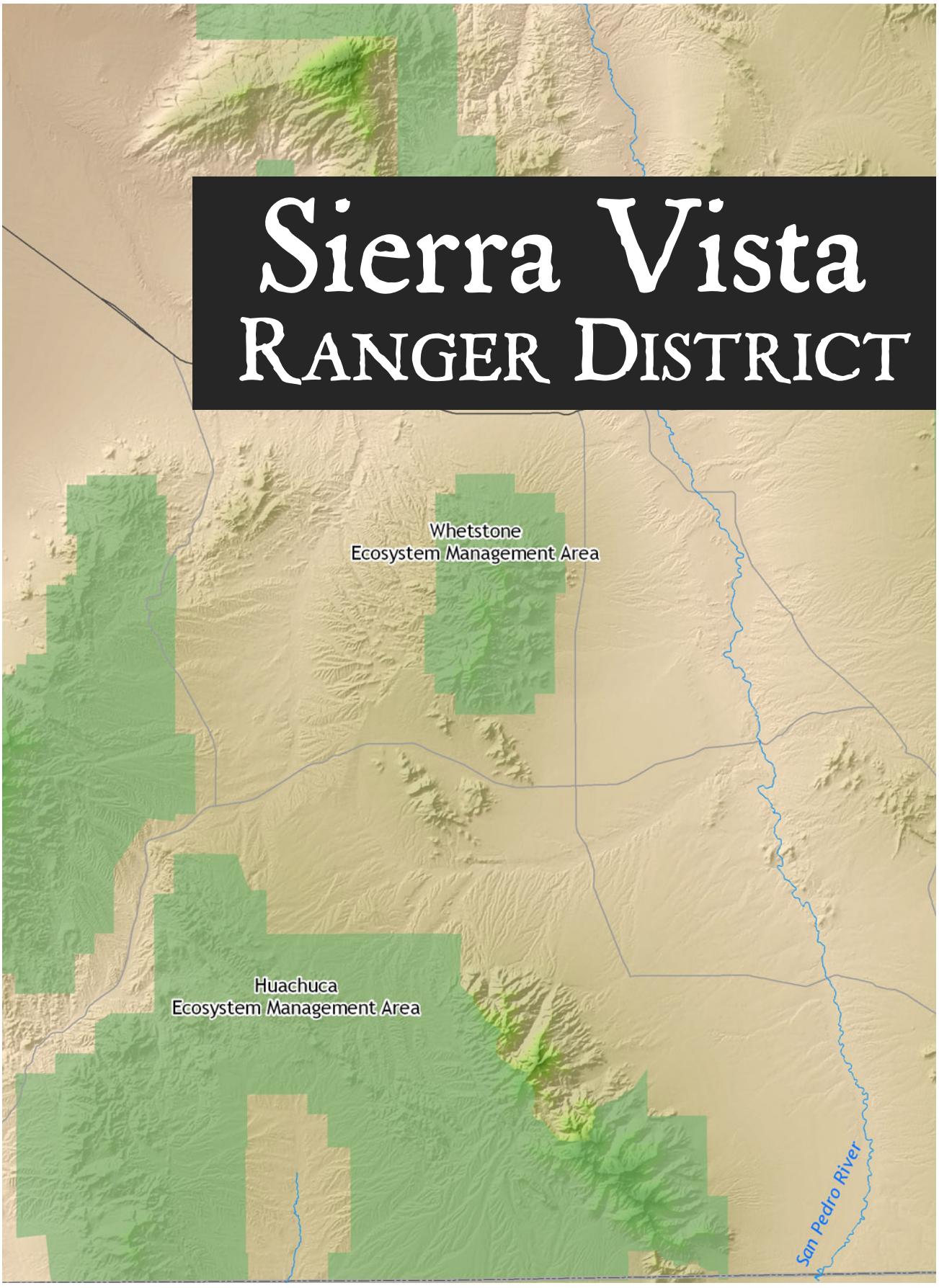
Sierra Vista
Ranger District
Whetstone
Ecosystem Management Area
Huachuca
Ecosystem Management Area
San Pedro River

CHAPTER 12 Huachuca Ecosystem Management Area

The Huachuca Ecosystem Management Area (EMA) encompasses the rugged southern portion of the Huachuca Mountains, and the rolling hills of the Patagonia Mountains and Canelo Hills. The sprawling 277,607 acre management area spans elevations ranging from 3,800 feet in the grasslands to 9,455 feet at the summit of Miller peak.

The formerly rural area surrounding this management area is experiencing rapid population growth. Development from the outward growth of nearby Sierra Vista is pushing up to the eastern base of the Huachuca Mountains. The northeast side of area is bordered by Fort Huachuca Military Reservation, which encompasses much of the northern portion of the Huachuca range. The southern EMA boundary runs along the U.S.-Mexico international border. Coronado National Memorial, managed by the National Park Service, is nestled at the southeast corner of the EMA between the Forest land and the international boundary. The Huachuca EMA harbors a number of outstanding riparian habitats. Ramsey Canyon on the eastern flank of the mountains is home to Ramsey Canyon Preserve, managed by The Nature Conservancy, renowned for its outstanding scenic beauty and the diversity of its plant and animal life. Approximately twelve miles east of the Forest boundary lies the San Pedro Riparian National Conservation Area managed by the Bureau of Land Management. The San Pedro River, flowing north through the conservation area, is one of the outstanding biological gems of Arizona. The southern slopes of the Huachuca Mountains drain south to the headwaters of the San Pedro River (Figure 12.1).

The San Rafael Valley lies at the heart of the Huachuca Management Area. The valley, primarily consisting of privately-owned land, is a pocket of rolling grasslands some of which still retain their natural composition of native grassland species. Patagonia Lake State Park, an impoundment on Sonoita Creek along the western edge of the Patagonia Mountains, is a popular recreation destination. Parker Canyon Lake, also a popular recreation spot, is an impoundment of Parker Canyon. Across the U.S.-Mexico border, lies Rancho Los Fresno in the state of

