National Wilderness Preservation System.

Some of the recommended areas are located immediately adjacent, oriented close to, existing designated wilderness area boundaries to enhance the Gila NF niche of large, mostly contiguous, wilderness complexes. Others are remote from, and do not directly enhance the character of existing areas, and do not contribute to the forest niche of large, mostly contiguous wilderness complexes.

Issues addressed under this alternative include restoration of rangelands and access to traditional recreation, cultural, and historical uses of the forest. Traditional recreation, cultural and historical uses may include, but are not limited to, tribal areas of importance and gathering areas requiring motorized access, motorized access and maintenance for permitted grazing of livestock, wilderness nonconforming recreational uses (including, but not limited to mountain biking) and gathering of forest products such as fuelwood. The purpose of these criteria were to allow for mechanical treatments to facilitate range and grassland restoration and mitigate restrictions imposed on wilderness that impact traditional, tribal uses and prohibit certain traditional, wilderness non-conforming uses (including, but not limited to, fuelwood harvesting and mountain biking).

This alternative emphasizes restoration objectives through mechanical treatments for grasslands and historically open-canopy woodlands and limits the use of prescribed fire, would place the least restrictions upon mechanical treatments for restoration of grasslands, and therefore, would have the least impact of limiting mechanical treatments associated with management of these areas.

Table 72. Recommended wilderness – alternative 3

Recommended Area	Acres
B10-ALDO LEOPOLD ADDITION NORTHEAST	4,076
B11-ALDO LEOPOLD ADDITION SOUTHEAST	943
B14-ALDO LEOPOLD ADDITION CARBONATE CREEK	3,592
B1a-ALDO LEOPOLD SECO ADDITION	517
B1b-ALDO LEOPOLD SECO ADDITION	208
B1c-ALDO LEOPOLD SECO ADDITION	78
G11-GILA DRY CREEKS ADDITION	1,973
G12-GILA WHITEWATER ADDITION	3,116
G1-MINERAL CREEK	16,540
G3-GILA RAIN CREEK ADDITION	374
QG1-NOLAN NORTH	7,686
R10a-GILA ADDITION NORTH RESERVE	536
R10b-GILA ADDITION NORTH RESERVE	657
RG4-NORTH MOGOLLON MOUNTAINS	11,584
S1-MOGOLLON BOX/TADPOLE RIDGE	930
S6a-GILA ADDITION SOUTHWEST	11
S6b-GILA ADDITION SOUTHWEST	270
S6d-GILA ADDITION SOUTHWEST	248
SB1-SAWYER PEAK	21,007
SW1-GILA ADDITION SAPILLO	186
W3-ALDO LEOPOLD ADDITION WEST	1,109
W4-ALDO LEOPOLD ADDITION MCKNIGHT CANYON	11,050
WB1-TAYLOR CREEK	6,672

Recommended Area	Acres
WB2-GILA ADDITION EAST	1,434
WB4-GILA ADDITION NORTHEAST	9,230
WSB1-RABB PARK	25,984
Alternative Total Acres	**130,012**

Wilderness Characteristics

The recommended areas under this alternative are located in areas determined to not restrict the use of mechanical vegetation treatments for piñon-juniper woodlands and grasslands, but there are a significant number of areas that would contribute to the Gila NF niche of large, mostly contiguous, wilderness complexes. However, implementation of this alternative does not significantly contribute to existing connectivity of the Gila with similarly managed areas of the Apache-Sitgreaves NFs. By effectively becoming additions to an existing wilderness or closely oriented wilderness complex with similar management objectives, the recommended wilderness areas will have significantly more positive effects to existing wilderness than smaller, stand-alone areas. These positive effects include enhancement of both wilderness characteristics in the recommended areas, and wilderness character within existing wilderness, contributing to the purposes of wilderness as directed by the Wilderness Act, subsequent wilderness legislation, policy and regulations. This will also positively influence the availability and quality of the wilderness experiences of visitors to those areas.

There is very little in the way of standalone areas recommended under this alternative, and even these are near other recommended areas that provide continuity to existing wilderness, or proximity to similarly managed areas. The few standalone areas also ranked at least as moderate/high in the evaluation for wilderness characteristics. However, some of the areas directly adjacent to the existing wilderness were only ranked as moderate in the evaluation. Areas that are standalone or of a moderate ranking in the evaluations do have the positive effects to wilderness character described previously, but these are somewhat mitigated by these conditions. Moderate ranked areas adjacent to wilderness also have the previously referenced positive effects to existing designated wilderness character somewhat mitigated compared to those similarly oriented areas with a higher ranking.

Areas recommended for wilderness designation and managed by plan direction implemented under this alternative in order to maintain or enhance wilderness characteristics. Implementation of this plan direction will result in positive effects of continued and expanded availability and enhanced quality of wilderness recreation opportunities for hikers and equestrians and enhanced backcountry camping opportunities across the area boundaries.

Little or no mineral development or its associated impacts to wilderness characteristics would be expected under this alternative due to exclusion of most areas with known valid existing rights in and likelihood of future minerals development. The effects of the presence of mineral extraction and exploration within recommended wilderness include negative physical impacts to resources and degradation of wilderness characteristics by digging, earthmoving, removal of vegetation, and use of mechanical equipment, also resulting in negative impacts to the quality of wilderness-type experiences to visitors to these areas.

Connectivity for native wildlife and vegetation would likely be somewhat enhanced between the large protected areas in the Gila NF by the increased size of the existing wilderness complex under implementation of this alternative. Such habitat connectivity is important to maintaining wildlife corridors and bird migration routes within these relatively undeveloped areas, as well as similar areas

to the west in Arizona. The increased connectivity could benefit species richness and abundance, and have positive effects to wilderness characteristics by preserving and enhancing naturalness within the recommended areas.

Because of the relevant alternative criteria common to both this alternative and alternative 4 for exclusion of areas with traditional uses and infrastructure associated with permitted grazing, these alternatives would have a minimal impact as previously described under common to all alternatives to traditional uses including, but not limited to, permitted grazing, fuelwood gathering, mountain biking, and traditional tribal uses.

Congressionally Designated Wilderness

Of the overall acres recommended in this alternative, 65,593 acres would be additions to existing wilderness areas, including 47,558 acres added to the Aldo Leopold Wilderness, 18,035 acres added to the Gila Wilderness, and no additional acres added to the Blue Range Wilderness. Effects described as being common to alternatives 2 through 5 would apply to those areas or portions thereof that lie adjacent and in close proximity to these recommended areas.

Alternative 4

Alternative 4 includes the same desired conditions and guidelines as alternatives 2, 3, and 5, which were developed to protect wilderness characteristics of recommended wilderness that are not addressed in existing wilderness plan direction. Additionally, 17 areas totaling 72,901 acres are recommended for inclusion in the National Wilderness Preservation System in alternative 4 (see table 73). Some of the recommended areas are located immediately adjacent, oriented close to, existing designated wilderness area boundaries for purposes of enhancing the Gila NF niche of large, mostly contiguous, wilderness complexes. Others are remote from, and do not directly enhance the character of existing areas, and do not contribute to the forest niche of large, mostly contiguous wilderness complexes.

This alternative emphasizes restoration objectives for forested/timberland vegetation types through mechanical treatments while limiting the use of prescribed fire. Areas with high relative probabilities of stand-replacement fire are considered in the context of the need for forest restoration. The alternative also takes into consideration access to traditional recreation, cultural, and historical uses of the forest. Traditional recreation, cultural, and historical uses may include, but are not limited to, tribal areas of importance and gathering areas that are important for them to have motorized access, motorized access and maintenance for permitted grazing of livestock, wilderness nonconforming recreational uses (including, but not limited to mountain biking and OHV use) and gathering of forest products such as fuelwood.

Wilderness Characteristics

The recommended areas under this alternative are located in areas determined to not restrict the use mechanical vegetation treatments for piñon-juniper woodlands and grasslands, but there are a significant number of areas that would contribute to the Gila NF niche of large, mostly contiguous, wilderness complexes. However, implementation of this alternative does not contribute to existing connectivity of the Gila with similarly managed areas of the Apache-Sitgreaves NF. By effectively becoming additions to an existing wilderness or closely oriented wilderness complex with similar management objectives, the recommended wilderness areas will have significantly more positive effects to existing wilderness than smaller, stand-alone areas. These positive effects include enhancement of both wilderness characteristics in the recommended areas, and wilderness character

within existing wilderness, contributing to the purposes of wilderness as directed by the Wilderness Act, subsequent wilderness legislation, policy and regulations. This will also positively influence the availability and quality of the wilderness experiences of visitors to those areas.

Table 73. Recommended wilderness – alternative 4

Recommended Area	Acres
B11-ALDO LEOPOLD ADDITION SOUTHEAST	943
B1a-ALDO LEOPOLD SECO ADDITION	4,031
B1c-ALDO LEOPOLD SECO ADDITION	40
B9-ALDO LEOPOLD ADDITION EAST	11,909
G11-GILA DRY CREEKS ADDITION	373
G3-GILA RAIN CREEK ADDITION	871
G6-LOWER SAN FRANCISCO	14,746
G8-SMOOTHING IRON MESA	3,152
R10b-GILA ADDITION NORTH RESERVE	207
S1-MOGOLLON BOX/TADPOLE RIDGE	4,856
S6a-GILA ADDITION SOUTHWEST	120
SB1-SAWYER PEAK	23,353
SW1-GILA ADDITION SAPILLO	256
W1c-GILA ADDITION LAKE ROBERTS	691
W7-GILA ADDITION EAST	642
WB2-GILA ADDITION EAST	4,437
WB6-GILA ADDITION BEAVER CREEK	2,273
Alternative Total Acres	**72,901**

Several standalone areas recommended in this alternative are not within relatively close proximity to other recommended areas that would serve to provide significant continuity to existing wilderness, or proximity to similarly managed areas. These standalone areas are moderate/high in the evaluation for wilderness characteristics; however, some of the recommended areas under this alternative that are directly adjacent to the existing wilderness were only ranked as moderate in the evaluation. Areas that are standalone or of a moderate ranking in the evaluation do have the positive effects to wilderness character described previously, but these are somewhat mitigated by these conditions. Moderate ranked areas adjacent to wilderness also have the previously referenced positive effects to existing designated wilderness character somewhat mitigated compared to those similarly oriented areas with a higher ranking.

Areas recommended for wilderness designation and managed by plan direction implemented under this alternative would be managed similar to existing designated wilderness in order to maintain or enhance wilderness characteristics. Implementation of this plan direction will result in positive effects of continued and expanded availability and enhanced quality of wilderness recreation opportunities for hikers and equestrians and enhanced backcountry camping opportunities across the area boundaries.

Little or no mineral development or its associated impacts to wilderness characteristics would be expected under this alternative due to exclusion of most areas with known valid existing rights in and likelihood of future minerals development. The effects of the presence of mineral extraction and

exploration within recommended wilderness include negative physical impacts to resources and degradation of wilderness characteristics by digging, earthmoving, removal of vegetation, and use of mechanical equipment, also resulting in negative impacts to the quality of wilderness-type experiences to visitors to these areas.

Connectivity for native wildlife and vegetation would likely be somewhat enhanced between the large protected areas in the Gila NF by the increased size of the existing wilderness complex under implementation of this alternative. Such habitat connectivity is important to maintaining wildlife corridors and bird migration routes within these relatively undeveloped areas, as well as similar areas to the west in Arizona. The increased connectivity could benefit species richness and abundance, and have positive effects to wilderness characteristics by preserving and enhancing naturalness within the recommended areas.

Because of the relevant alternative criteria common to both this alternative and alternative 3 for excluding areas with traditional forest uses and infrastructure associated with permitted grazing, and because this alternative recommends a less acreage than all others except the no-action alternative, it would have minimal impacts as previously described as common to all alternatives to traditional uses including, but not limited to, permitted grazing, fuelwood gathering, mountain biking, and traditional tribal uses.

Existing Congressionally Designated Wilderness

Of the overall acres recommended in this alternative, 26,795 acres would be additions to existing wilderness areas, including 16,924 acres to the Aldo Leopold Wilderness, 9,871 acres added to the Gila Wilderness, and no additional acres added to the Blue Range Wilderness. Effects described as being common to alternatives 2 through 5 would be applicable to those areas or portions thereof that lie adjacent and in close proximity to these recommended areas.

Environmental Consequences to Alternative 5

Alternative 5 includes the same desired conditions and guidelines in alternatives 2, 3, and 4 that were developed to protect wilderness characteristics of recommended wilderness that are not addressed in existing wilderness plan direction. Additionally, 58 areas totaling 745,286 acres (table 74) are recommended for inclusion in the National Wilderness Preservation System.

Issues addressed under this alternative include emphasis on considering the greatest amount of areas with at least moderately ranked characteristics as recommended wilderness combined with emphasis of natural processes over use of mechanical treatments, and minimizing risk of wildfire to values at risk within the WUI areas of the forest.

Effects that were described previously as common to all, but variable in scale by alternative due to differences in which areas and total acres recommended, would be spread broadly across the entire forest landscape, including many areas that are adjacent or in close proximity to existing wilderness and similarly managed areas, but also to standalone and smaller groups of closely oriented standalone areas.

Table 74. Recommended wilderness – alternative 5

Recommended Area	Acres	Recommended Area	Acres
B10-ALDO LEOPOLD ADDITION NORTHEAST	15,181	R1-EAGLE PEAK	31,169
B11-ALDO LEOPOLD ADDITION SOUTHEAST	1,242	R3-MORAGA CANYON	8,162
B13-WAHOO NORTH	19,737	R4-O-BAR-O MOUNTAIN	18,555
B14-ALDO LEOPOLD ADDITION CARBONATE CREEK	4,546	R9-WAGON TONGUE	11,463
B1a-ALDO LEOPOLD SECO ADDITION	5,741	RB1-EAST ELK MOUNTAIN	8,924
B1b-ALDO LEOPOLD SECO ADDITION	229	RG1-ASPEN MOUNTAIN	21,895
B1c-ALDO LEOPOLD SECO ADDITION	48	RG2-DEVILS CREEK	43,383
B5-STONE CREEK	8,383	RG4-NORTH MOGOLLON MOUNTAINS	20,398
B8-BEAVERHEAD	8,055	S10-LOWER GALLINAS CANYON	8,544
G10-BLUE RANGE SW ADDITION	3,709	S1-MOGOLLON BOX/TADPOLE RIDGE	46,437
G11-GILA DRY CREEKS ADDITION	2,827	S2-GILA MIDDLE BOX	24,523
G12-GILA WHITEWATER ADDITION	2,223	S3-BEAR MOUNTAIN	10,056
G1-MINERAL CREEK	16,848	S4-NORTH BURROS	15,556
G3-GILA RAIN CREEK ADDITION	1,095	S5-SADDLE ROCK	6,519
G5-PARK MOUNTAIN	10,737	S6a-GILA ADDITION SOUTHWEST	447
G6-LOWER SAN FRANCISCO	21,018	S6b-GILA ADDITION SOUTHWEST	4,558
G7-HELL HOLE	19,623	S6d-GILA ADDITION SOUTHWEST	1,040
G8-SMOOTHING IRON MESA	3,588	S7-BURRO PEAK	7,319
G9-BLUE RANGE SE ADDITION	2,856	S8-KNIGHT PEAK	5,294
Q11-MOTHER HUBBARD	5,689	S9-ROYAL JOHN	6,915
Q1-LARGO	14,265	SB1-SAWYER PEAK	39,150
Q2-THE HUB	34,085	SW1-GILA ADDITION SAPILLO	128
Q4-CHAVEZ LAKE	6,759	W1c-GILA ADDITION LAKE ROBERTS	393
Q6-FOX MOUNTAIN	9,704	W3-ALDO LEOPOLD ADDITION WEST	3,389
Q9-APACHE MOUNTAIN	13,942	W4-ALDO LEOPOLD ADDITION MCKNIGHT CANYON	12,458
QG1-NOLAN NORTH	7,609	W7-GILA ADDITION EAST	564
QG2-NOLAN SOUTH	4,404	WB1-TAYLOR CREEK	26,852
QR1-UPPER FRISCO BOX	36,691	WB2-GILA ADDITION EAST	3,919
QR2-UPPER FRISCO BOX EAST	14,252	WB4-GILA ADDITION NORTHEAST	13,862
R10a-GILA ADDITION NORTH RESERVE	536	WB6-GILA ADDITION BEAVER CREEK	4,252
R10b-GILA ADDITION NORTH RESERVE	657	WSB1-RABB PARK	42,878
		Alternative Total Acres	**745,286**

Wilderness Characteristics

The recommended areas under this alternative are located across the entire forest, both enhancing the Gila NF niche of large, mostly contiguous, wilderness complexes, but also protecting wilderness characteristics of groups of closely oriented areas, and standalone areas somewhat remote from existing wilderness or other recommended areas. This alternative features a significant number of additions to an existing wilderness or closely oriented wilderness complex with similar management

objectives, and will have a high magnitude of positive effects to wilderness characteristics and existing wilderness character than alternatives with less recommended areas. These positive effects include enhancement of both wilderness characteristics in the recommended areas, and wilderness character within existing wilderness, contributing to the purposes of wilderness as directed by the Wilderness Act, subsequent wilderness legislation, policy and regulations. This will also positively influencing the availability and quality of the wilderness experiences of visitors to those areas.

However, because the selection criteria for this alternative allowed for areas that were only ranked as moderate, positive effects to wilderness characteristics and existing designated wilderness character are somewhat mitigated, and of a lower quality than alternatives that required a higher characteristics ranking of moderate/high or higher. This will result in disparity of the quality of wilderness experiences for visitors between existing designated wilderness, recommended wilderness with higher rankings, and the areas that only ranked as moderate. Effects to visitors to areas ranked as moderate would likely have experiences that are somewhat degraded by comparison.

Areas recommended for wilderness designation would be managed by plan direction implemented under this alternative in a similar manner as existing designated wilderness in order to maintain or enhance wilderness characteristics. Due to the large number of areas and acres of recommended wilderness, implementation of this alternative would result in significantly more positive effects of continued and expanded availability and quality of wilderness recreation opportunities for hikers and equestrians and enhanced backcountry camping opportunities across the area boundaries.

There are some recommended wilderness areas under implementation of this alternative that contain portions of mining districts, some of these mining districts are rated as a “yes” for potential future development, and the recommended wilderness areas contain 558 active mining claims. There are also some recommended wilderness areas under this alternative within other minor mining districts. There is a very high likelihood that if this alternative were implemented, some recommended wilderness would see negative effects to wilderness characteristics due to mineral extraction. The effects of the presence of mineral extraction and exploration within recommended wilderness include negative physical impacts to resources and degradation of wilderness characteristics by digging, earthmoving, removal of vegetation, and use of mechanical equipment, also resulting in negative impacts to the quality of wilderness-type experiences to visitors to these areas.

Connectivity for native wildlife and vegetation would likely be substantially enhanced between the large protected areas in the Gila NF by the increased size of the existing wilderness complex under implementation of this alternative. Such habitat connectivity is important to maintaining wildlife corridors and bird migration routes within these relatively undeveloped areas, as well as similar areas to the west in Arizona. The increased connectivity could benefit species richness and abundance, and have positive effects to wilderness characteristics by preserving and enhancing naturalness within the recommended areas. Although the highest effects will be expected in the contiguous and closely oriented recommended areas, there could be benefit of smaller magnitude across the forest because of the broadness of areas recommended for wilderness designation across the forest landscape.

Congressionally Designated Wilderness

Of the overall acres recommended in this alternative, 128,780 acres would be additions to existing wilderness areas, including 85,713 acres to the Aldo Leopold Wilderness, 36,503 acres added to the Gila Wilderness, and 6,564 acres added to the Blue Range Wilderness. Effects described as being common to alternatives 2 through 5 would be applicable to those areas or portions thereof that lie adjacent and in close proximity to these recommended areas

Cumulative Effects

Cumulative effects for recommended wilderness, wilderness study areas and inventoried roadless areas are analyzed with cumulative effects for congressionally designated wilderness.

Herbicide-Use Environmental Consequences

See the analysis for herbicide-use effects under the wilderness study area herbicide-use environmental consequences section.

Inventoried Roadless Areas

Affected Environment

Introduction

National Forest System inventoried roadless areas (IRAs) were established under 36 CFR Part 294, the 2001 The Roadless Area Conservation Final Rule (Roadless Rule). The Roadless Rule prohibits road construction, reconstruction, and timber harvest, except under certain circumstances. These are activities are limited in IRAs because they have the greatest likelihood of altering and fragmenting landscapes, resulting in long-term loss of roadless area values. Some roads may already be present within currently designated IRAs. The Roadless Rule does not prohibit travel on existing roads, or prohibit the use, maintenance, or construction motorized trails within IRAs.

The regional forester reviews the cutting, sale, or removal of generally small-diameter timber when needed for one of the following purposes:

- To improve threatened, endangered, proposed, or sensitive species habitat;
- To maintain or restore the characteristics of ecosystem composition and structure, such as to reduce the risk of uncharacteristic wildfire effects within the range of variability, that would be expected to occur under natural disturbance regimes of the current climatic period; or,
- For the administrative and personal use, as provided for in 36 CFR 223, where personal use includes activities, such as Christmas tree and fuelwood cutting, and where administrative use includes providing materials for activities, such as construction of trails, footbridges, and fences.

The regional forester reviews all projects involving new road construction or reconstruction and the cutting, sale, or removal of timber in all designated IRAs, with the exception of the following list of management activities, which are reviewed for compliance with the Roadless Rule by the forest supervisor, with optional review by the regional forester:

- Any necessary timber cutting or removal or any road construction or road reconstruction in emergency situations involving wildfire suppression, search and rescue operations, or other imminent threats to public health and safety in IRAs.
- Timber cutting, sale, or removal in IRAs incidental to the implementation of an existing special-use authorization. Road construction or road reconstruction is not authorized through this re-delegation without further project-specific review.

Gila National Forest Inventoried Roadless Areas

Approximately 22 percent of the Gila NF (733,836 acres) is located within 29 individual existing IRAs found across the forest (figure 50). The current Gila NF IRAs and their acreage are listed in table 75.

IRAs provide opportunities for dispersed outdoor recreation. These opportunities may be diminished elsewhere in the forest as open space and natural-appearing areas see increased development. However, many of the IRAs in the forest receive very light use by the public. Current management direction for Gila NF IRAs is provided by the 2001 Roadless Rule and the 1986 forest plan for management areas with semi-primitive and primitive ROS classifications.

Existing roads and trails on the boundaries of and within IRAs have continued to be maintained. Grazing, outfitter-guide, communication site, and utility right-of-way special-use permittees all use existing roads within IRAs for access.

Table 75. Gila National Forest inventoried roadless areas

IRA Name	Official Acres
1978 Administratively Endorsed Wilderness Proposal	4,286
Apache Mountain	17,506
Aspen Mountain	23,783
Brushy Mountain	7,199
Brushy Springs	5,735
Canyon Creek	9,824
Contiguous to Black & Aldo Leopold Wilderness	111,811
Contiguous to Blue Range Wilderness	1,980
Contiguous to Gila Wilderness and Primitive Area	79,048
Devils Creek	89,915
Dry Creek	26,719
Eagle Peak	34,016
Elk Mountain	6,550
Frisco Box	38,977
Gila Box	23,759
Hell Hole	19,553
Largo	12,730
Lower San Francisco	26,459
Meadow Creek	34,167
Mother Hubbard	5,895
Nolan	13,050
Poverty Creek	8,770
Sawyers Peak	59,743
Stone Canyon	6,801
T Bar	6,823
Taylor Creek	16,639
The Hub	7,498
Wagon Tongue	11,411
Wahoo Mountain	23,121
TOTAL Forest-wide IRA Acres:	**733,836**

The overall condition, health, and roadless characteristics within IRAs are variable across the forest, and influenced by the context of circumstances relative to their location.

All IRAs located within the Gila National Forest will be included as part of the potential wilderness inventory process; however, by direction of the 2012 Planning Rule, existing IRA boundaries may not be reconsidered via the plan revision process. Although the forest has the authority to correct minor cartographic errors, any changes to IRA boundaries not directed through congressional legislation must be part of a state-wide process involving state and local governments.

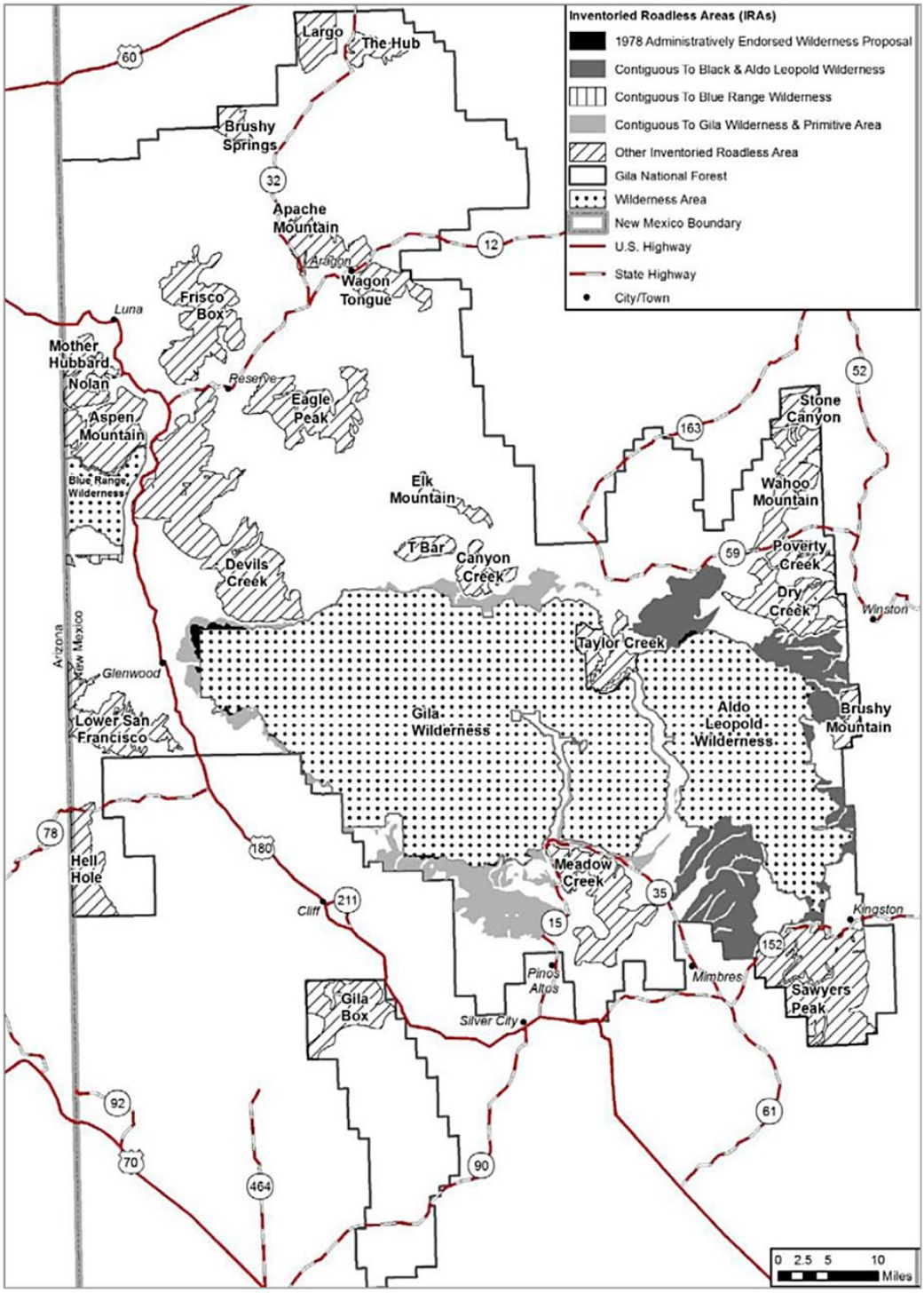


Figure 50. Gila National Forest inventoried roadless areas

Plan-Level Environmental Consequences

Analysis Methodology

This section analyzes the potential consequences for implementation of forest plan direction of each alternative to designated IRAs in the Gila NF.

