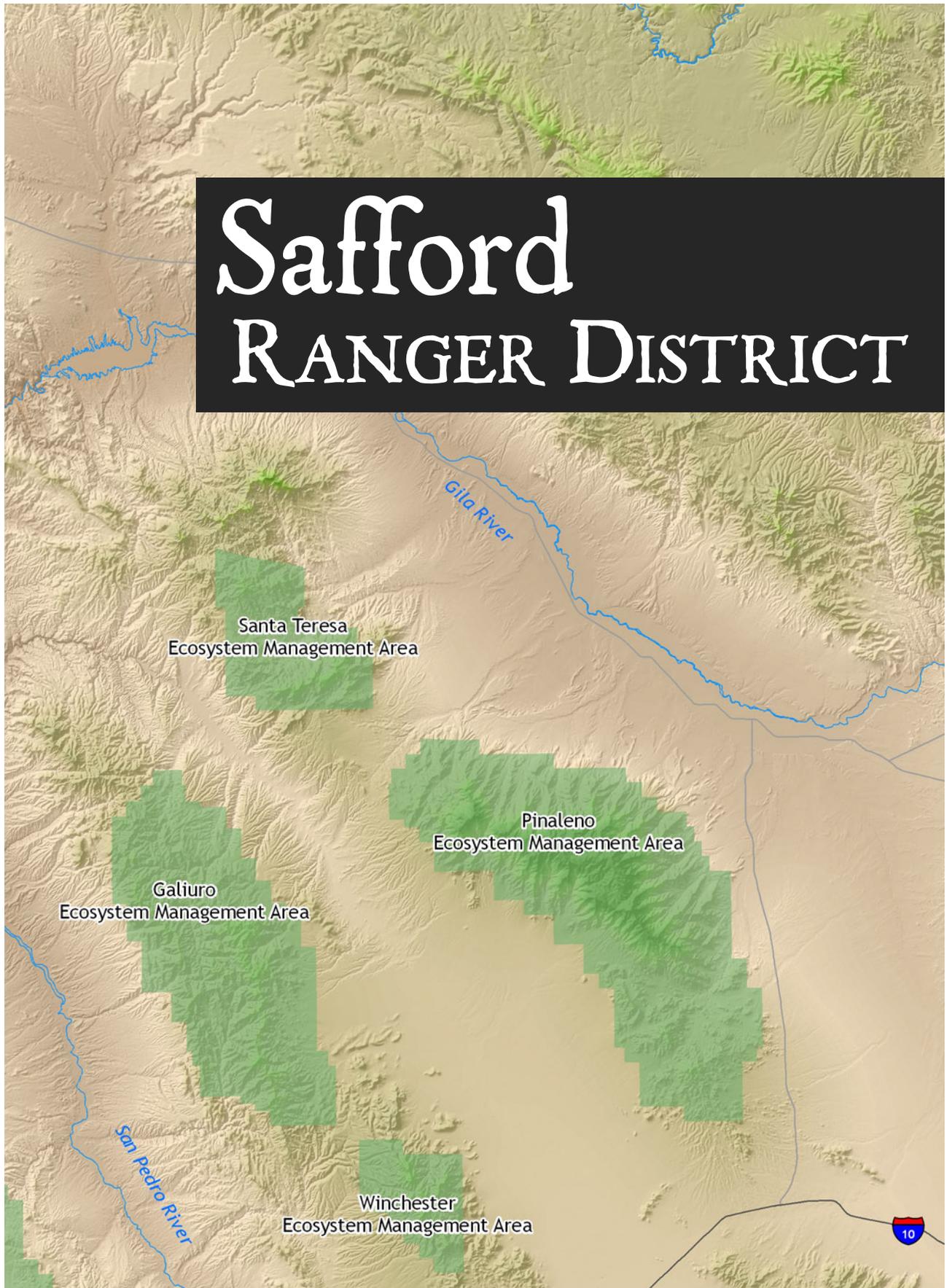


# Safford RANGER DISTRICT







## CHAPTER 8 Pinaleno Ecosystem Management Area

The Pinaleno Mountains are the tallest sky island managed by the Coronado National Forest. The range tops out at 10,720 on the most prominent peak in southern Arizona, Mount Graham. This is not only the highest peak in southern Arizona but also the highest Sky Island in the region.<sup>1</sup> The Pinalenos span the greatest elevation change on the Coronado National Forest rising roughly 6,800 feet from semidesert grasslands at the desert floor to mountainous woodlands at the highest peaks. The Pinaleno Ecosystem Management Area (EMA) encompasses 198,884 acres making it the second largest Management Area on the Forest.

The Pinalenos lie north of the population center of Willcox and west of the town of Safford. The Santa Teresa Mountains lie just northwest of the Pinalenos and together, these mountain ranges form the eastern boundary of the Aravaipa Creek watershed. To the west, across Sulphur Springs Valley, the Winchester and Galiuro Mountains form the western bounds of this portion of the Aravaipa Creek watershed. Aravaipa Creek flows northwest between the two sets of mountain ranges until it cuts through the north end of the Galiuros in the Aravaipa Canyon Wilderness (Figure 8.1).

High elevations of the Pinaleno Mountains are a popular recreation destination in the hot summer months. The paved route of Swift Trail starts near Safford and offers easy access to the eastern flanks of the range. Swift Trail passes a number of well-used trail heads, developed and undeveloped campgrounds, and private cabins as it climbs from the desert floor. The road tops out along the spine of the mountains in montane mixed-conifer forest where it becomes a well-graded dirt road ending near the popular recreation destination of Riggs Lake. State Highway 266 connects State Highway 191 and

the Ft. Grant road cutting through the lowlands near the southern end of the range.

### Natural History

The Pinaleno Ecosystem Management Area encompasses some of the roughest terrain on the Coronado National Forest. The relatively narrow base of the range combines with the largest elevational gradient on the Forest to create amazingly steep terrain. This combination also creates dense vertical stacking of life zones contributing to the great biological diversity of this range. The Pinalenos support the highest diversity of habitats in the shortest vertical distance of any mountain range in North America. Five ecological communities span the range from semidesert grassland at the lowest elevations, to Madrean oak-pine woodland at mid-elevations, to subalpine spruce-fir forest and woodland at the highest elevations.<sup>2</sup> The peaks of the Pinalenos reach high enough to support the most southerly spruce-fir forest found in the United States, a vegetation community characteristic of Canada.

These mountains have been isolated from other montane systems in the southwest for longer than 11,000 years and many species have genetically diverged from similar species on nearby mountains. Engelmann spruce atop the peaks are thought to now be genetically distinct from other populations of Engelmann spruce in the Rocky Mountains. The Pinalenos are also unique among the sky islands of Arizona in supporting high elevation species that have been eliminated from other ranges because of the inability to migrate further vertically.<sup>3</sup>

Mount Graham is home to the Mount Graham Red Squirrel, a subspecies that exists only in the mixed conifer and spruce-fir forests of the Pinaleno Mountains. These forests also support porcupine, badger, mountain lion,

eleven species of bat, twin-spotted rattlesnake, and the endemic Pinalaño tallusnail. All told, 18 endemic species live exclusively in the Pinalaños.

