

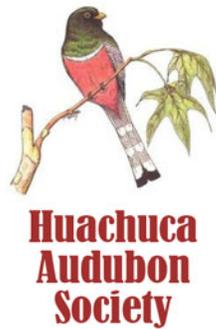
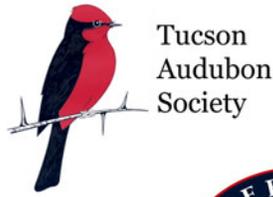
State of the Coronado National Forest:

An Assessment and Recommendations for the 21st Century



A report prepared by the Coronado Planning Partnership

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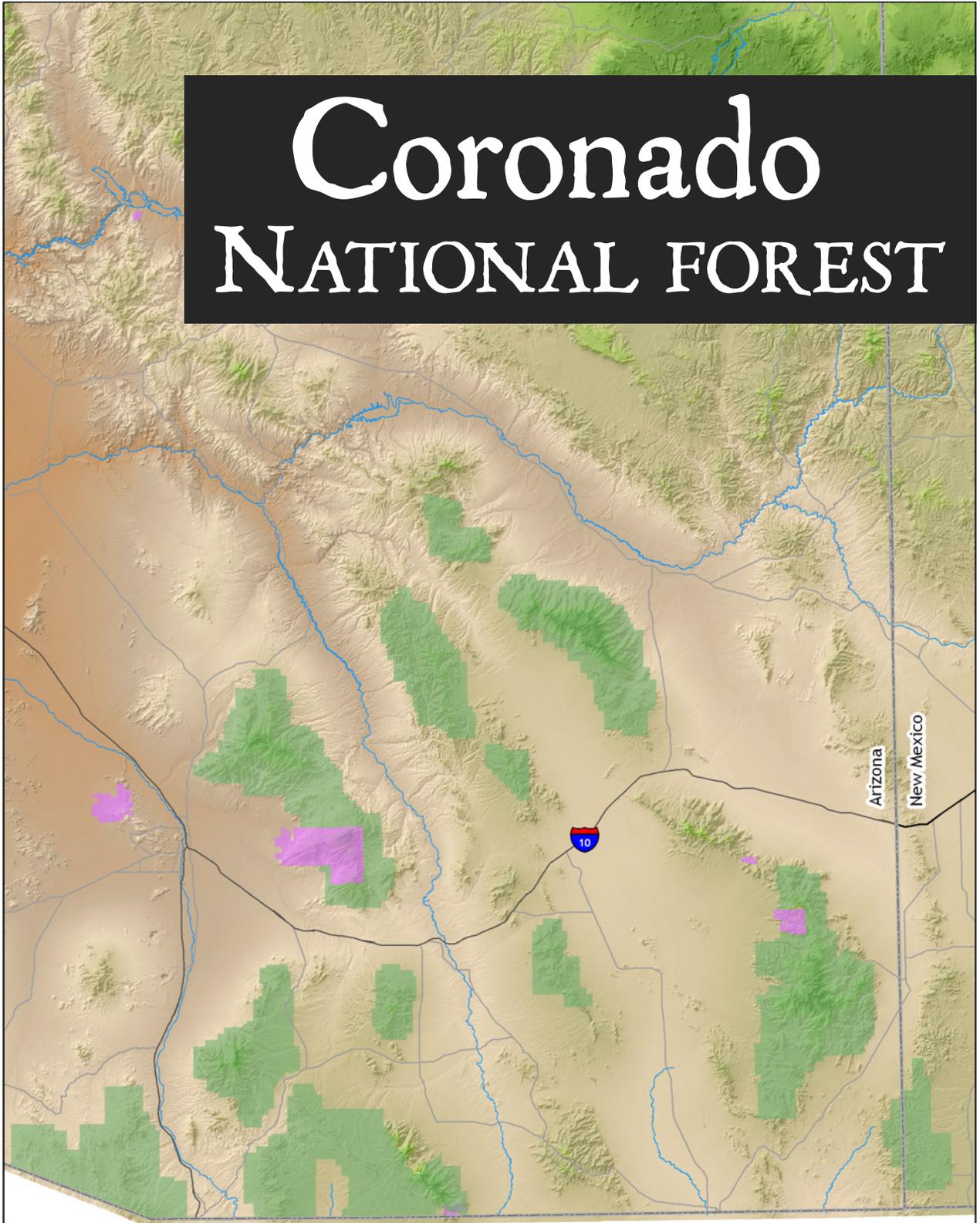
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State of the Coronado National Forest: An Assessment and Recommendations for the 21st Century

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Coronado NATIONAL FOREST





CHAPTER 1 The Coronado National Forest: An Overview

Executive Summary

The Coronado National Forest is a global treasure encompassing a remarkable diversity of plants and animals and a wealth of natural beauty. The Forest is located at the heart of the Sky Island region of southeastern Arizona, southwestern New Mexico, and northwestern Mexico. The “sky islands” of this region are forested mountain ranges isolated by intervening valleys of grassland or desert. Ecosystems here are some of the most diverse in the world because of their great topographic complexity and their unique location at the meeting point of two distinct deserts and two continental mountain ranges. These sky islands form a bridge between the wild realms of the temperate Rocky Mountains and the subtropical Sierra Madre Occidental. Also coming together in this region are the Sonoran and Chihuahuan deserts.

The Coronado National Forest encompasses a number of sky islands scattered across southeastern Arizona and extreme southwestern New Mexico. Because of the isolated nature of the mountain ranges, the Forest is split into twelve distinct Ecosystem Management Areas. The mountains of the Coronado harbor a huge slice of our nation’s natural heritage, supporting more than half of the bird species of North America, 29 bat species, more than 3,000 species of plants, 104 species of mammals and many native species found nowhere else. These mountains and surrounding valleys have also been home to a variety of people who made their living from the diverse natural resources of the area. The Sky Island region is rich in human culture—contemporary, historic, and prehistoric.

The Forest is facing a growing number of threats as it is pressed on all sides by a rapidly growing human population, development, and by a changing climate. The biological and cultural wealth of Coronado National Forest is in peril: habitat fragmentation, the legacy of fire suppression, invasive species, water withdrawals, disturbance of cultural sites, and encroachment from Arizona’s population explosion all continue to bring change to the landscape. The Forest is home to more threatened and endangered species than any other National Forest in the United States. Without management direction that anticipates and challenges these threats, other native species will join their ranks.

In 2006 the Coronado National Forest initiated a process to create a new Forest Management Plan that will guide forest and grassland management for the next twenty years or more. The new plan will be created by revising the existing Coronado National Forest Management Plan. The Coronado is the first National Forest in Region 3 of the Forest Service (Arizona and New Mexico) to undergo management planning under new regulations. This presents an opportunity not only to strengthen the protection of these extraordinary sky islands, but also to create a model of successful plan revision for other National Forests. This plan revision process presents an exceptional opportunity to strengthen the conservation emphasis of the new Forest Management Plan to protect the unique natural heritage of the Coronado National Forest.

The current Coronado National Forest Plan, developed in the mid 1980s, does not address many issues that now affect the Forest. Human movement

across the USA-Mexico border, development on surrounding lands, invasive species, and climate change are changing the face and surroundings of the Forest. Now, the Forest Service has the opportunity to address these threats and make needed changes.

The final revised Forest Plan will be most valuable as a land management tool if it is implementable. The Forest will not be able to accommodate all interests and management must be grounded in its mandate to “protect the lands.” If the Forest does not have resources to manage for certain activities, those activities should be curtailed or redirected in order to protect the Forest. Some current uses will have to be managed differently, reduced or eliminated from certain areas.

The majority of forest users visit the Coronado to participate in quiet activities such as hiking, biking, camping, horse back riding, bird watching, fishing and hunting. The experience of quiet and solitude is an important value for the vast majority of Forest users and the primary reason that most people visit the forest. In the face of rapid population growth in the region, demand for outdoor recreation opportunities in quiet settings is expected to increase. This highly valued aspect of the Forest should be adequately reflected in the new Management Plan.

To maintain a healthy and biologically diverse forest within its boundaries, the Coronado needs to look beyond its boundaries to the larger landscape. Because of the isolated nature of its mountain ranges, the Forest will be impacted by development near the Forest Boundary, as well as development that occurs in the intervening valleys. These outside threats call for much greater protection of public lands, keeping them in the most natural state possible. Management should prioritize protection of resilient ecosystems that can adapt over the long-term.

The Coronado National Forest has an ethical and legal mandate to provide stewardship for the full array of places, objects, and intangibles that are significant in the regional history and culture. Doing this entails consultations and collaborations with tribes and other place-focused communities in the culturally appropriate identification; documentation and conservation of the full spectrum of spiritual, socioeconomic, research and management values linked to specific cultural resources.

Recognizing the critical importance of the Forest for an extraordinary variety of animals and plants, Sky

Island Alliance spearheaded formation of the Coronado Planning Partnership. The Planning Partnership seeks to protect wild species, their habitats and ecological communities, as well as the processes that sustain them on the Coronado. To accomplish this goal for the benefit of future generations, the Partnership (1) mobilizes a wide range of individuals and groups on behalf of our shared stake in the Forest, to ensure conservation-based management; and (2) provides and fosters leadership in the oversight of the revised Forest Plan: its development, outcome, implementation, and long-term monitoring. The Partnership convened in 2006 with an initial meeting of 23 organizations and landowners and has since grown to nearly 40 organizations and landowners. To channel the wealth of existing site-specific information into conservation of the Coronado's ecosystems, the Partnership has taken responsibility for collecting, compiling, and analyzing data on Sky Island mountain ranges, and for reporting the outcome. The result is *State of the Coronado National Forest: An Assessment and Recommendations for the 21st Century*. This report summarizes information gathered from the Coronado Planning Partnership and other stakeholders regarding ecological values, threats, opportunities, and recommendations for management of the land. Now is the time for citizens, scientists, and advocates to pool their experience and work together on behalf of the Forest's future.