Assumptions

- IRAs will continue to be managed under the direction of the 2001 Roadless Rule
- At some point in the foreseeable future, a process will be undertaken to correct and update current mapping of IRAs

Analysis methodology consists of consideration of a diversity of information sources, including but not limited to, data from recent NVUM surveys, the updated ROS analysis, the current plan revision wilderness recommendation process, and institutional knowledge of forest staff in all program areas. These were all considered in context of being in alignment with relevant law, policy, and regulations. The potential differences in treatments within ERUs as indicated by activities associated with vegetation management activities by implementation of plan direction across all alternatives were used to consider effects to roadless character and resources from those activities.

Effects Common to All Alternatives

Roadless Characteristics

The overall condition, health, and roadless characteristics within IRAs are variable across the forest, and influenced by the context of circumstances relative to their location. These conditions are likely to continue; management of IRAs would be in alignment with current law, policy and regulation; and there would likely be no effects to the roadless character of IRAs under implementation of any of the alternatives.

Prescribed Fire, Wildfires, Timber Sales and Mechanical Vegetation Treatments of Restoration Projects

Under all alternatives, fire management would continue with appropriate measures and best management practices to protect roadless characteristics where practicable, and fire suppression of human-caused wildfires would serve to minimize the potential negative effects of degradation to roadless characteristics. Suppression of uncharacteristic fire would benefit roadless character by preventing degradation to the scenic and recreational qualities of areas by the occurrence of fire severities and extent outside the known historic range of variability.

Naturally ignited fires, when managed for resource benefit, could enhance conditions within IRAs by reducing fuel loading to acceptable levels, and maintaining fire-dependent vegetation. This could result in progress toward desired conditions, reducing the likelihood of deterioration of roadless characteristics by the use of mechanical vegetation treatments. However, temporary impairments to air quality, visual aesthetics, and water quality could occur within the IRAs, but are in most cases likely to be short term in duration. There may some short-term negative effects to visitor experiences due to degradation of scenic resources, availability for use, or quality of recreation experiences.

In certain situations, including restoration projects, during prescribed fire, and suppression of wildfires, use of motorized transport may occur within IRAs. This authorized use would not impact roadless characteristics because temporary or permanent roads would not be constructed, and

existing ML 1 roads would not be improved for use from basic custodial condition. Reduction of hazardous fuels by using prescribed fire and mechanical treatments could have short-term impacts to roadless character due to the visible presence of motorized equipment, and evidence of vehicle tracks within the area.

Due to the requirements of the Roadless Rule, fire suppression or restoration work would not include construction of any new, permanent roads. There may also be temporary degradation to visitor dispersed recreation experiences, water quality, and wildlife habitat within the IRAs. However, there may be positive effects by allowing naturally ignited fires to play their natural role in the ecosystem, and reduce likelihood of uncharacteristic wildfires, which may serve to enhance all of these temporarily impacted resources in the long term.

Typically, the types of impacts from large, high-severity wildfires are the same as those for prescribed fires, but may be of a much greater magnitude and longer duration than prescribed fires. Areas within and surrounding large fires typically experience more intense and frequent flooding. Other impacts or damages include landslides, dead trees falling on or within facilities and trails, encroaching nuisance vegetation, erosion, extended closures due to hazardous conditions, and silting in of available water sources.

All IRAs would continue to implement the direction from the 2001 Roadless Area Conservation Rule prohibiting road construction and limiting tree cutting in these areas. Ecosystems would be restored and vegetation composition and structure may be manipulated in some IRAs. In most circumstances, mechanical treatments would not be used to accomplish restoration work in any of the portions of IRAs that lie within areas recommended as wilderness. This may have effects to management of these areas for restoration and fire prevention; however, there would be no negative effect to the roadless character of IRAs from these alternatives.

Gila NF Visitation

The largest projected increases in visitation to the forest are likely to occur in general forest Areas, which tend to attract different uses at different locations and be dispersed widely across the forest. To date, there have been minimal issues with overcrowding or conflicts between user groups within general forest areas. Because very little area of IRAs is accessible by motorized vehicles, they are not likely to see effects from an increase in this type of use.

NVUM survey results indicate a perceptible trend of visitor use shifting from developed sites to dispersed sites and congressionally designated wilderness, and this trend is likely to continue regardless of the forest plan alternative. IRAs share characteristics in common with both types of areas, and are likely to see similar effects. Potential impacts common to all alternatives that are associated with increased dispersed recreation use within IRAs include resource damage from overuse within riparian areas, increased litter, and impacts to visitor experiences due to perceptions of overcrowding, conflicts between visitors due to crowding, and conflicts between different non-compatible uses.

Alternative 1 – 1986 Forest Plan

Alternative 1 has no effects to currently existing IRAs. All existing IRAs would continue to be managed according to existing law, policy, and regulation. No new areas would be recommended for designation as wilderness, and the existing 1986 forest plan recommendation to Congress that the two existing WSAs (that also contain IRAs) should not be designated as wilderness would remain in effect.

The existing WSAs would continue to be managed to protect their wilderness characteristics as directed by the existing forest plan until Congress provides new management direction through legislation.

Effects Common to Alternatives 2 through 5

Recommended Wilderness

Differences between alternatives 2 through 5 and alternative 1 lie primarily in the number of acres of IRAs that are also managed as recommended wilderness, which will still protect the roadless characteristics of each area, but will also be managed for the protection of wilderness characteristics. Managing for protection or enhancement of wilderness characteristics may mean some types of management allowable for IRAs would not be allowable where IRAs and recommended wilderness overlap. Management not allowable under these circumstances may include, but are not limited to, mechanical treatment for forest restoration and fire management purposes, and motorized or mechanized transportation. This would likely protect and enhance the wilderness characteristics and associated visitor experiences within the areas, but would degrade the forest's ability to address desired conditions that are dependent upon being achieved by the use of mechanical transport or motorized equipment.

All IRAs would continue to implement the direction from the 2001 Roadless Area Conservation Rule on prohibiting road construction and limiting tree cutting in these areas. The portions of IRA that are also within recommended wilderness may still be managed to restore ecosystems, and vegetation composition and structure may be manipulated, though only by use of wildfire managed for resource benefit or by agency ignited prescribed fire.

Alternative 2 – Proposed Action

Recommended Wilderness

Alternative 2 would recommend 94,124 total acres within existing IRAs to Congress for designation as wilderness, which would require that these areas also be managed to protect or enhance their wilderness characteristics.

Under this alternative, the IRAs that also overlap with recommended wilderness are all oriented immediately adjacent to, or are oriented nearby to existing wilderness in keeping with the forest wilderness niche of large, mostly contiguous wilderness complexes. Likely effects to IRAs that overlap with recommended wilderness are those identified as being common to alternatives 2 through 5 and would likely be specific to these areas identified above.

Alternative 3

Recommended Wilderness

In alternative 3, 105,022 total acres within existing IRAs would be recommended to Congress for designation as wilderness, which would require that these areas also be managed to protect or enhance their wilderness characteristics. Under this alternative, the IRAs that also overlap with recommended wilderness are not due to criteria for being oriented immediately adjacent to or nearby to existing wilderness. Because of this difference in criteria, some of the affected IRAs are located nearby or adjacent to wilderness, but others are located across the forest. Effects to IRAs that overlap with recommended wilderness are those identified as being common to alternatives 2 through 5 and would likely be specific to these areas identified above.

Alternative 4

Recommended Wilderness

Alternative 4 recommends 62,076 total acres within existing IRAs to Congress for designation as wilderness, which would require that these areas also be managed to protect or enhance their wilderness characteristics. This is less than any of the alternatives except for alternative 1. Under this alternative, the IRAs that also overlap with recommended wilderness are not selected for being oriented immediately adjacent to or nearby to existing wilderness. Because of this difference in criteria, some of the affected IRAs are located nearby or adjacent to wilderness, but others are located across the forest. Effects to IRAs that overlap with recommended wilderness are those identified previously as being common to alternatives 2 through 5 and would likely be specific to these areas identified above.

Alternative 5

Recommended Wilderness

Under alternative 5, 476,935 acres within existing IRAs would be recommended to Congress for designation as wilderness, which would require that these areas also be managed to protect or enhance their wilderness characteristics. This the most recommended wilderness that overlaps with IRAs of any of the alternatives, and would have the greatest effect on management of existing IRAs. Under this alternative, the IRAs that also overlap with recommended wilderness are not selected for being oriented immediately adjacent to or nearby to existing wilderness. Because of this difference in criteria, some of the affected IRAs are located nearby or adjacent to wilderness, but there are many other areas located across the forest. Effects to IRAs that overlap with recommended wilderness are those previously identified as being common to alternatives 2 through 5, and would likely be specific to these areas identified above.

Cumulative Effects

Cumulative effects for IRAs, wilderness study areas, and recommended wilderness are analyzed with cumulative effects for Congressionally Designated Wilderness.

Eligible National Wild and Scenic Rivers

Affected Environment

Introduction

Congress created the National Wild and Scenic Rivers System in 1968 (Public Law 90-542; 16 U.S.C. 1271 et seq.) to preserve certain rivers with outstanding natural, cultural, and recreational values in a free-flowing condition for the enjoyment of present and future generations. For a river to be eligible for wild and scenic river designation it must be free flowing and (with its adjacent corridor) must possess one or more outstandingly remarkable values (ORVs). ORVs are specific to each river segment and may include scenic, recreational, geologic, fish and wildlife, historic, cultural, or other similar values.

The Gila NF does not include any waterways that have been legislatively designated by Congress as wild and scenic river s. However, there are currently eight eligible wild and scenic rivers, none of which has yet undertaken a suitability study to determine if it should be recommended to Congress for designation as wild and scenic.

The Wild and Scenic River Act and 2012 Planning Rule require that each national forest revising its forest plan must include a process for identifying and determining the eligibility of potential additions to the National Wild and Scenic Rivers System (National System) on NFS lands. The Forest Service Planning Handbook (FSH 1909.12 Chapter 80) provides guidance and direction for a three-step process for evaluating eligibility and ultimately suitability as wild and scenic rivers:

1. **Determining Eligibility**: identify if rivers are both free-flowing and possess outstandingly remarkable values, giving them status as Eligible Wild and Scenic Rivers

2. **Assigning Eligible Rivers initial classifications** as Wild, Scenic, or Recreational based on the condition of the river and the level of development level of adjacent lands

3. **Determining Suitability**: a study to ascertain if eligible rivers should be recommended to Congress for inclusion in the National Wild and Scenic Rivers System

Although the third step, determining suitability, may be accomplished at any time, including during plan revision, it is not a requirement to do so during that process. The Gila NF has elected not to complete the suitability step during its plan revision process.

“Free flowing” means existing or flowing in a natural condition without impoundment, diversion, straightening, riprapping, or other modification of the waterway. The existence of low dams, diversion works, or other minor structures does not automatically bar consideration for eligibility (However, this also does not imply automatic approval for future construction of such structures in a designated National Wild and Scenic River.) A river segment may flow between large impoundments and still be considered “free flowing”; such segments may qualify if conditions within the segment meet the eligibility criteria. There are no requirements for minimum flows for an eligible segment. Flows are considered sufficient for eligibility if they sustain or complement the outstandingly remarkable values for which the river would be designated.

For a river to be eligible for inclusion in the National System, the river and its adjacent land area (referred to as the “river area”), must have one or more outstandingly remarkable values. Under the Wild and Scenic Rivers Act, the categories of outstandingly remarkable values include:

- Scenic
- Recreational
- Geologic
- Fish and wildlife
- Historic
- Cultural
- Other similar values

To be "outstandingly remarkable," river-related values must be unique, rare, or exemplary features that are significant when compared with similar values with other rivers within the region of comparison. Unique, rare, or exemplary features are those that are conspicuous examples, among the best representatives of these features, within this region of comparison. The interdisciplinary team is tasked with preliminarily identifying a "region of comparison," for each outstandingly remarkable value. The region of comparison may vary for different categories of outstandingly remarkable values, so multiple regions of comparison may be used to evaluate one river. Each region of comparison is scaled at an appropriate level for the type of river value being evaluated.

2002 Wild and Scenic Rivers Eligibility Study

In 2002, the Gila NF undertook a process to identify eligible wild and scenic rivers, and the 1986 forest plan was amended to provide management direction to preserve their free-flowing nature and ORVs, pending determination of suitability for inclusion in the National Wild and Scenic River System. The rivers determined eligible in this study are shown in table 76.

The following rivers were determined eligible in the 2002 eligibility study findings: Whitewater Creek, Spruce Creek, Middle Fork Gila River, West Fork Gila River, Diamond Creek, South Diamond Creek, Holden Prong, and Las Animas Creek (figure 51). A complete list of all rivers considered in the wild and scenic rivers eligibility study may be found in appendix G.

Most of the eligible wild and scenic rivers identified by the 2002 study conducted in the forest occur within the Gila or Aldo Leopold Wilderness Areas. Eligible river and stream corridors accommodate a variety of uses, including but not limited to, picnicking, fishing, day hiking and walking for pleasure, primitive camping, boating (canoeing, kayaking, rafting, tubing), swimming, and nature study.

Past management activities that have been implemented within currently eligible wild and scenic river corridors include upland vegetation thinning, herbicide application of saltcedar (*Tamarix* spp.), and fire management activities.

None of the rivers determined to be eligible under the 2002 eligibility study has yet been included in a suitability study or designated as wild and scenic rivers by legislation passed by Congress.

Table 76. 2002 Study determined eligible wild and scenic rivers in the Gila NF

Eligible River Name	Outstandingly Remarkable Values Identified	River Miles	Initial Segment Classification*
Diamond Creek	Fish, Historic	31	Wild (26 miles), Recreational (6 miles)
Holden Prong	Fish	8	Wild (8 miles)
Las Animas Creek	Fish, Historic	9	Wild (3 miles), Scenic (6 miles)
Middle Fork Gila River	Scenic	27	Wild (27 miles)
South Diamond Creek	Fish	9	Wild (9 miles)
Spruce Creek	Fish	5	Wild (5 miles)
West Fork Gila River	Scenic, Historic	26	Wild (26 miles), Recreational (1 mile)
Whitewater Creek	Recreation, Historic	14	Wild (11 miles), Recreational (3 miles)

**Wild*: Those rivers or sections of rivers that are free of impoundments and generally inaccessible except by trail, with watershed or shorelines essentially primitive and waters unpolluted. These represent vestiges of primitive America.

Scenic: Those rivers or sections of rivers that are free of impoundments, with shorelines or watershed still largely primitive and shorelines largely undeveloped, but accessible in places by roads.

Recreational: Those rivers or sections of rivers that are readily accessible by road or railroad, that may have some development along their shorelines, and that may have undergone some impoundment or diversion in the past.

Eligibility Study under the Current Plan Revision

In accordance with direction of the 2012 Planning Rule, the Gila NF undertook a study to determine eligibility of rivers for potential inclusion in the Wild and Scenic Rivers System. The interdisciplinary team evaluated 158 river segments, named on a standard 7.5 minute USGS quadrangle map, that were not included in the 2002 eligibility study. River segments that were included in the 2002 study that were determined to be affected by changed circumstances were reevaluated to determine if there was a change from the original finding. Eight existing eligible rivers from the 2002 eligibility study and eight additional reaches were determined eligible, resulting in 16 rivers totaling 231.3 miles determined as eligible under the current plan revision eligibility study process.

For a complete description of the overall eligibility study process steps and results, see appendix G, Documentation of the Wild and Scenic Rivers Eligibility Process. Because a suitability study (the next step in the wild and scenic river process following eligibility) was not completed as part of the plan revision process, potential recommendations for designation were not analyzed by alternative; regardless of which alternative is selected for the Final Plan EIS, the eligible rivers determined though the process will be the same.

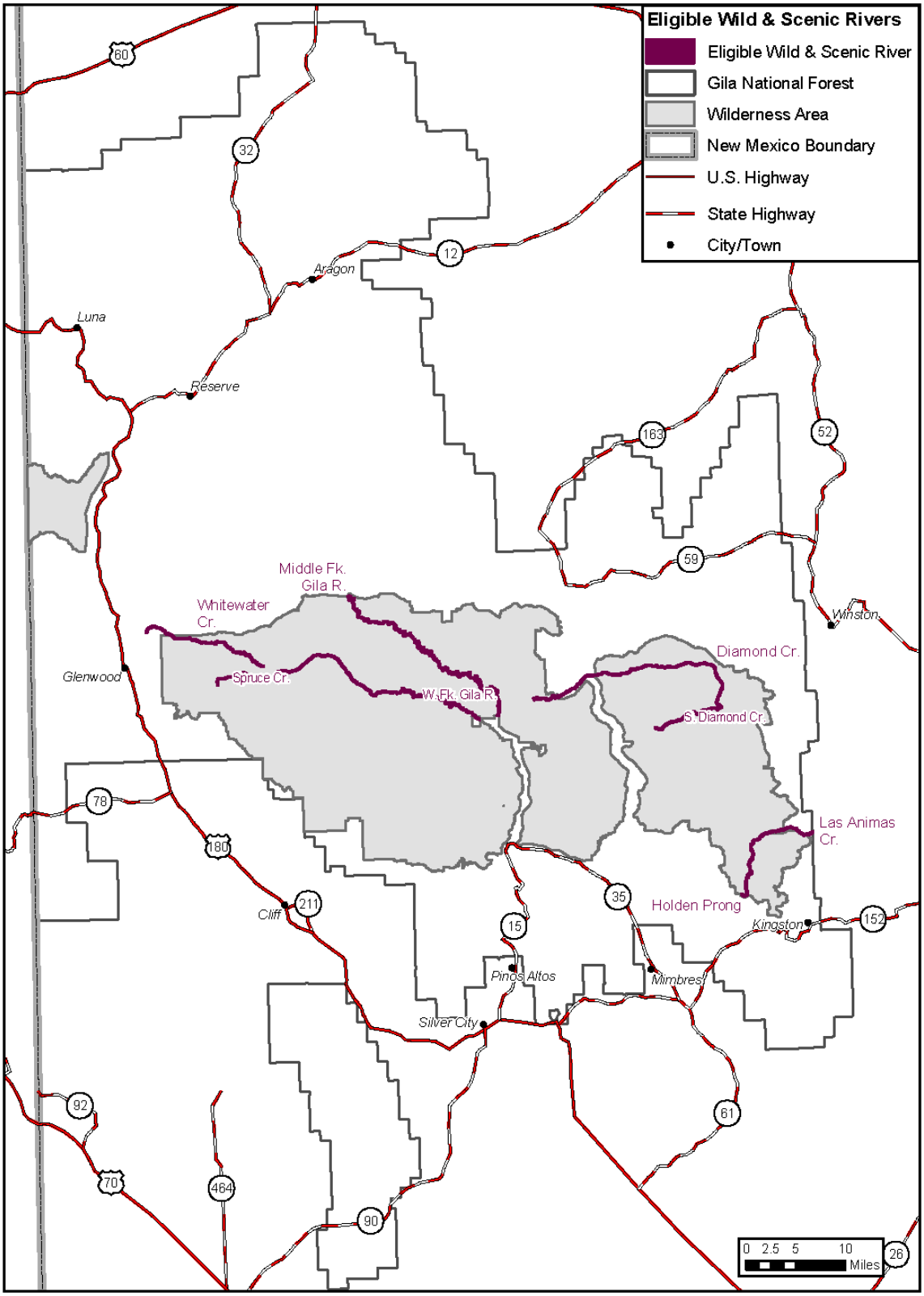


Figure 51. Gila NF eligible wild and scenic rivers determined by the 2002 eligibility study

Plan-Level Environmental Consequences

Analysis Methodology

This section provides an assessment of the potential impacts that implementation of each alternative could have to eligible wild and scenic rivers in the Gila NF.

Assumptions:

- Under all alternatives, eligible wild and scenic rivers will be managed under current law, policy, and regulation for the preservation or enhancement of the free-flowing nature and outstandingly remarkable values for which they were selected as eligible.
- The 2012 Planning Rule requires that each national forest revising its forest plan must include a process for identifying and determining the eligibility of potential additions to the National Wild and Scenic Rivers System (National System) on NFS lands. This includes the first two steps of the 3-step overall evaluation process—eligibility and classification
- The 2012 Planning Rule does not require that forests undergo step 3 of the process, suitability, during plan revision; because of this, the Gila NF has elected to not conduct a suitability study during the current forest planning process.

Analysis methodology consists of consideration of a diversity of information sources, including but not limited to, data from recent NVUM surveys, the updated ROS analysis, both the 2002 and current plan revision wild and scenic rivers eligibility study processes, and institutional knowledge of Gila NF staff in all program areas. The potential differences in treatments within ERUs as indicated by activities associated with vegetation management activities by implementation of plan direction across all alternatives were used to consider effects to free-flowing conditions and outstandingly remarkable values of river corridors and resources from those activities.

Effects Common to All Alternatives

Under the current eligibility study, 8 existing eligible rivers from 2002 eligibility study, and 8 additional reaches were determined to be eligible, resulting in 16 rivers totaling 231.3 miles that were determined as eligible under the current plan revision eligibility study process.

The revised forest plan direction or existing amended 1986 plan direction implemented under all alternatives contain interim protection measures for all identified eligible river corridor(s) to maintain their free-flowing nature and outstandingly remarkable values until a congressional decision is made on the future use of the river and adjacent lands, or unless a suitability study concludes that the river is not suitable. The effects of implementation of all alternatives is likely to result in the preservation and enhancement of the free-flowing condition and ORVs of these eligible rivers, listed in table 77.

Table 77. Current plan revision process study identified eligible wild and scenic rivers

River Name	Outstanding Remarkable Values	Total Miles	Classification (# of miles)
Diamond Creek	Fish, Historic	23.80	Wild (22.12) Scenic (1.68)
Middle Box of the Gila River	Wildlife, Scenic, Recreation, Fish, Historic	8.90	Recreational (1.34) Wild (7.56)
Middle Fork Gila River	Scenic	35.54	Wild (35.54)
West Fork Gila River	Scenic, Historic	30.01	Wild (30.01)
Wilderness Run of the Gila River	Geologic, Scenic, Recreation, Historic, Wildlife	40.39	Wild (33.67) Recreational (6.72)
Holden Prong	Fish	7.27	Wild (7.27)
Iron Creek	Fish	3.53	Wild (3.53)
Las Animas Creek	Fish, Historic	7.35	Wild (2.53) Scenic (4.82)
Mineral Creek	Fish, Recreation	8.71	Wild (8.71)
Mule Creek	Geologic	4.33	Scenic (4.33)
Lower Box of the San Francisco River	Scenic, Recreation, Wildlife	17.02	Scenic (2.43) Wild (14.59)
Upper Box of the San Francisco River	Scenic, Recreation	5.70	Scenic (3.78) Wild (1.92)
South Diamond Creek	Fish	8.05	Wild (8.05)
Spruce Creek:	Fish	3.74	Wild (3.74)
Whitewater Creek	Recreation, Historic	14.73	Wild (11.79) Recreational (2.94)
Willow Creek	Recreation	4.95	Recreational (4.95)
Total Eligible River Miles:		**224.11**	

Outstandingly Remarkable Values and Free-Flowing Condition

Under implementation of all alternatives, streams identified as eligible wild and scenic rivers would be required to have their eligibility maintained in accordance with Forest Service Manual and Handbook direction until they are evaluated in a suitability study and by congressional action are either designated or released to other forest uses. This would have the effect of all management actions taken by the forest being conducted in a manner that ensures that the eligible rivers identified will maintain their free-flowing condition and identified outstandingly remarkable values.

Fish and Wildlife Management

Under implementation of all alternatives, new habitat improvements for fish and wildlife would only be created, or existing improvements maintained within eligible wild and scenic river corridors when they are in alignment with levels of development for the identified preliminary classification, do not degrade the free-flowing condition or identified outstandingly remarkable values that established their eligibility, or due to requirements of legislation. When meeting these criteria, the installation of these habitat improvements are likely to protect and enhance the ORVs for which these areas are found to meet eligibility requirements.

Visitation

Current visitation within the forest is considered to be at manageable levels. Potential impacts common to implementation of all alternatives that may occur within eligible wild and scenic river corridors due to increased visitation include negative effects to visitor experiences from overcrowding in popular areas, potential resource damage from overuse, and conflicts between

incompatible types of recreation user groups seeking to use the same areas. Although identified ORVs vary among the eligible rivers, all of these impacts may have the effect of degrading the ORVs for which these areas were determined to be eligible.

Installations and Level of Development

Because of the provisions that accompany any new or existing structures must be in alignment with the requirements of the classification of the eligible wild and scenic river by law, regulation, and policy, under all alternatives levels of development will have none to very small impact to free-flowing conditions and outstandingly remarkable values.

The most common installations within eligible wild and scenic river corridors are NFS trails and signs. Trails are appropriate in all classifications for visitor safety, facilitation of recreational use, resource protection (concentrating and directing travel away from fragile resources) and to provide for administrative access.

Permitted Grazing

Permitted grazing of livestock is in alignment with the management requirements of law, policy and regulation for eligible wild and scenic rivers. However, the presence of cattle could impair the recreation experiences of some eligible wild and scenic river visitors, including activities such as hunting, fishing hiking, backpacking, and equestrian use. These effects may include uneasiness or displeasure with the presence of cattle, and impaired experiences of solitude due to the presence of domestic animals in an otherwise solitary setting. There may also be conflicts when animals are blocking passage or presenting a collision hazard, negatively affecting visitor safety.

Prescribed Fire, Wildfires, Timber Sales and Mechanical Vegetation Treatments of Restoration Projects

Under all alternatives, fire management activities would continue with appropriate measures and best management practices to protect eligible wild and scenic river corridor outstandingly remarkable values, and fire suppression of all human-caused wildfires would minimize the potential negative effects of degradation to outstandingly remarkable values. Suppression of uncharacteristic fire would benefit eligible wild and scenic rivers by preventing degradation to free-flowing conditions and outstandingly remarkable values by the occurrence of fire severities outside the known historic range of variability.

Prescribed and naturally ignited fires, when managed for resource benefit, could benefit free-flowing conditions and outstandingly remarkable values by reducing fuel loading to acceptable levels, and maintaining fire-dependent vegetation. However, impairments to air quality, visual aesthetics, and water quality could occur, though in most instances it is likely be short term.