At least nine perennial streams are found in the range. They support excellent riparian habitat and myriad aquatic species. Apache trout, native to the White Mountains in Arizona, have been successfully established in Ash Creek, Grant Creek and Marijilda Creek at the upper reaches of the mountains. Smaller creeks may also contain native trout including Soldier Creek, Big Creek, Post Creek and Moonshine Creek. The range also contains three high elevation cienegas creating lush and rare montane wet meadows.

### **Human Prehistory and History**

The Pinalaño Mountains sit near the confluence of home ranges for the Mogollon, Salado, and Hohokam peoples that populated the region, possibly as early as 200 A.D. and lasting in some form through the arrival of the Apache.<sup>5</sup>

History of extant cultures in the region dates to the 1500s when European first made contact with the Apache in this region. Written history of the area began with Coronado's 1540 journey from Mexico City to the Zuni area of New Mexico. The Pinalaño Mountains are of great spiritual importance to Western Apache. They reside in the historical and present day homeland of Western Apache. The abundant springs and high altitude meadows of the range have offered physical and spiritual sustenance to desert dwelling Apaches for centuries. The Mountain Spirits known to Western Apaches as *Gaahn* have profound religious significance. They reside at special mountains such as *Dzil Nchaa Si'An* (Mount Graham). *Dzil Nchaa Si'An* is a Western Apache sacred site, and is an essential part of Western Apache's homeland and religious life. Mount Graham has been officially recognized as eligible for listing in the National Register of Historic Places in the U.S. as a Western Apache Traditional Cultural Property.<sup>6</sup>

In the spring of 1871 one of the ugliest events in Arizona history took place near the confluence of Aravaipa Creek and the San Pedro River near the western foothills of the Pinalaños at Camp Grant. At that time, Apaches were living near the camp after a peace

agreement with the U.S. military. Tucson citizens, seeking retribution for depredations they believed these Apaches had committed, traveled to this village and launched an attack. A group of Anglos, Hispanics and Papagos surprised the Apache camp killing 85 to 100 Apaches, most of whom were women and children, in what became known as the Camp Grant Massacre. The late 1800s were a turning point in interactions with Apaches as violence slowed and peace became an alternative. The White Mountain Apache reservation, followed by the Chiricahua Reservation were established in an attempt to exchange food and protection for peaceful relations.<sup>7</sup>

Anglo-American settlements continued to expand throughout the region with the successive subjugation of the Apaches, the 1881 arrival of the railroad, and the boom of the cattle industry. This time period saw the simultaneous rise of the mining and lumbering industries. In 1873 the army began construction of Camp Grant at a new location along the southwestern flank of the Pinalaños. A timber cutting operation for construction materials led to commercial logging of Nuttall Canyon, Ash Canyon and atop Mount Graham. Transportation of lumber in the steep mountains proved difficult. After coming into operation as the Mount Graham Lumber Company in 1895, Ash Canyon Mill was broken down by 1916. Rusty remnants of the mill's operations are still visible along the Ash Creek trail. Stockton Pass and Jacobson Canyon supported stands of oak and juniper that were eyed by other hopeful lumbermen. During the 1880s, Hospital Flat Campground was the site of a field hospital for ailing soldiers from Fort Grant. Located along Big Creek, the cool mountain meadow became a summer retreat for officers and their families to escape desert heat at Fort Grant. Today it offers the same escape to a variety of people recreating on the Forest during the hot Arizona summer months.

Mining operations were not as prolific in the Pinalaños as in other mountains in the region. The Precambrian granite and gneiss of this range are virtually unmineralized. Only five small, relatively unproductive, metallic mineral districts are located in the range and mining played a relatively small role in the human history of the range.<sup>8</sup>

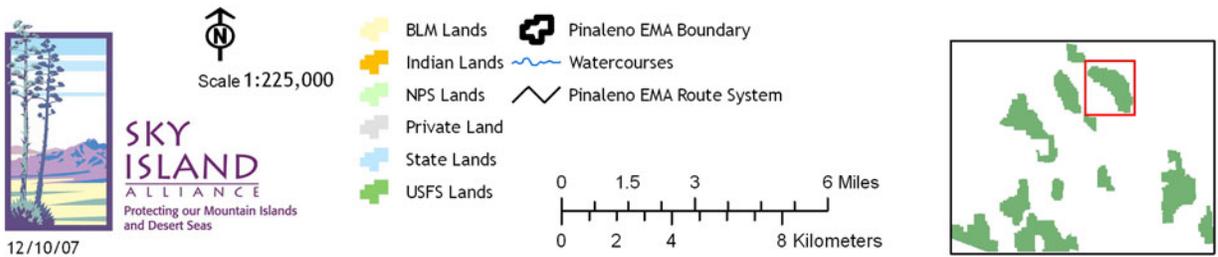
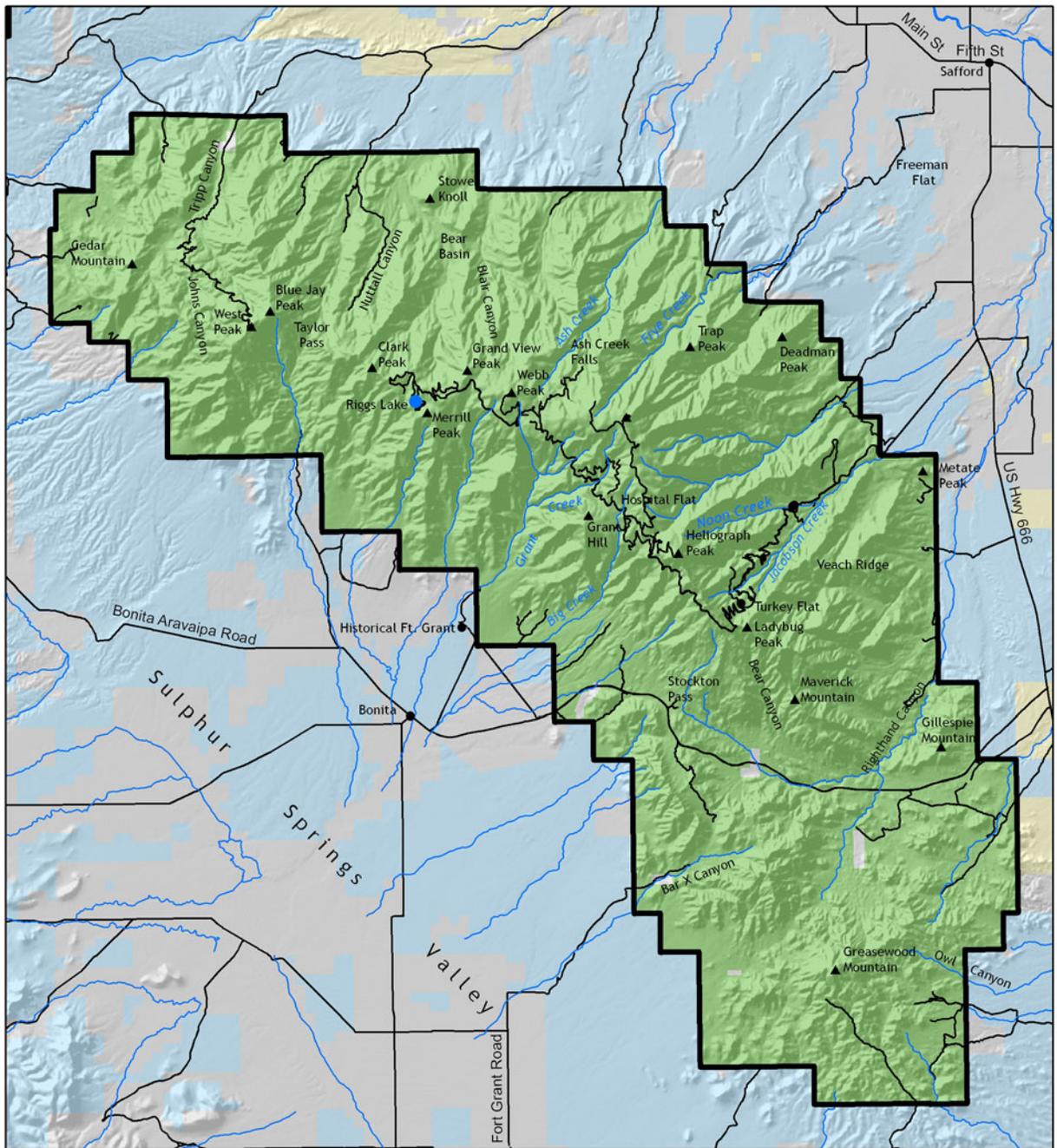