Our Approach

The Coronado National Forest is divided into twelve Ecosystem Management Areas (EMA's) that encompass isolated mountain ranges. Because of the isolated and diverse nature of the sky islands, each Ecosystem Management Area harbors unique combinations of plants, animals and ecological systems. Each Management Area faces challenges and threats specific to its particular makeup. There are also plants and animals common to all Ecosystem Management Areas and some threats affect all of the Coronado National Forest.

The report consists of an overview chapter addressing the Forest in its entirety, and individual Ecosystem Management Area chapters addressing details of the separate mountain ranges. The overview covers biological diversity, management threats, and proposed management actions that pertain to the entire Coronado National Forest. Species found on all twelve Management Areas, and threats affecting all of

the Forest are treated here. The rest of the chapters offer descriptions, assessments and recommended management actions that pertain to individual Ecosystem Management Areas. For each Management Area we identified elements of biological diversity that contribute to the ecological health and unique character of the Forest, assessed management threats, and proposed actions to address them. All proposed objectives and actions are designed to guide plan revision and to be incorporated into subsequent project level activities.

An important aspect of forest plan revision is the opportunity for citizens and scientists to propose new Special Interest Area designations to protect unique biological or cultural elements. There are a number of

Special Interest Area proposals included in the Ecosystem Management Area chapters. A crucial part of the plan revision is the requirement that the Forest Service assess the Forest for potential wilderness. Management Area chapters include maps of areas suitable for wilderness and descriptions of their wilderness characteristics. Law and statute mandate these areas be designated in the Forest Plan as Suitable for Wilderness and managed as such.

Analysis of existing conditions on the Coronado was conducted by consulting published and unpublished literature, expert opinion, a variety of field work, spatial analysis and the collective experience of Sky Island Alliance and its partners.

A Global Treasure: The Coronado National Forest in Perspective

The Coronado National Forest manages 1,780,000 acres across a number of widely scattered mountain ranges (Figure 1.1). The Forest is located in the Sky Island region of the southwestern United States and northwestern Mexico. Low-elevation desert scrub and grassland rise thousands of feet in elevation to forested mountain-tops that harbor pine, mixed conifer, and subalpine spruce-fir forests. The mountains of this region are also known as the “Madrean Archipelago” because of the characteristic Madrean oak woodlands that cover their hillsides. The Sky Island region is unique on earth, connecting subtropical latitudes of the Sierra Madre Occidental to temperate latitudes of the Rocky Mountains. The Sonoran Desert and Chihuahuan Desert also come together in this region creating an overlap zone where many plants and animals are at the edge of their ranges (Figure 1.2).

The regional landscape began to take form between 70 and 40 million years ago during a period of intense folding and faulting. The activity was of volcanic and igneous intrusive origin, and of greatest importance in the placement of major ore bodies. Most of the present ranges were uplifted during the basin and range disturbance between 30 and 25 million years ago. The basin and range development exposed older rocks derived from a diverse geologic past: multiple marine invasions, volcanic explosions and lava flows, and metamorphic core complexes. Each sky island is a remarkable mixture of rock types

including granite, rhyolite, dacite, basalts, gneiss, schists, quartzite, limestones, shale, and conglomerates. This great mix of rock types has led to an array of soils that support a huge diversity of grasses, shrubs, and trees; talus slopes that support a remarkable diversity of snails; limestone slopes and outcrops that greatly increase the diversity of plants; and vegetation growing in unexpected climatic zones. The erratic ridge lines, subtle tones of blue-gray limestone, speckled granite and pastel volcanics area a visual reminder of the many forces that shaped the sky islands.¹

The twelve Ecosystem Management Areas that comprise the Coronado National Forest range from approximately 27,981 acres in the Winchester Mountains to 291,492 acres in the Chiricahua Mountains. Each Management Area supports a unique combination of vegetation, habitats and wildlife thus harboring an amazing amount of biological diversity. Distinct species have evolved across the Coronado’s sky islands due to barriers to movement. Mountain ranges harbor numerous endemic and rare species such as Mt. Graham red squirrel, Peloncillo talus snail, Huachuca water umbel and Chiricahua fox squirrel. The Pinaleno Mountains boast as many as 18 species of plants and animals found nowhere else in the world. Sheltered canyons in the Huachuca, Chiricahua and Santa Catalina mountains support a remarkable variety of bird

species that attract birdwatchers from around the world.

The lands of the Coronado National Forest support an impressive diversity of ecological communities that provide habitat for an equally impressive myriad of plants and animals. Because of the north-south axis of the ranges and their great variation in elevation, the Madrean Archipelago spans three major climatic zones (temperate, subtropical, and tropical).² Following the recession of glaciers in North America, the climate of southeastern Arizona became warmer and drier, shifting the distribution of vegetation. Conifer forests that were once in the valleys as well as the mountains, disappeared from lower elevations. They hung on only in higher elevations where the air was cooler and precipitation more frequent. Arizona cypress, also common on hillsides and out on the bajada, retreated back to

cooler canyon bottoms. Sonoran and Chihuahuan desert vegetation, able to endure the warmer, drier conditions filled in the valleys and low elevations. As a result of warming, plants left from this period are arranged on mountain slopes with species requiring less moisture and able to stand more heat at the lowest elevations, and species requiring the coolest and most moist conditions at mountain summits, or sheltered canyon bottoms, or on north-facing slopes. The vertical stacking of life zones (environments characterized by particular groupings of plants and animals) in these steep mountains packs tremendous species diversity into the space of each slope. In a days walk, one can climb through desert and scrub habitats characteristic of central Mexico, up to spruce-fir forests characteristic of Canada.

Madrean encinal savanna and woodland are widespread at middle elevations in this region,