Typically, the types of impacts from large, high-severity wildfires are more significant than those for prescribed fires and naturally ignited fires managed for resource benefit, and may be of a much greater magnitude of damage with a significantly longer duration of effects. Impacts from severe wildfires to facilities and trails within the river corridor that may occur across all alternatives include temporary area and trail closures during the incident and post-fire effects of infrastructure damage. Areas within and surrounding large fires typically experience more intense and frequent flooding. Other impacts or damages include landslides, dead trees falling on or within facilities and trails, encroaching nuisance vegetation, erosion, extended closures due to hazardous conditions, silting in of water sources, and fish kills.

Cumulative Effects

The Apache-Sitgreaves NFs identified three eligible wild and scenic rivers with the potential to be influenced by Gila NF management decisions, because portions of each are located across shared forest boundaries. The San Francisco River's headwaters are located in the Apache-Sitgreaves NFs west of Alpine, Arizona, but it flows through Gila NF-managed lands and private lands in New Mexico before reentering Arizona and the Apache-Sitgreaves NFs.

The upper San Francisco River from its headwaters and across to the Gila NF-managed lands is not currently designated as an eligible or suitable wild and scenic river. However, the lower portion of the river located downstream of the Gila NF in the Apache-Sitgreaves NFs is currently administratively designated as an eligible wild and scenic river.

The Gila NF also contains small portions of Coal Creek and Campbell Blue Creek, both of which are also administratively designated eligible wild and scenic rivers by the Apache-Sitgreaves NFs (USDA FS A-S NFs 2014b). These river segments and the ORVs for which determined their eligibility are likely to complement the overall preservation and enhancement of the river-related opportunities and settings within the greater landscape. This in turn is also likely to enhance the availability of recreation experiences similar to wild and scenic rivers, decreasing the likelihood that use will be concentrated into relatively few areas, and result in enhancement to the quality and availability of these uses within the surrounding area.

Trends on private lands are relevant to NFS lands. Total non-Federal forestland area is expected to change with continuing conversions from forests and farmlands to residential development. Some resources are more sensitive to conversion of private lands from natural settings to more developed settings, including river characteristics and qualities. Over time as relatively undeveloped river corridors become more developed outside the national forest, the river characteristics and qualities in the Gila NF may become more significant. Because demand for these settings and opportunities are likely to continue and may increase, this may increase the intensity of visitation and use of the available areas within the greater Gila NF region. This concentrated use may cause the need for more intensive management to prevent the degradation of outstandingly remarkable values and the quality and availability of the associated visitor experiences.

Other Water Development plans

The Arizona Water Settlements Act allows the Secretary of Interior (via New Mexico Interstate Stream Commission) to permit consumptive use of an additional 14,000 acre-feet of water from the Gila and/or San Francisco Rivers, their tributaries, and groundwater sources in New Mexico. The Arizona Water Settlements Act involves many parties including the Interstate Stream Commission, Bureau of Reclamation, State of New Mexico, local communities, counties, irrigators, and various stakeholders. The New Mexico Central Arizona Project Entity is responsible for the planning, design, construction, and operation of the New Mexico Unit of Central Arizona Project.

Forest plan revision and Arizona Water Settlement Act are both concurrent planning processes involving many stakeholders. The Arizona Water Settlements Act planning process is still ongoing with The New Mexico Unit diversion project currently in the middle of a NEPA environmental analysis, and the specific locations of proposed infrastructure still undecided. From what is known from scoping and preliminary proposals, the Arizona Water Settlements Act proposed infrastructure is located, in many cases, outside of the Gila NF; and where it is proposed in the Gila NF, it is located on ineligible segments of the Gila and San Francisco Rivers from the current eligibility study, so no direct conflict is known at this time.

The Wild and Scenic River Act expressly reserves the quantity of water necessary to protect river values, including water quality and flow-dependent ORVs. This reservation of water is called a Federal reserved water right and is generally adjudicated in a state court (e.g., basin-wide adjudication). River designation does not supersede existing, valid water rights. The priority date is the date the river was added to the National System if designated by Congress and (IWSRCC 2018). A Federal reserved water right does not result from just an eligibility determination. If rivers in the Gila National Forest were designated by Congress as Wild and Scenic Rivers, the Federal reserved water right may affect future water rights. Once water rights are adjudicated, the Federal reserved water right may affect future water development projects, depending upon the impacts of the new proposal on the river's flow dependent values. River-administering agencies can work with local and state agencies to negotiate solutions that accommodate future water needs and that protect Wild and Scenic River flows and ORVs (IWSRCC 2018).

Rivers found eligible or suitable for the National System through Federal agency planning processes are not protected by the Wild and Scenic Rivers Act from proposed hydroelectric facilities or other federally assisted water resources projects that have the potential to affect the river's free-flowing characteristics and other identified values. However, the Gila National Forest should, within its authorities, protect the values that make the river eligible or suitable.

If there is a resource management conflict due to eligible status, it may be resolved by conducting a suitability study (i.e., should the river's free-flowing character, water quality, and ORVs be protected, or are one or more other uses important enough to warrant doing otherwise?). In answering these questions, the benefits and impacts of wild and scenic river designation are evaluated, and alternative protection methods considered. The eligibility study is required as part of the forest plan revision process whereas the suitability study is optional during plan revision, and the Gila NF suitability study will be completed outside of plan revision as either part of a plan amendment, in conjunction with a project decision, or in a separate study.

There has been citizen interest in designating rivers legislatively through Congress within the Gila National Forest as wild and scenic rivers. If rivers were to be designated by Congress, the full protections of the Wild and Scenic Rivers Act would apply. Proposed federally assisted water resources projects within the designated wild and scenic river corridor would be prohibited if they would have a "direct and adverse effect" on the values for which a river was added to the National System. For water resources projects below, above or on a stream tributary to the designated wild and scenic river corridor, the river-administering agency evaluates non-hydroelectric project proposals under the "invade the area or unreasonably diminish" standard. The Federal official proposing or permitting the project typically includes analysis (called a Section 7 analysis) of what, if any, impact the proposal would have on a designated wild and scenic river in their respective environmental and/or permitting processes. The river-administering agency is responsible for conducting the Section 7 analysis and making a determination under the statute (IWSRCC 2004).

The wild and scenic rivers eligibility and suitability studies that have been completed, and are likely to be completed in the foreseeable future by the forest could decrease the likelihood that other water development plans will impair the existing outstandingly remarkable values and free flowing nature of the identified watercourses. However, the cumulative effects of water development projects that occur on lands outside the forest boundaries are difficult to anticipate, and could have unforeseen detrimental effects to wild and scenic river types of settings and opportunities throughout the greater Gila NF region. As was described before, decreased availability of these settings and opportunities elsewhere in the area may increase demand for them where they occur in the Gila National Forest.

Climate Conditions
The Southwest has recently experienced an extended drought, and climate predictions indicate drought conditions are likely to reoccur on a cyclical basis. As fire danger increases, restrictions may be put in place to reduce the risk of human-caused fires. Depending on the severity of conditions, restrictions typically range from a ban on open campfires to forest closures. These restrictions limit access to recreational settings and opportunities within eligible wild and scenic river corridors.

Extended droughts directly affect water levels of all streams and rivers within the Gila NF, including eligible wild and scenic rivers. As stream and lake levels decrease, the diversity of recreational opportunities become more limited. This results in concentrated use of streams that continue to have flowing water conditions, and adds pressure to streamside trails. The flow rate, along with depth, can determine the quality of fishing, navigability by watercraft, and suitability for swimming or bathing in hot springs. These conditions may degrade both the free-flowing condition and the outstandingly remarkable values that determined the eligibility of streams and rivers.

Herbicide-Use Environmental Consequences

The following discussion of environmental consequences addresses the effects of the herbicide-use alternatives on eligible wild and scenic rivers.

Effects of Herbicide-Use Alternative A-No Action

This alternative would allow only limited herbicides and the noxious weed species as approved, based on the 2000 forest level decision. There would be no effects to free-flowing conditions of eligible wild and scenic rivers by this alternative. This alternative would not approve newer herbicides for invasive plant treatments, and the current effects of invasive plants and their treatment to ORVs within eligible wild and scenic river corridors would continue. Noxious weed populations are often located in areas of eligible wild and scenic river corridors where use is concentrated and the ground is disturbed. With limited treatment options, any current infestations are likely to continue to multiply, particularly in disturbed areas.

If invasive plants multiply throughout eligible wild and scenic river corridors, they could replace native plants with noxious weeds. Where noxious weeds dominate, they could be visually evident even to the casual observer, and may not be in alignment with scenery ORVs. As noxious weeds multiply, many areas of eligible wild and scenic river corridors could see degradation to ecological and social ORVs. Current infestations of invasive species along adjacent roads and at eligible wild and scenic river corridor trailheads are likely to facilitate introduction of new populations, similarly degrading ORVs, and therefore, degrading the quality and availability of river corridor-dependent experiences.

Effects Common to All Herbicide-Use Action Alternatives

All of these alternatives include the use of manual removal and herbicide treatments as invasive and noxious weed control methods. There should be no effects to the free-flowing condition of eligible wild and scenic rivers in any of these alternatives. By implementation of each of these alternatives, there will be common effects to ORVs, although these effects will vary by their likely frequency, location, and magnitude across the alternatives, and this will be addressed separately for each.

Use of herbicides by implementation of any of these alternatives could result in degradation to ORVs, due to visible evidence of dyes and the presence of dead and dying plants. However, use of herbicides has a high potential to improve long-term ORVs by eradicating and restoring native

vegetation. Dyes used with herbicides would fade and be gone within a few days. As plants die from herbicides, they wilt and turn brown, and the plants generally become smaller than surrounding native plants. In the fall, as native plants turn brown, treated plants may not be as distinguishable from native plants, and by the following spring could be unnoticeable.

Effects may include short-term degradation to scenic resources, which may also result in short-term degradation to visitor experiences. Positive long-term effects include improvement of ORVs by enhancement of the naturalness of the area, which will also improve visitor experiences long after short-term negative effects cease.

Some manual treatment methods cause minor ground disturbance that could affect ORVs. Minor soil disturbance may be expected in small areas where noxious weeds are found, as the current conditions indicate generally patchy distribution of noxious weeds in the Gila NF. Manual treatments may result in an unnatural appearance if parts of the plants remain on site. These treatments by themselves may only contain noxious weed populations, and may need to be repeated unless other treatment methods are also used. Manual treatment methods may not be effective, and ORVs could continue to be degraded.

Under all treatment methods, the degree of effects to ORVs would depend on the size and density of the treated invasive plant infestation. Effects would primarily occur in small patches interspersed with native vegetation, and treatments would not likely be noticeable for more than several weeks. Larger patches may be present in open, dry areas. Broadcast or backpack spraying over significantly sized areas could result in concentrated short-term degradation of ORVs, but these areas are already negatively affected by the presence of noxious weeds. Short-term impacts could be offset by long-term improvement by restoration of native vegetation.

Recreation experiences may be degraded and river corridor visitors may be temporarily inconvenienced by treatments through the presence of warning signs, noise, smells, and possibly short-term area closures degrading availability of areas for use. These short-term experiential impacts, usually a few days in duration, could be offset by long-term restoration of native plant populations, improving ORVs and visitor experiences. Other social impacts may include the degradation or loss of availability for use for visitors uncomfortable or fearful of the perceived health effects of herbicides.

Effects to human health are covered in the Social and Economic Conditions section.

Effects of Alternative B

The effects from this alternative would include all areas likely to be treated for noxious weeds and native vegetation for restoration and fuels reduction. Native vegetation treatments are most likely to occur within eligible river corridors with an interim classification of recreational, and possibly under some circumstances with an interim classification of scenic, but not within interim classifications of wild. Effects to eligible wild and scenic rivers described as being common to all alternatives would be likely to occur in these areas.

Effects of Alternative C

The effects from this alternative would not include any areas treated for native species, and therefore, the effects that are described as common to all alternatives are likely to occur only in areas of all eligible wild and scenic rivers that may be treated for noxious/non-native species.

Effects of Alternative D

This alternative would allow chemical treatment of native species, but would restrict herbicide applications to the urban interface. Therefore, the effects described as being common to all alternatives are only likely to occur within treated areas restricted to the WUI and areas that may be treated for noxious/non-native species. These are most likely to occur in eligible river corridors with an interim classification of recreational, and would not likely to occur in interim wild eligible rivers. Although treatments in the WUI are far less likely to coincide with eligible scenic classification river corridors, under some circumstances this may be a possibility.

Cumulative Effects

There should be no effects to the free-flowing condition of eligible wild and scenic rivers in any of these herbicide alternatives. Although effects may include short-term degradation to scenic resources from minor soil disturbance, evidence of dyes and dying plants, which may result in short-term degradation to visitor experiences. Long-term positive effects are expected to improve ORVs by enhancement of the naturalness of the area, which will also improve visitor experiences.

The design features and plan components listed here, along with other plan direction would be integrated into any treatments carried out in within eligible river corridors with an interim classification of recreational, and possibly under some circumstances with an interim classification of scenic, (no treatments would occur within interim classifications of wild). Chemical methods of pest control will only be used when physical or cultural methods are unlikely to be successful. Where herbicide use is deemed appropriate, application of design features and plan direction would mitigate any long-term effects of herbicide use. These include minimizing or eliminating direct or indirect negative effects to non-target plants, animals and water quality by following the label and consulting the risk assessment. Before application, site-specific soil characteristics, slope, surface drainage patterns, proximity to surface water and local water table depth to determine the appropriate herbicide formulation, application timing and method, and if there is a need for buffers. Where herbicide is likely to be delivered to surface waters, only herbicides registered for aquatic would be used.

Social and Economic Conditions

Affected Environment

Introduction

One of the most unique characteristics of southwestern New Mexico is its diversity of people, culture, traditions, and values. People benefit, either directly or indirectly from multiple use of forest resources. The plan area has a long human history of occupation that precedes the establishment of the Gila NF. Native American, Hispanic and Anglo-American traditional communities continue to use the forest for economic, social and cultural purposes. The management of the Gila NF contributes to social and economic sustainability by maintaining a set of desired social, cultural and economic conditions within the forest and beyond the forest boundary that benefit people.

Demographic and economic characteristics have been shown to affect forest use, volunteerism, environmental attitudes, preferences for site development, and opinions regarding forest management (UNM-BBER 2014). Understanding the unique characteristics, trends, history, and challenges of the area of influence communities is an important consideration for public land managers working to meet the needs of the public. This section provides social and economic analysis, including past and current conditions and the potential consequences of the alternatives on the social and economic environment. The affected environment section is split into five parts: (1) population and demographics, (2) employment and income, (3) potential environmental justice populations, (4) relationship of the Gila NF to local social and cultural conditions, and (5) the Gila NF's contribution to the local economy. This section presents demographic and economic statistics within the context of a multi-county "area of influence." The area of influence concept recognizes that the forest provides contributions and affects social, cultural, and economic conditions outside the forest boundary. The Gila NF area of influence is composed of the four counties that contain the Gila NF within their boundaries: Catron, Grant, Hidalgo, and Sierra counties. Areas beyond these four counties are part of the broader landscape where forest contributions can affect a specific interest, but do not fundamentally affect the social, cultural, and economic conditions as within the four-county area.

Demographic and socioeconomic data reported for the area of influence are based on the U.S. Census Bureau county-wide data. Statistics for the State of New Mexico are presented for comparison with the area of influence. In some cases, the data for the multi-county area of influence has been aggregated using a program economic tool kit from Headwaters Economics (2015). Many statistics were compiled by the University of New Mexico Bureau of Business and Economic Research (UNM-BBER). Not all of the data are reported in this section, and to read more, please see the Gila Final Assessment Report of Ecological/Social/Economic Sustainability Conditions and Trends (2017), UNM-BBER Socioeconomic Assessment Supplement for the Gila NF (2014), the UNM-BBER Socioeconomic Assessment for the Gila NF (2007), which are part of the planning record.

Population and Demographics

This section highlights population and demographic trends in the study area. Population is an important consideration in managing natural resources. In particular, population structure (e.g., size, composition, density) and population dynamics (how the structure changes over time) are essential to describing the consequences of forest management and planning on a social environment (Seesholtz et al. 2004). Population increases may lead to conflicts over land use, travel management, recreation

activities, and values. These are conflicts that Forest Service managers attempt to balance when making management decisions.

Population

In 2010, New Mexico was home to more than 2 million people (less than 1 percent of the U.S. population) (U.S. Census Bureau 2000a). Since 1980, the state's population has grown more rapidly than that of the United States. UNM Geospatial and Population Studies has projected state population growth rates for the next two decades of 14 and 11 percent, which will result in a 2030 population of more than 2.6 million people (UNM BBER 2014).

The area of influence (Catron, Grant, Hidalgo, and Sierra Counties) contains approximately 2.4 percent of the population of New Mexico. In 2010, the area of influence had a population of 50,121 with Grant County being the most populous (29,514) and Catron County being the least (3,725). Figure 52 shows the population trend for the four-county area, which has increased slowly from the 1980s to the early 2000s, when it reached a peak, and then declined slightly in 2010 due to the Great Recession (a period of severe economic decline in 2008 and 2009 due to a housing market correction and subprime mortgage crisis) and depressed copper prices, leading to temporary mine operation suspension and layoffs in Grant County in 2009. Between 2010 and 2030, the area's population is expected to hold relatively constant (UNM-BBER 2014).

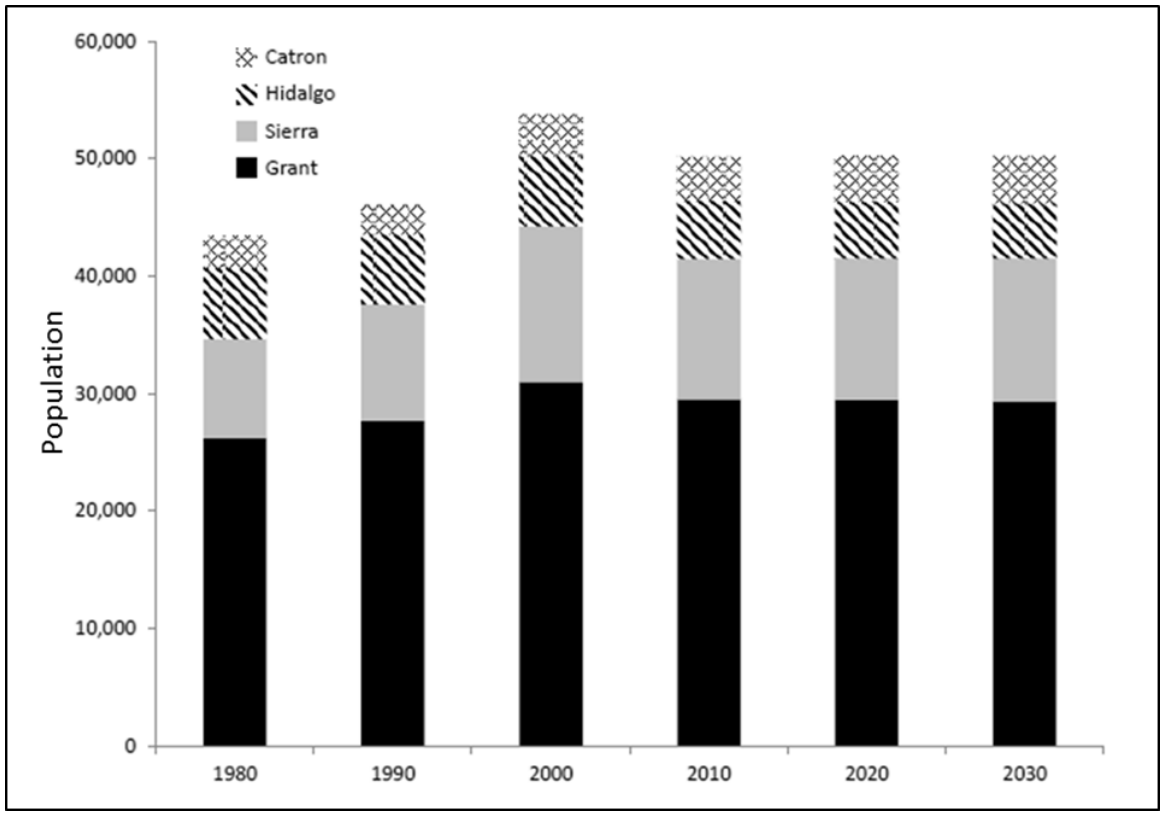


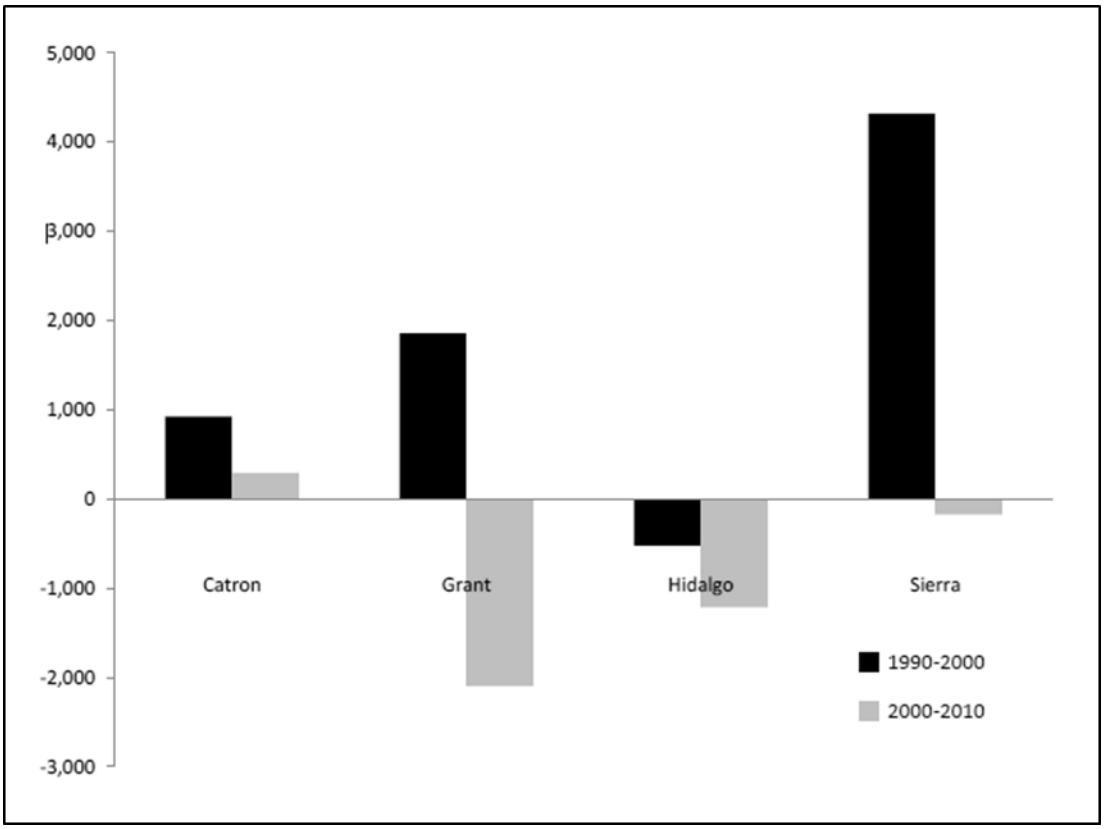
Figure 52. Historical and projected population of Gila NF area of influence counties. Figure from UNM-BBER 2014

Population Density

The Gila NF area of influence is rural, with an average 2010 population density of fewer than 3 people per square mile. Due to the presence of Silver City, densities have historically been highest in Grant County, where the population density was more than 7 people per square mile in 2010. Catron County's population density is exceedingly low, at 0.5 person per square mile, making it one of New Mexico's least populated counties (UNM-BBER 2014).

Net Migration

Net migration is a useful indicator of the population dynamics of an area. Are people moving in or leaving or is the population stable? Between 1990 and 2000, most counties associated with the Gila NF area of influence experienced some level of net in-migration. Hidalgo County was the one exception possibly due to not attracting as much of an influx of retirees from the baby-boomer generation (UNM-BBER 2007). Between 2000 and 2010 migration patterns changed with the exception of Catron County, all area of influence counties experienced net out-migration likely due to many people moving to find employment during the Great Recession (figure 53) (UNM BBER 2014).



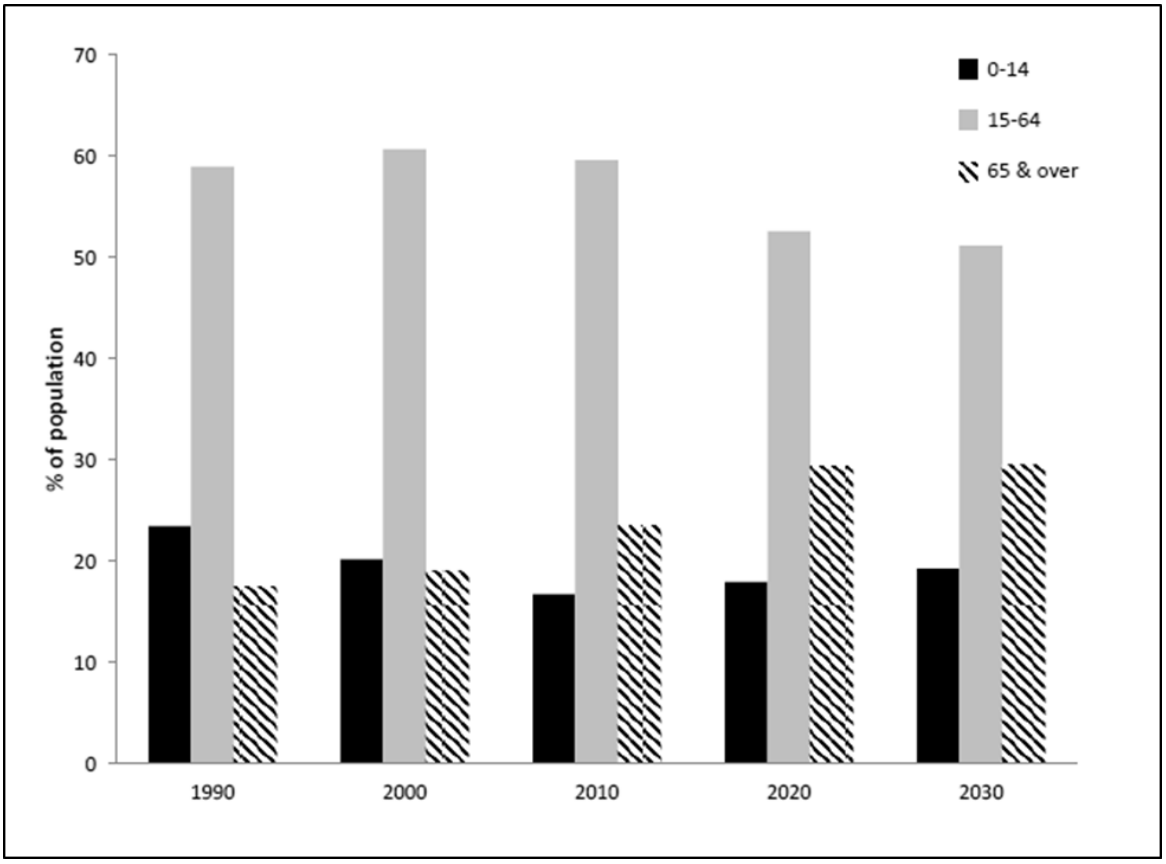
Source: UNM-BBER 2014.