Figure 8.1 Overview of Pinaleno EMA

## Elements of Biological Diversity and Cultural Heritage

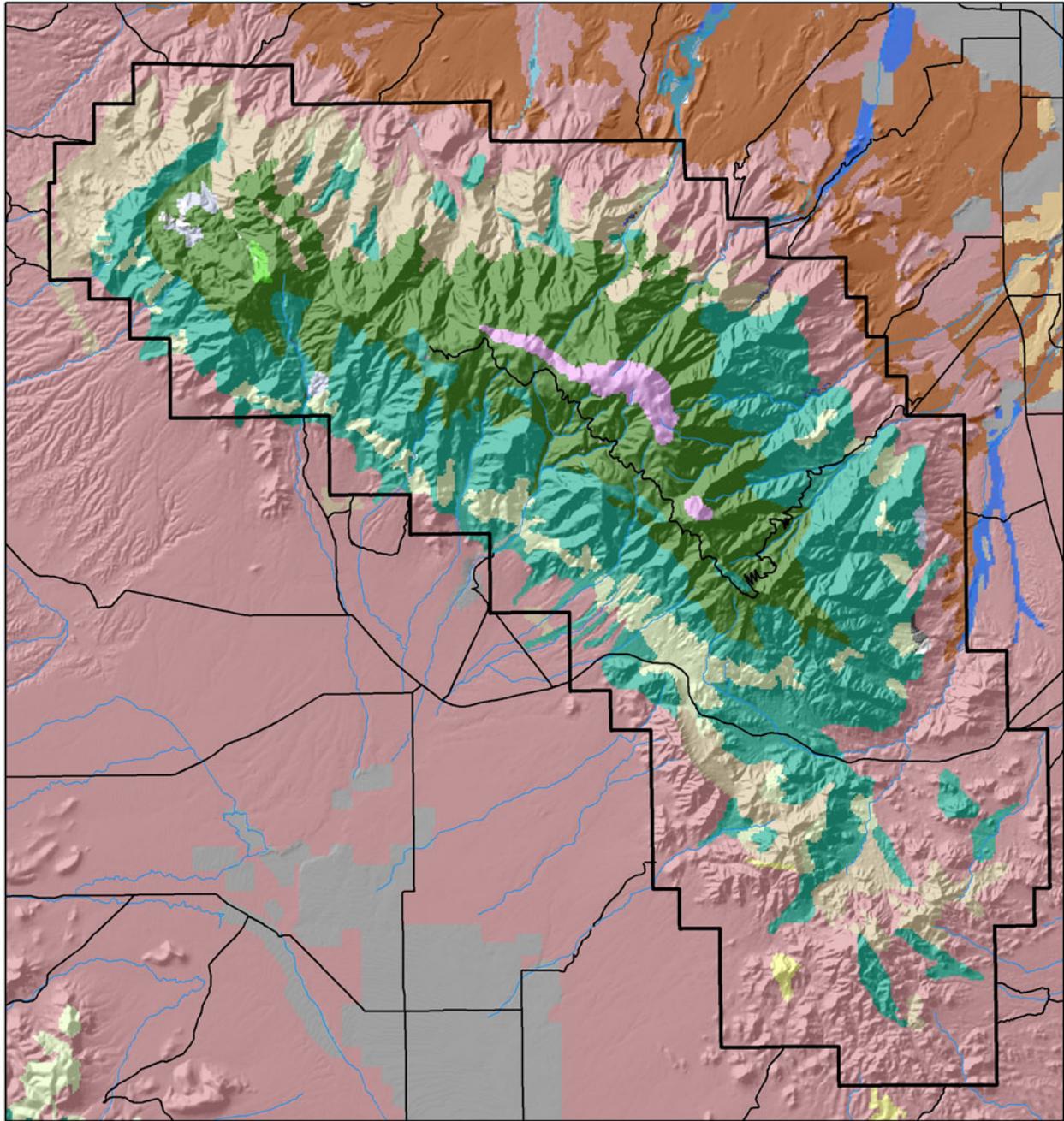
The Pinaleno Ecosystem Management Area harbors a unique combination of vegetation types and species that contribute to the biological diversity of the Coronado National Forest. The Forest Service recognizes that building a framework for ecological sustainability will require management of entire biological communities combined with special management for particular species. For revision of the Forest Plan the Forest Service identified species that will be the focus of planning efforts. Species and vegetation types of management interest found across the Coronado National Forest were described and listed in the Forest Overview (Table 1.1, page 1-11). Described here are species and vegetation types specifically found on the Pinaleno Ecosystem Management Area. The Forest Service identified 56 species of plants and animals including Threatened or Endangered species, along with other species

determined to be Species of Concern or Species of Interest due to management issues (Table 8.1). This includes five listed Endangered species along with other species the Forest Service has determined to be Species of Concern or Species of Interest. These species will be used to guide management decisions.