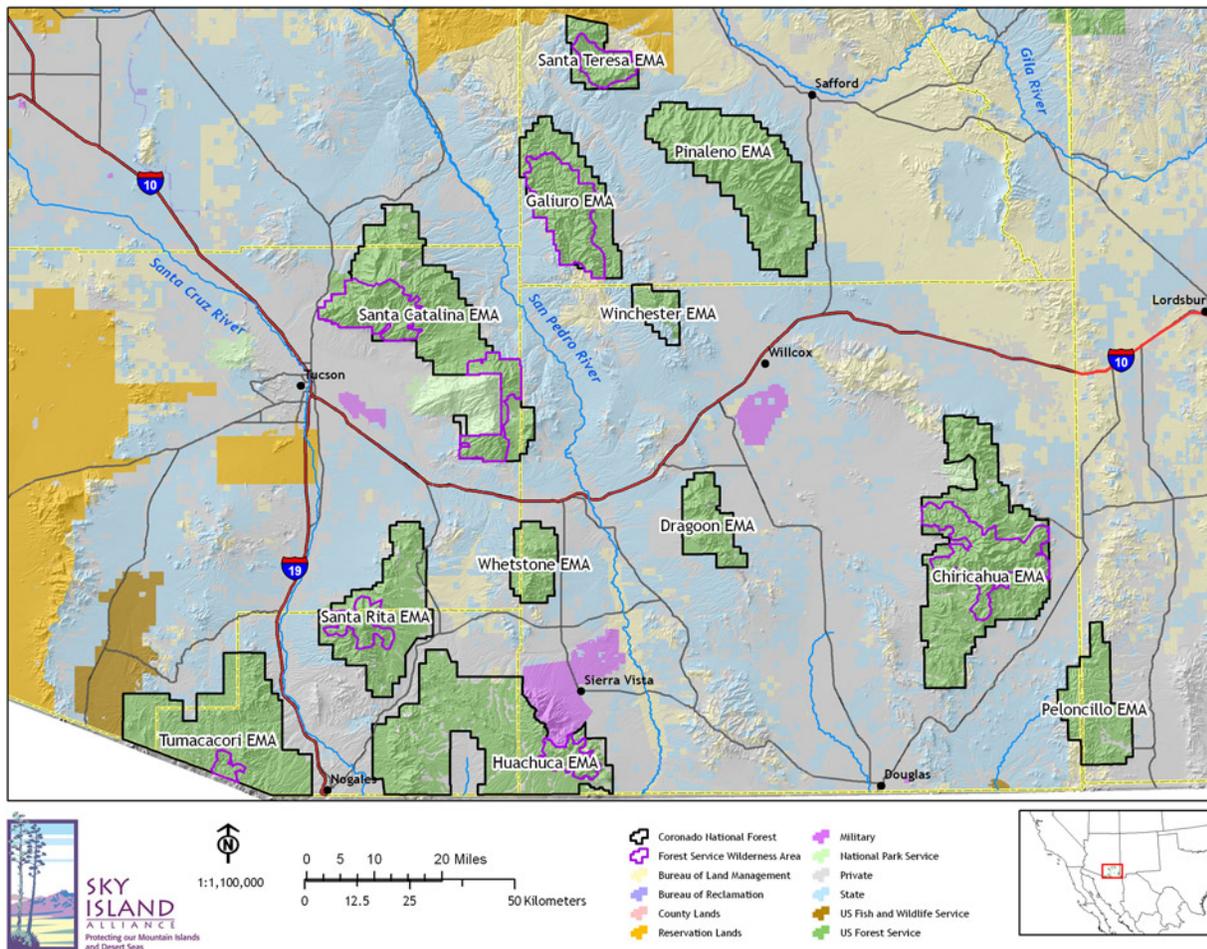


Figure 1.1 Overview of ownership

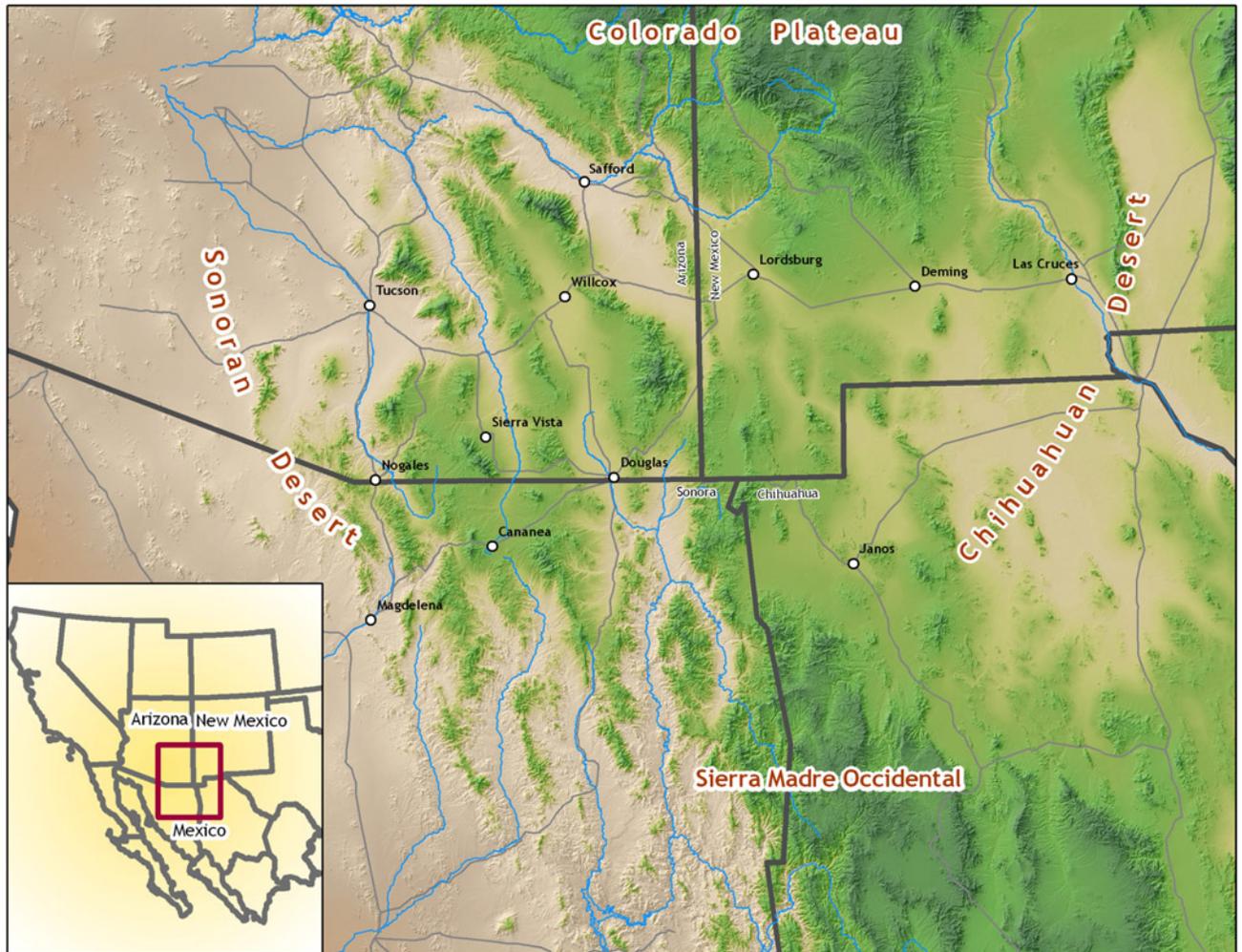


Figure 1.2 Map of the Sky Island Region

forming one of the distinguishing features of sky islands of the Coronado National Forest. Encinal communities bear strong affinities with flora of the Sierra Madre, and are strikingly different from oak dominated communities in other parts of the United States. Floral surveys of several U.S. sky island ranges have found species diversity at the community level to be higher in encinal woodlands than in virtually any other resident plant community — with roughly twice the number of species per 1 hectare plot than is typical for temperate plant communities.³ Oak woodlands also support some 43% of the tree species known from the entire bi-national region.⁴

The Sky Island region contains some of the most rugged and remote lands in the Southwest and features some of the highest levels of regional biological diversity in the United States. The region has

received national and international recognition for its conservation value. In 1999 World Wildlife Fund recognized the greater Chihuahuan Desert Ecoregion as globally outstanding in its biological distinctiveness and named the ecoregion a top continental-level conservation target.⁵ The Coronado National Forest is located in the northwestern part of the Apachean Subregion of the Chihuahuan Desert Ecoregion.

Conservation International recognized the Madrean pine-oak woodlands and sky islands of Mexico and the United States as a conservation hotspot. The Madrean sky islands consist of about 40 mountaintops that lie between the Sierra Madre Occidental and the Mogollon Rim. About half of these sky islands are in the United States portion of the hotspot and harbor more species of hummingbirds than any other part of the US.⁶ The Coronado

National Forest manages the highest proportion of Madrean pine-oak woodlands, and Madrean encinal woodlands across all major landowners in Arizona.

Native Species and Ecological Communities

The Forest Service is charged with developing management plans that create a framework for sustainability on National Forests. In the eyes of the Forest Service, ecological sustainability means providing for a diversity of plant and animal communities. This is done by providing guidance for ecosystem and species management at multiple scales. Maintaining ecological sustainability requires consideration of both ecological systems and species diversity.⁷ The Forest has focused planning efforts on characteristics that are useful for evaluation of ecosystem composition, structure and process. These characteristics are significant to the decisions to be made in the Forest Plan. Managing for ecosystem health inevitably captures much of the biological diversity found on the Forest. However, for some species, there is reason to believe their needs will not be fully met through provisions for ecosystem diversity. These species are of concern and need to be addressed directly.

Some of the species and ecological systems highlighted in this report are found across the Forest. These species are treated in this section while species and ecological systems found only on certain Ecosystem Management Areas are discussed in more detail in each of the Management Area chapters. Special interest species that will be the focus of planning efforts include federally listed Threatened and Endangered Species, Species of Concern and Species of Interest. Table 1.1 shows a list of species that occur across the Forest and have been identified by the Forest Service to guide management decisions.

The Forest Service utilized Potential Natural Vegetation Types as the primary framework for vegetation analysis for Forest plan revision. Potential Natural Vegetation Types represent the vegetation that would dominate a site under natural disturbance regimes and biological processes. In the Southwest Forest Assessment (a joint project between The Nature Conservancy and the Forest Service), Potential Natural Vegetation Types were used to summarize vegetation because of their relevance to the historic range of variability and vegetation models. The models will be used to help guide management decisions in an effort

to restore vegetation types to their natural range of composition and structure.⁸

In Ecosystem Management Area chapters of this report, we use ecological systems as the framework for vegetation and species management. Table 1.2 crosswalks ecological systems with Potential Natural Vegetation Types. Ecological systems, as defined by The Nature Conservancy, are vegetation community types that share similar natural processes (e.g. fire, flooding), substrates (e.g. shallow soils, limestone bedrock), and/or environmental characteristics (e.g. local climate, hydrology). They were classified to be most useful for conservation actions such as mapping, land management and monitoring.⁹ Vegetation is the primary ecological system component utilized by the Forest Service for analysis. It represents habitat for wildlife, is affected by natural processes and is the primary target of management actions.

The extraordinary diversity of plant and animal life on the Coronado National Forest is due in part to the wealth of plant community types. The Coronado National Forest supports 13 different Potential Natural Vegetation Types. The primary vegetation types include desert communities, interior chaparral, Madrean encinal woodlands, Madrean pine-oak woodlands, and semi-desert grasslands. Collectively, these vegetation types cover 93% of the total area on the Coronado National Forest. Of this 93%, Madrean encinal woodlands make up approximately 42%. Within Region 3, the Coronado manages 26% of the cottonwood willow riparian forests, 25% of the semi-desert grasslands and 17% of Madrean pine-oak woodland. The species composition and general characteristics of each vegetation type are described below.¹⁰ Maps of ecological systems based on primary vegetation type are found in each Ecosystem Management Area chapter, offering a more detailed look at vegetation characteristics on the ground.

Aspen Forest and Woodland

These upland forests and woodlands are dominated by quaking aspen. Found between approximately 5,000 feet elevation and 10,000 feet elevation, their composition varies greatly depending on the maturity of the forest. Conifers mingled with aspens and shrubs make up the understory layer. Associated species include Arizona peavine, meadow rue, yarrow, paintbrush, arnica and several grasses and sedges. These forests are dependent on adequate soil moisture

and major disturbances that clear areas of vegetation and stimulate root sprouting and colonization.

Cottonwood Willow Riparian

This system is typically found at lower elevation along rivers and streams. Species include cottonwood species, willow species, and mesquite species along with various forbs and grasses.

This system is often subjected to heavy grazing and can be severely degraded and the water table depleted. This system has also been subject to invasion from exotic species including salt cedars and Russian olive. Seasonal flooding and high water tables are needed to sustain seed germination, and growth and survivorship of the woody dominants.

Desert Communities

The Coronado National Forest primarily encompasses elements of the Sonoran and Chihuahuan desert. Some species occurring in these communities include catclaw acacia, triangleleaf bursage, white bursage mesquite, saltbush, creosote, iodine bush, splitleaf brickellia, desert broom, desert willow, Apache plume, cheesebush, barrel cactus, hedgehog cacti, cholla, prickly pear, saguaro, salt grass, rice grasses and dropseed grasses.

Madrean Encinal

Madrean encinal is discontinuously distributed in the foothills of mountain ranges throughout the Sky Island region with nearly 90% of the vegetation type occurring in Mexico. These woodlands occur between approximately 3,600 and 6,500 feet of elevation grading into semi-desert grassland at lower elevations and pine-oak woodlands at higher elevations. Mexican blue oak, Arizona white oak, Emory oak, and gray oak are the most common oak species found in the U.S. range of these communities. The understory is dominated by perennial bunch grasses such as sideoats grama, blue grama, hairy grama, purple grama, Plains lovegrass, Mexican lovegrass, deer grass and longtongue muhly.