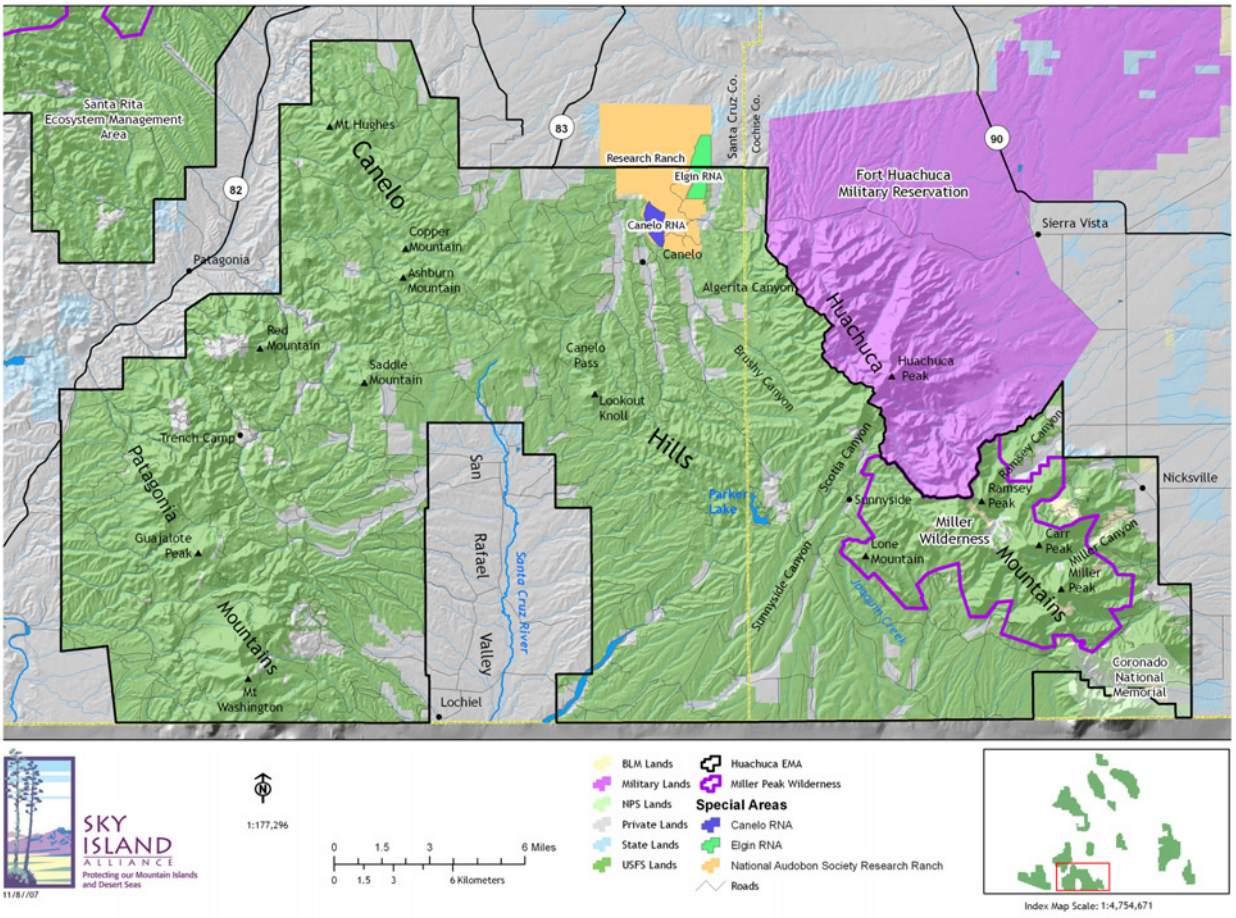

Figure 12.1 **Overview of the Huachuca EMA**

Sonora Mexico. Los Fresno is a 10,000 acre ranch jointly managed by The Nature Conservancy, Naturalia and Biodiversidad y Desarrollo Armónica. The Huachuca Ecosystem Management Area is an important destination to Forest users seeking a wilderness experience. A 1997 study found that over 70% of people surveyed came to the Huachucas specifically to hike and engage in hiking associated activities such as sightseeing, wildlife watching, bird watching and wilderness exploration.[1]

Natural History

For their size and elevational range, the Huachuca Mountains are comparatively rich in species. Forest land here harbors nine listed Threatened or Endangered species including the colorful Sonoran tiger salamander, and Huachuca water umbel. Besides supporting much of the same biological diversity found across the Sky Island region, the Huachuca Management Area has its own unique and exciting species. The buff-breasted flycatcher, one of the smallest flycatchers occurring in the United States, is known to breed in the Santa Catalina, Huachuca and Chiricahua Mountains. Canelo Hills ladies' tresses, slender white orchids, are found in a handful of Cienega habitats in the Canelo Hills. Endangered Huachuca water umbel is found only in the Huachuca Mountains and along the San Pedro River in the United States, with a few scattered sites in Mexico.

The Huachuca Mountains harbor six perennial streams where several species of fish native to Arizona still survive in the well-watered canyons. Longfin dace inhabit the watershed complex of Bear Creek, Lone Mountain Canyon, Cave Creek, Joaquin Canyon and Sycamore Canyon that drains from the western side of the Huachuca Mountains south to the headwaters of the San Pedro River. Bear Creek and Cave Creek currently harbor populations believed to be free of nonnative fish. Red Rock Canyon in the Patagonia Mountains provides habitat for Gila topminnow and other native fishes. These streams have exceptional

value for native fisheries and other riparian-dependent species. The western barking frog, dependent on deeply-fissured limestone or rhyolite outcrops, is known to breed in the southern Huachucas on the Coronado National Memorial. Mammal diversity and abundance of the area supports a large population of mountain lions.

The Huachuca Mountains grassland valley complex harbors isolated populations of species such as Endangered Sonoran tiger salamander and Candidate (for listing) mountain tree frog, that are found nowhere else in the Sky Island region.

Twenty-six populations of avian "species of conservation concern" can be found here. Some of these populations are only found in the United States in the borderland Sky Islands including Elegant Trogon, Whiskered Screech Owl, and Buff-Breasted Flycatcher. Also found in the Huachucas are rare neo-tropical species found only in the southern most sky islands of the Coronado. These include Berylline Hummingbird, Blue-Throated Hummingbird, Violet-Crowned Hummingbird, White-Eared Hummingbird, and Sulphur-Bellied Flycatcher. The Huachuca Mountain range supports the largest number of breeding pairs of Elegant Trogon and likely the largest population of Whiskered Screech Owl in the United States. The Huachuca Mountains along with the Chiricahua Mountains host the greatest diversity of Sierra Madrean neo-tropical birds in the United States. The Huachucas support a great diversity of hummingbirds with over fourteen species recorded in the range. They are the site of ongoing hummingbird research such as mapping nectar resources. Particularly of note is their diversity of oaks with eleven distinct oak species found on the Management Area.[2]

Human Prehistory and History

The first solid archeological evidence of human habitation in this area shows Clovis hunters spearing mammoths in the San Pedro Valley by 9,000 years B.C.[3] Next came the long occupancy of the Cochise Culture of hunter-gatherers, eventual introduction of domesticated crop plants, and development of more densely settled networks of farming peoples.

Written history of the area around the San Rafael Valley began with Coronado's 1540 journey from Mexico City to the Zuni area of New Mexico. One proposed route has this epic journey entering southern Arizona by way of the upper Santa Cruz River, passing north across the San Rafael Valley and over the Canelo Hills via Canelo Pass into the upper Babocomari River valley.[4] The Canelo Hills were later traversed by Father Eusebio Kino in the 1690s during his explorations of southern Arizona. Coronado encountered ancestral Sobaipuris living in villages along the San Pedro River.