Ecological systems and the processes that sustain them are the foundations of native biological diversity. Vegetation communities and aquatic habitats that are especially species rich, diverse, or threatened; or are endemic to the region or locality are of particular management concern. To evaluate current conditions and management prescriptions for ecological systems, the Forest Service is using the framework of Potential Natural Vegetation Types. Potential Natural Vegetation Types are defined as the vegetation that would dominate a site under natural disturbance regimes and biological processes. Using this classification allows

**Table 8.1 Species Identified by the Forest Service to Guide Management Decisions**

<b>Birds</b>		<i>Arceuthobium microcarpum</i>	Western Spruce Dwarf-mistletoe
<i>Meleagris gallopavo mexicana</i>	Gould's Turkey	<i>Draba helleriana</i> var. <i>bifurcata</i>	Heller's Whitlow-grass
<b>Fish</b>		<i>Erigeron heliographis</i>	Heliograph Peak Fleabane
<i>Oncorhynchus apache</i>	Apache Trout	<i>Erigeron pringlei</i>	Pringle's Fleabane
<b>Insects</b>		<i>Eriogonum arizonicum</i>	Arizona Wild-buckwheat
<i>Cicindela oregona maricopa</i>	Maricopa Tiger Beetle	<i>Eupatorium bigelovii</i>	Bigelow's Thoroughwort
<i>Eumorsea pinaleno</i>	Pinaleno Monkey Grasshopper	<i>Hackelia ursina</i>	Chihuahuan Stickseed
<i>Melanoplus pinaleno</i>	A Spur-throat Grasshopper	<i>Heuchera glomerulata</i>	Chiricahua Mountain Alumroot
<i>Ophiogomphus arizonicus</i>	Arizona Snaketail	<i>Hieracium rusbyi</i>	Rusby's Hawkweed
<b>Mammals</b>		<i>Hymenoxys ambigens</i> var. <i>ambigens</i>	Pinaleno Mountains Rubberweed
<i>Microtus longicaudus leucophaeus</i>	White-bellied [Long-tailed] Vole	<i>Lupinus neomexicanus</i>	New Mexico Lupine
<i>Idionycteris phyllotis</i>	Allen's Big-eared Bat	<i>Margaranthus solanaceus</i>	Netted Globeberry
<i>Lasiurus blossevillii</i>	Western Red Bat	<i>Penstemon deaveri</i>	Mt. Graham Beardtongue
<i>Tamiasciurus hudsonicus grahamensis</i>	Mt. Graham Red Squirrel	<i>Perityle dissecta</i>	Slimlobe Rockdaisy
<b>Mollusks</b>		<i>Physalis latiphysa</i>	Broad-leaf Ground-cherry
<i>Oreohelix grahamensis</i>	Pinaleno Mountainsnail	<i>Polemonium foliosissimum</i> var. <i>flavum</i>	Leafy Jacob's-ladder
<i>Sonorella macrophallus</i>	Wet Canyon Talussnail	<i>Potentilla albiflora</i>	White-flowered Cinquefoil
<b>Plants</b>		<i>Potentilla thurberi</i> var. <i>atrorubens</i>	Thurber's Cinquefoil
<i>Agave toumeyana</i>	Toumey Agave	<i>Rumex orthoneurus</i>	Blumer's Dock
<i>Arceuthobium blumeri</i>	Southwestern White Pine Dwarf-mistletoe	<i>Sisyrinchium longipes</i>	Timberland Blue-eye-grass
		<i>Sophora arizonica</i>	Arizona Necklace
		<b>Reptiles</b>	
		<i>Aspidoscelis arizonae</i>	Arizona Striped Whiptail
		<i>Aspidoscelis burti stictogramma</i>	Canyon Spotted Whiptail
		<i>Crotalus pricei</i>	Twin-spotted Rattlesnake



  
 1:220,000



-  Apachean Grassland and Savanna
-  Apachean Riparian Grassland
-  Apachean Shrubland
-  Chihuahuan Desert Scrub
-  Interior Chaparral
-  Madrean Encinal
-  Madrean Oak-Pine Woodland
-  Pinyon-Juniper Woodland
-  Montane Mixed-Conifer Forest
-  Subalpine Spruce-Fir Forest and Woodland
-  Montane Riparian Woodland and Shrubland
-  Arizona Cypress
-  Sonoran Paloverde-Mixed Cacti Desert Scrub
-  Desert Riparian Woodland and Shrubland
-  Pinaleno EMA
-  Watercourses

0 1.5 3 6 Miles  
 0 1.5 3 6 Kilometers

**Figure 8.2 Ecological Systems of the Pinaleno EMA**

current vegetation to be effectively compared to vegetation under historic conditions. Because Potential Natural Vegetation Types are relatively broad groupings, and because the Forest contains a high diversity of vegetation types, we present ecological systems as a focus for management direction. These ecological systems are cross-walked with the Potential Natural Vegetation Types used by the Forest Service (Table 8.2). Although there are many fine variations in plant communities on the Pinaleno Ecosystem Management Area, ecological systems classify plant communities into broader groups so as to be most useful for management actions such as mapping, land management, and monitoring. Plant communities were

grouped based on shared characteristics such as natural processes (e.g. fire and flood), substrates (e.g. shallow soils, limestone outcroppings), and local climate.<sup>9</sup> Figure 8.2 shows the distribution of ecological systems in the Pinalenos. Through contact with regional scientists and experts, and other people familiar with the Pinalenos, we identified ecological systems, physiographic features, additional species and cultural resources that should also be considered in the Forest Plan revision.

Species that will need special management attention include species that are endemic to the region or locality, species that have a restricted distribution within the region, and species dependent on specialized habitat. Also needing special consideration are species that are rare, vulnerable or declining throughout their ranges; are rare, imperiled or vulnerable in the U.S. portion of their ranges that overlap the Coronado

**Table 8.2 Foundations of Native Biological Diversity**

<b>“Potential Natural Vegetation Types” (bold) as they correspond with The Nature Conservancy’s “Ecological Systems”</b>
<b>Desert Communities</b> Sonoran Paloverde Mixed-Cacti Desert Scrub
<b>Interior Chaparral</b> Interior Chaparral
<b>Madrean Encinal Woodland</b> Madrean Encinal
<b>Madrean Pine-Oak Woodland</b> Madrean Pine-Oak Woodland
<b>Mixed Broadleaf Deciduous Riparian Forest</b> Montane Riparian Woodland and Shrubland Riparian Woodland
<b>Mixed Conifer Forest</b> Montane Mixed-Conifer Forest Subalpine Spruce-Fir Forest and Woodland
<b>Piñon-Juniper Woodland</b> Piñon-Juniper Woodland
<b>Semi-desert Grasslands</b> Apachean Grassland and Savannah Apachean Shrubland
<b>Wetland/Cienega</b> Cienega
<b>Community</b>
Chihuahuan Pine Stands