Madrean Pine-Oak Woodland

Pine-oak woodland overlaps Madrean Encinal and occurs on foothills and mountains from approximately 4,000 to 7,000 feet of elevation. The open canopy of woodland is dominated by evergreen oaks such as Arizona white oak, alligator juniper, Chihuahua pine and other pines with a grassy understory.

Interior Chaparral

Interior chaparral occurs throughout central Arizona at mid elevations of 3,000 to 6,000 feet. It is

Table 1.1 Forest-wide Species Identified by the Forest Service to Guide Management Decisions

Birds	
<i>Accipiter gentilis</i>	Northern Goshawk
<i>Falco peregrinus anatum</i>	American Peregrine Falcon
<i>Haliaeetus leucocephalus</i>	Bald Eagle
<i>Strix occidentalis lucida</i>	Mexican Spotted Owl
<i>Patagioenas fasciata</i>	Band-tailed Pigeon
Insects	
<i>Melanoplus desultorius</i>	Red Whiskers Grasshopper
Mammals	
<i>Antilocapra americana</i>	Pronghorn
<i>Eumops perotis californicus</i>	California Bonneted Bat
<i>Lasiurus xanthinus</i>	Western Yellow Bat
<i>Leptonycteris yerbabuenae</i>	Lesser Long-nosed Bat
<i>Odocoileus hemionus</i>	Mule Deer
<i>Odocoileus virginianus couesi</i>	Coues' White-tailed Deer
<i>Puma concolor</i>	Mountain Lion
<i>Ursus americana</i>	Black Bear
Plants	
<i>Astragalus allochrous</i> var. <i>playanus</i>	Halfmoon Milk-vetch
<i>Bouteloua rothrockii</i>	Rothrock's Gramma
<i>Draba petrophila</i> var. <i>viridis</i>	Rock Whitlow-grass
<i>Hedeoma dentata</i>	Arizona False Pennyroyal
<i>Potentilla subviscosa</i> var. <i>subviscosa</i>	Navajo Cinquefoil
Reptiles	
<i>Kinosternon sonoriense</i>	Sonoran Mud Turtle
<i>Terrepepe ornate luteola</i>	Desert Box Turtle

bordered by ponderosa pine or piñon juniper at the upper elevations and semi-desert grassland or Sonoran desert at the lower elevations. Species composition varies greatly in chaparral with shrub live oak being the most common community. It is characterized by species with the ability to quickly re-sprout following disturbance events. Associated shrubs can include mountain mahogany, pointleaf Manzanita, silktassels, cliffrose and sumacs.

Mixed Broad Leaf Deciduous Riparian Forest

These forests are found along rivers and streams from low elevations (4,000 feet) to montane elevations of approximately 9,000 feet. The vegetation is variable depending upon elevation, soil type and depth to water. Some forests are dominated by bigtooth maple with mixed stands of Gambel oak, scattered conifers and

possibly aspen. Other sites can be dominated by a mixture of boxelder, narrowleaf cottonwood, Fremont cottonwood, Arizona sycamore, velvet ash, Arizona walnut, Arizona cypress, and willows. Vegetation can be dependent on annual or periodic flooding for growth and reproduction.

Riparian Woodland

Riparian vegetation occurs in drainage ways and floodplains, and supports an array of plants species that differ from the surrounding nonriparian vegetative species. Low elevation (below 3,500 ft) ephemeral streams support high densities of deep-rooted trees and shrubs such as mesquite, acacia, paloverde, cottonwood, willow and sycamore. At higher elevations (3,500-7,000 ft) canopy cover is denser with cottonwood, willow, sycamore, ash and walnut overlapping. At elevations above 7,000 feet, willow, chokecherry, boxelder, and various coniferous species are dominant. Riparian woodlands are of great importance in the Sky Islands where their geographic area is greatly limited.

Human Prehistory and History

The lands of the Sky Island region are part of a complex mosaic of history and culture. The valleys and foothills surrounding the sky islands of the Coronado National Forest have been inhabited by humans since around 11,000 B.C. Palo-Indians of the Clovis culture, whose Asian ancestors crossed the Bering Strait, hunted bison, mammoth, and other large ungulates in the area

until approximately 8,000 B.C. Following the disappearance of ice-age mammals, the Chiricahua and San Pedro cultures hunted deer and antelope, and gathered plant foods in the vicinity of the San Pedro River Valley and Cienega Creek for the approximate time period of 8,000 to 1,700 B.C. The pottery-making and agricultural archeological traditions of the Hohokam and Mogollon inhabited the area from approximately 100-1150 A.D. The Hohokam tradition was centered in the lower Sonoran desert regions of Arizona and adjacent Chihuahua and Sonora. The Mogollon tradition occupied an extensive area that encompasses southeastern Arizona, southwestern New Mexico, and adjacent Sonora and Chihuahua. The two cultures built different style houses and produced distinct pottery forms. During this period people lived primarily in pithouses, and village life became the norm with domesticated crops and small game accounting for most of the diet.

Starting around 1150 A.D., the Casas Grandes and Salado traditions lived in the area in increasingly larger villages, and built structures of coursed adobe.¹¹ The exact relationship of these cultures to the Tohono O’odham people is still debated; that they are in some way connected, is not. The aridity of the region along with a relatively low density of modern population and lack of industrial development has favored the preservation of materials left behind by these cultures.¹² Signs of these ancient peoples are found across the

Table 1.2 A Comparison of Two Vegetation Classifications for the Coronado National Forest.

“Potential Natural Vegetation Types” (bold) as they correspond with The Nature Conservancy’s “Ecological Systems”		
Aspen Forest and Woodland Montane Mixed-Conifer Forest	Madrean Pine-Oak Woodlands Madrean Pine-Oak woodland	Ponderosa Pine Ponderosa Pine Forest and Woodland
Cottonwood Willow Riparian Forests Desert Riparian Woodland and Shrubland (<4,500 ft elevation)	Mixed Broadleaf Deciduous Riparian Forest Montane Riparian Woodland and Shrubland (>4,500 ft elevation)	Riparian Woodland Desert Riparian Woodland and Shrubland (<4,500 ft elevation) Montane Riparian Woodland and Shrubland (>4,500 ft elevation)
Desert Communities Chihuahuan Desert Scrub Sonoran Paloverde-Mixed Cacti Desert Scrub	Mixed Conifer Forest Montane Mixed-Conifer Forest Subalpine Spruce-Fir Forest and Woodland	Semi-desert Grasslands Apachean Grassland and Savannah Apachean Shrubland Apachean Riparian Grassland
Interior Chaparral Interior Chaparral	Montane Willow Riparian Forest Montane Riparian Woodland and Shrubland (>4,500 ft elevation)	Wetland/Cienega Cienega
Madrean Encinal Woodlands Madrean Encinal Arizona Cypress	Piñon-Juniper Woodland Piñon-Juniper Woodland	

Forest in the form of pictographs, petroglyphs, grinding holes, pottery shards, etc.

The first written history of the region comes from the Spanish expeditions of Fray Marcos de Niza in 1539 and Francisco Vasquez de Coronado in 1540. These men traveled north from present day Mexico through the heart of the Sky Island region looking for the Seven Cities of Gold. Records from these expeditions do not name indigenous groups encountered but it has been inferred that they were Athapaskan-speakers such as Janos, Jocomes, Mansos and Apaches. These indigenous groups did not make pottery or build permanent settlements but were mobile and relied on gathering food plants and hunting for subsistence.

In the late 1600s Father Eusebio Kino ventured into the region in the vicinity of the Santa Cruz Valley to establish missions and save souls. He vied with other Jesuit and Franciscan padres for the faith of the native Sobaipuris, Tohono O'odham, Pimas and Apaches. The beginning of permanent European settlement in the area was met with strong Apache resistance. Establishment of Spanish and Mexican settlements marked the beginning of the Spanish and Mexican Colonial period and was accompanied by more consistent written records. The period from the late 1600s to the late 1800s was marked by cycles of raids and retaliation between the Spanish and Apaches, and eventually the Americans and Apaches. Although many of the more sedentary indigenous groups utilized river valley habitat to construct homes and agricultural sites, the Apaches spent most of their time in the foothills and higher elevations of the Sky Islands. Much of the mountainous area encompassed by the Coronado National Forest was of great importance to Apache for subsistence activities and eventually for avoiding the influx of Anglo settlers that followed the creation of railroad and stage routes. The continued historical ranges of the Western Apache and Chiricahua Apaches cover the Sky Islands, overlapping on the northern portion of the Coronado National Forest.

Spanish missionary trips were soon followed by Spanish settlers traveling to the Santa Cruz Valley and discoveries of gold and silver in the late 1700s. Spanish mining was primarily for silver with much of the activity centered around the Tumacacori, Patagonia, Huachuca and Santa Rita Mountains. Throughout this period hostilities continued between Apaches and Spaniards and between Apaches and neighboring indigenous groups. The early 1800s saw the beginning

of Mexican land grants for cattle ranching. Ranches had existed since the 1720s but with the beginning of Apache peace settlements in the 1790s, stock raising became a major enterprise by 1800. The peace settlements deterred Apaches from raiding until rationing stopped in 1831. They returned to raiding and decimated the haciendas in what is now southern Arizona and northern Sonora. The devastation wrought by Apaches was rapidly followed by the 1846 start of the Mexican-American war. The Mormon Battalion and other U.S. Army forces marched into present day southern Arizona. Along with the subsequent California gold rush these events changed the face of settlement in the area.¹³

By the time the first Americans ventured into the Apache homeland in the 1820s, the Western and Chiricahua Apaches had been warring on and off with Spanish and Mexican interlopers and their Indian allies for nearly two centuries. For a number of years, Anglo-Apache relations were amicable.¹⁴ Following the Treaty of Guadalupe Hidalgo that ended the Mexican-American War in 1848 and the subsequent Gadsden Purchase of 1853, the United States took on its present day southern boundary in the Sky Island region. The lands the United States obtained under the Gadsden Purchase encompassed much of the Apache homeland leading to inevitable conflict as new discoveries of valuable minerals in the region brought increasing numbers of Anglos settlers. The establishment of U.S. Army garrisons followed, along with rediscovery of silver mines, and the establishment of the Butterfield Overland Trail to carry mail overland between Texas and California. Now that the U.S. Army and Anglo settlers were establishing themselves in the region, conflict with Apache broke out. Much of the next three decades were marked by mutual violence between Anglos and Apache, and ended with the surrender of Geronimo in 1886.