The Sobaipuris probably colonized the San Rafael Valley area starting in the 15th century and lived in scattered *rancherìas.* They utilized the San Rafael Valley and the surrounding Canelo Hills, and the Patagonia and Huachuca Mountains for hunting, gathering of agaves, yucca, acorns, walnuts, beargrass and other plants found in plains grasslands and evergreen woodlands. By the late 17th century when Kino and his companions first encountered them, the Sobaipuris were already battling natives identified by Spaniards as Janos, Jocomes, and Apaches.[5] Resident Apaches managed to largely hold their own first against Spanish, then Mexican, and later U.S. armed forces and settlers for the next 300 plus years.[6]

Boundaries of the Sky Island region coincide almost perfectly with the known range of the Chiricahua Apaches, with Chokonen (or Chiricahua), Bedonkohe, Chihenne, and Nedhni groups occupying various subdivisions of the region.[7] Members of the Chokonen band ranged across the Dragoons, Chiricahuas, Dos Cabezas, Peloncillo and probably the Huachuca mountains on both sides of the present U.S.-Mexico border.[8] The compressed latitudinal and elevational gradients that characterize the Sky Island region and the area's high productivity provided year-round hunting and gathering opportunities, which enabled the Chiricahua Apaches to remain the only entirely non-agricultural culture in the American Southwest during this era.

The name Huachuca is a Chiricahua-Apache word meaning thunder. Canelo comes from the Spanish word meaning cinnamon in reference to the color of the Canelo Hills from a distance.[9]

At the turn of the century, Sunnyside Canyon in the southeastern portion of the management area was filled with the hustle and bustle of two copper mines and a sawmill. The community of Sunnyside once boasted 80 residents. Today, this canyon's intermittent stream supports a riparian community where songbirds and other wildlife are abundant.

The Huachuca 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 Huachuca Ecosystem Management Area. The Forest Service identified 126 species of plants and animals including nine Threatened or Endangered species, along with other species determined to be Species of Concern or Species of Interest (Table 12.1). 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

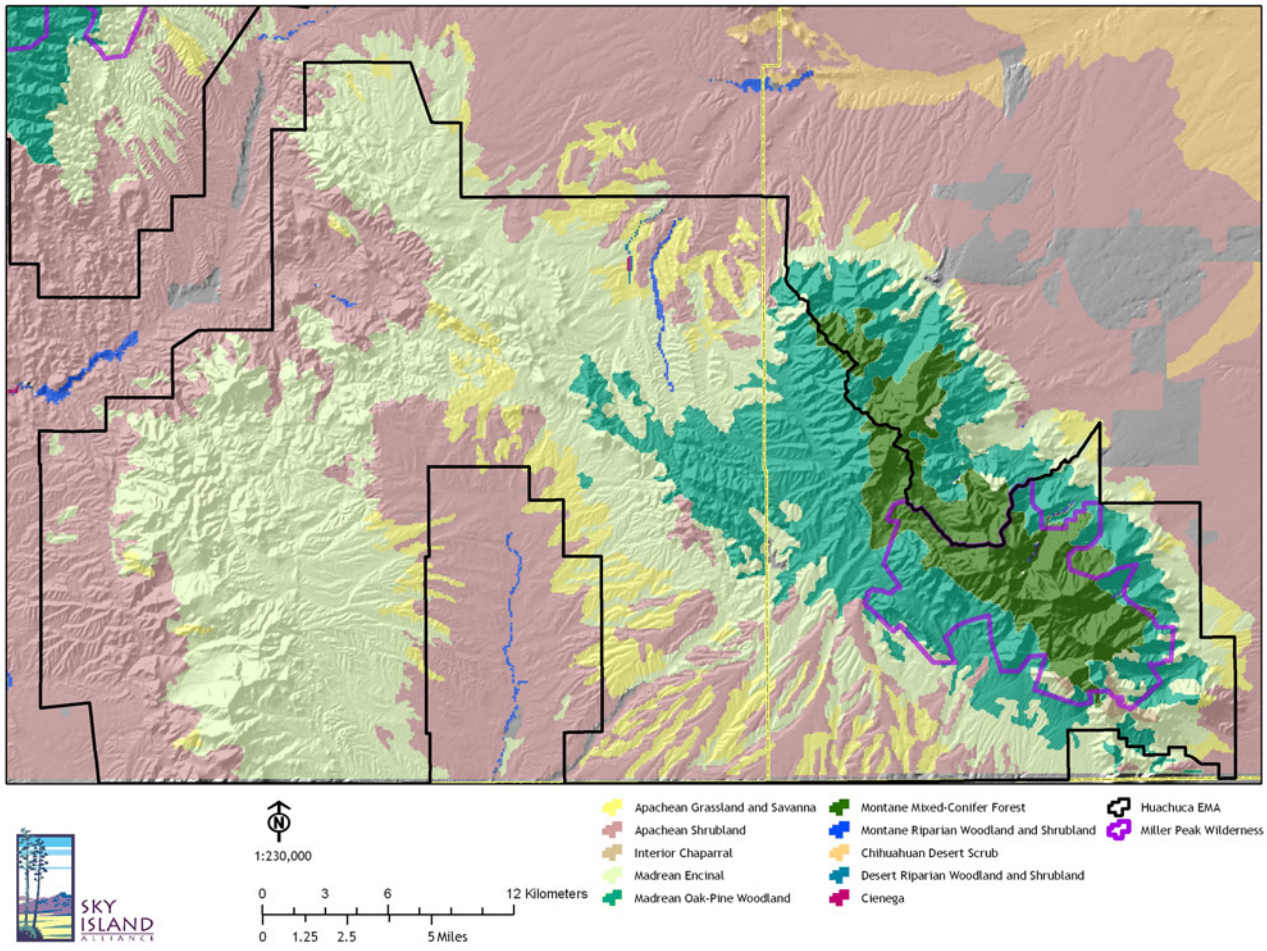

Figure 12.2 **Ecological Systems of the Huachuca EMA**

Table 12.1 **Species Identified by the Forest Service to Guide Management Decisions**