**Table 8.3 Additional Species that Require Special Management Consideration**

<b>Amphibians</b> <i>Rana yavapaiensis</i>	Lowland Leopard Frog
<b>Birds</b> <i>Callipepla squamata</i>	Scaled Quail
<b>Invertebrates</b> <i>Abedus herberti</i>	Giant Water Bug
<b>Mammals</b> <i>Sigmodon ochrognathus</i>	Yellow-Nosed Cotton Rat
<b>Mollusks</b> <i>Sonorella christenseni</i> <i>Sonorella grahamensis</i> <i>Sonorella imitator</i> <i>Sonorella macrophallus</i>	Clark Peak Talussnail Pinaleno Talussnail Mimic Talussnail Wet Canyon Talussnail

**Table 8.5 Elements of Cultural Heritage**

<b>Human History</b> Mt. Graham a sacred site for Western Apaches Forest Service’s Columbine Administrative Site 13 archeological and historic sites Heliograph Tower Lookout
<b>Other Values</b> Opportunities for quiet and solitude Opportunities for primitive recreation

National Forest; or are harvested for economic interests. These species may not be adequately protected by managing for ecological systems and may require specific management actions or monitoring. Table 8.3 lists additional species whose needs should be assessed during plan revision.

The Pinaleno Mountains contain a wealth of prehistoric and historic influences. Visible and physical

remnants of previous human habitation of the area include built structures, physical sites, or objects or assemblages of material culture. Human uses of the land compatible with the protection of biological diversity, and traditional Western Apache uses of the land are an important part of the area's Cultural Heritage (Table 8.4).

## Desired Conditions

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★ The Pinaleno EMA remains situated in a landscape in which wide-ranging species (black bear, mountain lion, deer, pronghorn, Mexican gray wolf, jaguar, coati, and others) are able to move between the Pinaleno EMA and the following: Santa Teresa EMA, Galiuro EMA, Aravaipa Canyon Wilderness, and wildlands to the north.

★ Upper elevation conifer forests are characterized by pre-fires suppression vegetation characteristics and support a viable population of Mt. Graham red squirrels.

★ Opportunities for quiet recreation exist in a variety of settings across the EMA.

★ The Pinaleno EMA continues to be a high quality location for primitive recreation with opportunities to experience quiet and solitude. Wildlife and human visitors are free from direct disturbance and noise.

## Conservation Assets

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The physiographic, and biological landscape of the Pinaleno EMA contributes particular assets to our conservation vision for it. The following emerged as strengths and opportunities for conservation in the Pinaleno EMA.

### **Apaches for Cultural Preservation and Apache Survival Coalition**

These two groups, Apache NGOs, work to protect Mount Graham, an Apache sacred site and environmentally critical habitat in Arizona. The abundant springs and high altitude meadows of Mount Graham have offered sustenance and a source of healing to desert dwelling Apaches.

### **Location**

The Pinaleno EMA is located in close proximity to the neighboring Galiuro and Santa Teresa EMA along with the Winchester EMA and Aravaipa Wilderness. To the northwest lie San Carlos Reservation lands.

This EMA sits in a relatively connected landscape that allows for the movement of wide ranging species to and from neighboring mountain ranges.

### **Mount Graham Coalition**

The Coalition works closely with the San Carlos Apache and other Western Apache Tribes to stop telescope and other development on Mount Graham. The Coalition maintains a website with information about the biological diversity of Mount Graham, documents that chronicle resistance to telescopes on Mount Graham, and a wealth of information about the spiritual significance of Mount Graham to Apache.

### **Pinaleno Ecosystem Restoration Project**

In August of 2007 the Forest Service created an ecosystem restoration plan for the high elevations of the Pinalenos. In response to the threat of catastrophic wildfire in Douglas-fir forests, the project proposes to

treat 3,705 acres through thinning, removal of dead trees and down woody debris, and prescribed fire. Active fire suppression over the last 100 years, along with progressive insect infestations have combined to create high fuel loading, and reduce cone production in the forest. Mount Graham red squirrel populations have been hit hard by these forest changes, experiencing direct mortality from severe wildfires that burned in the area in 1996 and 2006, and indirect mortality from habitat loss. The Pinaleño Ecosystem Restoration Project lays the groundwork for restoring ecological processes and habitat health in the old growth spruce-fir and mixed-conifer forest inhabited by the red squirrel.<sup>10</sup>

### **Pinaleño Partnership**

Scientists, homeowners, land managers, conservation advocates, wildlife managers, members of the San Carlos Apache Tribe, county

commissioners, and others formed the Pinaleño Partnership in 2006. The Partnership develops projects and activities that contribute to restoration of the mountain's diverse forest ecosystems. Their work contributes to collaborative management of the forest as they continue to support ecosystem health in the spruce-fir and conifer forests of the Pinaleños.

### **Significant Opportunity for Wildland Fire Use**

The remote nature of the Pinaleño EMA, along with the rural character of the surrounding landscape, offers significant opportunity for wildland fire use. Managing naturally-ignited fire to burn in so that it fulfills its natural role in the ecosystem will benefit the natural resources of the Pinaleño EMA. Natural fire occurring at regular intervals creates a mosaic of different vegetation types, cycles nutrients into the soil, helps control insect and disease levels in plants, and reduces heavy fuel accumulation.

## **Threats to the Forest: A Need for Change**

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The Coronado National Forest and surrounding lands have experienced a variety of changes in the twenty years since the current Forest Plan was written. Management concerns and threats exist in the Pinaleños that are not addressed in the Forest Plan, or have not been adequately dealt with through management. The plan revision will update existing management direction and add new management direction, both of which should address these concerns. The following issues present challenges to ecological sustainability on the Pinaleño Ecosystem Management Area.

### **ECOLOGICAL RESTORATION**

Areas of the Pinaleño forest are severely threatened by the potential for uncharacteristic, stand-replacing wildfires. The combination of fire suppression, historic livestock overgrazing, and logging of large diameter trees have created a forest composed of dense, small-diameter trees. Insect activity and tree mortality have significantly increased in the Pinaleño Mountains in the past two decades. This had led to a large quantity of dead and downed trees, and a dense understory of smaller trees and snags.<sup>11</sup> Threats include suppression of historical fire regimes in vegetation types adapted to regular fire; drought exacerbated by human activity; high-intensity stand-

replacing fires due to higher fuel loads; and changes in natural watershed function/ flow regimes. Direct impacts include:

- ★ Changes in overstory and understory structure in fire-adapted vegetation types
- ★ Decreased viability of native species
- ★ Shrub encroachment into grasslands
- ★ Changes in ranges of species
- ★ Changes in species composition
- ★ Damage to essential habitat for species
- ★ Direct mortality to species
- ★ Soil erosion, sedimentation, and loss of soil nutrients
- ★ Decreases in overall water infiltration in upland areas

Affected resources include: Apachean and grassland savanna, Madrean pine-oak woodlands, Madrean encinal; Subalpine spruce-fir forest and woodland and associated species (Mount Graham red squirrel, Mexican spotted owl), riparian systems and associated species, springs, ephemeral watercourses,

seeps; all native vegetation types and their associated flora and fauna; Chiricahua leopard frog, native fish species.