Figure 53. Net migration to/from Gila NF area of influence counties

Age

Since at least 1990, compared to the rest of New Mexico, a smaller portion of the area of influence population is between the ages of 0 and 14, while a larger portion is age 65 or older. Age structure differences between the area of influence and New Mexico have increased over time. The portion of the population that is less than 15 years of age has declined more rapidly in the area of influence than

in New Mexico, while at the same time the portion of the population that is over the age of 64 has increased more rapidly in the area of influence than in New Mexico. Figure 54 shows a continued increase in the proportion of the population over 64 projected in the area of influence for 2030, while the proportion of the population between 15 and 64 is expected to decline (UNM-BBER 2014). Facing limited opportunities for employment, younger people migrate to larger communities, accelerating the aging of the population. In addition, some counties in the area of influence are attracting an influx of retirees from the baby-boomer generation (UNM-BBER 2007). Catron County has one of the oldest populations in the nation, with a median age of 60.1 years old.



Source: UNM-BBER 2014

Figure 54. Historical and projected age distribution in Gila NF area of influence

Educational attainment

Educational attainment is a category where the State of New Mexico has historically struggled. New Mexico's population has become more educated during the last two decades. The portion of individuals age 25 or older with less than a 9th grade education decreased from 11 to 8 percent; the portion with some high school education but no diploma or GED decreased from 14 to 10 percent; and the portion with an associates or other advanced degree increased from 26 to 33 percent (UNM BBER 2014).

Although, in 1990, the area of influence's population was less educated than New Mexico's population, now the two populations are similar in educational attainment (table 78). Between 1990 and 2010, the portion of the area of influence population with less than a high school education declined from nearly 33 to 16 percent. During this same time, the portion of the area's population

with at least some college education increased from just over 33 to nearly 54 percent. The higher share for Grant County may be partly related to access to education because Western New Mexico University is located in Silver City (UNM-BBER 2007). Therefore, it is expected that educational improvements will continue throughout the Gila NF-associated counties (UNM-BBER 2014). Rural communities generally offer fewer opportunities for educational or occupational advancement, and they typically struggle to retain and attract educated and highly skilled individuals. Residents interested in pursuing advanced education typically move from these rural communities to areas that support greater educational and economic opportunities.

Table 78. Education attainment within the area of influence, New Mexico, and U.S.

Education/Population	U.S. (%)	New Mexico (%)	Area of Influence (%)	Catron County (%)	Grant County (%)	Hidalgo County (%)	Sierra County (%)
Less than 9th grade	6%	7%	6%	2%	6%	11%	5%
9th to 12th grade, no diploma	8%	9%	9%	8%	9%	13%	10%
High school graduate (includes equivalency)	28%	26%	30%	33%	27%	31%	36%
Some college, no degree	21%	24%	25%	32%	25%	26%	24%
Associate's degree	8%	8%	7%	5%	8%	5%	6%
Bachelor's degree	18%	15%	12%	11%	12%	10%	14%
Graduate or professional degree	11%	11%	10%	10%	13%	6%	5%
Percent high school graduate or higher	86%	84%	85%	91%	85%	77%	85%
Percent bachelor's degree or higher	29%	26%	23%	21%	26%	16%	19%

Source: US Census Bureau 2010-2014

Employment and Income

Employment and income data are key measures of the economic well-being of a local area.

Median Household Income

Table 79 lists the median household income for area of influence counties, the state, and the Nation. All counties in the area have median household incomes below the state and Nation. The un-weighted average of household income in the four-county area is approximately $10,000 below the state median, and nearly $20,000 below the national median. The lower median household income value for Sierra County may indicate a significant retiree population that is on fixed income from age-related transfer payments (e.g., Social Security). These findings are borne out in the “Non-Labor Income” section that follows.

Table 79. Median household income

Location	Median Household Income
Catron County	$39,342
Grant County	$38,923
Hidalgo County	$35,048
Sierra County	$28,855
New Mexico	$44,968
United States	$53,482

Source: U.S. Census Bureau, 2014

Non-Labor Income

Total personal income comprises labor and non-labor income. Labor income is the wage or salary received by an employee or sole proprietor. Non-labor income includes investments (e.g., rent, dividends and interest) and age-related transfer payments (e.g., Social Security) and hardship-related transfer payments (e.g., welfare). Table 80 identifies the division of labor and non-labor income in the area counties, the state, and the nation.

Table 80. Share of labor and non-labor income

	Labor Income (%)	Non-Labor Income (%)
Catron County	45	55
Grant County	46	54
Hidalgo County	56	44
Sierra County	41	59
AREA OF INFLUENCE	**47**	**53**
New Mexico	62	38
United States	65	35

Source: U.S. Bureau of Economic Analysis 2010, REIS Table CA30

The four-county analysis area is much more reliant on non-labor income than the state and the Nation. Total personal income in New Mexico and the United States is composed of approximately two-thirds labor income and one-third non-labor income. In contrast, three out of the four area of influence counties receive more non-labor income than labor income. Sierra County is particularly skewed toward non-labor income. From 1990 to 2014, in the four-county analysis area, labor income grew from $594 million to $767 million (a 29 percent increase), while non-labor income grew from $487 million to $956 million (a 96 percent increase) (Headwaters Economics 2015). These data suggest that the area of influence has a growing concentration of retirees possibly attracted by high quality of life, mild climate, and affordable housing. The non-labor income is primarily from investments (35 percent), age-related transfer payments (e.g., Social Security and Medicare) (35 percent), and hardship-related transfers (24 percent) (Headwaters Economics 2015).

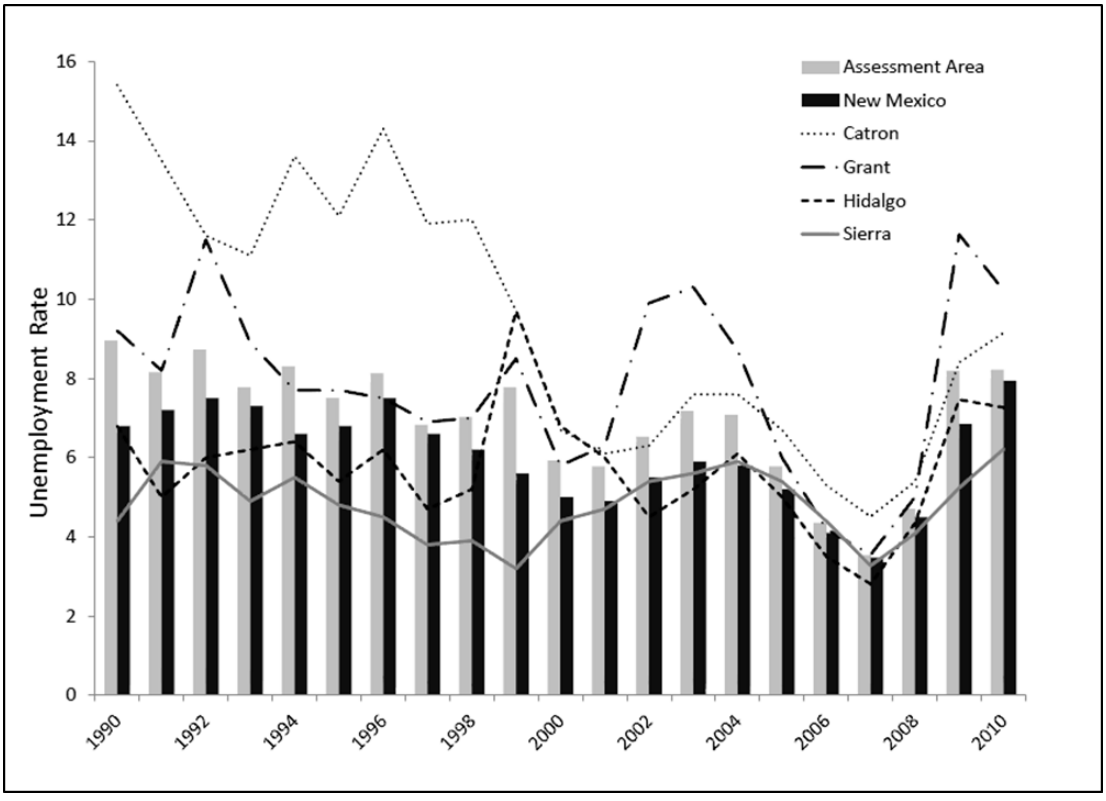
Employment

Prior to this century, New Mexico's unemployment rate typically exceeded that of the United States. The relationship changed after 2002, and since 2006, the New Mexico unemployment rate has been considerably below that of the rest of the Nation. Between 2000 and 2008, much of the growth in New Mexico nonfarm employment occurred in health and social assistance, local government,

professional and business services, and construction. In 2008 to 2009, the economy crashed, resulting in what is now referred to as the Great Recession. More than 34,000 New Mexico jobs were lost between 2008 and 2009. A large portion of these losses (nearly 10,000 jobs) occurred in the construction industry. Other areas of significant job loss during this time were manufacturing, administrative and waste services, retail trade, and mining. However, strength remained in the health care and social assistance industry, as well as government (UNM-BBER 2014).

The gap between New Mexico and U.S. unemployment rates grew during the Great Recession, as the U.S. unemployment rate rose faster than New Mexico's. The gap between the two was greatest in 2009, when New Mexico had an unemployment rate of 6.8 percent, while the U.S. unemployment rate was 9.3 percent. In 2011, both the New Mexico and U.S. unemployment rates began to fall from their 2010 peaks. The U.S. rate fell more rapidly than the New Mexico rate, narrowing the gap between the two. As of 2011, the U.S. had an unemployment rate of 8.9 percent, while New Mexico had a rate of 7.4 percent. As the economy continues to recover from the Great Recession, unemployment rates are expected to continue declining (UNM-BBER 2014).

Since at least 1990, the area of influence has had an unemployment rate that exceeds that of New Mexico. In all but seven years between 1990 and 2010, Catron County had an unemployment rate higher than Grant, Hidalgo, and Sierra counties. At the other end of the spectrum is Sierra County, which has had an unemployment rate that has frequently been lower than that of New Mexico. The spike in unemployment caused by the Great Recession (after 2007) is evident in figure 55. As the national economy continues to recover, unemployment rates should gradually decline (UNM-BBER 2014).



Please note that "assessment area" is the same as "area of influence." Figure from UNM-BBER 2014.

Figure 55. Unemployment rate in Gila NF counties (1990 to 2010)

Sectors of the Economy

Economic diversity generally promotes stability and offers greater employment opportunities. Highly specialized economies (i.e., those that depend on very few industries for the bulk of employment and income) are prone to cyclical fluctuations and offer more limited job opportunities. Determining the degree of specialization in an economy is important for decision makers, particularly when the dominant industry can be affected by changes in policy. For Forest Service responsible officials, this is likely to be the case where the forest products industry or the tourism and recreation industries, for instance, are reliant on the local national forests.

Table 81 shows employment levels by aggregated job sectors within the area of influence. The table stresses the importance of the government, retail trade, health care and social assistance, mining, and agriculture job sectors. Together these industries provide 61 percent of the area's employment. These industries are consistent with findings discussed in the demographic section: namely, a substantial government presence, a retiree population that consumes health and social services, amenities that attract tourists who support the retail trade and accommodation and food services sectors, and natural resource mining and agriculture (e.g., cattle ranching) industries. The majority of area of influence jobs (more than 60 percent) are located within Grant County (UNM-BBER 2014).

Table 81. 2014 employment levels by industry classification for Gila NF area of influence

Job Sector	Employment[a] In Area of Influence	Job Sector Employment as Percent of Total Employment
Agriculture (includes forestry)	1,615	8%
Mining	1,467	7%
Utilities	121	1%
Construction	1,175	6%
Manufacturing	473	2%
Wholesale Trade	257	1%
Transportation and Warehousing	353	2%
Retail Trade	2,432	12%
Information	221	1%
Finance and Insurance	449	2%
Real Estate, Rental, and Leasing	636	3%
Professional, Scientific, and Technical Services	824	4%
Management of Companies	151	1%
Administrative, Waste Management, and Remediation Services	438	2%
Educational Services	223	1%
Health Care and Social Assistance	2,177	10%
Arts, Entertainment, and Recreation	464	2%
Accommodation and Food Services	1,665	8%
Other Services	875	4%
Government	4,990	24%
Total	21,006	100%

[a] Employment: jobs in IMPLAN are the annual averages of monthly jobs in each industry. Thus, one job lasting 12 months is equivalent to two jobs lasting six months each, or three jobs lasting four months each. A job can be either full-time or part-time - the job estimates are not full-time equivalents (FTEs).

Source: MIG 2016 and USDA FS 2018e

A descriptive tool that can be used to analyze the composition of the local economic activity is an economic base study. Economic base studies can assist stakeholders to better understand regional economic dynamics including local and export product markets. An economic base analysis provides detailed information on local economic industries, such as which industries are the driving force of the economy, and which industries survive because the base industry exists. Base industries are important because they bring outside dollars to an area, much like an export, and serve as an anchor for other industries, which would otherwise not exist. For example, agricultural products grown in the region are sold to firms outside the local area, or dollars spent by tourists from other regions are spent in the local community. Non-basic industries serve local residents and provide support to basic industries.

Local basic activity is identified using location quotients (LQs) (NMSU 2017). LQs are calculated as a single industry's percent of total local employment divided by that industry's percent of total state or national employment. For example, a LQ for a single New Mexico industry may be calculated as follows:

$$LQ = \frac{\text{Employment in industry, in NM/ total employment in NM)}}{\text{(Employment in industry, in US/ total employment in US)}}$$

The LQ illustrates the relative importance in the level of the local employment of that sector with respect to the benchmark economy, state or national. An LQ greater than 1.0 indicates that a particular industry employs proportionately more workers locally than it does at the state or national level. Conversely, an LQ of less than 1.0 indicates that the industry of note employs fewer workers locally as compared to the state or national average. Table 82 contains LQs for the area of influence counties in 2015, calculated using data for New Mexico and the United States as basis for comparison.

Environmental Justice

In 1994, President Clinton issued Executive Order 12898. This order directs Federal agencies to focus attention on the human health and environmental conditions in minority and low-income communities. The purpose of Executive Order 12898 is to identify and address, as appropriate, disproportionately high, and adverse human health or environmental effects on minority and low-income populations.

Environmental justice is the fair treatment and meaningful involvement of people of all races, cultures, and incomes, with respect to the development, implementation, and enforcement of laws, regulations, and policies as well as programs and activities. The goal of environmental justice is for Federal agency decision makers to identify impacts that are disproportionately high and adverse with respect to minority and low-income populations and identify alternatives that would avoid or mitigate those impacts. Minority, minority population, low-income population, and human health and environmental effects are defined in the glossary.

The emphasis of environmental justice is on health effects and/or the benefits of a healthy environment. The Council on Environmental Quality has interpreted health effects with a broad definition: "Such effects may include ecological, cultural, human health, economic or social impacts on minority communities, low-income communities, or Indian Tribes … when those impacts are

interrelated to impacts on the natural or physical environment" (Council on Environmental Quality 1997).

Table 82. Location quotients for area of influence counties, 2015 data (NMSU 2017)
Location Quotients greater than 1 are shaded in gray.

Industry	Catron County LQ (compared to NM)	Catron County LQ (compared to US)	Grant County LQ (compared to NM)	Grant County LQ (compared to US)	Hidalgo County LQ (compared to NM)	Hidalgo County LQ (compared to US)	Sierra County LQ (compared to NM)	Sierra County LQ (compared to US)
Farm employment	**8.41**	**15.89**	**1.14**	**2.16**	**3.48**	**6.58**	**2.60**	**4.92**
Mining	N/A	N/A	**N/A***	**N/A***	0.36	**1.50**	N/A	N/A
Utilities	N/A	N/A	**1.17**	**1.57**	**1.36**	**1.84**	**1.50**	**2.03**
Construction	0.93	0.98	0.77	0.81	N/A	N/A	**1.29**	**1.36**
Retail Trade	N/A	N/A	**1.08**	**1.14**	**1.03**	**1.08**	**1.09**	**1.15**
Real estate and rental and leasing	N/A	N/A	0.83	0.67	N/A	N/A	**1.03**	0.83
Arts, entertainment, and recreation	N/A	N/A	0.77	0.78	N/A	N/A	**1.22**	**1.23**
Accommodation and food services	N/A	N/A	0.95	**1.06**	N/A	N/A	**1.27**	**1.43**
Transportation and warehousing	N/A	N/A	0.44	0.31	**1.65**	**1.15**	0.47	0.33
Federal government (civilian)	**2.25**	**4.05**	0.57	**1.02**	**4.67**	**8.43**	0.72	**1.30**
State government	0.49	0.96	**1.98**	**3.82**	0.65	**1.26**	**1.05**	**2.03**
Local government**	**1.01**	**1.29**	**1.42**	**1.81**	**1.58**	**2.02**	**1.02**	**1.30**

*= No information was available for 2015, but in 2014 the LQ for mining in Grant County was 15.28 (compared to the US) and 3.70 (compared to NM) indicating a base industry.

**= Local government is generally categorized as non-basic since local governments collect taxes from local residents to provide for the local services to the community, including employment

Note: Data is summarized from NMSU Arrowhead Center reports. For full reports on each county, please see http://arrowheadcenter.nmsu.edu/economic-and-policy-studies/

An environmental justice community is a population of people or a community that meets the criterion for being considered either low-income or minority under Executive Order 12898. These populations are defined based on guidance from the Council on Environmental Quality:

1. "Low-income population: Low-income populations in an affected area should be identified with the annual statistical poverty thresholds from the Bureau of the Census' Current Population Reports, Series P-60 on Income and Poverty. In identifying low-income populations, agencies may consider as a community either a group of individuals living in geographic proximity to one another, or a set of individuals (such as migrant workers or

Native Americans), where either type of group experiences common conditions of environmental exposure or effect."

2. "Minority population: Minority populations should be identified where either: (a) the minority population of the affected area exceeds 50 percent or (b) the minority population percentage of the affected area is meaningfully greater than the minority population percentage in the general population or other appropriate unit of geographic analysis..."

In the context of forest planning, the forest will examine whether low-income and minority groups would be disproportionately deprived of these benefits or have more difficulty accessing these benefits compared to the population as a whole.

Median Income

Table 83 shows the median income (household and non-family) for the area of influence counties, New Mexico, and the United States.

Table 83. Median income

Location	Median Household Income	Median Non-family income
Catron County	$39,342	$20,272
Grant County	$38,923	$24,643
Hidalgo County	$35,048	$22,083
Sierra County	$28,855	$16,639
New Mexico	$44,968	$28,122
United States	$53,482	$32,191

Source: U.S. Census Bureau, 2014

In 2016, the poverty guideline was $12,228 for a one-person household and $24,563 for a four-person household. None of the counties in the analysis area has a median income below the poverty threshold.

Race/Ethnicity

Cultural diversity is rich and evident in New Mexico. In 2000, New Mexico became a majority-minority state, with a total minority population exceeding that of the white non-Hispanic population (UNM-BBER 2007). The portion of the New Mexico population that identified themselves as of Hispanic descent increased from 38 to 46 percent between 1990 and 2010 (UNM-BBER 2014). As a whole, the Hispanic/Latino composition of the area of influence remained stable between 1990 and 2010.

The ethnic compositions of the four counties differ notably. Since 1990, the populations of Catron and Sierra Counties have been between approximately 20 and 30 percent Hispanic/Latino (any race); while between 50 and 60 percent of the populations of Grant and Hidalgo Counties have been Hispanic/Latino (UNM-BBER 2014). Table 84 breaks down race and ethnicity for each of the four counties as well as data for New Mexico and the U.S. to enable comparisons. All area of influence counties have a larger percentage of Hispanic/Latino residents than the Nation as a whole; however, this trend is also present in New Mexico. Grant and Hidalgo Counties have slightly higher percentages of Hispanic/Latino residents relative to the state percentage,

All area of influence counties have less American Indian percentage than the state percentage. Government centers for tribes and pueblos are located over an hour by vehicle from the forest, with many over two hours from the forest boundary. The physical distance between the forest and tribal lands reduces the day-to-day use of the forest by Native peoples and poses a logistical challenge. However, these factors do not reduce the forest's importance as a traditional homeland and a significant and sacred place to tribal people. Many Tribal members regularly visit the forest to gather traditional resources and to visit traditional cultural properties and sacred sites.

Table 84. Race and ethnicity within the area of influence (4 counties), New Mexico, and the U.S.

Hispanic and Race/Population	U.S. (%)	New Mexico (%)	Catron County (%)	Grant County (%)	Hidalgo County (%)	Sierra County (%)
Hispanic/Latino (any race)	16.9%	47.0%	20.1%	48.9%	56.6%	28.8%
Not Hispanic or Latino	83.1%	53.0%	79.9%	51.1%	43.4%	71.2%
White alone	62.8%	39.6%	75.7%	48.0%	42.1%	67.3%
Black or African American alone	12.2%	1.8%	0.6%	0.2%	0.3%	0.2%
American Indian alone	0.7%	8.5%	2.4%	0.9%	0.5%	1.0%
Asian alone	4.9%	1.3%	0.2%	0.3%	0.0%	1.0%
Native Hawaiian and other Pacific Is. alone	0.2%	0.0%	0.0%	0.0%	0.0%	0.0%
Some other race alone	0.2%	0.2%	0.0%	0.0%	0.0%	0.0%
Two or more races	2.1%	1.5%	0.9%	1.7%	0.6%	1.6%

Source: US Census Bureau 2010-2014

It should be noted that for many low-population racial groups, poverty data is highly unreliable, and even for more populous racial and ethnic groups the reliability of information is low. Those experiencing poverty or who are housing insecure are traditionally difficult to count for census purposes. However, the data does give some indication of which groups might experience particularly disproportionate impacts from some forest management actions or decisions.

Based on the minority status data presented above, Grant and Hidalgo Counties appear most at risk for environmental justice issues. However, even in counties with relatively small minority populations and low poverty rates, disproportionate impacts to vulnerable groups may occur. The impact analysis considers the potential for Forest Service management actions to adversely affect all area residents, with a particular attention to any potential disproportionate impacts on minority and/or low-income residents.

Relationship of the Gila National Forest to Local Social and Cultural Conditions

Since its inception in the early 1900s as the Gila Forest Reserve, the Gila NF has been the provider for many of the needs essential for settling this region of the southwestern frontier. It served Native American tribes, Spain, and Mexico long before it became a United States property and its borders were established. The heritage, culture, traditions, and values that grew from this time period were handed down over generations and still exist in New Mexico today. While those historical values are still prevalent, the social and cultural environment has evolved into the modern age. By this virtue, the Gila NF has the unique challenge of serving two different eras through present day management.

Aside from time-steeped heritages and traditions, the Gila NF has a diverse community composition, where Native American, Hispanic, Anglo, and other cultures have combined to make New Mexico a multicultural center. All of these cultures have ties to the forest through strong attachments to the land that may be generations old or a newfound discovery. In addition to serving the local population, the Gila NF also offers visitors who travel to the region a unique experience in culture, exploration, wilderness, and other activities such as hunting and backpacking. Collectively, the area of influence and the Gila NF are strongly influenced and shaped by local time-honored traditions, cultural diversity, and by those who wish to experience this unique setting from other areas around the country.

Traditions

Residents of communities surrounding the Gila NF have a strong connection to the land and its resources. There is also a strong sense of community across all of the diversity that exists within the area of influence. Both sentiments date back centuries, before the United States acquired this part of the country. Local passions continue to demonstrate these time honored connections to the land and culture, thereby giving long-lasting vibrancy to deeply rooted traditions and ways of life. The Gila NF has been an integral part of this history, and it continues to play a prominent role in the long-standing traditions and uses of the area of influence.

There is a strong sense of attachment to the land that is the Gila NF. Three major components characterize this sense of attachment. The first comes from traditional users having a sense of personal stewardship, based on historical associations with NFS lands (USDA FS 2006a). There is a significant generational element to this theme, which dates back to the time before the Gila NF was established. The second component is derived from historical practices around the use of natural resources. These traditional users believe their first-hand knowledge and self-interest in management of forest resources results in a culturally based understanding, and attachment to, forest lands (USDA FS 2006a). The third component views the Gila NF as a sustainable legacy. It is viewed that this land is a unique resource that should be cared for, conserved, and passed down to future generations (USDA FS 2006a).

Likewise, these historical connections to the land have been instrumental in giving the Gila NF a large part of its character. They still influence the forest in present-day terms, through various means, especially through traditional uses.

Traditional uses as they relate to the Gila NF have strong cultural ties to New Mexico's heritage. They hold historical significance, because they were necessities for survival, and many uses defined a way of life. While their prevalence has diminished somewhat over time, those with cultural ties to the area of influence still engage in many of these uses and view them as a vital part of their heritage. Those who have a cultural investment in the traditional uses of the area look to the Gila NF to continue providing these opportunities as a matter of right. These uses consist of livestock grazing, hunting and fishing, medicinal herb gathering, firewood gathering, open forest access, and wood harvesting for commercial uses. Acequias are an integral part of the cultural and traditional heritage identified in the area of influence. The Gila NF plays a role in this heritage by working with acequia commissions or ditch associations to support ongoing maintenance, accommodate access, and assist with authorized infrastructure improvements for the 30 historic ditches that originate on or cross the Gila NF.

Transitions in the Social Environment

In the past, communities and families who lived within the area of influence relied on natural resources to get by. The main activities were logging, mining, grazing, ranching, and farming. Today, logging and farming especially are not as prevalent as they once were. The declines in traditional uses are generally due to market demands, regulatory changes, and other economic constraints such as the long distance to markets. The decline in traditional uses is still strongly felt in the local economies of some communities, and many people would like more opportunities for economic development.

For communities and counties reliant on the timber industry, the 1990s saw the decline of the amount of timber harvested and closure of the largest sawmill in Reserve. The primary reasons for the decline were related to new required practices for sustainable forestry, concerns for limited remaining old growth, for management needs of the northern goshawk and Mexican spotted owl, litigation, economic constraints, and declining Forest Service budgets. The result of this sudden downward shift in economic activity caused a significant unemployment impact to the logging community and rippled throughout the community infrastructure (e.g., school, county road maintenance, government services, etc.) (USDA FS 1995). Catron County unemployment and poverty rates rose to 15 percent and 25 percent, respectively (Wilson 2006). Many residents of these communities and adjacent areas had made their living for decades working in association with the timber industry. For many residents and businesses of these communities, the change in management seriously disrupted their traditional way of life (i.e., culture and lifestyle) and sense of well-being (USDA FS 1995). Many families left the area in search of employment elsewhere impacting the community social fabric, supporting businesses, and county tax base to provide services such as road maintenance, law enforcement, and health care. School enrollment declined, and since the formula for receiving state education money is based on enrollment numbers, the Reserve School District budget was significantly reduced (Thal et al. 1995). Social hardships grew with significant increases in social service and mental health caseloads, especially regarding family stability-related social problems (Thal 2003).