Amphibians	
Ambystoma tigrinim stebbinsi	Sonoran Tiger Salamander
Eleutherodactulus augusti cactorum	Western Barking Frog
Hyla wrightorum	Arizona Tree Frog
Rana chiricahuensis	Chiricahua Leopard Frog
Rana subaquavocalis	Ramsey Canyon Leopard Frog
Birds	
Ammodramus savannarum ammolegus	Arizona Grasshopper Sparrow
Coccyzus americanus occidentalis	Western Yellow-billed Cuckoo
Empidonax fulvifrons pygmaeus	Northern Buff-breasted Flycatcher
Glaucidium brasilianum cactorum	Cactus Ferruginous Pygmy-owl
Meleagris gallopavo mexicana	Gould's Turkey
Pachyramphus aglaiae	Rose-throated Becard
Polioptilla nigriceps	Black-capped Gnatcatcher
Trogon elegans	Elegant Trogon
Insects	
Adopaeoides prittwitzi	Sunrise Skipper
Aeshna persephone	Persephone's Darner
Agathymus evansi	Huachuca Giant-skipper
Astylis biedermani	A Notodontid Moth
Automeris patagoniensis	Patagonia Eyed Silkmoth
Eumorsea balli	Ball's Monkey Grasshopper
Nectopsyche dorsalis	A Caddisfly
Oligocentria delicata	A Notodontid Moth
Ophiogomphus arizonicus	Arizona Snaketail
Piruna polingii	Four-spotted Skipperling
Speyeria nokomis coerulescens	Bluish Fritillary
Sphingicampa raspa	A Royal Moth
Sphinx smithi	A Sphinx Moth
Stygobromus arizonensis	Arizona Cave Amphipod
Sympetrum signiferum	Spot-winged Meadowhawk
Fish	
Agosia chrysogaster	Longfin Dace
Poeciliopsis o. occidentalis	Gila Topminnow
Rhinichthys osculus	Speckled Dace
Mammals	
Choeronycteris mexicana	Mexican Long-tongued Bat
Lasiurus blossevillii	Western Red Bat
Panthera onca	Jaguar
Sciurus arizonensis	Arizona Gray Squirrel
Sorex arizonae	Arizona Shrew
Thomomys umbrinus intermedius	Southern Pocket Gopher
Mollusks	
Gastrocopta prototypus	Sonoran Snaggletooth
Holospira ferrissi	Stocky Holospira
Pyrgulopsis thompsoni	Huachuca Springsnail
Vertigo hinkleyi	Heart Vertigo
Plants	
Agave parviflora ssp. *parviflora*	
Allium rhizomatum (=glandulosum)	Redflower Onion
Amsonia grandiflora	Arizona Slimpod
Arabis tricornuta	Rincon Mountain Rockcress
Asclepias lemmonii	Lemmon Milkweed
Asclepias uncialis ssp. *uncialis*	Greene's Milkweed
Astragalus allochrous var. *playanus*	Halfmoon Milk-vetch
Astragalus hypoxylus	Huachuca Milk-vetch
Brickellia simplex	Sonoran Brickell-bush
Browallia eludens	Elusive New Browallia Species
Carex ultra	Cochise Sedge
Conioselinum mexicanum	Mexican Hemlock-parsley
Coryphantha scheeri var. *robustispina*	Pima Pineapple Cactus
Coursetia glabella	Smooth Baby-bonnets
Cynanchum wigginsii (=Metastelma mexicanum)	Narrow-leaf (Wiggins) Swallow-wort
Delphinium andesicola	Chiricahua Mountains Larkspur
Draba petrophila var. *viridis*	Rock Whitlow-grass
Drymaria effusa var. *effusa*	Pinewood Drymary
Erigeron arisolius	Arid Throne Fleabane
Erigeron lemmonii	Lemmon's Fleabane
Escobaria vivipara var. *bisbeeana*	Bisbee's Pincushion Cactus
Fraxinus papillosa	Chihuahua Ash
Heterotheca rutteri	Rutter's Golden-aster
Hexalectris spicata var. *arizonica*	Crested Coralroot
Hexalectris warnockii	Purple-spike Coralroot
Hieracium rusbyi	Rusby's Hawkweed
Hymenoxys quinquesquamata	Rincon Bitterweed
Ipomoea plummerae var. *cuneifolia*	Huachuca Mountain Morning-glory
Ipomoea tenuiloba var. *lemmonii*	Lemmon's Morning-glory
Ipomoea thurberi	Thurber's Morning-glory
Laennecia eriophylla	Cochise Woolwort
Lilaeopsis schaffneriana var. *recurva*	Huachuca Water Umbel
Lilium parryi	Lemon Lily
Lupinus huachucanus	Huachuca Mountain Lupine
Macromeria viridiflora var. *thurberi*	Giant-trumpets
Macromeria viridiflora var. *viridiflora*	Giant-trumpets

continued

Table 12.1 **Species Identified by the Forest Service to Guide Management Decisions** *continued*

Mammillaria grahamii var. *oliviae*	
Mammillaria wrightii var. *wrightii*	Wright Fishhook Cactus
Margaranthus solanaceus	Netted Globeberry
Marina diffusa	Spreading Marina
Matelea (=Pherotrichis) balbisii	Balbis (=Huachuca Milkweed Vine)
Muhlenbergia palmeri (=M. dubioides)	Southwestern Muhly
Nissolia wislizeni	Arizona Yellowhood
Nothoscordum texanum	Texas False-garlic
Pectis imberbis	Beardless Chinch Weed
Pellaea ternifolia ssp. *arizonica*	Three-leaved Cliffbrake
Penstemon superbus	Superb Beardtongue
Phaseolus supinus	Supine Bean
Phoradendron bolleanum ssp. *pauciflorum*	Rough Mistletoe
Pinaropappus roseus var. *foliosus*	
Potentilla wheeleri	Wheeler's Cinquefoil
Psilactis gentryi	Gentry's Bare-ray-aster
Ranunculus hydrocharoides var. *stolonifer*	Frog's-bit Buttercup
Roldana hartwegii (=Senecio hartwegii, with syn = S. seemannii, S. carlomasonii, and R. carlomasonii)	Seemann (Hartweg's) Groundsel
Rumex orthoneurus	Blumer's Dock
Samolus vagans	Chiricahua Mountain Brookweed
Scutellaria tessellata	Huachuca Mountains Skullcap
Senecio huachucanus	Huachuca Groundsel
Sisyrinchium arizonicum	Arizona Blue-eyed-grass
Spiranthes delitescens	Canelo Hills Ladies'-tresses
Talinum humile	Pinos Altos Mountains Flameflower
Talinum marginatum	Tepic Flameflower
Viguiera dentata var. *lancifolia*	Sunflower Golden-eye
Woodsia cochisensis	Cochise Woodsia
Woodsia phillipsii	Phillips' Cliff Fern
Reptiles	
Aspidoscelis burti stictogramma	Canyon Spotted Whiptail
Crotalus pricei	Twin-spotted Rattlesnake
Crotalus w. willardi	Arizona Ridge-nosed Rattlesnake
Sceloporus slevini	Slevin's Bunchgrass Lizard
Tantilla wilcoxi	Chihuahuan Black-headed Snake
Thamnophis eques megalops	Northern Mexican Garternsake

Table 12.2 **Foundations of Native Biological Diversity**

"Potential Natural Vegetation Types" (bold) as they correspond with The Nature Conservancy's "Ecological Systems"

Cottonwood Willow Riparian Forest
Desert Riparian Woodland and Shrubland

Desert Communities
Chihuahuan Desert Scrub

Interior Chaparral
Interior Chaparral

Madrean Encinal Woodland
Madrean Encinal

Madrean Pine-oak Woodland
Madrean pine-oak Woodland

Mixed Broadleaf Deciduous Riparian Forest
Montane Riparian Woodland and Shrubland

Mixed Conifer Forest
Montane Mixed Forest

Semi-desert Grasslands
Apachean Grassland and Savannah
Apachean Shrubland

Wetland/Cienega
Cienega

Physiographic Features

Limestone and Rhyolite Outcroppings

Community

Sacaton Riparian Grassland

and biological processes. Using this classification allows current vegetation to be compared effectively 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 12.2). Although there are many fine variations in plant communities on the Huachuca 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.[10] Figure 12.2 shows the distribution of ecological systems in the Huachuca EMA. Through contact with regional scientists and experts, and other people familiar with the Huachuca EMA, 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. Other species that will need special consideration are species that area rare, vulnerable or declining throughout their ranges; are rare, imperiled or vulnerable in the U.S. portion of their ranges that overlap the Coronado National