## **EXTRACTIVE USES**

### **Mineral Withdrawal**

The Pinaleños have few mineral occurrences and mines and prospects are few and scattered. The only record of production is for the Black Beauty prospect in the northwest portion of the range. Based on mineral occurrences, future prospecting would likely occur in the Lindsay Canyon area, Gold Gulch area or the area south of and near Willow Springs Canyon.<sup>12</sup>

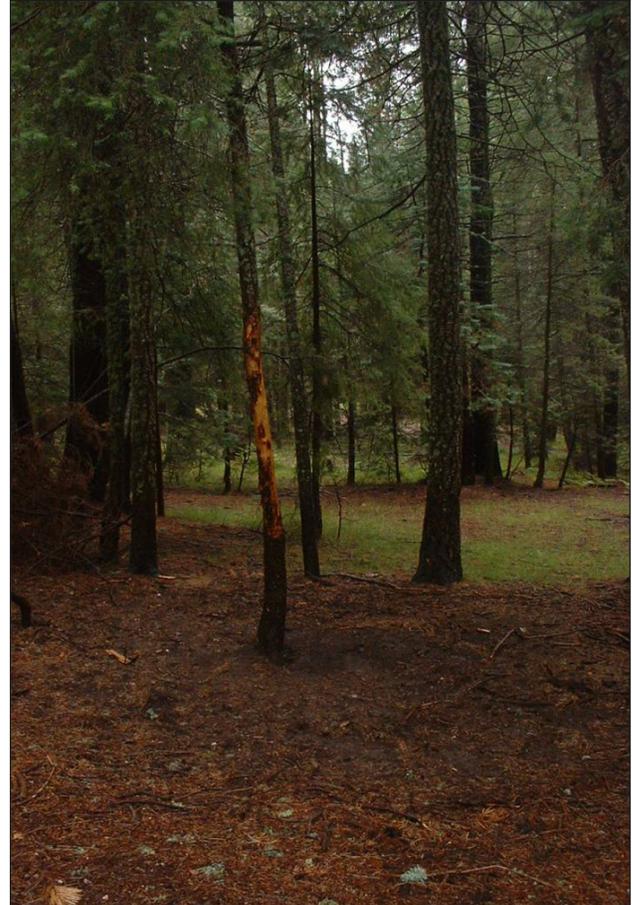
## **NON-EXTRACTIVE USES**

### **Recreational Activities**

The high elevations of the Pinaleños are a popular recreation destination for escaping the desert heat during the summers. Numerous campgrounds atop the range experience high use during peak season. Swaths of ecological degradation are forming around group campgrounds such as Treasure Park. Forest users are driving outside the delineated camping area, creating dispersed camping sites, expanding denuded areas and creating wildcat roads. Often these campsites are immediately adjacent to riparian areas. Wildcat roads created to reach campsites have been found to cross streams or run along stream beds (Figures 8.3a and 8.3b). Paintball activities are also evident in group campground areas where large amount of paintball debris have been left behind. Threats include unmanaged creation of more and larger campsites, creation of wildcat roads starting from developed campsites and defacement of natural and cultural resources. Impacts include:

- ★ Trampling of vegetation and soil compaction
- ★ Accumulation of litter
- ★ Erosion
- ★ Sedimentation in watercourses
- ★ Contamination of watercourses
- ★ Trampling of riparian associated species

Affected are: Montane wet meadows; springs; riparian woodland and associated ecological processes; scenic resources; species especially sensitive to direct human disturbance; historical sites, structures and artifacts.



**Figure 8.3A Denuded Area Around Campsite**



**Figure 8.3B User-created Road from Group Campsite to Edge of Stream**

### Treasure Park

Unmanaged dispersed camping and equestrian use in the Treasure Park area are creating a network of foot and equestrian trails leading up Grant Hill. This is causing erosion, trampling of vegetation, sedimentation in watercourses and other effects.

### ROADS/TRANSPORTATION SYSTEM

The Pinalenos are threatened by proliferation of user created roads, often in association with campgrounds. Lack of enforcement of the legal transportation system, existing roads located in ecologically sensitive areas, off-route driving, and proliferation of ATV recreation all need to be addressed in the area. Coronado National Forest law enforcement personnel have not been able to prevent off-road driving abuses through current enforcement activities.

Roads have far-reaching effects on the biological integrity of watersheds, flora, fauna, and soils on any given landscape. Indirectly, almost all forms of wildlife harassment and habitat degradation are associated with roads. Such road-mediated activities that negatively affect native species include resource extraction, increased human settlements, presence of wandering and feral domestic animals, direct human harassment of wildlife, poaching, over-hunting via exposure of refuge populations, and elevated noise levels.

Affected resources include: springs; ephemeral watercourses; seeps; scenic resources, all ecological systems, all native vegetation types and their associated flora and fauna, riparian plant and animal species, species especially sensitive to direct disturbance, Wide-ranging species of terrestrial animals, game species; prehistoric and historical sites, structures, and artifacts.

## Recommended Objectives and Management Actions

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The Pinaleno Ecosystem Management Area (EMA) harbors a variety of species dependent on the isolated, high elevation habitats of the mountain range. The area also offers great opportunities for primitive recreation where quiet and solitude can be experienced. These two characteristics should be a major focus and driver for future management of this area. New management direction that shows foresight

and proactively addresses threats will create a long-term framework for ecological health and sustainability in the Pinaleno EMA. To confront threats and capitalize on conservation assets, we recommend the following objectives and management actions to be incorporated into the revision of the Coronado National Forest Plan and subsequent project level activities.

## Ecological Restoration

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### Objectives

Restore the spruce-fir and mixed conifer ecological systems to a resilient forest that tolerates wildfire, flood, and insect infestation and contains a mosaic of habitat.

Restore natural disturbance regimes to promote naturally functioning ecosystem processes.

Restore and maintain pre-fire suppression fire patterns and frequencies.

Prevent catastrophic stand-replacing wildfires.

Maintain the health and function of all watersheds on the EMA.

### Actions

*Conduct restoration activities in accordance with the Pinaleno Ecosystem Restoration Project in the identified treatment area.*

*In the remaining mixed conifer and Madrean pine-oak woodland utilize mechanical thinning and prescribed fire to return these ecological systems to their pre-fire suppression structure.*

## Nonextractive Uses

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### Objectives

- Maintain recreational opportunities for people seeking quiet and solitude on the forest.
- Maintain a balance between motorized and muscle powered quiet recreation opportunities.
- Respect the traditional cultural properties of Native Americans.
- Promote visitor appreciation of historical and cultural resources.