In addition to traditional uses that continue to weather the test of time, the Gila NF has also experienced a gradual progression more contemporary in nature. There has been a shift toward recreation and tourism, and when asked, some members of the public view the Gila NF with a strong recreation emphasis, especially hunting (USDA FS 2006a). The elk hunting season attracts hunters from across the country, and private outfitter-guide companies provide a range of services to clients. Many other visitors come to experience the cultural distinctiveness, while others come to partake in various outdoor pursuits, and the beauty of the landscape is an attraction in and of itself. For these reasons, recreation and tourism have become focal points on portions of the Gila NF, incorporating its unique social and cultural setting. Approximately 390,000 people visited the forest during 2016 (USDA FS 2018f). However, some people doubt that recreation can replace the traditional uses as an economic base, especially with lower average salaries in the service sector (USDA FS 2006a).

The four-county area and the Gila NF elicit a strong sense of connection that is not only traditionally based, but is also shared by those who are considered “non-traditional” users and live in the area or visit the forest. Many of these connections are also based on interactions with the Gila NF and its resources, as well as personal experiences and values. Some users have special places in the forest, while others speak of the inspiration, solitude, and appreciation they feel by being in the Gila NF. The diversity of wildlife, plants, landscape, and other resources is another important value of the forest. There is a local environmental presence that has actively pursued implementing preservation values and beliefs about forest management and landscape conditions (USDA FS 2006a).

There is a perception that a transition is occurring within the social fabric of the area communities. This shift involves the exodus of younger people and the influx of newcomers. Younger people are believed to be leaving the area in search of jobs, which are limited within the area of influence. Despite a strong sense of attachment, many of these young people rarely make it back. It is also believed that newcomers are increasing in number attracted by the natural resources, rural lifestyle, and quality of life amenities. This influx has increased the diversity of lifestyles, most recently retirees and others who are not dependent on local economies for their income. Newcomers may not have the same appreciation for traditional uses, and may even view natural resource issues in different ways than longer-term residents (USDA FS 2006a). These characteristics imply a mix of values and beliefs based on types of use, length of residence, and cultural background. These diverse views, especially those concerning polarized natural resource issues, have created some social tensions. These perceptions indicate a social scenario where communities are feeling a change, and possibly a loss of traditional ways of life.

Gila National Forest's Contributions to Local Economic Conditions

For over a century, communities have relied on the Gila NF as a source of sustenance. This has manifested through various means ranging from utilizing the natural resources in the forest for livelihood; creating community synergy around issues and events; offering a place for groups to commune, work, and recreate together; to providing solitude, peace, and relaxation for individuals who want to get away from the social pressures and pace of their everyday world. While ways and means may have changed over time, people enjoy all manners of activities in the forest. Firewood gathering is regarded as a traditional family activity, since many local residents still rely on wood to heat their homes during the cold winter months. Commercial woodcutters also sell firewood collected from the Gila NF. Recreational group sites are used by families and friends who come together and celebrate weddings, birthdays, life-changing events, family reunions, and holidays. Permitted livestock grazing in the Gila NF is a long-standing tradition. In addition, local residents rely on the Gila NF for parts of their livelihood, by capitalizing on the opportunity to provide outfitting and guiding, tourist activities, and other services on NFS lands. Forest management continues to bring communities together over issues that affect them or to foster involvement through volunteer work on their favorite part of the forest. Others continue to engage in some of the more traditional uses. All of these uses help maintain social cultures and longstanding traditions.

Forest Service Gross Receipts from Commercial Activities

The Gila NF provides various economic opportunities to surrounding communities. These income-producing opportunities for local businesses include timber harvesting, ranching, and providing recreation services to the visiting public. Figure 56 shows the inflation adjusted total gross receipts from 1986 to 2015. Although before 2000, the receipts were not identified by source, historically most of the receipts collected in the Southwestern Region were from the sale of timber, and the significant decreases in the total receipts are apparent in the 1990s, when timber harvesting declined as discussed in the Transitions in the Social Environment section. Figure 57 shows the gross receipts the Gila NF collected by source from 2001 to 2014, which were deposited into the National Treasury as fees collected from those who use such opportunities. Grazing currently generates the largest share of gross receipts, with land special-use related activities (e.g., communication site leases) coming in second.

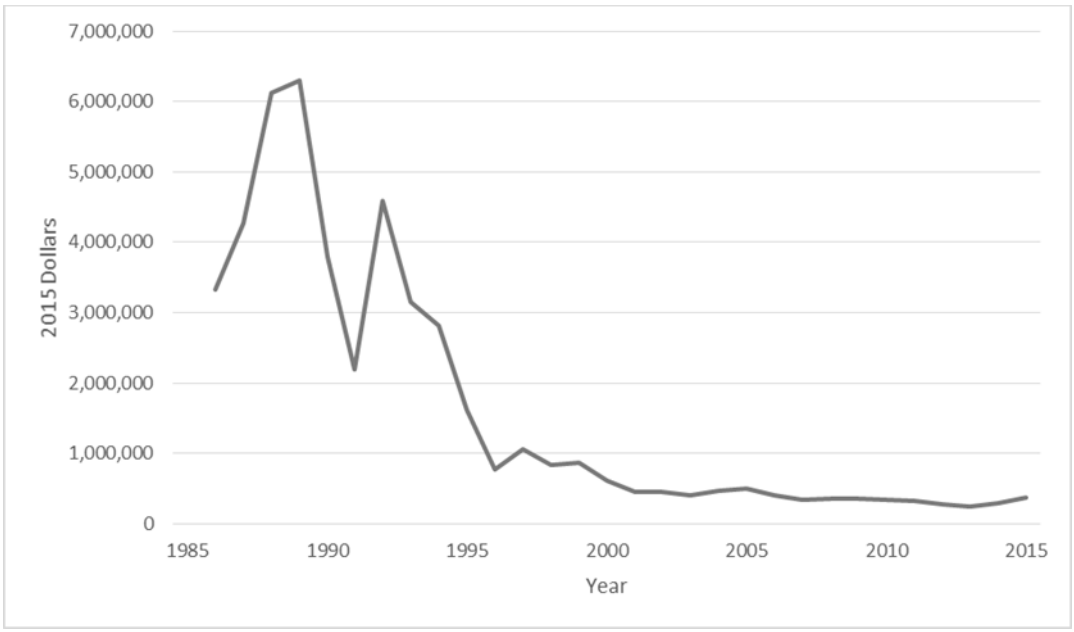


Figure 56. Gila NF inflation-adjusted total gross receipts 1986-2015

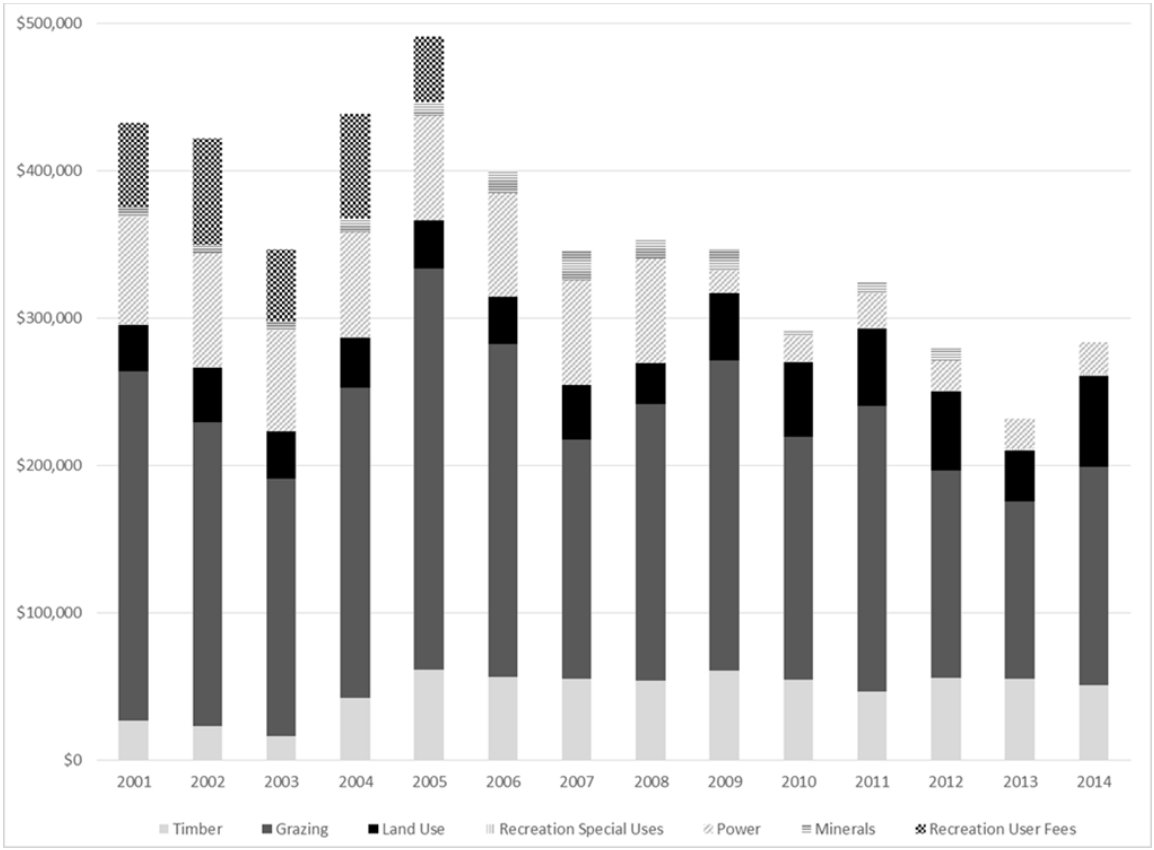


Figure 57. Gila NF gross receipts by source, 2001-2014

Current Economic Contribution

The Gila NF extends into four New Mexico counties—Catron, Grant, Hidalgo, and Sierra. There are a total of approximately 21,006 jobs, and $762 million in labor income in the four-county area. Market transactions attributable to activities in the Gila NF support an estimated 1,124 jobs and $34 million in labor income in the regional economy. Table 85 displays the economic contribution of Gila NF's activities by program area. Grazing-related program and Forest Service expenditures contribute the most to employment and labor income in the regional economy, supporting 638 and 303 jobs, and $12 million and $16.3 million in labor income, respectively, on an average annual basis.

The estimation of jobs contributed by Forest Service program areas are distributed across sectors of the local economy (table 86). The two sectors with the most Gila NF-related employment are agriculture and government, followed by, accommodation and food services and retail trade. The latter two sectors are, in part, associated with the tourism economy, which is supported by the Gila NF and other public and private lands in the study area. Relatively, the agricultural sector is the most reliant on Forest Service activities. Approximately 35 percent of employment and 25 percent of labor income in the agricultural sector with the four-county analysis area is attributable to grazing allotments in the Gila NF.

Calculating average contribution per job by dividing the total labor income by the total number of jobs (table 85) suggests the average contributions of a grazing-related job is approximately $18,700 in labor income, Forest Service expenditures is $53,700, and recreation visitor-related jobs is $18,400. Jobs related to Forest Service expenditures and timber have the highest per job income and grazing-related jobs have the least, on average. Factors that may contribute to the differences in relative labor income include whether the job is seasonal or part-time or what education or skill level is required. Program areas with the greatest number of jobs, total income, or per job incomes may offer more economic contributions or more desirable employment to the local area.

Table 85. Contribution of Gila NF, by Forest Service program area, 2016

Program Area	Employment	Labor Income (thousands of 2016 dollars)
Recreation	81	$1,501
Grazing	638	$11,920
Timber	12	$698
Minerals	<1	<$10
Payments to States/Counties	89	$3,796
Forest Service Expenditures	303	$16,278
Total Forest Management	1,124	$34,192

Source: Author generated using MIG 2016 and USDA FS 2018e

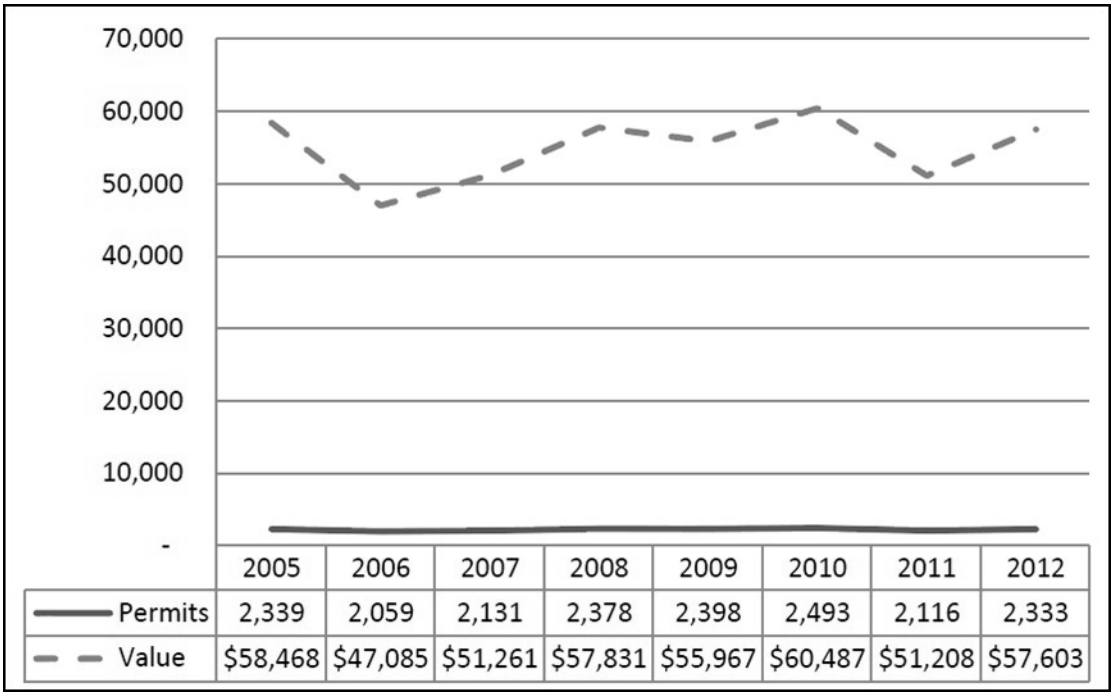
Table 86. Contribution of the Gila NF, by sector, 2016

Sector	Employment (jobs) *Area Totals*	Employment (jobs) *Forest Service-Related*	Labor Income (1,000s of 2016$) *Area Totals*	Labor Income (1,000s of 2016$) *Forest Service-Related*
Agriculture (includes forestry)	1,615	573	$35,642	$9,086
Mining	1,467	3	$85,648	$63
Utilities	121	1	$13,227	$185
Construction	1,175	8	$36,914	$265
Manufacturing	473	2	$11,572	$47
Wholesale Trade	257	12	$5,969	$447
Transportation and Warehousing	2,432	14	$51,113	$589
Retail Trade	353	69	$9,713	$1,464
Information	221	3	$7,645	$124
Finance and Insurance	449	9	$14,065	$435
Real Estate and Rental & Leasing	636	16	$6,920	$220
Prof, Scientific, & Tech Services	824	15	$24,161	$403
Management of Companies	151	2	$6,081	$121
Admin, Waste Mngt & Rem Serv	438	8	$10,096	$217
Educational Services	223	5	$2,473	$58
Health Care & Social Assistance	2,177	27	$78,106	$1,247
Arts, Entertainment, and Rec	464	8	$3,937	$77
Accommodation and Food Services	1,665	55	$28,835	$1,047
Other Services	875	17	$23,250	$582
Government	4,990	276	$306,365	$17,513
Total	21,006	1,124	761,729	34,192
Forest Service as Percent of Total	---	5.35%	---	4.49%

Source: Author generated using MIG 2016 and USDA FS 2018e

The amount of employment in the timber industry is greatly diminished from the 1980s. In 2005, a new mill was built in Reserve, New Mexico, which could handle more capacity and material from 9 to 24 inches in diameter. Since the mill's establishment, the number of acres treated mechanically and the volume of material removed from the forest has increased dramatically. Treatments have included timber sales, commercial and personal use fuelwood sales, post and pole permits, and other forest product sales. Fuelwood gathering in the forest is still tied to livelihoods in some of the surrounding communities. Wood for fires continues to be widely used either aesthetically or as the primary heat source within homes. Approximately 48 percent of the housing units in Catron County rely on wood as the primary heating fuel type. In Grant, Hidalgo, and Sierra Counties, approximately 5 to 12 percent of the housing units use wood for heat (U.S. Census Bureau 2000b). The use of wood for heating homes may be tied to long-term customs, traditions, and culture of the community, but it may also provide economic savings over propane, natural gas and electricity.

Figure 58 displays the quantity and value (in nominal dollars) of fuelwood permits in the forest since 2005.



	2005	2006	2007	2008	2009	2010	2011	2012
Permits	2,339	2,059	2,131	2,378	2,398	2,493	2,116	2,333
Value	$58,468	$47,085	$51,261	$57,831	$55,967	$60,487	$51,208	$57,603

Figure 58. Quantity and value of forest fuelwood permits, 2005-2012

In addition to fuelwood, piñon nuts, greenery, gravel, rocks, and other forest products are gathered on the forest for both commercial and personal uses. Gathering habits have been part of the customs, tradition, and culture of the people for many years (USDA FS 2006a). The above analysis considers only the market transactions that result from activities in the Gila NF. Numerous non-market social and economic values are associated with the Gila NF.

Total Federal Land Payments

Counties containing Federal lands have historically received a percentage of the revenues generated by the sale or use of natural resources on these lands. A steep decline in Federal timber sales on national forests during the 1990s significantly decreased revenues received by counties from the Forest Service. Federal land payments are payments made by the Federal Government to state and local governments to compensate for non-taxable Federal land within their borders. In the area of influence, the Forest Service makes contributions through both appropriations and revenue sharing via various programs, such as the appropriated Payment in Lieu of Taxes (PILT), and revenue sharing programs, such as the Secure Rural Schools program.

PILT are Federal payments to local governments that help offset losses in property taxes due to nontaxable Federal lands within their boundaries. PILT payments help local governments fund operations, such as emergency services and road maintenance. Payments are made annually for tax-exempt Federal lands administered by the BLM, National Park Service, USFWS, Forest Service, and for Federal water projects and some military installations. Payments to counties are based on population, receipt-sharing payments, and the amount of Federal land within a county although some entities in the region would like to see this formula changed (table 87).

Table 87. Payments in lieu of taxes (PILT) to counties, FY 2014-2017

County	2014	2015	2016	2017
Catron	$636,506	$619,691	$621,950	$617,372
Grant	$2,061,555	$2,078,740	$2,130,365	$2,185,171
Hidalgo	$768,743	$745,488	$749,220	$728,804
Sierra	$1,203,605	$1,205,512	$1,158,994	$1,166,412

Note: Portion of PILT attributable to Gila NF managed acres within four county analysis area. Additional payments to the analysis area are made as a result of other Federal land management (for example, BLM).

Source: USDA FS 2017 and USDOI 2018

Historically counties have received revenue sharing payments from commercial activities on Federal lands, such as oil and gas leasing and timber harvesting. For national forests, the payments are based on 25 percent of the 7-year rolling average annual receipts. These payments are commonly called 25-percent payments. However, in response to declining timber receipts, the Secure Rural Schools and Community Self-determination Act (SRSCS) was passed in 2000, which offered a guaranteed source of payments that was not tied to annual commercial revenue in national forests. All New Mexico counties with Gila NFs lands elected to receive the Secure Rural Schools Act State Payment share in fiscal years 2014 through 2017, and not the 25-percent payments. SRSCS payments are intended to improve public schools, maintain infrastructure, improve the health of watersheds and ecosystems, protect communities, and strengthen local economies. Table 88 lists the Secure Rural Schools and Community Self-Determination Act payments from the Gila NF for fiscal years 2014-2017. Congress did not authorize the SRSCS Act and no payments were made in 2016. When Congress does not extend SRSCS, Federal resource agencies revert to paying states and counties via the original revenue-sharing programs, including the 1908 Forest Service 25-percent program, 1920 Federal Mineral Leasing Act, and the 1934 Taylor Grazing Act, which are considerably less than the SRSCS payments under current management. The Secure Rural Schools payments were reauthorized in 2018 for fiscal years 2017 and 2018.

Table 88. Secure Rural Schools and Community Self-Determination Act, FY 2014-2017 payments

	SRSCS			2016
	2014	2015	2017	25-percent
Catron	$1,357,726	$1,559,361	$1,637,265	$66,283
Grant	$732,755	$712,149	$769,248	$26,062
Hidalgo	$5,184	$6,274	$7,539	$1,127
Sierra	$266,175	$294,143	$278,007	$12,621

Plan-Level Environmental Consequences

Management of public lands contributes to the economies of surrounding communities. The Gila NF makes up nearly 3.3 million acres or 7.9 percent of the area of influence, which is the multi-county analysis area of Catron, Grant, Hidalgo, and Sierra Counties, making it an important contributor to the local economies. These lands contribute a wide range of economic values to people. Market goods such as timber, forage for livestock, minerals, and recreation opportunities generate employment and income, as well as payments to local communities and revenue for the U.S. Treasury.

The 2012 National Forest System Land and Resource Management Planning Rule (2012 Planning Rule) guides the revision effort for the Gila NF (36 CFR 219.35(b)). Though not a requirement under the 2012 rule, job and income estimates—one measure of the economic contribution of forest management—by alternative is an informative indicator of the economic impacts of different management alternatives on the local economy. This report provides this economic impact analysis. This is only a portion of the full economic and social impacts of the current management and action alternatives. This analysis considers only the market transactions that result from activities in the Gila NF.

Numerous non-market social and economic values are associated with the forest. The value of ecosystem services, such as, clean air and water, are not captured in the economic impact analysis. Therefore, this analysis should not be conflated with a representation of the total economic value of the forest. Non-market goods, such as existence values of Gila trout or unique ecosystems and habitats, generate value everyone reaps, but do not necessarily pay for. Other forest benefits such as outdoor recreation and scenery are valued by the people who use them, but only a portion of this value is represented in market purchases. Where appropriate, discussion of how the alternatives may affect nonmarket values is presented in other sections. However, due to the qualitative nature of those discussions, direct comparisons between changes in market and nonmarket values are not possible.

This section presents the likely economic consequences, in terms of jobs and income, of implementing the alternatives presented in chapter 2 of the DEIS. The tables presented in this section will be referenced in the alternative-specific descriptions of economic impacts.

Analysis Methodology

An economic contribution analysis estimates the role of Forest Service resources, uses, and management activities on employment and income in the communities that surround the Gila NF.

Economic contribution to counties local to the Gila NF was estimated with input-output analysis using the IMPLAN (IMpact analysis for PLANning) modeling system (MIG 2016). The modeling system allows the user to build regional economic models of one or more counties for a particular year and estimates the economic consequences of activities, projects, and policies on a region. IMPLAN uses Forest Service data on expenditures and resource uses to estimate the economic consequences of Forest Service management.

Input-output analysis represents linkages between sectors in an economy. IMPLAN not only examines the direct contributions from the Gila NF, but also indirect and induced effects. Indirect employment and labor income effects occur when a sector purchases supplies and services from other industries in order to produce their product. Induced effects are the employment and labor income generated as a result of spending new household income generated by direct and indirect employment. For example, visitors to Gila NF spend money on accommodation and food. Accommodation and food service businesses buy supplies from other businesses. The employees of these firms spend their earnings on a variety of goods and services. These transactions result in direct, indirect, and induced effects, respectively, in the regional economy. Direct, indirect, and induced effects are combined in the discussion of effects.

Potential economic impacts are assessed using the Forest Economic Analysis Spreadsheet Tool developed by the Forest Service Inventory and Monitoring Institute in Fort Collins, Colorado. This

tool uses a Microsoft Excel workbook as an interface between user inputs and data generated using the IMPLAN input-output modeling system.

The FEAST analysis assesses the economic impacts of the resource outputs projected under each alternative. Resource outputs in this context are the amount of a resource (forest products, AUMs, recreation visits, etc.) that would be available for use under each alternative. Quantitative inputs (for example, animal unit months, recreation visits, and forest products) were obtained from Gila NF program areas for this analysis, unless otherwise cited. The model for this analysis used 2016 IMPLAN data, which is the latest available dataset.

Study Area

The four counties surrounding the forest—Catron, Grant, Hidalgo and Sierra counties—comprise the Gila area of influence due to their social and economic linkages between residents and the Gila NF (USDA FS Gila NF 2017). These four counties make up the regional economy for the purposes of this economic impact analysis. This analysis area is consistent with that used in the 2017 assessment.

Indicators and Assumptions

Indicators under each alternative were collected from resource specialists at the Gila NF unless noted otherwise. In most instances, the precise change is unknown. Therefore, the changes are based on the professional expertise of the resource specialists. The purpose of the economic impact analysis is to compare the relative impacts of the alternatives.

Recreation

Total annual recreation visits were obtained from the NVUM program. For this analysis, an estimated 390,000 recreational visits annually was assumed based on the most recent round of monitoring that occurred in 2016 (USDA FS 2018f). The distribution of visitor type (i.e., local or non-local visitor) and use type (e.g., was the visit wildlife-related?) from the most recent round of monitoring are used to estimate visitor spending. Average visitor expenditures by type were obtained from the Forest Service's NVUM program (White 2017).

Gila NF resource specialists provided estimates of changes in visitation across different activities (table 89). Actual changes in recreation are not known, and will vary. For non-wildlife and fish related recreation, there is very little difference in the alternatives that would be likely to affect visitation. For non-wildlife and fish related recreation, the percentage increases are to show that the potential for an increase in economic opportunity exists based on the average percentage of improvement in the departure ratings of desired conditions in the woodland and forested ERUs from existing conditions based on the 10-year modeling results. The woodland and forested ERUs are used for these percentages because these are the ERUs more commonly used by big game for which the majority of hunter/huntresses use the forest, as well as comprise the upland vegetation surrounding streams and lakes used by fisherpersons since riparian ERUs were not modeled. The assumption being that improvements in upland conditions will translate to an improvement in riparian and aquatic conditions. This is not to say that conditions will all be good all the time.

The estimated recreation-related impacts capture the expenditures of local and non-local visitors. This analysis examining the economic impact of outdoor recreation on planning area lands to the local economy includes the effects of spending by all visitors, both those who reside in the planning area and those who do not. The analysis shows the size and nature of economic activity associated with these recreational experiences to show relative importance to the local economy.

Table 89. Estimated changes in recreation visitors, by alternative

	Alternative 1	Alternative 2	Alternative 3	Alternative 4	Alternative 5
Recreation (non-wildlife and fish-related)	No Change	No Change	No Change	No Change	No Change
Recreation (wildlife and fish-related)	No Change	5%	2%	No Change	3%

Timber

Table 90 provides the estimated annual forest product volumes available, by alternative. Details of how these numbers were developed may be found in Timber, Forest and Botanical Products section. Demand for fuelwood, post and poles from personal use permits are assumed to remain constant across alternatives. It is the intent under all alternatives to make these products available to people in proportion to the demand, which is not anticipated to increase substantially over the planning horizon. These volumes may increase or decrease depending on demand.