Table 12.3 **Additional Species that Require Special Management Consideration**

Amphibians	
Rana pipiens	Northern Leopard Frog
Rana yavapaiensis	Lowland Leopard Frog
Birds	
Aimophila botterii	Botteri's Sparrow
Aimophila carpalis	Rufous-Winged Sparrow
Ammodramus bairdii	Baird's Sparrow
Asturina nitida maxima	Northern Gray Hawk
Athene cunicularia hypugaea	Burrowing Owl
Buteo albonotatus	Zone-Tailed Hawk
Buteogallus anthracinus	Common Black-Hawk
Callipepla squamata	Scaled Quail
Ceryle alcyon	Belted Kingfisher
Chloroceryle americana	Green Kingfisher
Colaptes chrysoides	Gilded Flicker
Cyrtonyx montezumae	Aplomado Falcon
Fish	
Catostomus clarki	Desert Sucker
Catostomus insignis	Sonora Sucker
Catostomus wigginsii	Matalote Opata
Cyprinodon macularius	Desert Pupfish
Cyprinodon macularius macularius	Desert Pupfish
Gila intermedia	Gila Chub
Insects	
Abedus herberti	Giant Water Bug
Ancyloxypha arene	Tropical Least Skipper
Heterelmis stephani	Stephan's Heterelmis Riffle Beetle
Mammals	
Corynorhinus townsendii pallescens	Pale Lump-nosed Bat
Cynomys ludovicianus	Black-Tailed Prairie Dog
Macrotus californicus	California Leaf-Nosed Bat
Myotis ciliolabrum	Western Small-Footed Myotis Bat
Myotis thysanodes	Fringed Myotis Bat
Myotis velifer	Cave Myotis Bat
Sigmodon ochrognathus	Yellow-Nosed Cotton Rat
Mollusks	
Pyrgulopsis thompsoni	Huachuca Springsnail
Reptiles	
Cnemidophorus burti stictogrammus	Canyon Spotted Whiptail
Cnemidoporus opatae	Huico de Oputo
Eumeces callicephalus	Mountain Skink
Plants	
Amoreuxia gonzalezii	Santa Rita Yellowshow
Aster potosinus	Lemmon's Aster
Dryopteris patula var. *rossii*	Mexican Shield Fern
Echinomastus erectocentrus var. *erectocentrus*	Needle-spined Pineapple Cactus
Erigeron pringlei	Pringle's Fleabane
Euphorbia macropus	Woodland Spurge
Graptopetalum bartramii	Patagonia Mountain Leather-Petal
Hexalectris revolute	Chisos Coral-Root
Hieracium pringlei	Pringle's Hawkweed
Macroptilium supinum	Supine Bean
Matelea (=Pherotrichis) balbisii	Balbis (=Huachuca Milkweed Vine)
Muhlenbergia dubioides	Box Canyon Muhly

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 3 lists additional species whose needs should be assessed during plan revision.

The Huachuca 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 are an important part of the Cultural Heritage of the area (Table 12.4).

Table 12.4 **Elements of Cultural Heritage**

Opportunities for quiet and solitude
Opportunities for primitive recreation

Desired Conditions

✶ The Huachuca 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 Huachuca EMA and the following: Santa Rita EMA, Whetstone EMA, Tumacacori EMA, lands in northern Mexico and other surrounding wildlands.

✶ Development around the Huachuca EMA does not prevent the continued use of prescribed fire and wildland fire as management tools.

✶ Ecological systems on the Huachuca EMA experience the natural pre-fire suppression burn cycles. Burn cycles restore a broad mosaic pattern of habitat types that maintain the biological diversity expected for each vegetation type. High-intensity stand-replacing fires occur at pre-fire suppression intervals due to the composition of fire-adapted vegetation types.

✶ The Huachuca EMA contributes to the health and recharge of the San Pedro Watershed, Davidson Canyon and the Cienega Creek watershed.

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

✶ 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.

✶ Human uses on the Huachuca EMA are in both short-term and long-term harmony with the ecological health of the land.

✶ The Huachuca Ecosystem Management Area 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

Conservation assets work on behalf of Forest health on the Huachuca Ecosystem Management Area. They will contribute to the Forest Service's ability to maintain ecological and social sustainability. The following emerged as strengths and opportunities for conservation on the Huachuca Ecosystem Management Area.

Audubon Appleton-Whittell Research Ranch

The Research Ranch is a cooperative partnership among the National Audubon Society, U.S. Forest Service, Bureau of Land Management, the Nature Conservancy, Swift Current Land and Cattle Company and The Research Ranch Foundation. The Research Ranch provides ecosystem conservation through restoration of natural processes, erosion control, eradication of exotic species, replanting of native grasses and reestablishment of fire. The Ranch is the location research on protecting the remaining grassland ecosystems in the southwest, and is a leader in regional education and outreach.

Canelo Hills Coalition

The Coalition is a group of ranches in Santa Cruz County working to improve water quality in Red Rock Canyon, a tributary to Sonoita Creek and the Upper Santa Cruz watershed. The Coalition is working with the Coronado Resource Conservation and Development Area, Inc. on this project to address sediment delivery by improving watershed health through the implementation of best management practices that facilitate a rest-rotation grazing system to maximize vegetation on the watershed.

Canelo Hills Preserve

This preserve is owned and managed by the Arizona chapter of The Nature Conservancy. It protects one of the best remaining cienegas in southern Arizona. Cienegas are dominated by sedges and other herbaceous woody wetland plants. O'Donnell Creek is a small perennial stream that runs through the Cienega and supports a population of Gila Chub. The cienega also harbors a population of the imperiled Canelo Hills ladies' tresses. The preserve contributes to the protection of rare species and native fisheries and the health and recharge of the Cienega Creek and Davidson Canyon watersheds.

Huachuca Area Fire Partners

The Huachuca Area Fire Partners are an alliance of public and private groups that came together to restore and manage fire on 500,000 acres of land that span from the San Pedro River on the east to the Patagonia Mountains on the west. The group worked together to produce a Fire Management Plan based on ecological rather than jurisdictional boundaries. Managing fire in this way will help to return ecological systems to their pre-fire suppression composition and resiliency. The group continues to work on landscape level compliance and implementation.

Huachuca Important Bird Area

The Huachuca Important Bird Area encompasses an area of the Huachuca Mountains surrounding Ramsey Canyon on the eastern side. Vegetative communities consist primarily of Madrean montane coniferous forest supporting Chihuahua and Apache pine, and evergreen forest and woodland. This site supports 26 populations of avian "species of conservation concern" whose range in the U.S. is limited to the Sky Islands of southern Arizona such as the Buff-Breasted Flycatcher, Whiskered Screech Owl and Elegant Trogon). Also found in this area are rare neo-tropical bird species (the Berylline Hummingbird, Blue-Throated, Violet-Crowned, and White-Eared Hummingbirds, and Sulphur-Bellied Flycatcher.

Ramsey Canyon Preserve

This preserve encompasses the spring-fed riparian environment of Ramsey Canyon on the eastern slopes of the Huachuca Mountains. Owned and managed by The Nature Conservancy the preserve protects excellent riparian habitat that supports the Endangered Chiricahua leopard frog. Over 170 species of birds are found on the preserve along with mountain lion, canyon tree frog, lemon lily, ridge-nosed rattlesnake and dozens of species of butterfly. The reserve protects habitat for a number of sensitive and imperiled species.

Threats to the Forest: A Need for Change

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 Huachuca Ecosystem Management Area that are not addressed in the Forest Plan, or have not been adequately dealt 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 Huachuca EMA.