By 1881 with the entry of the Southern Pacific Railroad into the region, large cattle companies began buying land and importing tens of thousands of head of cattle. Over time, ranching became the single largest revenue source for Coronado National Forest.¹⁷ Ranching remains a part of the economy of Graham, Pima, and Cochise County, Arizona and Hidalgo County, New Mexico. Mining activity in the region resumed post Civil War around 1878, spurred by remonetization of silver. Mining activity in the twentieth century has been greatest in times of high

metal prices with an emphasis on copper, lead, and zinc. Increasing costs and the depletion of ore bodies has caused the suspension of most mining but several major copper producers are still in operation on the Forest today. The lumber industry in southern Arizona was never a very large compared to other regions of the country and is almost nonexistent now due to the highly limited timber resources of the Forest.

Soon after 1900 many mountains in the Sky Island region became Forest Reserves and then National Forests to safeguard their value as watersheds. By the early 1900s many Tucson and Gila Valley residents who couldn't afford to summer on the Pacific Coast were seeking relief from desert heat in the canyons and parks of the Santa Catalina, Santa Rita, Huachuca, Pinaleno and Chiricahua Mountains. These summer visitors were the first large group of recreational users in the southern desert mountains.¹⁵

The Coronado National Forest retains visible remainders of its complex historic and cultural legacy. From pictographs, petroglyphs and pottery shards left by ancient peoples, to remnants of mines and ranches, to present day Apache uses of the Forest, the lands of the Coronado harbor a wealth of cultural values. Place names across the Forest are reminders of cultures and people who have lived in the Sky Island region and shaped the character of the Forest. Apache interest in the region remains strong. Despite having been nearly pushed out of the area in the late nineteenth century, Apache families continued to travel into the mountains of the Coronado National Forest to collect food products, medicinal plants, and to visit sacred sites. Today, many of the mountains managed by the Coronado are regarded as Apache homeland and are meaningful and holy because Apache ancestors persist there as living spirits.

Threats to the Forest: A Need For Change

Since the creation of the 1986 Coronado Forest Plan many factors affecting management of the Forest have changed dramatically. For example, immigration and interdiction activities along the U.S.-Mexico border, and the explosive growth in motorized recreation were not foreseen when the current plan was written. The new Forest Management Plan will update current management direction and add new management direction to address present-day conditions and threats. The need for changes in management across the Coronado National Forest is evidenced by decline in ecological system health, damage to watersheds, destruction of land by motorized vehicles, loss of species and their habitats, and changes in the viability of plant and animal populations in the face of a warming climate. The outstanding ecological characteristics of the sky

islands managed by Coronado National Forest make the Forest vital to conservation efforts throughout the continent. It is time for a Forest plan that prioritizes protection of the land.

The following section describes threats and concerns that should be dealt with in the revised plan and recommends management objectives and actions to be incorporated into the revision of the Coronado National Forest Plan and subsequent project level activities. These issues affect the Forest as whole. Threats, objectives, and actions that are specific to certain areas or specific Ecosystem Management Areas are described in the management area chapters. Objectives represent statements of what we want to be achieved on the Forest while actions offer strategies for achieving objectives.

ADJACENT LAND USES

Over the last twenty years demographics of the Sky Island region have changed dramatically. Many areas surrounding the Coronado National Forest are experiencing explosive growth leading to the conversion of rural landscapes to ranchettes and subdivisions. Low-density rural home development is the fastest-growing land use in the United States, and

the valleys of Southern Arizona are no exception. Serious implications stemming from future development in valleys and grasslands along Forest boundaries include:

- ★ Loss of access to the Forest boundary
- ★ Increased visitation to the Forest

- ★ Loss of plant and wildlife movement corridors between noncontiguous mountain ranges of the Forest
- ★ Proximity of houses to the Forest restricting options for fire management and creating wildland-urban interface
- ★ Negative changes in viewsheds on the Forest
- ★ Increased introduction and spread of nonnative species

Much of the land bordering the Coronado is privately owned, or owned by the state of Arizona. The development of these lands would have considerable impacts on the Forest. The non-contiguous nature of the Coronado creates a large amount of Forest interface with surrounding lands. The future uses of these surrounding lands will continue to effect both Forest users and plant and animal species that rely on habitat on the Forest. The Coronado is in a position to proactively ensure the health of the Forest in the face of these land use changes and their subsequent consequences.

Objectives

- Mitigate impacts from development on private land near the Forest so it does not negatively impact ecological health and cultural attributes.
- Maintain wildlife corridors between mountain ranges on the Forest that allow for the movement of wide ranging species between parcels of the Forest and other surrounding natural lands.
- Maintain the ecological integrity of Forest lands in the face of development of surrounding lands and increased visitor use of the Forest.
- Encourage land uses compatible with open space values on land surrounding the Coronado.

Actions

- Foster public-private partnerships that will lead to landscape-level conservation through coordination of land use across Forest boundaries.*
- Encourage good stewardship among private landowners on holdings adjacent to the Forest.*
- Work in partnership with affected communities and landowners adjacent to Forest boundaries and promote the efforts of county and city land use planners to institute sustainable regional approaches to urban development and resource conservation.*
- Utilize technical and organizational strengths of the Forest Service to help stakeholders make informed decisions about land ownership and use.*
- Use land-use data and models to anticipate and minimize the impacts of future development of currently undeveloped land between Ecosystem Management Areas on the Forest..*
- Monitor current human use of the Coronado National Forest. Look at trends in urban, suburban, and ex-urban growth, and sociographic trends to project and respond to human use trends on the Forest.*

DROUGHT

Arizona’s climate is characterized by a high degree of variability in precipitation amounts between successive wet and dry years. Precipitation peaks occur twice each year, in the winter driven by large frontal systems and in the summer driven by the North American monsoon circulation. There is a high degree of variability between winter precipitation and summer precipitation and the two are not related. Because of this variability drought is a normal and expected phenomenon. Arizona has been in a major, multi-year, statewide drought since 1998. Although it is not unusual for one or more relatively wet

years to occur during a prolonged drought, the reality of drought conditions remains and needs to be realistically factored into management practices. Drought conditions have wide-reaching effects that can be addressed through forest planning. These include increased wildfire occurrence, vegetation and wildlife mortality, and economic losses in ranching and the tourism sector. The frequent occurrence of extremely hot and dry conditions, such as those characteristic of drought, is a normal part of the region’s climate and needs to be met with forward-thinking, proactive management.

Actions

- Use drought conditions rather than the “average year” as the benchmark for setting conservative management thresholds.*

ECOLOGICAL RESTORATION

The Sky Island region is distinguished by some of the greatest species diversity in temperate North America and the Coronado National Forest encompasses a crucial amount of this diversity. The Forest is in a unique position to contribute to long-term ecological health of the Sky Island region. Past land management priorities in this region have not reflected the amazing diversity, focusing instead on maximum utilization of resources. The new Coronado Forest Plan can shift management focus and values toward sustaining healthy ecological systems and the species that inhabit them.

The Coronado is the most ecologically diverse forest in the National Forest System. Conservative estimates of the number of species inhabiting the Forest include 2,100 species of plants, 466 species of birds, 110 species of mammals, 91 species of reptiles, over 240 species of butterflies and nearly 200 species of mollusks. The Forest is home to 110 species that have special state status in Arizona or New Mexico. More federally listed Threatened and Endangered species are present on the Forest than on any other National Forest in the United States. Because of this great diversity, conservation of species on the Forest will depend on maintenance of functioning, healthy ecological systems.

Ecological systems include communities of living organisms, the environment in which they live, and

disturbance processes such as fire and flood. Ecological restoration will need to focus on entire communities, correct the primary causes of degradation, focus on restoring native species diversity and encourage natural recovery processes. As the Coronado creates a new Management Plan, it should prioritize preservation of healthy ecological systems that experience natural disturbances. Preserving biodiversity in the Sky Island region will require more than isolated preserves. Multiple examples of each ecological community, and connectivity that allows plants and animals to move between mountain ranges will be crucial.

The legacy of fire suppression over the last century has left its mark on the Coronado. Current conditions in many vegetation communities vary, sometimes substantially, from pre-fire suppression conditions. In ponderosa pine, mixed conifer and Madrean pine-oak woodland there is a current over-abundance of closed mid-seral stage stands. These vegetation types have higher amounts of fuel than natural, and are in danger of uncharacteristically large and intense insect outbreaks, and unnaturally large and hot fires. In semi-desert grasslands many of the vegetative communities support higher densities of shrubs than pre-fires suppression conditions. Some of these communities are at the risk of being converted to shrublands. These communities are also threatened by the introduction of nonnative grass species.

Objectives

Management activities attain the Potential Natural Community for each vegetation type on the Forest.

Native grassland with 10-35% shrub coverage experiences natural fire frequency and returns to open grassland with shrub coverage of less than 10%.

Fire return intervals in mixed desert grasslands within the uplands range between 2.5 to 10 years.

Semi-desert grasslands look like open grassland valleys with scattered shrubs on hillsides and moderate to dense shrub cover in drainages and washes.

Madrean encinal woodlands are dominated by open stands of oaks with denser stands on north-facing slopes and in drainages.

Fire return intervals in Madrean encinal woodlands range between 2.5 and 10 years with fire occurring predominately between April and June.

Fire return intervals in interior chaparral range between 20 and 100 years.

Actions

Increase fine fuels in shrub encroached native grassland by resting lands from grazing. Utilized prescribed burning to reduce shrub coverage.