Modeled projections for future forest product volumes under the treatment objectives for each alternative provide variation in forest products across alternatives. The actual volume of forest products depends on how many acres are able to be treated, site-specific conditions on those acres, and site-specific silvicultural prescriptions. Plan objectives are based on estimations of what could be accomplished with congressionally allocated dollars only. Future congressionally allocated dollars for vegetation treatments are assumed similar to the 2007-2017 time period. If budgeted dollars change substantially from the 2007-2017 time period, acres treated and volumes produced could change. Likewise, if partnerships and associated funding make additional treatment acres possible, acres treated and volumes could increase.

These timber volumes are used to estimate the economic impact of timber-related activities in the Gila NF. Alternative 4 would provide the highest annual forest product volumes. This table will be referenced in alternative-specific descriptions of the economic consequences of forest product removal.

Table 90. Estimated annual forest product volumes, by alternative

Forest Product	Alternative 1 (Current)	Alternative 2	Alternative 3	Alternative 4	Alternative 5
Harvest-Softwood Sawtimber (CCF)	747	680	115	2,928	326
Fuelwood (CCF)	1,217	1,228	1,455	1,497	1,254
Poles (CCF)	15	17	39	40	19
Posts (CCF)	412	424	673	689	453
All Other (CCF)	100	112	358	373	141
Total (CCF)	2,490	2,494	2,639	5,499	2,194

Source: Gila NF resource specialists

Grazing

The authorized AUMs in alternative 1 (table 91) was estimated using an average of authorized use between 1999 and 2018, which includes several periods of drought, as well as wetter years. Actual use is permitted annually based on a number of factors, such as current forage and market conditions. The main variable used to estimate the economic impacts of plan direction under a given alternative is the canopy cover of trees. Trees compete with the herbaceous vegetation that provide forage for permitted and authorized livestock. All alternatives contain plan objectives for varying levels of thinning treatments/mechanical treatments, prescribed fire and naturally ignited wildfire that reduce tree densities. For consistency, the analysis assumes that current market demand for livestock products would continue throughout the next several decades with a continuing demand for grazing of the forest lands. While new plan direction is designed to improve vegetation condition, periods of drought are also expected to continue into the future.

Table 91. Estimated annual AUM authorization, by alternative

	Current Authorized AUMs	Alternative 1 Continuation of Current Management	Alternative 2	Alternative 3	Alternative 4	Alternative 5
Average Annual	245,697	-8 to 0%	0 to 2%	-1 to 0%	0 to 1%	0 to 4%

Note: The economic impact analysis uses the midpoint of the range provided.

Minerals

Of the three categories of minerals, locatable, leasable and salable minerals, the Gila NF produces locatable and salable minerals. Locatable mineral volumes are not tracked because under a mining claim the claimant already owns the mineral. The saleable minerals removed from the Gila NF are crushed stone and construction sand and gravel. The Gila NF does not produce any leasable minerals such as oil, natural gas, or coal since the geologic formations for those resources are not present on the forest. Mineral production and associated revenues (and therefore actual economic impact) will fluctuate based on global, national, and regional market conditions including supply and demand, commodity prices, other market or regulatory forces, and technical factors that play larger roles than Forest Service management.

Under all alternatives, the Gila NF would continue to have an active salable mineral materials program, and demand for these resources is expected to continue. Generally, external demand for mineral materials is related to population growth as construction occurs to accommodate growth. Based on population projections, the trend for salable minerals is expected to remain level. Efforts are underway to foster partnerships with local county governments through the opening of new gravel and aggregate sources in the forest to be used for road maintenance purposes including roads recently conveyed by the Forest Service to local governments. However, the effects of salable mineral materials activities would be relatively limited since this material is for road maintenance activities and not new road construction. Therefore, the quantities removed are not expected to differ between alternatives and no variation in mineral production across alternatives is therefore modeled. The reported mineral production is an average of 2011-2013 values for crushed stone (common variety and high-purity silica) and construction sand and gravel (table 92).

Table 92. Estimated annual mineral materials, by alternative

Minerals	Units	Alternative 1 Average Volume	Alternative 2	Alternative 3	Alternative 4	Alternative 5
Crushed Stone (common variety/saleable)	Short Tons	16,305	No change	No change	No change	No change
Construction Sand and Gravel (common variety/saleable)	Short Tons	370	No change	No change	No change	No change
Crushed Stone (high-purity silica, locatable)	Short Tons	1,750	No change	No change	No change	No change

Forest Expenditures

The Gila NF's annual budget (including expenditures and salaries) was approximately $20 million in fiscal year 2016. Approximately 67 percent of the budget was spent on salaries in fiscal year 2016. The remainder was spent on equipment and other non-salary expenditures that contribute to land management. The Gila NF's operational expenditures contribute to economic activity in the communities that surround the lands. Forest Service employees live in these communities and spend their income on housing, food, and a variety of other local goods and services. The Gila NF's non-salary expenditures generate economic activity in businesses that supply goods and services to support Forest Service programs. Forest budgets may fluctuate over the life of the management plan, but are not dictated by the management plan or alternatives. Forest budgets are distributed by an act of Congress, and therefore, no variation across alternatives is modeled.

Payments to States and Counties

The analysis uses an average of the PILT payments in fiscal years 2015 through 2017 (table 87). Forest management as directed by the forest plan has no impact on payments, and therefore, they do not vary across alternatives.

The analysis uses an average of the SRSCS payments in 2014, 2015 and 2017 (table 88). Because SRSCS payments are not responsive to changes in Forest Service receipts, no variation in these payments occur across alternatives. While the original revenue-sharing programs payments are responsive to changes in Forest Service receipts, which can vary as a result of management (e.g., grazing and timber), no attempt has been made within this analysis to estimate any associated variation in these payments across alternatives due to the uncertainty of when or how often these revenue sharing programs would be used when the SRS authorization lapses.

Effects Common to All Alternatives

Under all alternatives, employment and labor income supported by activities in the Gila NF would account for approximately 5.5 percent and 4.5 percent, respectively, of regional totals (table 93 and table 94).

Table 93. Employment estimates by program area, by alternative (total number of jobs contributed)

Resource Area	Alternative 1	Alternative 2	Alternative 3	Alternative 4	Alternative 5
Recreation (non-wildlife and fish-related)	67	67	67	67	67
Recreation (wildlife and fish-related)	15	16	15	15	15
Grazing	612	644	635	641	651
Timber	12	12	11	31	10
Minerals	0	0	0	0	0
Payments to States/Counties	89	89	89	89	89
Forest Service Expenditures	303	303	303	303	303
Total Forest Management	1,099	1,131	1,120	1,146	1,135
Percent Change from Current	---	2.9%	2.0%	4.3%	3.3%
Percent of Regional Employment	5.2%	5.4%	5.3%	5.5%	5.4%

Source: Author generated using MIG 2016 and USDA FS 2018e

Table 94. Labor income estimates by program area, by alternative (labor income contributed in thousands of 2016 dollars)

Resource Area	Alternative 1	Alternative 2	Alternative 3	Alternative 4	Alternative 5
Recreation (non-wildlife and fish-related)	$1,234	$1,234	$1,234	$1,234	$1,234
Recreation (wildlife and fish-related)	$266	$279	$272	$266	$274
Grazing	$11,443	$12,039	$11,860	$11,979	$12,158
Timber	$698	$673	$538	$1,929	$516
Minerals	$0	$0	$0	$0	$0
Payments to States/Counties	$3,796	$3,796	$3,796	$3,796	$3,796
Forest Service Expenditures	$16,278	$16,278	$16,278	$16,278	$16,278
Total Forest Management	$33,715	$34,298	$33,977	$35,482	$34,256
Percent Change from Current	---	1.7%	0.8%	5.2%	1.6%
Percent of Regional Labor Income	4.4%	4.5%	4.5%	4.7%	4.5%

Source: Author generated using MIG 2016 and USDA FS 2018e

Minerals

Under all alternatives, the Gila NF would continue to have an active salable mineral materials program, and demand for these resources is expected to continue. While mineral production, associated revenues, and, therefore, actual economic impact will fluctuate based on market conditions, this is outside the control of forest management. No quantitative variation in mineral production across alternatives is modeled.

Under all alternatives, mineral activities in the Gila NF supports less than one full-time equivalent job, annually. This material supports regional infrastructure (for example, aggregate replacement for roads, riprap for drainage) and for local and/or regional economic development (silica rock used

locally at the copper mines, for example). Therefore, the mineral program contributes jobs, income, and raw materials to the local and national economy under all alternatives. Although mineral extraction occurs in the forest, the quantities of stone, sand and gravel removed are insufficient to result in measureable economic contributions to the four-county economy. In the four-county area, most of the active copper mines with large employment occur on private property, and mining employment generally follows copper prices.

Payments to States/Counties

As noted above, payments to local governments are received through the PILT and SRSCS programs. Across all alternatives, these payments would support approximately 89 jobs and $3.8 million in labor income annually (table 93 and table 94). In addition to the total employment and labor income supported by these programs, they provide relatively high average labor income contribution on a per job basis—approximately $42,000. PILT and SRSCS programs offers local economic stability in the form of jobs and labor income. However, dependency on these transfers exposes local services to changes in Federal policy and spending decisions

Forest management, as directed by the forest plan, has very little impact on the PILT payments. There could be a slight difference between alternatives over time where alternatives 2 and 5 would possibly show an increase in payments over time, and alternatives 3 and 4 remain relatively constant. This is because alternatives 2 and 5 allow flexibility in the occurrences of both land acquisitions (e.g., purchases) and land conveyances (e.g., sale, exchange, or donation), while alternatives 3 and 4 stipulate that land acquisitions (e.g., purchases) would be balanced over time with land conveyances (e.g., sale, exchange, or donation) so that no net loss of private property in a county occurred. Based on the authorities available, it is easier for land acquisitions to occur than land conveyances, which could lead to the forest growing slightly over the plan implementation period under alternatives 2 and 5. This would shift slightly the amount of private property to NFS land under alternatives 2 and 5, and therefore, some of the property that was previously generating tax revenue for counties (often at the lower agricultural rate) would be now included in the PILT formula to compensate counties for this now non-taxable Federal land within their borders. However, it is uncertain exactly how many acres would be acquired and conveyed especially with the regional consolidation of the lands program so for the purposes of this analysis the PILT payments do not vary across alternatives.

The SRSCS law ensures counties across the country can receive payments that provide funding for schools and roads and make additional investments in projects that enhance forest ecosystems. The SRS Act authorizes the use of resource advisory committees as a mechanism for local communities to collaborate with Federal land managers in recommending projects on Federal lands that will benefit resources.

Forest Expenditures

Across all alternatives, expenditures by Gila NF, including salary and non-salary (e.g., field and office equipment and supplies, trail construction, and range improvements) expenditures support approximately 303 jobs and $16.2 million in labor income in the local economy, annually (table 93 and table 94). This accounts for the second largest contribution to the local economy in terms of jobs and largest in terms of labor income relative to other forest program areas, and offers local economic stability both in number of jobs and total labor income. These values are the result of Forest Service spending on restoration activities, local lodging for Forest Service personnel, filling Forest Service vehicles at local gas stations, hiring local contractors for building maintenance, etc.

Forest Service employees also engage in their local communities on a more social level, with many employees involved as youth sports coaches, nonprofit board volunteers, and school board volunteers. In addition, many employees are active in the planning of local charity events, participate in local events, are active in neighborhood events, and generally care about the quality of life and conditions in their community.

Social

Broad ranges of people derive benefits from the Gila NF, but value these ecosystem services differently. These differences highlight different relationships with the Gila NF and different prioritization of ecosystem services with their inherent tradeoffs (Armatas et al. 2017). For instance, some people assign high importance to benefits that support biodiversity and abundance of plants and animals (including threatened and endangered species) and wildlife habitat and connectivity representing a landscape unmodified by human activities. While others place higher value on ecosystem services that support the economy (i.e., livestock grazing, timber production, outfitting and guiding), as well as those ecosystem services that support subsistence needs and the culture of resource use (i.e., hunting and fishing, traditional agricultural lifestyle, forest materials for personal use). Other archetypes identified in surveys include a focus on specific water-related issues and valuing primarily water quantity, flood and erosion control, water quality, irrigation for agriculture, and water for household and municipal use. Another archetype identified placed a high level of importance to motorized recreation, driving for pleasure, scenic beauty, aesthetics, and inspiration, solitude, quiet, and a clear night sky, and public ownership and access to public land. These diverse perspectives help the planning process understand the relationship the public has with the benefits provided by the forest.

Environmental Justice

As the economy continues to recover from the Great Recession, per capita income is expected to increase slowly, and unemployment and poverty rates are expected to decline gradually. None of the counties in the analysis area has a median income below the poverty threshold. The ethnic composition of the area of influence has remained rather stable since at least 1990—the area is approximately 58 percent non-Hispanic and 42 percent Hispanic, a composition that is similar to that of the state. The area of influence is not as racially diverse as the state; the area population is more predominantly White than that of the state, and has smaller portions of African-Americans, American Indians, and Asians. The study area has large percentages of Hispanic/Latino residents in Grant and Hidalgo Counties. Particular attention is paid to the above-identified counties, due to the higher percentages of minority residents.

Exposure pathways

An exposure pathway is how an individual or community is exposed to a particular hazard. Exposures may be cumulative (e.g., low-level exposure over a long period leading to build-up of toxins in the system) or there may be multiple hazards a community is exposed to (e.g., water contamination and smoke inhalation). Identifying major exposure pathways for an environmental justice community can help understand what health effects they may be facing.

In the Gila NF, the primary hazardous exposure communities may face is smoke from managed and natural fires. Although smoke direction cannot be entirely controlled, in the event of prescribed fire treatments in the forest, Forest Service personnel can mitigate health hazards associated with smoke by communicating with communities, timing prescribed fire, and monitoring. See the Effects

Common to Alternatives 2 and 5 for more discussion of environmental justice issues related to smoke.

Community ability to participate in NEPA process

Environmental justice communities may be less likely to access public meetings or Forest Service materials because of factors such as lack of childcare, working multiple jobs, lack of transportation, linguistic barriers, etc. This could impede their representation in the forest plan revision process.

Throughout the planning process, the Gila's staff has gone beyond routine practices and minimum notice and comment requirements to achieve meaningful, regular involvement of the surrounding communities in developing the draft plan. Meetings were held in areas with high economic and ethnic diversity. Public meetings were held throughout the process in the many small rural communities within and around the forest, as well as in urban community centers. The forest advertised these meetings on local radio and in local newspapers. Flyers for the meetings were posted at libraries, post offices, and other community buildings. Flyers and some major documents were translated into Spanish, and a bilingual planning team member was available at community meetings to translate and engage in conversation. Meetings often used small group break-out sessions to ensure participants' comments and ideas were heard.

During comment periods, hardcopy documents, maps, and comment forms were provided at the front desks of the supervisor's and district offices to ensure those individuals without computers or Internet access could still participate in the process. Verbal comments at public meetings and mailed in comments were also considered, even outside of formal comment-request periods. This ensured that even those who could not attend a meeting, or get a comment form, were still able to have their voices heard.

Throughout the planning process, the forest worked closely with local government officials, community leaders, and Tribes to ensure the voices of the rural, traditional, and Tribal communities were represented in the planning process. Many of these communities have high proportions of members who identify with a minority ethnic or racial group (e.g., Hispanic or Latino, or Native American). Forest planning team members and leadership also attended meetings convened by local leaders and groups. Tribal consultation and collaboration has been ongoing since 2015 with 10 federally recognized tribes. The Gila NF also participated in two regional tribal roundtables held by the Southwest Regional Forester. These discussions brought together all of the national forests in New Mexico to discuss, learn, and collaborate with tribes around forest plan revision.

There are desired conditions and management approaches that emphasize partnering and collaborating with local communities, non-governmental organization, volunteers, and governmental entities when identifying, planning, and implementing projects in the forest. Under all alternatives, continued management of the forest's ecosystems for ecological integrity; sustainable production of forest products; and healthy plant, fish, and wildlife populations will contribute to the resilience of communities using the forest.

Analysis of the decisions to be made under the alternatives finds no environmental justice consequences. Since all alternatives would continue to support similar levels of employment and income, none of the decisions is expected to exacerbate the poverty rate or disproportionately worsen the economic well-being of low-income individuals. Under all alternatives, American Indian residents would be able to gather forest products and visit sacred sites. None of the alternatives is expected to disproportionately adversely affect racial and/or ethnic minority individuals. The Gila

NF has less than 8,000 acres in Hidalgo County, so impacts would be minimal because there are no major land use changes associated with this area under any alternative.

Alternative 1 – 1986 Forest Plan

Alternative 1 would continue Gila NF management according to the 1986 plan. Management actions under alternative 1 are expected to support 1,099 jobs and approximately $33.7 million in labor income in the local economy (table 93 and table 94). The total contribution of jobs and labor income in alternative 1 is the lowest of all alternatives.

Recreation

There are an estimated 390,000 recreation visits to the Gila NF annually; 52 percent of these visits originate outside of the local area. The expenditures of local and non-local visitors to the Gila NF would support approximately 81 jobs and $1.5 million in labor income, annually. Alternative 1 provides the lowest estimated recreation-related contribution to the local economy in terms of jobs and labor income. However, the quantitative differences in economic impact due to recreation-related management changes is not meaningfully different across alternatives.

Timber

Under current management annual forest product removal is projected to be 2,490 CCFs, annually (table 90), the second lowest removal rate of all alternatives, although with the exception of alternative 4, the differences in total volumes are small. However, the distribution of product types vary. Forest product removal under alternative 1 would support 12 jobs and approximately $0.7 million in labor income in the local economy, annually. These estimated economic contributions, in terms of jobs and income, are moderate relative to other Forest Service program areas.

Range

Under alternative 1, it is assumed available forage will decrease, relative to current conditions, because of continued tree encroachment and infill. Authorized use is estimated at 235,869 animal unit months (AUMs). Actual use varies annually based on local forage and market conditions. This utilization supports 612 jobs and $11.4 million in labor income, which is the lowest estimated contribution relative to all other alternatives. Grazing-related activities support jobs and labor income in the local economy, as well as supporting a way of life for analysis area residents. Grazing-related employment is substantial relative to other resource areas in the Gila NF. Grazing is the largest single source of economic activity associated with Gila NF management across all alternatives.

Alternative 2

Management actions under alternative 2 are expected to support approximately 1,131 jobs and $34.3 million in labor income in the local economy (table 93 and table 94). This represents a 15 percent and 20 percent increase, respectively, from the jobs and labor income levels reported in 2017 (USDA FS Gila NF 2017). The contribution of jobs and labor income to the local economy due to Forest Service management activities in alternative 2 is estimated to be the third highest of all alternatives.

Recreation

Fish and wildlife related visitation is estimated to increase under alternative 2, due to improved stream habitat for fishing opportunities. Alternative 2 contains the greatest potential to improve forage opportunity and improve habitat for wildlife. However, the amount of hunting that can occur

in the forest is dependent upon the number of tags sold by New Mexico Game and Fish. It is not safe to say that hunting opportunity will increase just because habitat conditions may improve.

Fishing opportunity should improve as a result of alternative 2. Alternative 2 has better plan direction to improve stream quality and riparian health, which should lead to improved habitat to support fish important to fisherpersons. Improved riparian vegetation in many riparian areas will make access to some streams difficult, but not for all riparian types.

Plan direction that increases potential visitation would benefit the economy of surrounding communities with jobs and income from visitor expenditures, including lodging, meals, and other expenditures. Plan direction in alternative 2 would support 82 average annual jobs and $1.5 million in labor income. The estimated differences between action alternatives are small and differences in actual visitation and expenditures could make these estimated differences negligible.

Range

Alternative 2 promotes increased use of prescribed and naturally ignited wildfire, and allows for more mixed-severity fire on the landscape. Modeling results for alternatives 2 and 5 demonstrate that the use of fire has the potential to open up more country to the benefit of livestock grazing as opposed to reliance on mechanical treatments. Based on the estimated annual authorized AUMs listed in table 91, grazing under alternative 2 would support 644 jobs and $12 million in labor income in the local economy, annually.

While fire has the potential to benefit forage opportunities, there may be increased costs associated with potential infrastructure damage that could occur with the use of fire. There is also inconvenience and additional costs associated with finding alternative locations to graze during and immediately following fire.

Timber

Sawtimber volumes projected under alternative 2 are lower than would be projected under current management for several reasons. Alternative 2 includes a slightly stronger emphasis on prescribed fire, leading to fewer acres treated mechanically overall. Additionally, alternative 2 shifts emphasis within the timber vegetation types to dry mixed conifer, which has received little attention under current management. Less sawtimber volume is projected with these acres, as the desired conditions retain higher tree densities as compared to ponderosa pine vegetation types. Conversely, an increase in lower value wood products is projected under alternative 2.

While there are differences in management and resulting forest product volumes, the estimated economic impacts are only minimally different from other action alternatives. Forest product removal under alternative 2 is estimated to support 12 jobs and approximately $0.7 million in labor income in the local economy, annually. These economic contributions, in terms of jobs and income, are fairly moderate relative to other Forest Service program areas.

Social

The self-limiting nature of parts of the recommended wilderness due to topography and previous inventory roadless area status means that, in practice, many recommended wilderness areas under this alternative are already restricted from motorized access. In these instances, wilderness recommendation is unlikely to have negative economic consequences.

Effects Common to Alternatives 2, 3, and 4

Alternatives 2, 3, and 4 recommend substantially fewer acres for wilderness designation due to considerations made for the likelihood of extensive high-severity fire should a fire occur, the potential need for mechanical vegetation treatments and current modes of access to maintain infrastructure. None of the areas recommended under these alternatives are likely to be priority candidates for mechanical vegetation treatments, given relatively low likelihoods of extensive high-severity fire, and steep and rugged terrain that effectively limits modes of access and significantly increases the cost per acre for mechanical treatments. Additionally, some of the areas are also within IRAs, which require special circumstances and permissions in order to harvest. There is no economic impact in terms of forest products given all three of these alternatives leave significantly more acres of every vegetation type without wilderness recommendations than are likely to be harvested in the foreseeable future.

Effects Common to Alternatives 2 and 5

Environmental Justice:

Alternatives 2 and 5 include vegetation treatments using significant amounts of prescribed fire. Increases in prescribed fire could create the potential for disproportionate social consequences related to smoke emissions (see Upland Vegetation, Fire Ecology, and Fuels Section). Language barriers can make communicating about prescribed burn plans more difficult, which can reduce the ability of individuals to engage in behaviors to avoid smoke. Non-native English speakers and recent immigrants may be unable to understand or know where to find information (e.g., they do not have reliable Internet access) about planned prescribed burns or other Forest Service activities that may affect their communities. Individuals who are sensitive to smoke, children, the elderly, asthmatics, and those with illnesses, would be most affected by the increase in smoke from prescribed burns.

The New Mexico State Smoke Management[g] program coordinated by the New Mexico Environment Department includes requirements for burn registration, notification of local communities regarding burn date(s), visual tracking and reports for all prescribed fire or managed wildfires greater than a certain size. If air flow (ventilation) conditions or air quality conditions are not within the parameters set in NMAC 20.2.65, the prescribed fire must be postponed. Prescribed fire can also be postponed on the order of New Mexico Environment Department Air Quality Bureau for other reasons.

Smoke-sensitive communities, or those likely to be impacted by a particular fire, are identified during the decision-making and documentation process for both prescribed and wildfires. Prescribed burns are conducted in coordination with the New Mexico Environment Department, so as to occur when conditions are appropriate to minimize impacts to smoke-sensitive receptors downwind. Burn plans are developed for prescribed fires and contain measures to limit human exposure to smoke in relation to the predicted weather and ventilation conditions. These measures are often referred to as best available control measures or emission-reduction techniques. Management chooses the techniques best suited to the conditions of each individual fire. When feasible, management ignitions from wildfires are conducted when ventilation is favorable for good dispersal. Wind speed, wind direction, mixing layer height, atmospheric temperature profile upward in the atmosphere, and atmospheric stability all impact where and how well smoke would disperse. During windows of opportunity when fire weather and fire effects are favorable, fire managers in the Gila NF strive to

[g] https://www.env.nm.gov/air-quality/smp/

treat as many acres with wildland fire as possible each year, yet still remain within legal, climatological, logistical, and social limits. I

Providing timely, relevant information to the public using a variety of effective methods is a standard the forest holds itself to. Developing a long-term particulate monitoring program to detect sudden changes in air quality not related to forest management activities and continuing to deploy particulate monitors during prescribed fire and wildland fire incidents in the forest supports the agency's efforts to providing timely, relevant information. The Gila NF routinely monitors smoke generated by wildland fire, regardless of where that smoke is generated. Real time data from particulate monitors is available on the Interagency Real Time Smoke Monitoring website[h]. Air quality resource advisors are available to provide support when communities have the potential to be negatively impacted. These advisors prepare predictions, health warnings, press releases, and daily reports to inform the public and aid fire managers in decision making. Wildfire incidents occurring in the forest include air resource advisors as needed, and as they are available.

Most of the smoke from fire use in the Gila NF would carry from the southwest to the northeast (i.e., typically away from Hidalgo and Grant Counties and other populated areas within the plan area), and would not disproportionately adversely impact low-income and/or minority residents. However, smoke impacts are always a concern and can be a challenge for relationships between the forest and local communities, especially as the agency works to restore the natural role of fire on the landscape. Whether as a result of not treating enough acres, not treating the right acres, or accepting greater risk with prescribed and naturally ignited wildfire in order to treat more acres, there will be more fire on the landscape.

Alternative 3

Management actions under alternative 3 are expected to support approximately 1,120 jobs and $34 million in labor income in the local economy. This alternative supports the lowest estimated economic impact, in terms of jobs and labor income, in the local economy among the action alternatives (table 93 and table 94).

Recreation

Gila NF fish and wildlife related visitation is estimated to increase under alternative 3, relative to alternative 1. Plan direction that increases potential visitation would benefit the economy of surrounding communities with jobs and income due to visitor expenditures, including lodging, meals and other expenditures. Plan direction in alternative 3 would support 82 average annual jobs and $1.5 million, annually, in labor income to the local economy. However, the differences between action alternatives are small and differences in actual visitation and expenditures could make these estimated differences negligible.

Range

Under alternative 3, only historically open-canopy woodland and grassland vegetation types are treated outside the WUI. Alternative 4 reduces prescribed fire, maintains current use of naturally ignited wildfire, and emphasizes mechanical treatments. The potential decline in AUMs projected under alternative 3 are associated with the relatively lower proportion of acres under closed-canopy conditions in the targeted vegetation types. While it is ecologically appropriate to continue working in open-canopy conditions, particularly in encroached grasslands where the desired tree densities are less than 10 percent, there are diminishing returns for doing so in terms of increasing forage

[h] https://app.airsis.com/USFS/Units/Details?custId=2&unitId=1035

production. Furthermore, focusing on mechanical treatments reduces the number of acres that can be treated as it is the most expensive way to reduce tree densities. Alternative 3 management direction result in an increase in estimated AUMs relative to alternative 1, but the lowest increase of all action alternatives. Plan direction in alternative 3 would support 635 average annual jobs and $11.9 million, annually, in labor income to the local economy.

Timber

Alternative 3 sawtimber volumes are meaningfully lower, but other product volumes are higher as this alternative directs mechanical treatments in historically open-canopy woodlands and grasslands to the exclusion of timber vegetation types. Economic effects of forest product removal under alternative 3 would support an estimated 11 jobs and $0.5 million in labor income in the local economy annually.