ADJACENT LAND USES

Rapid growth of the city of Sierra Vista is creating a suburban fringe along the eastern boundary of the Forest. The Lone Mountain land exchange in the southeastern portion of the Ecosystem Management Area is on the market and could be at threat for development, which will almost certainly lead to more subdivision of land. This type of development threatens the integrity of wildlife corridors between mountain ranges, causes direct loss of wildlife habitat, and creates social resistance to grassland fires. Important wildlife linkages between the Huachuca Mountains and the San Pedro River Valley to the east will suffer from continued development. This also leads to more areas of wildland/urban interface and increases the threat of invasive species spreading from surrounding developments onto the Forest.

Resources likely affected by land development adjacent to the EMA include: geological features, springs, ephemeral watercourses, seeps, scenic resources, all ecological systems, all native vegetation types and their associated flora and fauna; species particularly sensitive to direct human disturbance (e.g., bats, lizards, desert box turtle, jaguar, ocelot, Mexican Spotted Owl, Coues' white-tailed deer); wide-ranging species of terrestrial animals: mountain lion, jaguar, ocelot, black bear, white-nosed coati, pronghorn, deer; prehistoric and historical sites, structures, and artifacts; Apachean grassland and savanna, Madrean pine-oak woodland, Madrean encinal grasslands, and animal species dependent on fire-adapted vegetation communities (e.g., Mexican Spotted Owl).

ECOLOGICAL RESTORATION

Past fire suppression has lead to a build up of dense fuels particularly in the pine-oak, ponderosa pine and Douglas fir habitats in mountainous areas. High fuel loads in these habitats create the potential for high-intensity stand replacing fires. These types of fires will have impacts on water infiltration in upland areas, species composition, and watershed function and flow regimes. Drought exacerbated by human activity has contributed to changes in watershed function and species composition.

Affected resources include: Apachean and grassland savanna, Madrean pine-oak woodlands, Madrean encinal; riparian systems and associated species, springs, ephemeral watercourses, seeps; all native vegetation types and their associated flora and fauna; native amphibian and fish species.

EXTRACTIVE USES

Livestock Grazing

Heavy grazing by cattle on the northern and western slopes of the Huachuca Mountains, particularly in riparian habitats within canyons presents a major localized threat on the EMA.

Mining

Mining claims currently exist in the west area of Canelo Hills. There are known copper-porphyry, beccia-pipe, manganese, alunite and base- and precious-metal deposits at various locations in the Patagonia Mountains and Canelo Hills but the Bureau of Mines believes none are economically feasible for commercial development.[11]

INVASIVE SPECIES

Crayfish pose a real problem to native populations of fish and amphibians and the riparian habitat that supports them. Stretches of Bear Creek, Cave Canyon, Parker Canyon, Sycamore Canyon and Temporal Gulch were all found to contain crayfish. These waters support important populations of native fish and amphibians and are in close proximity to other perennial stretches of water. Threats include predation on and competition with native species. Affected species include Gila topminnow, longfish dace, speckled dace, Chiricahua leopard frog and Sonoran tiger salamander.

ROADS AND TRANSPORTATION SYSTEM

The Huachuca EMA contains the most extensive road network of any of the mountain ranges in the Coronado National Forest. Increases in volume of motorized users and user irresponsibility is creating an expanding network of illegal user-created routes. The western portion of the Canelo Hills are heavily roaded. Because of their topography they are particularly susceptible to widespread motorized abuses. Threats include existing illegal user-created routes and creation of new non-system unauthorized roads, routes creating exclusive access, and lack of enforcement of the legal authorized transportation system.[11] The illegal and legal system of routes on the Huachuca EMA contribute to extensive habitat fragmentation, soil erosion, water, air and noise pollution, and degradation of riparian vegetation.

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.

SPECIAL MANAGEMENT AREAS

Brushy Peak, Canelo, and Mount Hughes roadless areas were not mentioned in the 2001 roadless rule. In a Management Area with such an extensive road network, the precious few remaining roadless areas must be recognized and adequately protected. Core areas of roadless habitat help to protect the ecological integrity of the area and are an essential tool for the Forest Service to maintain ecological sustainability.

U.S.-MEXICO BORDER

The Huachuca EMA is simultaneously threatened by foot and vehicular traffic from immigrants, smugglers and border patrol interdiction efforts and by the proposed construction of a border wall. Although foot travel of migrating people often occurs along washes and ridges rather than on designated hiking trails, there is heavy migrant foot traffic along the Arizona Trail where it traverses the ridgeline of the Huachuca Mountains. Checkpoints along State Highway 90 to the east of the EMA affect the flow of migrant traffic as attempts are made to avoid the checkpoint. Impacts from migrant foot travel include erosion due to off-trail walking especially in steep terrain and near waterways, deposition of trash, and increased danger of uncontrollable wildfire at unnatural times of the year.

Affected resources include: springs, all ecological systems, all native vegetation types and their associated flora and fauna, grasslands and savannas, lowland flora and fauna, riparian vegetation and species, and vegetation and communities not adapted to frequent fire.

Recommended Objectives and Management Actions

The Huachuca Ecosystem Management Area (EMA) encompasses a broad diversity of habitat types and an array of imperiled species found nowhere else in the United States. The area contains outstanding riparian habitat that is essential to the health of native fish in Arizona. These outstanding features of the Huachuca EMA 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 Huachuca 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.

Adjacent Land Uses

Objectives

Maintain wildlife corridors between the Huachuca EMA and (1) the Santa Rita EMA, (2) the San Pedro Riparian National Conservation Area, (3) the northern Sierra Madre Occidental, (4) Las Cienegas NCA, and (5) other surrounding natural areas.

Actions

Coordinate management on the EMA with that of private land adjacent to it.

Work collaboratively with Cochise County to influence land planning on lands adjacent to the eastern side of the EMA.

Ecological Restoration

Objectives

Restore the pine-oak 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.

Actions

Work to implement the Fire Management Plan written by the Huachuca Area Fire Partners.

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

Objectives

Maintain recreational opportunities for people seeking quiet and solitude on the Forest.

Maintain a balance between motorized and muscle powered quiet recreation opportunities.

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.

Ban paintball activities on the EMA.

Designate sound sheds in which quiet recreation is the primary suitable use.

Roads/Transportation System

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 pressure from off-road driving on National Forest law enforcement staff.

Actions

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.

Do not allow the construction of any new roads in the Huachuca EMA.

Close roads that are experiencing high levels of motorized recreation abuse including roads from which drivers are creating new illegal roads.