### Actions

- Work closely with Tribes, nongovernmental organizations, and other experts to identify and protect additional cultural resources.*
- Erect barriers at high elevation campgrounds to clearly delineate the area in which vehicles are allowed.*
- Ban paintball activities on the EMA.*
- Designate sound sheds in which quiet recreation is the primary suitable use.*
- Do not allow any further development of technology installations at high elevation sites.*

## Roads/Transportation System

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### Objectives

- Reduce the transportation network to the minimum that is consistent with the Travel Management Rule.
- Restore roaded areas degraded by indiscriminate driving.
- Prevent proliferation of wildcat roads.
- Maintain opportunities for low-density, high-quality primitive outdoor experiences.
- Relieve management pressure of off-road driving on National Forest law enforcement staff.

### Actions

- Do not pave the dirt portion of Swift Trail.*
- Do not allow any further creation of roads in the Pinaleno EMA.*
- See Figure 8.4 for the proposed Transportation System for the Pinaleno EMA.*
- Enforce existing regulations that prohibit cross-country travel and off-highway vehicle use in restricted areas such as washes and special closure areas.*
- Enforce the restriction of motorized vehicles to current system routes. When the travel map is made final, enforce the use of the revised legal transportation system.*

## Special Management Areas

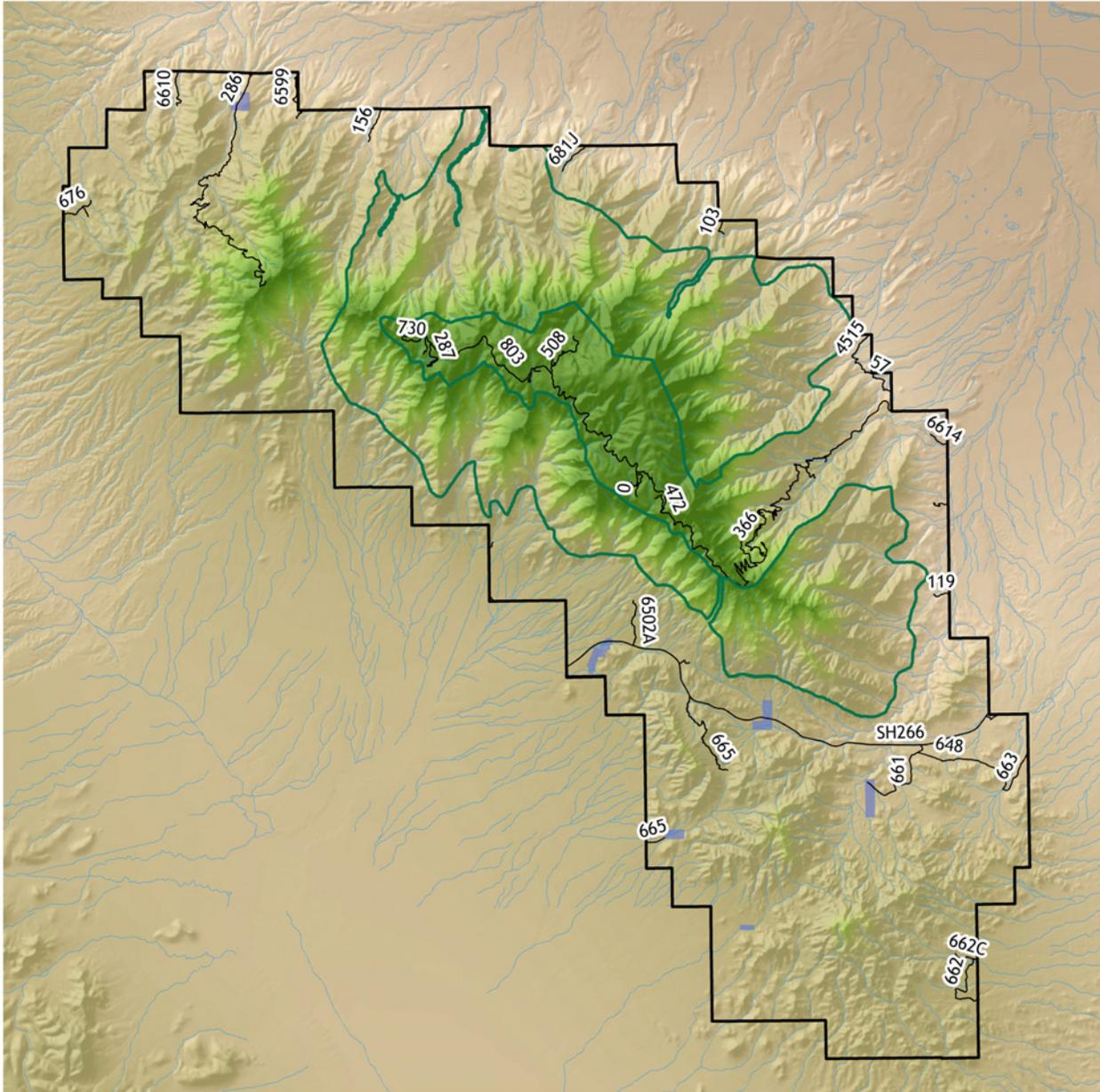
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### Objectives

- Maintain the intact nature, and unfragmented habitat, of the Pinaleno EMA.
- Maintain the wilderness characteristics of the Mount Graham Wilderness Study Area.

### Actions

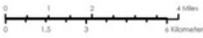
- Expand the Wilderness Study Area to include the surrounding 86,819 acres that have wilderness characteristics. Manage these acres to maintain their wilderness characteristics.*
- Manage 43,853 acres south of State Highway 266 to maintain their outstanding wilderness characteristics by designating a Wilderness Study Area. (See Figure 8.5 for a map of the area to be managed for wilderness suitability.)*



**SKY ISLAND ALLIANCE**  
Protecting our Mountain Islands and Desert Seas



Scale 1:175,000



**Legend**

- Wilderness Study Area Boundary
- Pinaleno EMA Boundary
- Watercourses
- Private Inholdings
- Proposed Open Route