Social

For individuals who primarily value the forest for economic opportunities related to livestock grazing, alternative 3 is likely to be favored. Alternative 3 is less likely to be favored among individuals who primarily value resource protection and primitive recreation opportunities.

Alternative 4

Management actions under alternative 4 are expected to support approximately 1,146 jobs and $35.5 million in labor income in the local economy. This alternative provides the largest economic contribution in terms of jobs and labor income impacts within the area of influence (table 93 and table 94). However, the estimated variation across alternatives is small.

Recreation

Gila NF fish and wildlife related visitation is not estimated to increase under alternative 4, relative to alternative 1. No increases in visitation results in no change in the contribution to the economy of surrounding communities as a result of recreation-related management actions. Visitors to Gila NF will continue to contribute to the local economy through expenditures, including lodging, meals and other expenditures. Again, the estimated differences between action alternatives are small and differences in actual visitation and expenditures could make these estimated differences negligible.

Range

Under alternative 4, only forest/timber vegetation types are treated outside of the WUI. Alternative 4 reduces prescribed fire, maintains current use of naturally ignited wildfire, and emphasizes mechanical treatments. Although focusing on mechanical treatments reduces the number of acres that can be treated, as it is the most expensive way to reduce tree densities. Plan components in alternative 4 result in an increase in estimated AUMs relative to alternative 1, but the second lowest increase of all action alternatives. Plan direction in alternative 4 would support 641 average annual jobs and $12 million, annually, in labor income to the local economy. Increasing the total AUMs in the forest results in positive economic impacts to the local economy in terms of jobs and labor income.

Timber

Alternative 4 has the highest overall forest product removal as a result of emphasis of mechanical treatments in timber vegetation types. The resulting forest product-related economic impact is meaningfully greater than all other alternatives—supporting jobs (31, average annual) and labor income ($1.9 million annually) in the local economy.

Payments to States/Counties

Since the Secure Rural Schools inception, these funds have been mostly reauthorized (except in 2016); however, future approval is difficult to predict through the life of the forest plan. In addition to the risk of program cancellation, payments could be delayed or reduced. If Secure Rural Schools is not reauthorized, the program would revert back to the 25-percent fund. If this were the case, it is likely that rural counties that rely on Secure Rural Schools payments would prefer alternative 4. The 25-percent fund distributes to counties where the forest is situated 25-percent of the receipts received from timber, grazing, mineral extraction, recreation, and power generation. Although even under alternative 4, this 25-percent of revenue may not offset the amount of Secure Rural Schools payment, which would have negative long-term consequences for the counties.

Social

Alternative 4 has the highest expected values of employment and income. For individuals who primarily value the forest for economic opportunities, alternative 4 is likely to be favored. Alternative 4 is less likely to be favored among individuals who primarily value resource protection and primitive recreation opportunities.

Alternative 5

Management actions under alternative 5 are expected to support approximately 1,135 jobs and $34.3 million in labor income in the local economy. This alternative provides the second largest economic contribution in terms of jobs and labor income impacts within the area of influence (table 93 and table 94). However, the estimated variation across alternatives is small and actual variation in resource use as well as changes in broad economic conditions will occur.

Recreation

Gila NF fish and wildlife related visitation is estimated to increase under alternative 5, relative to alternatives 1, 3, and 4. Plan direction that increases potential visitation would benefit the economy of surrounding communities with jobs and income due to visitor expenditures, including lodging, meals and other expenditures. Plan direction in alternative 3 would support 82 average annual jobs and $1.5 million annually, in labor income to the local economy. However, the differences between action alternatives are small and differences in actual visitation and expenditures could make these estimated differences negligible.

Timber

Alternative 5 has the lowest projected forest product volumes. This alternative invests in mechanical treatments in the WUI only. As a result, acres of harvest are significantly lower. Economic effects of forest product removal under alternative 5 would support an estimated 10 jobs and $0.5 million in labor income in the local economy annually. This is the lowest economic impact of all alternatives, although the estimates differences between alternatives 1, 2, 3, and 5 are small.

Range

Alternative 5 relies entirely on prescribed fire and naturally ignited wildfire to reduce tree densities outside the WUI. Of the available treatment methods, prescribed fire and naturally ignited wildfire occurring under favorable weather and fuel moisture conditions are the most cost effective tools, allowing more acres to be treated. Based on the estimated annual authorized AUMs listed in table 91, grazing under alternative 5 would support 651 jobs and $12 million in labor income in the local economy, annually. This is the largest range-related economic contribution, in terms of jobs and income, to the local economy.

Alternatives 2 through 5 propose recommending additional acres for consideration for wilderness designation. While livestock grazing is compatible with wilderness recommendation or designation, this could increase costs associated with infrastructure maintenance and/or modes of access if Congress ultimately designated these areas. Alternative 5, which contains that largest number of recommended acres, has the greatest potential for these impacts.

Social

Individuals who value resource protection above resource use are likely to derive benefit from the recommendation of additional lands for wilderness, regardless of intention to recreate in wilderness. Although wilderness visits account for a relatively small percentage of total visits, wilderness also has non-recreation values, such as ecosystem services. Alternative 5 is expected to appeal to people and groups who seek additional primitive recreation opportunities and/or the protection of forest resources. Alternative 5 is less likely to be favored among individuals who primarily value the forest for economic opportunities.

Local businesses benefit economically due to the forest visitors recreating in designated areas when they are travelling through the local communities to their destinations. However, additional designated areas can also impose opportunity costs on local economies due to land use restrictions and foregone commodities (Steed et al. 2011; Ashcroft et al. 2012) and may increase permit compliance obligations and raise maintenance costs due to more restricted access methods.

Cumulative Effects

The timeframe for the economic cumulative effects analysis is the next 10 to 15 years, and the geographic scope for the economic cumulative effects analysis is the four-county region identified above. This analysis considers how past, present, and reasonably foreseeable future actions on lands throughout the region may interact with decisions made under the proposed plan to affect the social and economic conditions. The economic analysis of the proposed plan is unique among the resources and uses in that the effects occur primarily off the forests. In this way, the indirect effects described above are cumulative in nature—they evaluate the role of Forest Service decisions under the proposed plan both within and outside of the Gila NF. However, the indirect effects analysis does not address how actions taken on adjacent lands would affect the economic consequences of the proposed plan.

Between 2010 and 2030, the area's overall population is expected to hold relatively constant (UNM-BBER 2014). Changing population size at finer scales may affect demand for recreation and other resources in the Gila NF. Population growth may place particular pressure on popular recreation sites near urban centers. Additionally, population growth may lead to the expansion of the wildland-urban interface, which affects the cost and difficulty of managing wildfire. Shrinking populations may indicate fewer economic opportunities. Economic opportunities on NFS lands, therefore, may be particularly important to community livelihoods in areas with static or negative population growth.

The Gila NF area of influence is rural, with a low population density. However, the population is not evenly distributed within counties. The populations of all four counties were less than 30,000 in 2010, but the population of Grant County was 10 times larger than that of Catron County. Population density can serve as an indicator of a number of socioeconomic factors of interest: urbanization, availability of open space, socioeconomic diversity, and civic infrastructure (Horne and Haynes 1999). More densely populated areas are generally more urban, diverse, and offer better access to infrastructure. In contrast, less densely populated areas provide more open space, which may offer natural amenity values to residents and visitors. The study area has a great deal of publicly owned

lands. This suggests that Forest Service decisions, and other Federal actions, may have a substantial effect on social and economic well-being of the communities.

The area of influence population is aging due to younger people migrating to larger cities and an influx of retirees from the baby-boomer generation arriving to the area. Older populations are likely to have different needs and preferences related to forest use than younger populations. For example, older populations are more likely to desire easily accessible recreation opportunities.

It is expected that educational improvements will continue throughout the Gila NF associated counties. Areas with more educated populations tend to be more resilient to economic changes (Florida 2002). Changes to forest management, therefore, are less likely to affect the economic well-being of highly educated counties.

All counties in the area have median household incomes below the state and Nation. Higher income may signal greater job opportunities, highly skilled residents, greater economic resiliency, and well-developed infrastructure while lower income is typically a reflection of poor economic conditions and relatively few economic opportunities available in a community. These data suggest that area of influence residents are more likely to be socially and economically vulnerable. Lower median household incomes correspond with fewer household assets to allow consumption smoothing during difficult economic circumstances. Economic changes (either positive or negative) may have a more pronounced effect the economic well-being of the area.

Non-labor income, such as retirement and investment funds, now make up over half of total personal income. The reliance on non-labor income may also indicate dependence on government transfer payments. Non-labor income may help to stabilize the economy, as it is not tied to employment status. However, non-labor income may fluctuate based on asset market performance (e.g., investments in stocks and bonds) or changes in government policy.

If the influx of retirees into the planning area continues, the growing role of nonlabor income in the economy can also be expected to continue. Older forest visitors may have different needs and preferences. Retirees have more leisure time than working-age adults have and may, therefore, be avid visitors. Retirees are also more likely to have mobility concerns, which make easily accessible sites more important.

The area boosts many environmental amenities, such as scenery and recreation opportunities, that improve quality of life. However, one of the biggest economic challenges of all the counties in the area of influence is their remoteness. Often to capitalize on environmental amenities in the form of economic growth, an area also needs to have access to markets (via airports or highways), an educated workforce, and a diverse economy that welcomes newcomers (Rasker et al. 2008). The area of influence for the Gila NF is considered rural and isolated in terms of interstate airports (although Grant County does have a small airport with daily flights to Albuquerque) and driving time length to major cities. Isolated, rural counties in the West often have slower rates of growth in population, employment, and real income (Rasker et al. 2008). The area's ability to attract and retain people, businesses, and industry is limited by the lack of ready access to major population centers. Conversely, isolation may have some advantages in terms of slower pace of life and affordable housing.

Stakeholder input reveals areas of broader agreement that could be the focus of future collaboration efforts. Restoration of forests, grasslands, and watersheds is a perceived need that could improve ecosystem function and offers potential economic benefits to local communities. Despite the

contentiousness of past relationships, there appears to be a potential foundation for future collaboration with stakeholders throughout the area. Coordinating with stakeholders, such as other Federal agencies, state agencies, local governments, organizations, and private landowners would not only improve efficiency and effectiveness of these restoration efforts, but could also bridge gaps between social differences and value conflicts within communities (USDA FS 2006a). There have been collaborative restoration efforts in the past, and this planning process is an opportunity to renew those relationships, and continue and expand this important work.

Climate change may make forest resources more vulnerable to disturbances and may cause resource conditions to depart further from desired conditions. Vegetative vulnerability can lead to disruptions in forest product markets, reduce forage availability, change water supply, and degrade recreation opportunities. These consequences could change resource availability and use in the Gila. People and communities may be socioeconomically vulnerable if they are exposed, are sensitive, and have limited ability to adapt to ecological changes (Hand et al. 2018).

The Forest Service acknowledges the critical need to increase the pace of restoration to address a variety of threats including fire, climate change, and insect and disease outbreaks (USDA FS 2012c). Across the Nation and in the Southwest, there is broad public support for actively managing forests to be more resilient to these threats. In response, the Gila NF is generally shifting planning and implementation efforts to encompass larger landscapes. This broad recognition is piquing interest in the feasibility of commercial use of traditionally sub-merchantable materials, such as small diameter dimensional lumber and wood-based energy production. The forest will continue to work with other Federal, State, and local government agencies, as well as non-government organizations to build facilities and markets that will use this type of material.

The proposed plan emphasizes vegetation restoration under all alternatives. Current and proposed plans on adjacent NFS lands and other land management agencies also emphasize ecosystem restoration. The recent Farm Bill provides permanent “Good Neighbor” authority for the Forest Service and BLM to enter into cooperative agreements or contracts with states to allow the states to perform watershed restoration and forest management services on NFS lands. The Gila NF is the first national forest in New Mexico to use the Good Neighbor Authority. Promoting more use of the Good Neighbor Authority in the southern part of the state would be beneficial for accomplishing needed watershed restoration and forest management, and encouraging collaborative partnerships.

The scale of the future proposed treatments (in Gila NF and adjacent lands) and increasing the pace of restoration activities could draw new forest product harvesting and processing firms to the region. The timber estimates presented in the environmental consequences section are based on a static model of the economy. However, if additional firms locate in the area due to region wide restoration efforts, the local economic impact of activities to occur under the proposed plan could increase. The Collaborative Forest Restoration Program in New Mexico provides cost-share grants to stakeholders for forest restoration projects on public land designed through a collaborative process. These projects may be entirely on any combination of federal, tribal, state, county, or municipal forest lands, and must include a diverse and balanced group of stakeholders in their design and implementation. A recent Collaborative Forest Restoration Program grant plans to construct a new mill in Luna, New Mexico, which could increase restoration treatments and economic activities in that area. Challenges facing contractors include a shrunken workforce, fewer Federal timber sales, landowners’ understanding about the expense of mitigation work, and competition with illegitimate contractors (Vaughan and Mackes 2015).

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 southwestern New Mexico continue this traditional practice that provides food, is a bonding activity between parents and children, and is a way of teaching children about nature and the land around them. Recently, sport hunting has emerged as a recreational activity, which can involve larger groups, OHVs, and hunting camps. Sport hunting can be very social and many hunters return to the forest annually for this activity. The growth of sport hunting has given rise to a community of commercial outfitters and guides. The Gila NF is known for its high quality hunts, especially elk, which attract hunters from all over the country. Ranchers are taking advantage of the hunting opportunities by developing outfitting and guiding businesses. Outfitters and guides look to the forest for special-use permits that allow them to host tourist activities on NFS lands. Some rely on this as a main portion of their income.

In 2013, New Mexico Department of Game and Fish commissioned a study of hunting, fishing, and trapping to estimate county-level and state-wide contributions to the state's economy (Southwick Associates 2014). The study found 248,334 New Mexico residents and nonresidents hunted, fished, or trapped in New Mexico in 2013 (table 95). Of these participants, 24 percent (59,751) hunted, trapped and fished in the four counties encompassing the Gila National Forest (table 96), expending approximately $46,595,774.

Table 95. Sportsmen participation and expenditures statewide and by county by activity in 2013

Location	Hunters	Economic Value	Trappers	Economic Value	Anglers	Economic Value
New Mexico	**86,384**	**$342,368,654**	**1,639**	**$3,493,874**	**160,311**	**$267,717,023**
Catron County	12,406	$15,018,759	109	$71,283	7,328	$1,841,330
Grant County	6,802	$8,902,764	161	$114,044	10,141	$6,452,871
Hidalgo County	2,281	$1,619,381	29	$16,107	153	$112,231
Sierra County	5,329	$4,357,758	29	$16,090	14,983	$8,073,156
Four-County Total	**26,818**	**$29,898,662**	**328**	**$217,524**	**32,605**	**$16,479,588**

From: Southwick Associates 2014

The expenditures of hunters, trappers, and anglers support jobs and garners additional tax revenues. Statewide, approximately 7,936 full- and part-time jobs, providing approximately $268 million in labor income and adding $106 million in tax revenue (table 96). In the four counties, there was approximately 620 full- and part-times jobs, providing approximately $12 million in labor income.

Table 96. Total number of jobs, income, and taxes statewide and by county from hunting, trapping, and fishing in 2013

Location	Jobs	Labor Income	Local, State and Federal Taxes
New Mexico	**7,936**	**$267,920,790**	**$106,493,369**
Catron County	259	$3,703,806	$2,675,882
Grant County	187	$4,760,746	$2,514,814
Hidalgo County	21	$502,401	$278,245
Sierra County	153	$3,370,197	$1,506,065
Four County Total	**620**	**$12,337,150**	**$6,975,006**

From: Southwick Associates 2014

With 65 percent of New Mexico residents participating each year, outdoor recreation generates $9.9 billion in consumer spending annually and 99,000 direct jobs in New Mexico (Outdoor Industry Association 2018). In addition, wildlife watchers spent $327 million on equipment and travel in the state of New Mexico in 2011 (USDOI-USDC 2014).

The recreation-related effects identified in the economic environmental consequences section may be influenced by trends and activities that occur off the forest. Under all alternatives, the proposed plan supports diverse and sustainable recreational opportunities in the forest. Increased recreational use on the Gila NF would lead to a higher economic impact than predicted in the indirect effects discussion. Population growth in the surrounding communities can contribute to high recreation visitation, and can lead to changes in preferences for the types and qualities of recreation supported in the Gila NF. Changes to visitation rates on public lands adjacent to the Gila NF may also impact visitation rates on the forest, and influence the economic impact on surrounding communities.

Herbicide-Use Environmental Consequences

The following discussion of environmental consequences addresses the social and economic effects, and includes a discussion on environmental justice related to the herbicide-use alternatives.

Analysis Methodology

This is a qualitative analysis supported by the available published literature as cited in the text.

Effects Common to All Herbicide-Use Alternatives

All of the alternatives authorize the use of some herbicides on some number of noxious weeds. Existing infestations vary in size and extent; some infestations occupy small areas of less than an acre while others are larger. In total, known infestations occupy less than one percent of the Gila NF. While the species and populations currently known to exist are not substantially reducing the productivity of the land, this could change in the future. Much remains undocumented or unknown, and few scientific analyses provide quantitative estimates of potential impacts. More survey is needed and known populations require treatment.

Noxious plant infestations can reduce the productivity of rangeland vegetation and threaten the ecological and economic viability of livestock grazing. In Montana, North Dakota, South Dakota, and Wyoming, leafy spurge infestations in rangelands has cost approximately $130 million and a loss of 1,433 jobs (Duncan et al. 2004). Russian, spotted and diffuse knapweeds in Montana's rangelands

are estimated to be costing the state's economy roughly $42 million annually, which could have supported an estimated 500 jobs (Hirsch and Leitch 1996). These losses are associated with reduced forage production, as these noxious weeds are not palatable to cattle and/or have reduced nutritional content. When they replace native perennial forage species, the capacity of the range is reduced. At present, very few noxious weed species have been confirmed as present on the Gila NF, and populations are small enough that no measurable reduction in forage production, or economic contribution has occurred. However, this may not always be the case.

The presence of saltcedar (*Tamarix* spp.) in the western United States will cost from $7 billion to $16 billion in lost ecosystem functions (irrigation and municipal water, flood control, hydropower, wildlife habitat, and river recreation) over the next 55 years (Zavaleta 2000). In addition to impacts to community structure and function and ecosystem services, certain nonnative invasive plants can also have impacts to human health such as allergens, skin irritation, tumor-promoting compounds, poisoning, and mechanical injury (Duncan et al. 2004).

Manual treatment methods are more labor intensive than other methods and may create more job opportunities, but this approach is usually ineffective for the treatment of large, well-established infestations of perennial invasive plants with long-term viable seed such as knapweeds (Brown et al. 1999). The forest has a limited budget for all the operations, and if treatments are not cost-effective, invasive plants would continue to threaten native plant communities, wildlife habitats, riparian areas and aesthetic values. On many sites, the use of herbicides would be expected to decline in subsequent entries and the amount of herbicide applied would greatly diminish as the infestations are contained, controlled or eradicated. Herbicides are in many cases, the only effective treatment for noxious weed species and thereby the only way to sustain the productivity of forests and woodlands and the benefits they provide to people. Without herbicide, control, containment and eradication of most noxious weed species would not be possible. With herbicide, control, containment and eradication are possible in most cases.

The potential for herbicides to affect non-target organisms, including humans, depends on the chemistry of the herbicide, route of exposure, duration or frequency of exposure, and dose. Risk assessments for each herbicide proposed for use evaluate the likelihood of adverse human health and ecological effects based on doses that could possibly be encountered (see appendix K).

Herbicide applicators are more likely than the general public to be exposed to herbicides, and may handle undiluted herbicide concentrate during mixing and loading. In routine broadcast and spot applications, workers may contact and internalize herbicides mainly through exposed skin, but also through the eyes, mouth, nose or lungs. Worker exposure is influenced by the application rate selected for the herbicide, the number of hours worked per day, the acres treated per hour, and variability in human dermal absorption rates. Herbicides can generally cause irritation and damage to the skin and eyes if mishandled. Eye or skin irritation would likely be the only overt effect because of mishandling these herbicides. These effects can be minimized or avoided by prudent industrial hygiene practices during handling. Worker exposure can be effectively managed through ordinary prudent practices and use of personal protective equipment required for applicators.

Many people live near, spend time in, work in, or depend on forest products from the Gila National Forest. Some dispersed and developed recreation areas (trailheads, campgrounds, picnic areas, recreation sites, etc.) and forest product collection areas currently occur in or near the vicinity of invasive plant sites. People engaged in these activities could potentially be inadvertently exposed to herbicides from treatment of invasive plants in or near these areas. However, the general public is

unlikely to be exposed to high levels of any herbicides given the design criteria; all alternatives comply with law, regulation and policy aimed at protecting worker safety and public health.

The Federal Insecticide, Fungicide and Rodenticide Act (1996 as amended by the Pesticide Registration Improvement Act of 2003) mandates that all pesticides, including herbicides, be registered through the EPA. The registration process takes between 7 and 10 years, requiring extensive testing to determine efficacy, crop and weed susceptibility, environmental hazard and risk, effects to animal systems and toxicology. The Registration Division of the EPA makes sure that labels are written to comply with legal requirements and minimize risk to human health and the environment. When evaluating risks from the use of herbicides and other pesticides, the courts have determined that reliance on the EPA risk assessments that support a chemical's registration under the amended Federal Insecticide, Fungicide and Rodenticide Act, is insufficient. Court decisions in the 1980s determined the Forest Service can use the EPA toxicology data, but it is still required to do an independent assessment. These risk assessments are discussed in detail in appendix K.

The potential for herbicides to affect non-target organisms, including humans, depends on the chemistry of the herbicide, route of exposure, duration or frequency of exposure, and dose. Risk assessments for each herbicide proposed for use evaluate the likelihood of adverse human health and ecological effects based on doses that could possibly be encountered (see appendix K).

Some people feel that they suffer from multiple chemical sensitivity (MCS), which is sometimes referred to as idiopathic environmental intolerances. In general, individuals with MCS report that they experience a variety of adverse effects as a result of very low levels of exposure to chemicals (including herbicides) that are generally tolerated by individuals who do not have MCS. Forest Service risk assessments incorporate an uncertainty factor of 10 to account for sensitive individuals, which may or may not eliminate risk that an individual may suffer symptoms. However, the uncertainty factor for sensitive individuals addresses variability in tolerances within a normal population. Individuals reporting MCS assert, either explicitly or implicitly, that they are atypically sensitive. There is no current consensus on the diagnosis and cause of MCS. Until the etiology and pathogenesis of MCS has been clarified, an organic cause of the MCS-associated symptoms and symptom complexes cannot be entirely ruled out. The Forest Service has no way to completely resolve concerns for MCS, although the action alternatives do provide additional measures to for those living with MCS as described under effects common to all action alternatives.

Environmental Justice

The goal of environmental justice is for agency decision makers to identify impacts that are disproportionately high and adverse with respect to minority and low-income populations and identify alternatives that will avoid or mitigate those impacts. Environmental justice communities were identified in the plan-level analysis. None of the herbicide use alternatives would reduce employment or income relative to current conditions, therefore, no disproportionate adverse economic effects would occur.

At sufficiently high doses, short or long-term exposure to herbicides can have adverse health effects; however all alternatives comply with the law, regulation and policy aimed at protecting worker safety and public health. This includes adherence to label instructions, the use of risk assessments developed specifically for Forest Service programs, consultation with tribal governments, and permit and reporting requirements through the EPA's National Pollutant Discharge Elimination System program. Alternative A meets this minimum threshold, and the design criteria included in the action alternatives provides additional risk reduction for all workers and communities. This includes

advance notice prior to herbicide application so that sensitive individuals of any ethnicity and income level can take the actions they deem appropriate to limit their potential exposure.

Effects of Herbicide-Use Alternative A-No Action

Alternative A allows all noxious weed species on the New Mexico Department of Agriculture's noxious weed list as it existed in 2000, with the addition of tree of heaven, to be manually pulled or cut with a chainsaw and/or treated with herbicide. Fourteen different herbicides, all with Forest Service risk assessments, are approved for use, and all methods except aerial application are allowable. No new noxious weeds added by NMDA to the noxious weed list after 2000 are authorized for treatment and no native plant species may be targeted.

However, it does not fully support EDRR or the maintenance of vegetation communities dominated by native species. When new noxious species designated by NMDA are introduced and/or discovered, time is usually of the essence. The longer noxious weed populations are allowed to persist on the landscape, the greater the risk of spread and the more area that may potentially need treatment. If discovered and treated early, eradication is more likely. If delayed, control or containment may be the only realistic goals, depending on the particular noxious species. This alternative does not facilitate rapid response to emerging threats and compromises management's ability to maintain, to maintain the ecological and economic sustainability of the forest.

Furthermore, many risk assessments have been updated since 2000. In the case of triclopyr, this includes new information on potential reproductive effects. The no-action alternative does not provide the information necessary to design applications with acceptable levels of risk, protect female workers of childbearing age, or allow female members of the general public to make informed decisions about how they use areas of the forest where triclopyr has recently been applied (see appendix K).

Effects Common to All Herbicide-Use Action Alternatives

Alternatives B, C, and D authorize manual removal and herbicide treatments on all noxious weed species listed on the most current APHIS, NMDA, or other state department of agriculture noxious weed lists. Any noxious plant species added to any of these lists after this NEPA decision would be automatically authorized for treatment. Noxious species could be introduced from most places in the United States, and while the climate in the Gila NF may not be conducive to some noxious species now, it may be in the future. Waiting for state listing to authorize their treatment could limit EDRR, and therefore, these alternatives are more likely to support a successful EDRR program, preserve native biodiversity and ecosystem function, and promote sustainable livestock grazing and forestry.

These alternatives also authorize the use of any of the 21 herbicides with both an EPA and Forest Service risk assessment (see appendix K). It does not contribute to any additional detrimental human health effects because law, regulation, policy, risk assessments and design criteria will be followed to ensure proper use and acceptable levels of risk. It does have the potential to generate beneficial effects as several of the new herbicides are associated with reduced risk.

Herbicide use may have health and quality of life consequences and is most likely to affect vulnerable populations—children, the elderly, and individuals with health or respiratory issues. The design criteria and plan direction that requires mixtures of herbicides only be used when the sum of their human hazard quotients is less than one helps reduce the potential risk of synergistic or enhanced effects (see appendix K). Additional risk reduction criteria for the general public includes specific notification and posting requirements for treatment areas to allow the public, including

vulnerable populations and those that feel they suffer from MCS, to avoid treated areas to further reduce the possibility of exposure.

Effects of Herbicide-Use Alternative B-Proposed Action

Alternative B would also authorize the use of herbicide to control the density of native alligator juniper and evergreen oak species to accelerate progress toward desired conditions for vegetation communities and the urban interface. Instead of repetitively treating the same site mechanically, new acres could be treated, reducing the risk of detrimental fire effects especially in urban interface. With proper use, the effects of using herbicide to control the density of native alligator juniper and evergreen oak species would be similar to the effects described as common to all action alternatives. The use of herbicides within urban interface would bring the use of herbicide in closer proximity to private property and populated areas although these exposure scenarios would be captured in the Forest Service risk assessments when calculating hazard quotients.