Implement wildland fire use for restoring historical fire patterns and for restoring natural vegetation characteristics.

Maintain and/or restore pre-fire suppression fire patterns and frequencies.

Use prescribed and naturally ignited fire, and mechanical thinning, as tools to change or maintain natural vegetative structure in Apachean Grassland and Savanna, Madrean Pine Oak Woodland and Madrean Encinal.

Restore ecosystem components and processes: consider and challenge threats that originate outside, as well as inside, Forest boundaries.

Reintroduce native species, including predators that have been extirpated from the Forest.

Restore riparian areas, forests, and grasslands to provide natural ecosystem processes for species and habitats. Include the restoration of native predation (species and relationships). For areas to be restored, set priorities that are based on ecological integrity.

ECOLOGICAL RESTORATION *continued*

Objectives

Watershed Management

Take into account the potential impacts of any project on the entire watershed.

Protect and enhance the quality of subsurface and surface waters, recognizing they are linked systems integral to the health of ecological communities and downstream users.

Restore and maintain natural disturbance regimes (e.g., fire, flood), in a manner that promotes naturally functioning ecosystem processes.

Maintain the health and function of all watersheds.

EXTRACTIVE USES

Livestock Grazing

Livestock grazing has historically been an extractive use on the Coronado. Poorly managed livestock grazing on arid lands can seriously damage ecosystems leading to soil erosion, soil compaction, desertification, damage to sensitive canyon and riparian habitat, watershed

destruction, the loss of native plants, and a decrease in grass cover. Forest resources affected by poor grazing practices include, ecological systems historically maintained by low-intensity, regular fires.¹⁶

Objectives

Keep the extent and intensity of livestock grazing at levels compatible with long-term ecological health and ecosystem integrity.

Ensure permitted use does not exceed the lands' capacity and suitability for livestock grazing and does not harm the sustained productivity of the Forest.

Minimize and mitigate impacts of range developments on wildlife.

Actions

When livestock grazing exceeds the lands capacity to be ecologically sustainable, implement all strategies for recovery including resting the allotment and then adjust livestock management.

Implement quantitative monitoring of grazing allotments conducted at regular intervals.

Use riparian exclosures and other methods to limit livestock use in sensitive riparian habitats, especially where livestock use conflicts with watershed health or recovery.

Allow voluntary retirement of grazing allotments and extended nonuse for resource protection.

Make management decisions in an adaptive management framework that alters management practices based on resource conditions.

Mining

Mining on Forest lands has the potential to cause irrevocable ecological harm through draw down and pollution of water sources, degradation of viewsheds and other scenic resources, generation of dust and other air pollution, increased vehicular traffic, deposition of toxic materials on the land, and destruction of habitat for native plant and animal species. Mining is directed by the

General Mining Law of 1872, which cannot be changed by the New Forest Plan. However, the Forest does have control over ensuring that environmental laws are followed on Forest lands. The Forest Reserves were originally established for watershed protection. Mining can quickly compromise the integrity of watersheds that human communities downstream depend upon.

Objectives

Minimize ecological damage caused by mining activities.

Actions

Ensure that mine plans and permitted mines exceed minimum standards in reducing damage and protecting the ecosystem.

Identify areas of the Forest that, because of their outstanding biological, cultural, or scenic values, or because they are vital to protect watersheds and groundwater resources, are incompatible with any form of mining. Work to permanently withdraw these areas from mineral entry.

Require new mines proposed in the Forest to demonstrate they will minimize adverse environmental impacts to surface resources. Exercise discretion under current law to deny a mine that does not demonstrate how it will minimize impacts.

Work with the Bureau of Land Management to perform validity exams for all new mining proposals.

Perform a Surface Use Determination for all proposed mining operations.

Ensure that reclamation plans for all new and existing mining operations are complete and will restore the area to a functioning ecosystem. As part of the reclamation plan require a backfilling of the pit alternative during the EIS process. Also require full and liquid bonding at a level that would fund third-party reclamation if needed.

Technology Installations on High-elevation Sites

The sky islands managed by the Coronado National Forest harbor many unique habitats that are separated from similar habitats on neighboring mountain ranges. Mountain peaks are particularly isolated and often sustain species that live exclusively in high mountain

habitats of the Sky Island region. These habitats and species are especially vulnerable to disturbance and destruction and play an important role in the ecological sustainability of the Forest.

Actions

Prevent the development of any new technology installations (cell phone towers, electronic sites, astrophysical installations) on sites at high elevation on the Coronado National Forest.

Analyze the ecological and socioeconomic costs and benefits of any existing technology installations at high elevations on the Coronado. As a result of this analysis, consider whether these installations should remain operational.

Utility Corridors

As the population in southern Arizona continues to grow there will be increasing demand for the expansion of development and associated infrastructure. The establishment of utility corridors

on many areas of the Forest would have negative impacts on habitats, species, cultural values and scenic values.

Actions

Prevent the establishment of utility corridors in areas of the Forest where biological, cultural, and scenic values would be harmed.

Protect scenic landscapes from clearing and infrastructure for utilities.

FIRE AND FUELS MANAGEMENT

The landscape of the Sky Island region has been shaped and influenced by fire for hundreds of years. The restoration of fire as a natural part of the ecosystem is essential to the health of the Forest. Over a hundred years of fire suppression has changed the character of the Forest leading to unnaturally dense stands of trees, large amounts of dead and downed trees, and the unnatural buildup of fuels. These changes in vegetation structure put large areas of woodland at risk for unnaturally severe wildfires that can be stand-replacing. Widespread tree mortality due

to insect infestation and disease are another huge risk. Combined with human presence on the Forest these factors pose a great risk for fire at unnatural times of the year. Driven by these conditions, devastating fires have already occurred in a number of the mountain ranges managed by the Coronado National Forest. By restoring natural fire cycles and fuel density through a variety of techniques, the Forest Service can restore the ecological integrity of the Forest, protect watersheds and promote public safety.

Objectives

Incorporate the role of fire as an ecological process in all management planning.

Restore and maintain natural fire patterns and frequencies that maintain the historical range of variation in vegetative communities.

Prevent catastrophic stand-replacing wildfires.

Actions

Utilize wildland fire and prescribed burns as the primary tools for fuel reduction and restoration of resilient vegetative communities.

Implement appropriate suppression responses (contain, confine, and control strategies) for wildfires.

Ensure that fire suppression activities make protection of habitat and wildlife the greatest priority when possible.

Restrict mechanical thinning to system roads, except in extraordinary circumstances where temporary roads may be constructed to protect human life or habitat.

Educate property owners on the need to take primary responsibility for maintaining a defensible space around their structures.

MANAGEMENT CAPACITY

Federal land management agencies across the country continue to experience debilitating budget cuts with no end in sight. The backlog of maintenance activities across the Forest grows each year, while the management capacity of the Forest Service shrinks. With increased recreational pressures and a shrinking budget it continues to become more difficult for the

Forest Service to effect change on their land through activities like trail maintenance, law enforcement, and ecological restoration. With reduced personnel, enforcement of Forest regulations and implementation of restoration activities has become more difficult. New management strategies are needed to address these issues while under budget constraints.

Objectives

Ensure adequate funding is available for any management strategy that is included in the Forest Plan.

Prevent damage to ecological and economic values of the Forest.

Actions

Assert the need for U.S. Government allocations.

Strengthen law enforcement.

Utilize management tools such as special management areas, and designated quiet areas to more efficiently effect change on the ground.

Prohibit uses with high impact and high probability of violations in any area where the capacity for observation and intervention is inadequate.

Increase size and improve deployment of Forest Service staff ("more boots on the ground") who are not law enforcement officers (e.g. rangers, maintenance staff).

Actions

Improve communication about activities proposed on the Forest either by the Forest Service or by private-sector interests. Ensure that local and regional stakeholders have the opportunity to provide information and comments at the initial state of each proposal.

Create ATV free zones on the Forest in areas where resource damage cannot be adequately controlled by law enforcement.

Reduce the legal network of roads on the Forest to a level that is enforceable and maintainable.

U.S.-MEXICO BORDER

Unanticipated changes in human immigration, drug smuggling, and border patrol interdiction activities have occurred over the past twenty years. An increase in border enforcement infrastructure and operations in the valleys surrounding the Forest is funneling increased traffic into sensitive sky island habitats. These activities have led to unprecedented resource damage on the Forest. Foot traffic from human immigrants and smugglers, creation of new roads by border enforcement activities and off-road driving have resulted in myriad negative impacts on Forest land.

Impacts from these activities that are occurring across the Forest include:

- ★ Increased risk of uncontrollable fire and fire during unnatural times of the year
- ★ Barriers to spread of natural fire
- ★ Wildlife disturbance
- ★ Alteration of hydrologic flows

- ★ Habitat destruction and modification
- ★ Establishment and spread of invasive species
- ★ Deposition of trash and human waste
- ★ Soil erosion
- ★ Fragmentation of wildlife habitat and impediments to wildlife movement
- ★ Livestock damage to riparian areas due to cut fences

The proposed construction of a border wall along the international boundary would also result in significant impacts to the Forest. If constructed on or near Forest lands, a border wall would seriously disrupt the movement and availability of resources to a variety of species that are of conservation concern for the Coronado along with ecological systems that support those species. Although the boundaries of the Coronado National Forest end at the U.S.-Mexico border, the Forest is continuous on both sides.

Objectives

Mitigate and reduce damage caused by all activities related to human activities across the international border.

Portions of the international border located on the Coronado National Forest remain permeable to wildlife.

The network of roads created by interdiction efforts and illegal cross-border traffic does not increase from current size.

Actions

Adhere to the Memorandum of Understanding regarding cooperative national security and counter-terrorism efforts on Federal lands along the U.S. border.

Prevent the construction of a border fence to the extent possible and promote the implementation of less damaging security alternatives such as vehicle barriers and remote surveillance towers.