Index Map



Index Map Scale 1:4,900,000

**Figure 8.4 Travel Management Plan and Route Recommendations for the Pinaleno EMA**

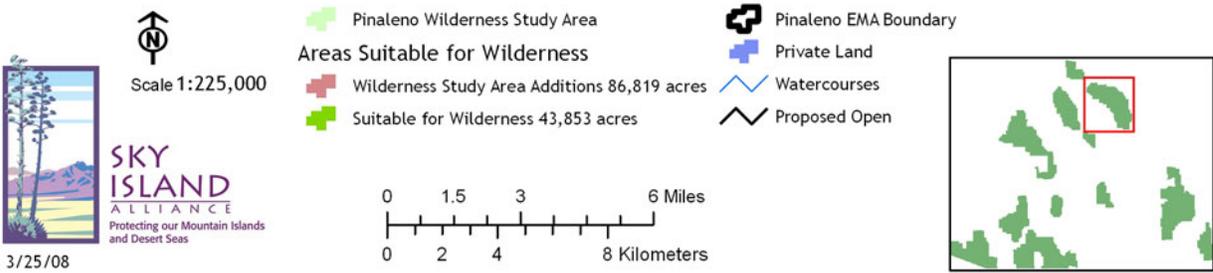
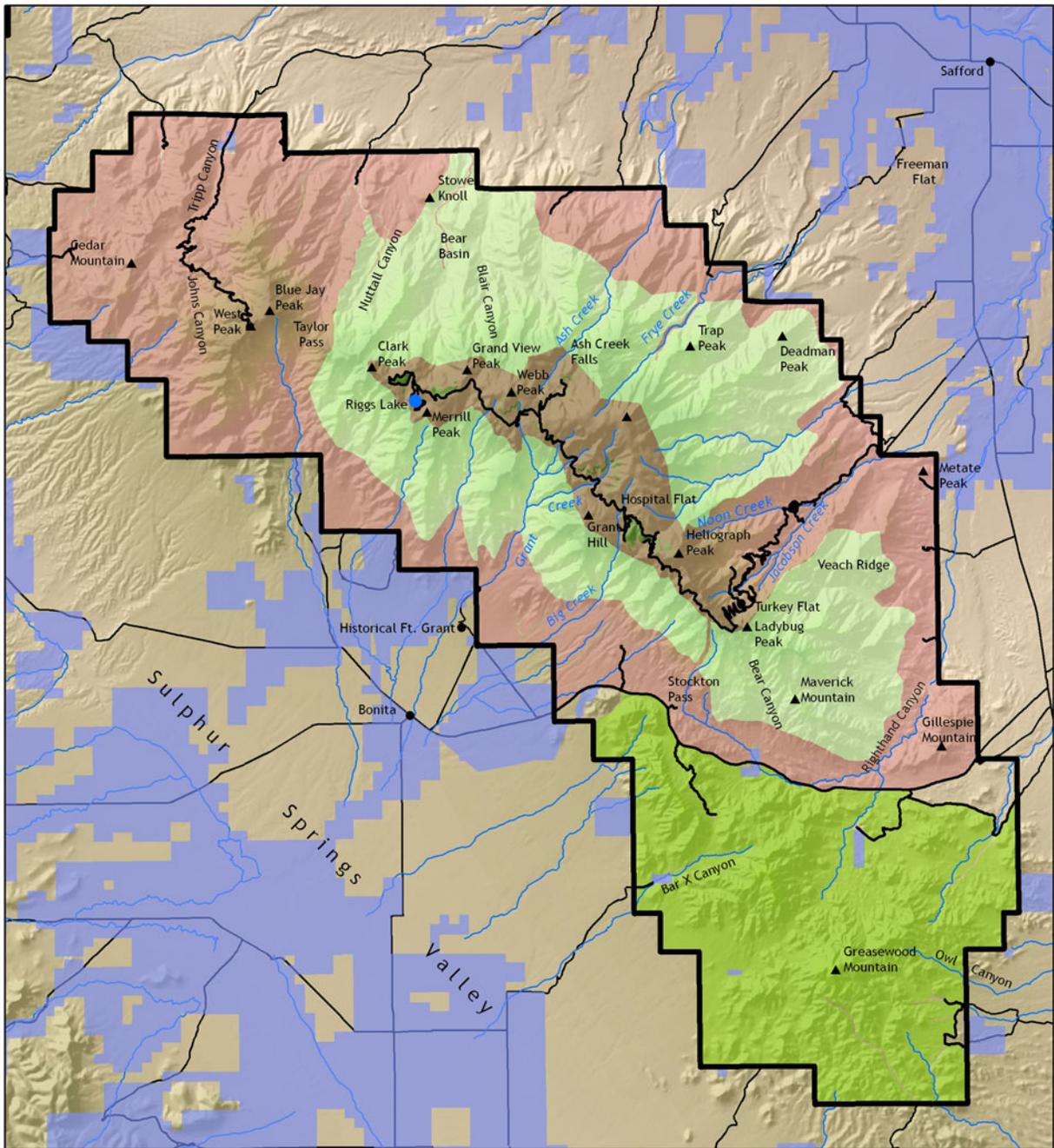


Figure 8.5 Area Suitable for Wilderness and to be Managed for Wilderness Characteristics

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<sup>1</sup> Mittermeier, R.A., P. Robles Gil, M. Hoffmann, J. Pilgrim, T. Brooks, C. Goetsch Mittermeier, J. Lamoreux, G.A.B. Da Fonseca. 2004. Hotspots Revisited: Earth's Biologically Richest and Most Endangered Terrestrial Ecoregions. Prepared by CEMEX, Conservation International and Agrupación Sierra Madre.

<sup>2</sup> The Nature Conservancy. 2007. Apache Highlands Ecoregion. Accessed at <http://www.nature.org/wherewework/northamerica/states/arizona/preserves/art1942.html>. Accessed 12/7/07.

<sup>3</sup> Stromberg, J. C., D. T. Patten. 1991. Dynamics of the spruce-fir forests on the Pinaleno mountains, Graham Co. Arizona. *The Southwestern Naturalist* 36(1) 37-48.

<sup>4</sup> Reid, J., and S. Whittlesey. 1997. *The Archeology of Ancient Arizona*. University of Arizona Press, Tucson.

<sup>5</sup> Reid and Whittlesey. 1997.

<sup>6</sup> Mount Graham Coalition. 2005. [www.mtgraham.org](http://www.mtgraham.org). Accessed 3/21/08

<sup>7</sup> Wilson, John. P. 1995. *Islands in the Desert: A History of the Uplands of Southeastern Arizona*. University of New Mexico Press, Albuquerque.

<sup>8</sup> Wilson. 1995.

<sup>9</sup> Marshall, R.M., D. Turner, A. Gondor, D. Gori, C. Enquist, G. Luna, R. Paredes Aguilar, S. Anderson, S. Schwartz, C. Watts, E. Lopez, P.Comer. 2004. *An Ecological Analysis of Conservation Priorities in the Apache Highlands Ecoregion*. Prepared by The Nature Conservancy of Arizona, Instituto del Medio Ambiente y el Desarrollo Sustentable del Estado de Sonora, agency and institutional partners. 152 pp.

<sup>10</sup> U.S. Forest Service. 2007. Proposal: Pinaleno Ecosystem Restoration Project. File Code: 1950-3/2470.

<sup>11</sup> U.S. Forest Service. 2007. Pinaleno Ecosystem Restoration Project. Accessed at <http://www.fs.fed.us/r3/coronado/perp/index.shtml>. Accessed on 3/20/08.

<sup>12</sup> United States Bureau of Mines. 1993. *Mineral Appraisal of Coronado National Forest, Part 10: Pinaleno-Greasewood Mountains Unit 8*. Intermountain Field Operations, Denver, Colorado. 12 p + Appendices.