Firewood gathering in the Gila NF is tied to livelihoods in some of the communities. Wood for fires continues to be widely used either aesthetically or as the primary heat source within homes. Treatment of native oak and alligator juniper in thinning treatments in the forest and in the WUI would not substantially reduce the amount of firewood available for use. These treatments involve cutting the trees with chainsaws, then painting the stumps with herbicide to prevent re-sprouting. This is a work-intensive activity and is not anticipated that this would be done at a given time on a large-scale basis. Authorizing herbicide to help change the trajectory of treatment areas toward desired conditions for vegetation would benefit local industry by favoring the reproduction and growth of higher value species and reducing the potential for structural changes that increase the likelihood of fire losses. None of the alternatives are expected to adversely affect low-income families who depend on fuelwood.

Effects of Herbicide-Use Alternative C

This alternative was developed to respond to issues surrounding the use of herbicide to treat native species. It is identical to the proposed action in the way it addresses noxious weed treatments, but does not include any treatment of native species. Therefore, the effects would be the same as those described in the Effects Common to All Herbicide-Use Action Alternatives section.

Effects of Herbicide-Use Alternative D

The effects specific to alternative D are similar to those for alternative B. However, the use of herbicide would be restricted to the urban interface, reducing the potential for non-target and off-site effects as compared to alternative B. Outside the urban interface, trajectories would remain unchanged for vegetation communities where alligator juniper and evergreen oak are present.

Cumulative Effects

The contributions of social and economic systems to ecological cumulative effects are relevant here, and discussed under the relevant ecological cumulative effects sections. This cumulative effects discussion focuses on human health.

Workers and the public may be exposed to the herbicides used to treat invasive plants under all alternatives in this project. Cumulative doses are possible within the context of this project, or when combined with herbicide use on adjacent lands or home use by a worker or member of the general public. Application of design criteria such as prior notification and posting signs;, buffers of a minimum of 300 feet from private residences and live water for loading and mixing of herbicides;

and restrictions on applications of herbicides for rain, wind, and slope all minimize the potential for exposure to the public. These design features will be part of plan direction for use of herbicides.

The Forest Service risk assessments evaluated chronic exposure scenarios that would involve the general public, including repeated drinking of contaminated water, repeated consumption of contaminated berries, and repeated consumption of contaminated fish. The potential for cumulative human health effects from any herbicide use proposed in this EIS, combined with other potential herbicide applications in the assessment area, would be encompassed in the health risks estimated for chronic exposure scenarios. In general, these herbicides do not bio-accumulate in people and are rapidly eliminated from the body. However, the risk is very small that a person would receive additive exposures that exceed the reference dose (see appendix K).

A plausible exception is those female applicators of childbearing age. A U.S. Occupational Safety and Health Administration (OSHA) epidemiology study on Forest Service personnel found a marginally significant increase in the odds ratios for miscarriages among women who reported using herbicides. While this OSHA study does not implicate a particular herbicide as the cause, herbicides that lack epidemiology studies focused on women of reproductive age, such as triclopyr, adds uncertainty to the risk characterization (SERA 2011d), and therefore, the potential cumulative effects on herbicide applicators.

Of the known herbicide use on adjacent lands by other Federal, State, and county agencies, some may pose greater risk to workers or the public than the herbicide use proposed in the forest, especially on State Highways managed by the New Mexico Department of Transportation. However, the potential contribution to cumulative pesticide use by any alternative is not significant. The small and scattered nature of the noxious weed infestations make it unlikely that exposures exceeding a level of concern would occur from simultaneous herbicide treatments on NFS and other lands.

Short-term Uses and Long-term Productivity

NEPA requires consideration of "the relationship between short-term uses of man's environment and the maintenance and enhancement of long-term productivity" (40 CFR 1502.16). As declared by the Congress, this includes using all practicable means and measures, including financial and technical assistance, in a manner calculated to foster and promote the general welfare, to create and maintain conditions under which man and nature can exist in productive harmony, and fulfill the social, economic, and other requirements of present and future generations of Americans (NEPA Section 101).

The revised forest plan would govern management of the Gila NF's resources for the next 10 to 15 years. The DEIS discloses the analysis of effects for a range of alternatives, including no action. It considers effects on the significant issues and other resources for this timeframe. Overall, under all alternatives, design and implementation of projects and activities consistent with the direction in this forest plan would ensure the short-term uses, long-term productivity, ecological integrity, and ecological diversity of NFS lands within the Gila NF.

Unavoidable Adverse Effects

The revised forest plan provides a programmatic framework that guides site-specific actions but does not authorize, fund, or carry out any project or activity. Before any ground-disturbing actions take place, they must be authorized in a subsequent site-specific environmental analysis. Therefore, none of the alternatives causes unavoidable adverse impacts.

Irreversible and Irretrievable Commitments of Resources

Irreversible commitments of resources are those that cannot be regained, such as the extinction of a species or the removal of mined ore. Irretrievable commitments are those that are lost for a period of time such as the temporary loss of timber productivity in forested areas that are kept clear for use as a power line right-of-way or road.

The revised forest plan provides a programmatic framework that guides site-specific actions, but does not authorize, fund, or carry out any project or activity. Before any ground-disturbing actions take place, they must be authorized in a subsequent site-specific environmental analysis. Therefore, none of the alternatives causes an irreversible or irretrievable commitment of resources.

Other Required Disclosures

The NEPA at 40 CFR 1502.25(a) directs "to the fullest extent possible, agencies shall prepare draft environmental impact statements concurrently with and integrated with…other environmental review laws and executive orders." As a proposed Federal project, the proposed plan decisions are subject to compliance with other Federal and State laws. Determinations and decisions made in the proposed plan have been evaluated in the context of relevant laws and executive orders. Various State and Federal agencies collaborated throughout the development of the proposed plan.

Preparers and Contributors

The Forest Service consulted the following individuals, Federal, State, and local agencies, tribes and other organization and individuals during the development of this environmental impact statement:

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Matt Schultz, Forest Planner, Interdisciplinary Team Leader, USDA Forest Service, Gila National Forest. Education: B.A. Biology/Environmental Studies, Grinnell College; M.S. Ecology/Geospatial Science, Colorado State University; and graduate training in hydrology through the New Mexico Institute of Mining and Technology. Experience: 20 years working for federal land management agencies, a state regulatory agency, and research institutions across the Southwest and Pacific focused on evaluating site characteristics and monitoring, assessing, and restoring terrestrial, riparian, and wetland systems.

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Cooperating Agencies

New Mexico Department of Agriculture

New Mexico Department of Game and Fish

San Francisco Soil and Water Conservation District

Tribes

Alamo Navajo Chapter

Fort Sill Apache Tribe

Mescalero Apache Tribe

Pueblo of Acoma

Pueblo of Laguna

Pueblo of Zuni

Ramah Navajo Chapter

The Hopi Tribe

The Navajo Nation

San Carlos Apache Tribe

White Mountain Apache Tribe

Ysleta Del Sur Pueblo

Distribution of the Environmental Impact Statement

This draft environmental impact statement has been distributed to individuals who specifically requested a copy of the document and those who are on the Forest Plan Revision contact list. The draft environmental impact statement is available on the Forest Plan Revision website and available for review at the Supervisors Office. In addition, copies have been sent or provided electronically to the following Federal agencies, federally recognized Tribes, State and local governments, and organizations representing a wide range of views:

Advisory Council on Historic Preservation

Alamo Navajo Chapter

American Motorcyclist Association

Audubon New Mexico

Back Country Horseman Association

Bureau of Land Management

Bureau of Reclamation

Caballo Soil and Water Conservation District

Catron County

Center for Biological Diversity

City of Bayard

City of Las Cruces

City of Truth or Consequences

Coalition of Arizona and New Mexico Counties

Continental Divide Trail Alliance

Defenders of Wildlife

Deming Soil and Water Conservation District

Dona Ana Soil and Water Conservation District

El Paso Electric

Federal Aviation Administration

Federal Highway Administration

Friends of Cosmic Campground

Freeport McMoRan Inc.

Fort Sill Apache Tribe

Gila Basin Irrigation Commission

Grant County

Grant County Cooperative Extension Service

Grant Soil and Water Conservation District

Gila Farm and Livestock Bureau

Gila Livestock Growers

Gila Native Plant Society

Hidalgo County

Hidalgo County Public Lands Advisory Committee

Hidalgo Soil and Water Conservation District

International Mountain Bicycling Association

Luna County

Luna Irrigation Company

Mescalero Apache Tribe

Mesilla Valley Fly Fishers

Mimbres Farm and Livestock Bureau

National Park Service

National Outdoor Leadership School

National Wild Turkey Federation

Native Plant Society of New Mexico

Natural Heritage New Mexico

Navopache Electric Cooperative Inc.

New Mexico Association of Conservation Districts

New Mexico Cattle Growers Association

New Mexico Central Arizona Project Entity

New Mexico Council of Outfitters and Guides

New Mexico Department of Agriculture

New Mexico Department of Game and Fish

New Mexico Department of Transportation

New Mexico Economic Development Department

New Mexico Environmental Department

New Mexico Farm and Livestock Bureau

New Mexico Federal Land Council

New Mexico Forest and Watershed Restoration Institute

New Mexico Interstate Stream Commission

New Mexico Land Conservancy

New Mexico Livestock Board

New Mexico Off Highway Vehicle Alliance

New Mexico Office of the State Engineer

New Mexico Pilots Association

New Mexico State Forestry Division

New Mexico State Land Office

New Mexico State University

New Mexico Wilderness Alliance

New Mexico Wildlife Federation

New Mexico Wool Growers Inc.

NOAA Fisheries Service

PNM

Pueblo of Acoma

Pueblo of Laguna

Pueblo of Zuni

Ramah Navajo Chapter

Recreational Aviation Foundation

Rocky Mountain Elk Foundation

Salado Soil and Water Conservation District

San Carlos Apache Tribe

San Francisco Soil and Water Conservation District

Sierra County

Sierra County Cooperative Extension Service

Sierra Soil and Water Conservation District

Socorro Soil and Water Conservation District

Southwestern Council of Governments

State Historic Preservation Office

The Hopi Tribe

The Nature Conservancy

The Navajo Nation

The Quivera Coalition

The Trust for Public Land

The Wilderness Society

Town of Hurley

Town of Lordsburg

Town of Silver City

Trout Unlimited

Tucson Electric Power

U.S. Army Corps of Engineers

U.S. Coast Guard

U.S. Department of Energy

U.S. Department of the Navy, Energy and Environmental Readiness Division

U.S. Environmental Protection Agency

U.S. Fish and Wildlife Service

USDA APHIS PPD/EAD

USDA National Agricultural Library

USDA Natural Resources Conservation Service

USDI Office of Environmental Policy and Compliance

Upper Gila Watershed Alliance

Village of Reserve

Village of Santa Clara

Western New Mexico University

White Mountain Apache Tribe

WildEarth Guardians

Wildlands Network

Ysleta Del Sur Pueblo

Glossary

Adaptive Management - Adaptive management is the general framework encompassing the three phases of planning: assessment, plan development, and monitoring (36 CFR 219.5). This framework supports decision-making that meets management objectives while simultaneously accruing information to improve future management by adjusting the plan or plan implementation. Adaptive management is a structured, cyclical process for planning and decision-making in the face of uncertainty and changing conditions with feedback from monitoring, which includes using the planning process to actively test assumptions, track relevant conditions over time, and measure management effectiveness.

Adjuvant - A pesticide adjuvant is broadly defined as any substance added to the spray tank, separate from the pesticide formulation that will improve the performance of the pesticide.

Assessment - For the purposes of the Forest Plan Revision, an assessment is the identification and evaluation of existing information to support land management planning. Assessments are not decision-making documents, but provide current information on select topics relevant to the plan area, in the context of the broader landscape (36 CFR 219.19).

At-risk species - A term used in land management planning to refer to, collectively, the federally recognized threatened, endangered, proposed, and candidate species and species of conservation concern within a plan area.

Basal area - The area covered by tree trunks and stems of shrubs, forbs and grass species where they meet the ground.

Best management practices (BMPs) - Site and project specific methods or measures to prevent or mitigate potential adverse impacts to environmental quality, especially water quality. They include protection measures to address potential detrimental changes in water temperatures, blockages of water courses, deposits of sediment in streams, streambanks, shorelines, lakes, wetlands and other bodies of water that are likely to seriously and adversely affect water conditions or fish habitat.

Classification of herbicides - Herbicides can be grouped according to their activity, use, chemical family, mode of action, or type of vegetation controlled.

By activity:

- Contact herbicides destroy only the plant tissue in contact with the chemical. Generally, these are the fastest acting herbicides. They are less effective on perennial plants, which can regrow from roots or tubers.
- Systemic herbicides are translocated through the plant, either from foliar application down to the roots, or from soil application up to the leaves. They can destroy a greater amount of plant tissue than contact herbicides.

By use:

- Soil-applied herbicides are applied to the soil and are taken up by the roots of the target plant.
- Preemergent herbicides are those herbicides applied to the soil before the crop emerges, and they prevent germination or early growth of weed seeds.

- Post-emergent herbicides are those applied herbicides after the crop has emerged.

By mechanism of action:

- The classification of herbicides by mechanism of action (MOA) indicates the first enzyme, protein, or biochemical step affected in the plant following application. The main groupings are:
- ACCase inhibitors: These are compounds that kill grasses. Acetyl coenzyme A carboxylase (ACCase) is part of the first step of lipid synthesis. Thus, ACCase inhibitors affect cell membrane production in the meristems of the grass plant. The ACCases of grasses are sensitive to these herbicides, whereas the ACCases of dicot plants are not.
- ALS inhibitors: The enzyme acetolactate synthase (ALS) (also known as acetohydroxyacid synthase, or AHAS) is the first step in the synthesis of branched-chain amino acids (valine, leucine, and isoleucine). These herbicides slowly starve affected plants of these amino acids, which eventually leads to inhibition of DNA synthesis. They affect grasses and dicots alike. The ALS inhibitor family includes sulfonylureas (SUs), imidazolinones (IMIs), triazolopyrimidines (TPs), pyrimidinyl oxybenzoates (POBs), and sulfonylamino carbonyl triazolinones (SCTs).
- EPSPS inhibitors: The enzyme enolpyruvylshikimate 3-phosphate synthase (EPSPS) is used in the synthesis of the amino acids tryptophan, phenylalanine and tyrosine. They affect grasses and dicots alike. Glyphosate (RoundupTM) is a systemic EPSPS inhibitor, but it is inactivated by soil contact.
- Synthetic auxins: Synthetic auxins mimic the plant hormone auxin. They have several points of action on the cell membrane, and are effective in the control of dicot plants. 2,4-D is a synthetic auxin herbicide. They inaugurated the era of organic herbicides.
- Photosystem II inhibitors: They reduce electron flow from water to NADPH2+ at the photochemical step in photosynthesis. They bind to the Qb site on the D2 protein, and prevent quinone from binding to this site. Therefore, this group of compounds cause electrons to accumulate on chlorophyll molecules. Consequently, oxidation reactions in excess of those normally tolerated by the cell occur, and the plant dies. The triazine herbicides (including atrazine) are PSII inhibitors.

Connectivity - Ecological conditions that exist at several spatial and temporal scales that provide landscape linkages that permit the exchange of flow, sediments, and nutrients; the daily and seasonal movements of animals within home ranges; the dispersal and genetic interchange between populations; and the long distance range shifts of species, such as in response to climate change (36 CFR 219.19).

Daphnids - are tiny, freshwater crustaceans with a transparent body, also referred to as water fleas.

Designated area - An area or feature identified and managed to maintain its unique special character or purpose. Some categories of designated areas may be designated only by statute and some categories may be established administratively in the land management planning process or by other administrative processes of the Federal executive branch.

Dicots - are flowering plants that have two embryonic leaves in the seed. Their flower parts are usually in multiples of four or five and their leaves have a web like network of veins.

Disturbance - Any relatively discrete event in time that disrupts ecosystem, watershed, community, or species population structure and/or function and changes resources, substrate availability, or the physical environment (36 CFR 219.19).

Disturbance regime - A description of the characteristic types of disturbance on a given landscape; the frequency, severity, and size distribution of these characteristic disturbance types; and their interactions (36 CFR 219.19).

Ecological conditions - The biological and physical environment that can affect the diversity of plant and animal communities, the persistence of native species, and the productive capacity of ecological systems. Ecological conditions include habitat and other influences on species and the environment. Examples of ecological conditions include the abundance and distribution of aquatic and terrestrial habitats, connectivity, roads and other structural developments, human uses, and invasive species (36 CFR 219.19).

Ecological integrity - The quality or condition of an ecosystem when its dominant ecological characteristics (for example, composition, structure, function, connectivity, and species composition and diversity) occur within the natural range of variation and can withstand and recover from most perturbations imposed by natural environmental dynamics or human influence (36 CFR 219.19).

Ecological Response Unit (ERU) – Vegetation type concepts and map units that combine themes of site potential, or potential natural vegetation, historic disturbance regimes and natural succession. Site potential is a term used to describe the characteristic ecological conditions at the latest successional state, resulting from the interactions among climate, soil and vegetation over time.

Ecosystem services - Benefits people obtain from ecosystems.

Endemic species - Those that occur only in a certain area. In this context, the term is used to describe species that exist only on the Gila, or only in New Mexico and are found nowhere else in the world.

Functioning Properly – A condition class of the Watershed Condition Classification. For more information on the Watershed Condition Classification, please refer to page 205 of the Gila National Forest's assessment report. As applied to the rangeland vegetation indicator, this term means that rangelands reflect native or desired nonnative plant composition and cover at near-natural levels as defined by the site potential.

Functioning at Risk - A condition class of the Watershed Condition Classification. For more information on the Watershed Condition Classification, please refer to page 205 of the Gila National Forest's assessment report. As applied to the rangeland vegetation indicator, this term means that rangelands reflect native or desired nonnative plant composition and cover with slight to moderate deviation compared to natural levels as defined by the site potential.

Geographic Range – The area within which an ecosystem or species can be found.

Geomorphic – of or relation to the form or shape of the landscape and other natural features of the earth's surface.

Heterogeneity - A term referring to the quality or state of consisting of dissimilar or diverse elements.

Historic Property – The term "historic property" is defined in the NHPA (National Historic Preservation Act) as: "any prehistoric or historic district, site, building, structure, or object included in, or eligible for inclusion on the National Register"; such term includes artifacts, records, and remains which are related to such district, site, building, structure, or object.

Impaired Function - A condition class of the Watershed Condition Classification. For more information on the Watershed Condition Classification, please refer to page 205 of the Gila National Forest's assessment report. As applied to the rangeland vegetation indicator, this term means that rangelands reflect native or desired nonnative plant composition and cover that are greatly reduced or unacceptably altered compared to natural levels as defined by the site potential.

Indian Sacred Site – a "sacred site" retains the same meaning as provided in Executive Order 13007; that is " ... any specific, discrete, narrowly delineated location on Federal land that is identified by an Indian tribe, or Indian individual determined to be an appropriately authoritative representative of an Indian religion, as sacred by virtue of its established religious significance to, or ceremonial use by, an Indian religion; provided that the tribe or appropriately authoritative representative of an Indian religion has informed the agency of the existence of such a site." Within this document, this term also refers more broadly to those sites that could in the future be so identified. Such sacred sites may also be eligible for the National Register of Historic Places as historic properties of religious and cultural significance to Indian tribes.

Invasive plants - reproduce rapidly, spread over large areas of the landscape, and have few, if any, natural controls, such as herbivores and diseases, to keep them in check. Many invasive plants share some important characteristics that allow them to grow out of control: (1) spreading aggressively by runners or rhizomes; (2) producing large numbers of seeds that survive to germinate; and (3) dispersing seeds away from the parent plant through various means such as wind, water, wildlife, and people.

Maintenance levels. The level of service provided by, and maintenance required for, a specific road (FSH 7709.59, ch. 60, sec. 62.3).

Level 1. These are roads that have been placed in storage between intermittent uses. The period of storage must exceed 1 year. Basic custodial maintenance is performed to prevent damage to adjacent resources and to perpetuate the road for future resource management needs. Emphasis is normally given to maintaining drainage facilities and runoff patterns. Planned road deterioration may occur at this level. Appropriate traffic management strategies are to "prohibit" and "eliminate" all traffic. These roads are not shown on motor vehicle use maps. Roads receiving level 1 maintenance may be of any type, class, or construction standard, and may be managed at any other maintenance level during the time they are open for traffic. However, while being maintained at level 1, they are closed to vehicular traffic but may be available and suitable for nonmotorized uses.

Level 2. This level is assigned to roads open for use by high-clearance vehicles. Passenger car traffic, user comfort, and user convenience are not considerations. Warning signs and traffic control devices are not provided with the exception that some signing, such as W-18-1 "No Traffic Signs," may be posted at intersections. Motorists should have no expectations of being alerted to potential hazards while driving these roads. Traffic is normally minor, usually consisting of one or a combination of administrative, permitted, dispersed recreation, or other specialized uses. Log haul may occur at this level. Appropriate traffic management strategies are

either to “discourage” or “prohibit” passenger cars. “Accept” or “discourage” strategies may be employed for high clearance vehicles.

Level 3. This level is assigned to roads open and maintained for travel by a prudent driver in a standard passenger car. User comfort and convenience are not considered priorities. The manual on uniform traffic control devices is applicable. Warning signs and traffic control devices are provided to alert motorists of situations that may violate expectations. Roads in this maintenance level are typically low speed with single lanes and turnouts. Appropriate traffic management strategies are either to “encourage” or “accept” passenger cars. “Discourage” or “prohibit” strategies may be employed for certain classes of vehicles or users.

Level 4. This level is assigned to roads that provide a moderate degree of user comfort and convenience at moderate travel speeds. Most roads are double lane and aggregate surfaced. However, some roads may be single lane. Some roads may be paved and/or dust abated. The manual on uniform traffic control devices is applicable. The most appropriate traffic management strategy is to “encourage” passenger cars. However, the “prohibit” strategy may apply to specific classes of vehicles or users at certain times.

Level 5. This level is assigned to roads that provide a high degree of user comfort and convenience. These roads are normally double lane, paved facilities. Some may be aggregate surfaced and dust abated. The manual on uniform traffic control devices is applicable. The appropriate traffic management strategy is to "encourage" passenger cars.

Monocots - are flowering plants that have one embryonic leaf in the seed, such as grasses and lilies. Their flower parts are usually in multiples of three and the veins in their leaves run parallel to each other.

Multiple use - The management of all the various renewable surface resources of the NFS so that they are utilized in the combination that will best meet the needs of the American people; making the most judicious use of the land for some or all of these resources or related services over areas large enough to provide sufficient latitude for periodic adjustments in use to conform to changing needs and conditions; that some land will be used for less than all of the resources; and harmonious and coordinated management of the various resources, each with the other, without impairment of the productivity of the land, with consideration being given to the relative values of the various resources, and not necessarily the combination of uses that will give the greatest dollar return or the greatest unit output, consistent with the Multiple-Use Sustained-Yield Act of 1960 (16 U.S.C. 528–531) (36 CFR 219.19).

Native species - occurs naturally in a particular place without human intervention. Species native to North America are generally recognized as those occur-ring on the continent prior to European settlement.

Non-native plants - are species that have been introduced to an area by people from other continents, states, ecosystems, and habitats. Many non-native plants have great economic value for agriculture, forestry, horticulture, and other industries and pose little to no threat to our natural ecosystems. Others have become invasive and pose a serious ecological threat.

Natural range of variation (NRV). - Those ecosystem conditions that pre-date European settlement. This timeframe is considered a sufficiently long enough to include the full range of variation in conditions produced by dominant natural disturbance regimes such as fire and flooding,

as well as short-term variation and cycles in climate (FSH 1909.12, zero code, sec. 05). The variation of ecological characteristics and processes over scales of time and space that are appropriate for a given management application.

Passerines - are birds that have feet specialized for grasping, with the first toe facing backward. This includes songbirds and certain other groups such as flycatchers.

Potential natural vegetation - Vegetation classification system and an ecological concept referring to the late successional vegetation that would be expected under the constraints of the physical environment in the absence of human intervention or high severity disturbance.

Rangeland Vegetation Indicator – One of twelve indicators of watershed condition utilized in the Watershed Condition Classification. This indicator addresses impacts to soil and water relative to the vegetative health of rangelands. For more information on the Watershed Condition Classification please refer to page 205 of the Gila National Forest's assessment report.

Resilience - The ability of an ecosystem and its component parts to absorb, or recover from the effects of disturbances through preservation, restoration, or improvement of its essential structures and functions and redundancy of ecological patterns across the landscape.

Restoration, ecological. - The process of assisting the recovery of an ecosystem that has been degraded, damaged, or destroyed. Ecological restoration focuses on reestablishing the composition, structure, pattern, and ecological processes necessary to facilitate terrestrial and aquatic ecosystems sustainability, resilience, and health under current and future conditions (36 CFR 219.19).

Riparian Areas - Three-dimensional ecotones [the transition zone between two adjoining communities] of interaction that include terrestrial and aquatic ecosystems that extend down into the groundwater, up above the canopy, outward across the floodplain, up the near-slopes that drain to the water, laterally into the terrestrial ecosystem, and along the water course at variable widths (36 CFR 219.19).

Risk - A combination of the likelihood that a negative outcome will occur and the severity of the subsequent negative consequences (36 CFR 219.19).

Site potential - A term used to describe the characteristic ecological conditions in the latest successional state, resulting from interactions among climate, soil and vegetation.

Species of conservation concern - A species, other than federally recognized threatened, endangered, proposed, or candidate species, that is known to occur in the plan area and for which the Regional Forester has determined that the best available scientific information indicates substantial concern about the species' capability to persist over the long-term in the plan area (36 CFR 219.9(c)).

Surfactants (surface active agents) - are a type of adjuvant designed to improve the dispersing/emulsifying, absorbing, spreading, sticking and/or pest-penetrating properties of the spray mixture.

Sustainability - The capability to meet the needs of the present generation without compromising the ability of future generations to meet their needs. For the purposes of the land management planning regulation at 36 CFR part 219 ''ecological sustainability'' refers to the capability of ecosystems to maintain ecological integrity; ''economic sustainability'' refers to the capability of society to produce and consume or otherwise benefit from goods and services including

contributions to jobs and market and nonmarket benefits; and ‘‘social sustainability’’ refers to the capability of society to support the network of relationships, traditions, culture, and activities that connect people to the land and to one another, and support vibrant communities (36 CFR 219.19).

Traditional Cultural Property (TCP) - A property or site that is eligible for inclusion on the National Register of Historic Places because of its association with cultural practices or beliefs of a living community that are rooted in that community's history and because of its importance to maintaining the cultural identity of that community.

Watershed - Watersheds are defined by the topographic extent of an area that drains to a single point in a stream or river system. Watersheds are cataloged using a uniform hierarchical system developed by the United States Geological Society (USGS) where the United States is divided and subdivided into successively smaller hydrologic units. There are six levels of hydrologic units: region (1st level), subregion (2nd level), basin (3rd level), subbasin (4th level), watershed (5th level) and subwatershed (6th level).

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Index

Reserved for Final Environmental Impact Statement.

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