Strengthen interagency cooperation to confront the problems associated with undocumented immigration and interdiction: e.g. new roads and trails, wildfires, livestock damage to riparian areas because fences have been cut, trash dumping.

CLIMATE CHANGE

Although understanding of climate change has increased in the last twenty years, predicting how it will affect native species and ecological communities is challenging. Species will respond to changes in unique ways and the effects of climate change will vary depending on factors specific to local ecosystems. Plants and animals found at the mountaintop and

valley floors are likely to be most affected because of their dependence on habitats that may be greatly reduced, altered, or even disappear as temperatures warm and rainfall patterns are altered.¹⁸ Promoting ecosystem resiliency, and adaptability to change will be increasingly important in the face of a changing climate.

Objectives

Maintain and support native species and community viability.

To the extent possible, maintain a diverse mix of native species, control invading and aggressive exotics, maintain vegetative cover to support dependent species, and preserve hydrological conditions that encourage infiltration of rainwater.

Ensure the persistence of genetic variation within species.

Minimize threats from outside Forest boundaries that damage vulnerable habitats.

Actions

Respond to changes in the viability and range of invasive and exotic species.

Respond to changes in ranges of native species and to changes in the composition of native species.

Promote landscape connectivity by adaptively managing the surrounding semi-natural matrix via regional collaborations.

Avoid fragmentation of natural areas, promote habitat diversity, and protect climatic gradients and refugia at multiple scales.

Restore and/or maintain natural fire regimes.

On the level of species, observe changes in periodic phenomena and behavior that are correlated with climatic conditions.

On the level of communities, plan for increased frequency of extreme events and amplified disturbance regimes.

Prepare for increased invasions by exotics as well as the arrival of new assemblages of native species.¹⁹

NON-EXTRACTIVE USES

Non-extractive users, particularly recreation users, play a major role in Forest use. Recreational use of the Coronado National Forest has steadily increased as the population and proportion of residents living in urban areas has increased. In Arizona where more than 42% of the land base is managed by federal agencies, access to public lands is considered by many to be a major contributor to quality of life. Arizona experienced a tenfold increase in population between 1940 and 2000 and continues to be one of the fastest growing states in the nation. These factors combine to create very high recreational use on the Coronado

National Forest while urban expansion continues to decrease the amount of available open space. The Forests of the southwest (Region 3), received 19.5 million visits in 2001 and 20.5 million visits in 2004. Unmanaged recreation has been identified by the Forest Service as one of four “key threats” to the nation’s forests and grasslands. The trend of increased pressure on Forest resources by recreation users can be expected to continue well into the future.¹⁷ The new Forest Plan needs to focus on the realistic ability of the Forest Service to enforce regulations across the Forest

Objectives

Minimize damage to natural and cultural resources due to recreational uses of the Forest.

Promote visitor appreciation of historical and cultural resources.

Protect historic and pre-historic sites from degradation and disturbance.

Actions

Work closely with Tribes, nongovernmental organizations, and other experts to identify and protect additional cultural resources.

Manage cultural resources for interpretive use only by the public.

Control numbers of users in areas of high impact.

NON-EXTRACTIVE USES *continued*

Objectives

Protect historic and prehistoric cultural resources that have been identified to date.

Prevent the creation of illegal, user-created road.

Actions

Regulate commercial rock-climbing, equestrian use, and mountain biking to minimize harm to biodiversity and cultural resources.

Motorized Recreation

All National Forests in the country are undergoing an analysis under the Travel Management Planning Rule. This is in response to resource damage due to badly constructed roads, excessive road density and redundancy, the impacts from motorized recreation, and finally, that the Forest Service cannot currently manage and maintain its current transportation.

Through this analysis, each forest is to determine the minimal transportation system needed to carry out its mission.

The use of off-road vehicles on public lands has become a major concern for public lands managers throughout the country. The current assumption that all areas are open to off-road vehicle use unless posted otherwise has wreaked havoc on the Coronado National Forest. It has led to widespread, indiscriminate creation of illegal, user-created roads that has left overwhelming habitat destruction in its wake. Legal roads that currently traverse sensitive habitat and cultural sites are also of great concern.

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. Coronado National Forest law enforcement personnel have not had the resources to patrol the Forest for off-road abuses, nor are they expected to in the future. Current threats on the Forest arising from motorized recreation include lack of enforcement of the legal road system, roads located in ecologically sensitive areas, off-route driving, proliferation of ATV off-road recreation, and creation of illegal user-created roads. Ecological impacts²⁰

associated with roads include:

- ★ Soil erosion
- ★ Stream sedimentation
- ★ Alteration of hydrological flows
- ★ Vegetation destruction
- ★ Wildlife mortality
- ★ Spread of exotic/invasive species
- ★ Fragmentation of wildlife habitat
- ★ Alteration of wildlife behavior due to direct disturbance and road aversion
- ★ Increased opportunities for poaching and collection of species
- ★ Water, air, and noise pollution
- ★ Barriers to natural spread of fire
- ★ Opportunity for further creation of illegal roads
- ★ Physical damage to cultural resources

The 2004 Travel Management Planning Rule directed Forests to establish a system of roads, trails, and areas designated for motor vehicle use with motor vehicle use prohibited off the designated system or outside of designated use areas.²¹ It is still necessary that the results of Travel Management Planning dovetail with the revision of the Forest plan so that ecological systems on the Forest are protected from further destruction.

Motorized Recreation *continued*

Objectives

Mitigate impacts of the existing road network and of motorized recreation on all physiographic features, species, and ecological systems.

Relieve pressure of off-road driving on National Forest law enforcement staff by designating a legal network of roads that can be adequately enforced.

Reduce impacts associated with roads.

Reduce the road density across the Forest to less than 1 mile per square mile. This calculation should not include inventoried roadless areas or designated Wilderness.

All roads on the Forest have a clear purpose that is balanced against associated impacts.

Reduce additional proliferation of illegal user-created roads.

Protect opportunities for quiet recreation activities across the Forest.

Actions

Limit motorized access to areas where damage to natural and cultural resources will be minimal.

Clearly define the legal system of roads (Transportation System) for Forest users.

Limit the number of roads on the Forest to a network of legal roads that is within the capacity of the Forest Service to enforce legal usage of, and to maintain.

Enforce the restriction of motorized vehicles to designated system routes. When the Forest travel map (road network) is finalized enforce the use of the revised legal transportation system.

Restore roaded areas degraded by indiscriminate driving.

Enforce existing regulations that prohibit cross country travel and off-highway vehicle use in restricted areas such as washes and special closure areas.

Revise management zones so that access is closed to areas where wildlife habitat, ecology, and behavior are disrupted. Pay particular attention to sensitive areas, such as land near archeological sites and habitat for threatened, endangered, or sensitive species, among others.

Restore closed road beds through erosion control and vertical mulching.

Monitor closures and restoration efforts for re opening of road and restoration efficacy. Upgrade barriers where necessary to insure restoration success.

Where enforcement is not possible or effective, close area to all ATV use.

Work with adjacent landowners and land management agencies as well as Arizona Game & Fish Department to educate Forest users regarding legal roads and appropriate motorized vehicle use on the National Forest.

Quiet Recreation

Increasing urban populations in the southwest have created a large demand for quiet recreation and solitude on Forest lands. An explosion in motorized recreation over the last twenty years has changed the character of the Coronado National Forest making it harder for Forest users to experience quiet when visiting their Forest. At the time the current plan was written, at the scale of current-day motorized

recreation use was not anticipated. Growth in the areas surrounding the Coronado is expected to continue at a rapid rate for the foreseeable future and the demand for quiet recreation opportunities is also expected to continue to grow. In order to preserve the quiet uses of the Forest the new Forest Plan needs to explicitly address the importance of quiet recreation.

Objectives

Adopt a road/trail ratio that reflects the needs of wild species and communities.

Stop damage to the Forest's trails from overuse or inappropriate use.

Minimize conflicts between muscle powered quiet forest recreation activities and motorized recreation activities.

Maintain 80% of the Forest to provide quiet, muscle powered recreation opportunities.

Actions

Create designated sound sheds where only quiet recreation activities are permitted.

Convert non-system roads to hiking/equestrian trails where appropriate.

Visitation Management

The Coronado National Forest provides opportunities for a wide range of recreation from nature-based activities to high-density recreation in developed sites. People visit the Forest to experience the outdoors through hiking, wildlife viewing, camping, picnicking, driving, sightseeing, mountain biking, rock climbing, hunting and horseback riding. Improperly managed recreational use can be very detrimental to the Forest and can even destroy the natural values for which people visit the Forest and for which the Forest was protected. The growing population in southern Arizona, coupled with rapid growth in motorized recreation activities is leading to

increased visitation pressures on the Forest. Much of the increased visitation has not been managed and is negatively affecting the health of the Coronado. The trends of population growth and increased visitation are expected to continue and must be met with forward-thinking recreation management strategies. Active management should focus on protecting biological diversity and ecosystem processes. There are ways to continue to provide a variety of recreational opportunities while protecting sensitive habitats, and maintaining the health of the Forest so it can be enjoyed into the future.

Objectives

- Use demographic information on human populations in the region surrounding the Forest to predict growth trends.
- Minimize wildlife disturbance due to recreational uses of the Forest.

Actions

- Identify appropriate recreational carrying capacities for all human uses of Forest lands. Manage uses so that they fall within those limits.*
- Assess and address management concerns at existing hotspots for visitation pressure on the Forest. (See individual Ecosystem Management Area Chapters).*
- Identify appropriate recreation management zones (i.e. recreational activities in relation to occurrences of sensitive species or riparian areas). Use that information to contain visitation with high impact within specific management zones where ecological value is low. Consider closures and permit systems to manage access to these zones.*
- Ban the use of paintball activities on all Forest lands.*
- Control numbers of users in areas of high impact.*
- Regulate commercial rock-climbing, equestrian use, and mountain biking to minimize harm to biodiversity and cultural resources.*

Volunteers and Site Stewards

In recent years the Coronado National Forest has placed increasing priority on the social relationships between national forests and surrounding communities. Volunteerism and community

collaboration are becoming increasingly important resources for the Forest Service. These resources should be fostered in the new plan.