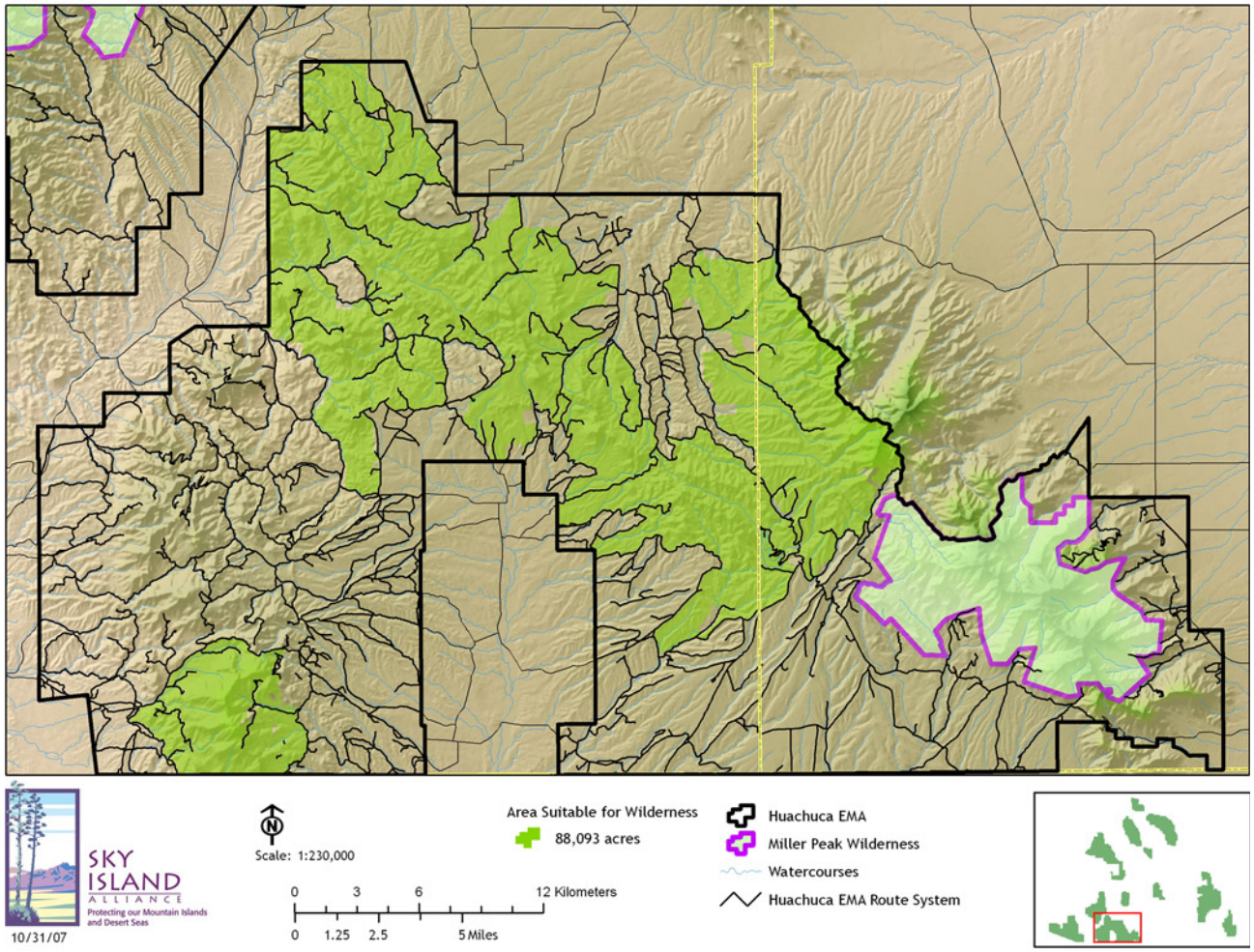

Figure 12.3 **Area Suitable for Wilderness and to be Managed for Wilderness Characteristics**

Special Management Areas

Objectives

Maintain the intact nature, and unfragmented habitat, of the Huachuca EMA.

Maintain lands with wilderness characteristics.

Maintain and enhance opportunities for primitive backcountry recreation.

Actions

Properly map the Brushy Peak and Mount Hughes Roadless Areas and designate them as protected roadless areas. Do not allow any road incursion or construction of new roads in these areas.

Manage 88,093 acres with outstanding wilderness characteristics to maintain their wilderness suitability. (See Figure 12.3 for a map of the area to be managed for wilderness suitability.)

Wilderness

Miller Peak Wilderness

Miller Peak Wilderness was designated through the passage of the Arizona Wilderness Act of 1984. Consisting of 22,228 acres, it encompasses some of the most rugged country in southern Arizona. The Wilderness area takes it name from Miller Peak, the highest peak in the Huachuca range topping out at an elevation of 9,455 feet. Characterized by sheer cliffs, this area is known for large, intensive fires. An astounding diversity of wildlife has been identified here including 170 species of birds, 60 species of reptiles and 78 species of mammals.

Special Management Areas

RESEARCH NATURAL AREAS

Research Natural Areas are special management areas established to protect land in perpetuity as living, learning centers for ecological research and ecosystem restoration. They should include broad representation of the ecological diversity that occurs on the Forest. Two Research Natural Areas (RNA) currently exist in the Huachucas, Canelo Hills RNA and Elgin RNA.

Canelo Hills Research Natural Area

Elgin Research Natural Area

Elgin Research Natural Area encompasses 600 acres comprised of National Forest, state and private lands. The land is in the transition zone between southwestern grasslands and oak savanna. Common oaks in the area include Mexican blue oak, and Emory oak. A diversity of grasses are present and include blue gramma, sideoats gramma, plains lovegrass and kane beardgrass. Topography varies from relatively flat ridges to rolling slopes. Part of the area is located on the National Audubon Society Research Ranch at Elgin.

SPECIAL INTEREST AREAS

Special Interest Areas are designated to protect unique values including botanical, zoological, geological, historical, or scenic values. They may also be designated to protect and manage sensitive or imperiled species or other elements of biological diversity. Special Interest Areas help the Forest Service preserve important historic, cultural and natural aspects of our national heritage. The extraordinary characteristics of the Huachuca Ecosystem Management Area warrant the designation of two new Special Interest Areas, Scotia Canyon Zoological and Botanical Area and Red Rock Canyon Special Management Area.

Proposed Scotia Canyon Zoological and Botanical Area

Scotia Canyon harbors perennial stream flow that supports a variety of sensitive and imperiled species. The area encompasses unique seep, creek and Cienega habitat that has high restoration potential and contributes to the biological diversity of native riparian dependent species.

NAME: Scotia Canyon, Huachuca Mountains. Cochise County, Arizona

SIZE: 2,589 Acres

BOUNDARIES: Scotia Canyon Watershed above FR48. (See Figure 12.5)

ELEVATION: Approximately 5700 to 6400 feet

GENERAL DESCRIPTION OF AREA: Scotia Canyon lies on the southwestern slope of the Huachuca Mountains in the upper San Pedro River subwatershed at approximately 6,000 feet (see Project Location Map). Uplands and slopes are characterized by oak and pine-oak woodlands, while the riparian bottom supports Arizona sycamore, walnut, and willows. The stream flows through approximately 1.5 miles of the canyon. Stream flow is perennial where the canyon is constricted, and ephemeral where the canyon has greater width.

Scotia Canyon is currently undergoing restoration work. In cooperation with the U.S. Forest Service, the U.S. Fish and Wildlife, Arizona Game and Fish Department, The Nature Conservancy, and Fort Huachuca, Sky Island Alliance developed a restoration plan to restore a more natural hydrological regime to the canyon and remove bullfrog breeding sites.