Objectives

- Improve opportunities for individuals and nongovernmental organizations to volunteer their services for the Forest

Actions

- Foster direct contributions from individuals by managing (or supporting) an NGO's management of a strong volunteer program.*
- Enlist volunteer site stewards as part of the "more boots on the ground" strategy.*

WILD SPECIES AND HABITATS

The Coronado National Forest has the distinction of managing more than 576 species of mammals, birds reptiles and amphibians, some of which occur on no other National Forests in the country. Several Endangered, Threatened or Sensitive species rely entirely on habitat in the Coronado for their survival. Numerous

other species have a range in the United States that is primarily restricted to the Sky Island region and often primarily restricted to Sky Islands managed by the Coronado. Management direction should be focused on protecting the wealth of biological diversity that is unique to the Coronado National Forest.

Objectives

Control or eliminate invasive and exotic species, especially those that pose a threat to natives and their communities.

Protect habitat for all native species so that they persist over large scales of time and space.

Ensure that sensitive species do not become further imperiled.

Actions

Identify important habitat and Forest uses in a manner that native species persist.

Ensure that threatened and endangered species and their habitats are protected in accord with the Endangered Species Act and other legislation.

Expand protection for sensitive species.

Ensure that management activities and permitted uses do not contribute to nonnative species invasions on the Forest.

Manage for the maintenance and enhancement of habitat connectivity.

Manage wildlife habitat from a metapopulation perspective and employ principles of conservation biology.

WILDERNESS SUITABILITY

Many areas of the Coronado offer exceptional opportunities for quiet recreation and solitude, and remain rugged and wild. The Wilderness Act of 1964 defines wilderness as a place that “generally appears to have been affected primarily by the forces of nature, with the imprint of man's work substantially unnoticeable; (2) has outstanding opportunities for solitude or a primitive and unconfined type of recreation; (3) has at least five thousand acres of land or is of sufficient size as to make practicable its preservation and use in an unimpaired condition; and (4) may also contain ecological, geological, or other features of scientific, educational, scenic, or historical value.

Wilderness is a cornerstone for protecting biological diversity and ecological sustainability on the Forest. Whether designated, or proposed, these areas provide a refuge for many species from large carnivores to small invertebrates. They also provide opportunities for the highest quality primitive recreation including activities such as hiking, backpacking, horsepacking and hunting. As roadless areas become increasingly scarce in the United States, remaining roadless areas on the National Forest that meet wilderness criteria deserve protection.

The Coronado National Forest is required to analyze potential Wilderness Areas during Forest Plan Revision. It is mandated by both statute and regulation that the Forest Plan revisions include wilderness suitability analyses. In this document, areas suitable for wilderness are mapped and described for each Ecosystem Management Area. Lands with wilderness characteristics must be considered for recommendation as potential wilderness areas during plan revision. These areas should be designated as Wilderness Study Areas in recognition of their outstanding qualities and managed to protect their wilderness characteristics. Identification of areas suitable for wilderness should not be influenced by nonwilderness activities or uses that can be seen or heard from areas within the potential wilderness. Protection of wilderness-quality roadless areas through designation as Wilderness Study Areas is key to ensuring the ecological integrity of the Coronado National Forest. Remaining roadless areas with wilderness characteristics are essential tools for the Coronado National Forest to be able to maintain ecological sustainability on each Ecosystem Management Area and across the Forest.

WILDERNESS SUITABILITY *continued*

Objectives

Existing Wilderness areas retain their wilderness characteristics.

Other areas of the Forest with wilderness character are recognized and retain this characteristic.

Actions

Strengthen current management to protect Wilderness and Wilderness Study Areas including improving signage, and rapidly closing illegal roads that are incursions.

Adequately consider the suitability of national Forest system lands for inclusion in the National Wilderness Preservation System.²²

Designate areas with wilderness characteristics as Wilderness Study Areas.

SPECIAL MANAGEMENT AREAS

The Coronado National Forest currently manages eight Research Natural Areas, eight Wilderness Areas, one Wilderness Study Area, and two Zoological and Botanical Areas. There are a variety of areas that were identified during writing of the 1986 Plan to be further considered for special area designation that have not yet been analyzed or designated. There are also a number of vegetation types not currently represented in Research Natural Areas. Given the

outstanding biological diversity and uniqueness of the Sky Island ecosystems the Forest Service manages, there are a number of other areas we have identified that should be considered for a special designation. Specially Designated Areas including Research Natural Areas, can be established as part of the land and resource management planning process that the Coronado is currently undertaking.

Objectives

Control or eliminate invasive and exotic species, especially those that pose a threat to natives and their communities.

Protect habitat for all native species so that they persist over large scales of time and space.

Ensure that sensitive species do not become further imperiled.

Actions

Work with stakeholders to identify and create more Special Management Areas and ensure that (1) they are of a significant size and number for proportional representation of habitat types and special or unique vegetative communities, (2) they represent potential natural vegetation communities to the greatest extent possible, and (3) provide and maintain habitat for threatened endangered, and sensitive species.

When designating special management areas, select entire drainages (sub-watersheds) to ensure functional conservation areas.

Act on the Forest Service mandate to designate Research Natural Areas that include each habitat type on the Forest. Align the designation of habitat types with the results of the vegetation classification in the Southwest Forest Assessment Project while recognizing the complexity and diversity within these types.

Designate new Zoological and Botanical Areas in areas with unusual biodiversity.

Adapt management of Special Management Areas to site-specific needs.

Desired Conditions

Desired conditions articulate future conditions on the Coronado National Forest that will promote the protection of wild species, their habitats, and the processes that sustain them. They should serve as guidance for future management decisions.

★ Human uses are in both short-term and long-term harmony with the ecological health of the land; the Forest continues to provide inspiration, solace, recreation, watershed health and aquifer recharge, habitat for all native species, scenic beauty, immersion education experience of the region's culture and history, and opportunities for research on native ecosystems.

★ Native species persist over large scales of time and space. Viable populations of all native species are restored to natural patterns of abundance. Extirpated and imperiled native species return to their historical ranges.

★ The foundation of vegetative community management is the identification of Potential Natural Vegetation Type for each vegetative community. Potential Natural Vegetation Types are coarse-scale groupings of ecosystem types that share similar geography, vegetation, and historic ecosystem disturbances such as fire, drought, and native herbivory. They represent vegetation types and characteristics that would occur when natural disturbance regimes and biological processes prevail. Potential Natural Vegetation Types have been reached and fire regimes are restored to natural intervals. Any activities occurring on the Forest are evaluated for their impacts on Potential Natural Vegetation Types.

★ Native grasslands with less than 10% shrub coverage are maintained as open native grasslands. Native grassland disturbance regimes are restored to shrub-invaded native grasslands with 10-35% shrub coverage. These grasslands reach a composition with less than 10% shrub coverage.

★ Encinal oak savannah has ground cover dominated by a diverse assemblage of native grasses, interspersed with oaks. Oak stands are denser along drainages and interspersed with other riparian trees.

★ Fire patterns restore a broad mosaic of different habitat types, and plant diversity. High-intensity, stand-replacing fires are reduced to a natural frequency because of the fire-adapted composition of vegetation types on the Forest.

★ Special Interest Areas exist across the Forest that encompass representatives of all important forest and range types, as well as other plant community types that have special or unique characteristics of scientific interest and importance, and that encompass important historical or cultural sites. These specially designated areas retain their unique characteristics.

★ Negative impacts of poorly managed livestock grazing on riparian areas, wildlife habitat, threatened and endangered species, and human recreational activities are reduced.

★ Ecosystem changes on the Forest are consistently monitored by reliable, scientifically sound means.

★ Motorized travel on the Coronado is limited to the legal network of roads due to rigorous enforcement and maintenance.

★ Road density across the Coronado is lowered by closing and restoring at least 1,000 miles of roads including roads that are redundant or unnecessary, system roads that are causing significant damage to natural and cultural values, and all nonsystem roads.

★ Scenic resources, including geological features and viewsheds, do not lose value from their current classifications.

★ The Forest responds to increasing human use of the forest by setting reasonable thresholds for all human uses of Forest lands. Areas on the Forest are protected for quiet recreational uses. Future visitation pressure is actively managed with uses being allowed only in appropriate places.

★ Development on lands surrounding the Forest does not hinder the continued use of prescribed fire and wildland fire as management tools.

★ Landscape linkages exist that allow unrestricted movement of wildlife between mountain ranges and habitat patches on the Forest.

★ Existing wilderness areas retain their current wilderness characteristics and offer recreation opportunities for people seeking quiet and solitude on the Forest. Other areas of the Forest with wilderness characteristics are protected as Wilderness Study Areas and those wilderness characteristics are permanently retained.

★ Soundsheds exist on the Forest where quiet recreation is considered the highest and best use.

★ Areas sensitive to the impacts of roads or the noise of motorized vehicles are protected from motorized recreation.

★ Public-private partnerships are fostered that lead to landscape-level conservation through coordination of land use.

★ Private lands adjacent to the Forest are under good stewardship and landowners actively participate in conservation and protection.

★ Historic and Cultural resources identified to date are protected, treated with respect, and managed so that their value does not diminish through time. Forest neighbors and visitors share responsibility for stewardship with the Forest Service.

★ Additional cultural resources are identified and protected through collaboration between the Forest, Tribes, nongovernmental organizations and other experts.

Conclusions

As the Forest Service proceeds with the creation of its new long-term forest plan it will be essential that citizens, scientists, forest neighbors and people who recreate on the Forest continue to speak out about how they want the Coronado National Forest to be managed. As human population continues to grow

and land use changes, the role of the Coronado National Forest in protecting native species and ecological communities, providing recreation opportunities for quiet and solitude, and providing ecosystem services such as clean water, will become increasingly important.

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