Figure 12.4 **Scotia Canyon Proposed Zoological and Botanical Area**

CURRENT USES: Scotia Canyon is actively grazed during the winter by cattle as part of the Coronado National Forest's Lone Mountain Allotment. The canyon is also popular with campers, hikers, birdwatchers, hunters, and off-highway vehicle enthusiasts. In recent years the canyon has received much use from undocumented immigrants, smugglers, and associated law enforcement (primarily U.S. Border Patrol). The canyon also adjoins the U.S. Army's Fort Huachuca, which has unique security and other management needs.

JUSTIFICATION FOR DESIGNATION: Scotia Canyon contains a unique mid-elevation perennial spring, seep, creek and ciénega system. These types of Sky Island region systems have been highly modified by water diversion for human and livestock use, and many that still retain some function are not perennial.

The canyon is particularly rich in sensitive species, including the federal endangered Huachuca water umbel (*Lilaeopsis schaffneriana* var. *recurva*) and critical habitat for this species; Huachuca springsnail (*Pyrgulopsis thompsoni*) — a candidate for federal listing under the Endangered Species Act; and Mexican garter snake (*Thamnophis eques*), which has been petitioned to be listed as a federal endangered species and is an Arizona Game and Fish Department (AGFD) Species of Special Concern. The Huachuca Mountain population of the Mountain treefrog (*Hyla wrightorum*, a candidate for federal listing) breeds in Scotia Canyon, is only known from a few sites, and is disjunct from other populations in the Sierra Madre Occidental and on the Mogollon Rim. The federal threatened Chiricahua leopard frog (*Rana chiricahuensis*) and federal endangered Sonora tiger salamander (*Ambystoma tigrinum stebbinsi*) (both are

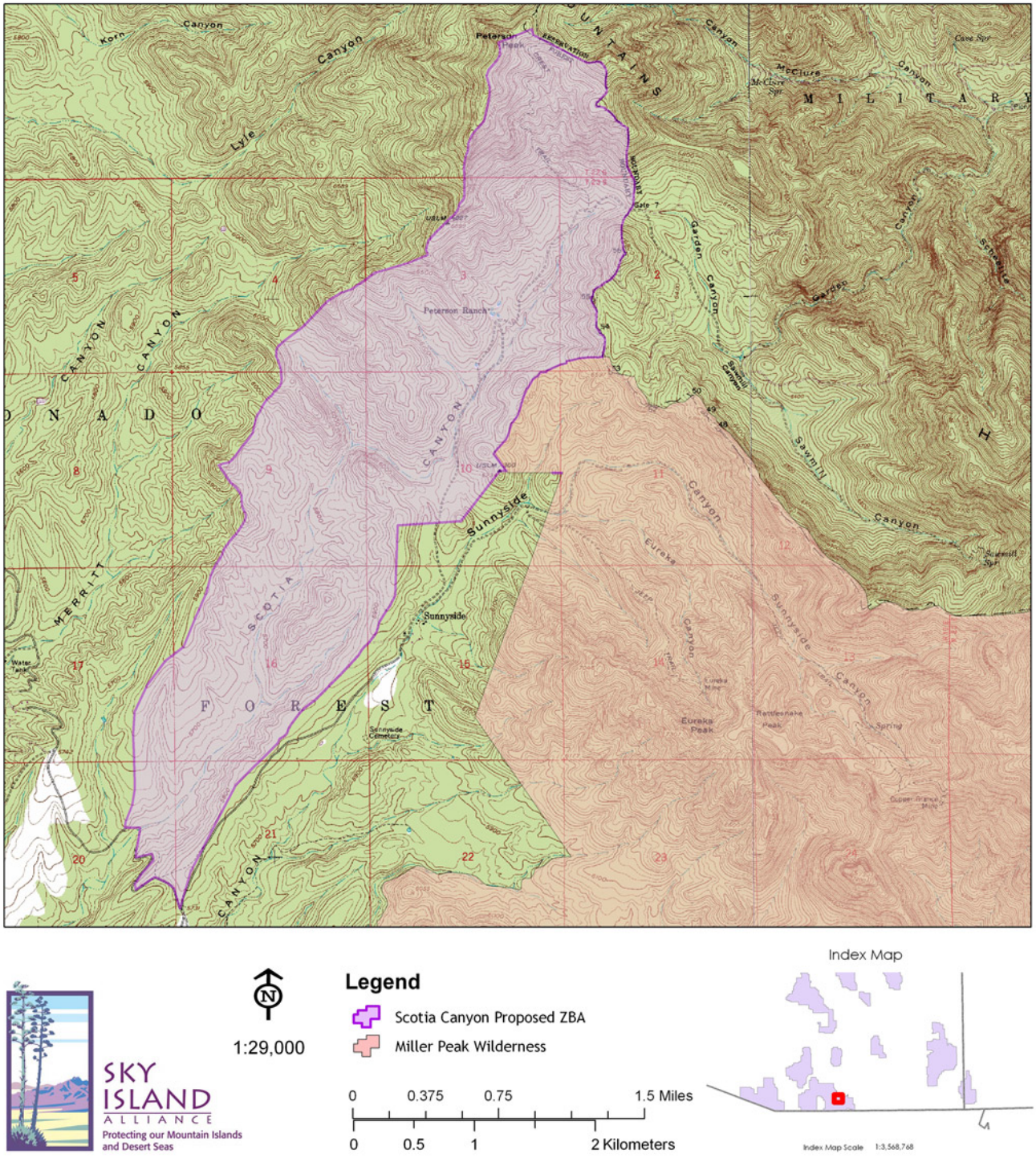

Figure 12.5 **Scotia Canyon Proposed Zoological and Botanical Area**

AGFD draft Species of Special Concern) inhabited the canyon until recently. Restoration of habitat and reestablishment of Sonora tiger salamanders in Scotia Canyon was recommended in the recovery plan for the salamander (U.S. Fish and Wildlife Service 2002). Scotia Canyon was also recommended as a reestablishment site for Gila chub (*Gila intermedia*), a federal threatened species that is also on AGFD's draft Species of Special Concern, and longfin dace (*Agosia chrysogaster*, Stefferud and Stefferud 2004). We believe Scotia Canyon is also appropriate as habitat for the federal endangered Canelo Hills ladies' tresses (*Spiranthes delitescens*).

The Huachuca Mountains are unique and species-rich due to their location in the transition between the Rocky Mountain species to the north and the subtropical thornscrub and Sierra Madrean species to the south. It is likely that plant and animal species will be discovered at this site that reach their northern most distribution making them rare in Arizona.

RECOMMENDATIONS FOR FUTURE USE: A livestock and wildlife water will be constructed on the ridge just south and above the perennial reach of the stream to reduce livestock use in the canyon bottom. A water right exists for a small portion of spring flow from Sylvania Spring before it enters Peterson Tank; this proposed special designation will not effect this water right nor the right of way established to allow access to the spring and waterline. With careful monitoring of the flood and drought cycles of the canyon, livestock could be allowed in to help maintain some open water to add diversity to the spring, cienega and stream habitat. This small and fragile stream habitat should remain relatively secluded from the public and the growing local population recreating in the canyon should be managed intensively. To control public use the closure of motorized routes that cross the stream should be seriously considered. Continued support for the restoration plan and for long-term monitoring, maintenance, and management must be a priority in annual workplans and in long-term Forest Service planning.

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