



Recommended Critical Biological Zones in Southern California's Four National Forests:

Los Padres • Angeles • San Bernardino • Cleveland



Lake Fulmor, San Jacinto Mountains,
San Bernardino National Forest.
Photo by Monica Bond

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- Timothy Krantz – University of Redlands and San Bernardino Valley Audubon Society
- Fred Roberts – California Native Plant Society
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Executive Summary

With majestic mountains, dramatic coastlines, and a remarkable diversity of wildlands from alpine forests to desert scrublands, Southern California’s four national forests – Los Padres, Angeles, San Bernardino, and Cleveland – are beloved by millions of backpackers, hikers, birdwatchers, hunters and fisherman, and outdoor enthusiasts.

Scientists recognize our region as one of the richest areas of plant and animal life on the planet. It is home to roughly 3,000 plant and 500 animal species, many of which are found nowhere else on Earth. Our national forests form the backbone for the conservation of the natural beauty and extraordinary biological diversity of the region. One of the great pleasures of hiking in the forests is to see this diversity, from rare butterflies, fish, frogs, and birds to mule deer, bighorn sheep, and bobcats.

As the largest natural open spaces in south-coastal California, our public forests are an important refuge for plants and animals under siege from the development of surrounding private lands. Urban sprawl, roads, pollution, off-road vehicles, and commercial development are threatening the very survival of many of our unique flora and fauna. About 200 species of plants and 200 species of animals are currently considered threatened or sensitive by government agencies and conservation groups in southern California. Within the boundaries of the four southern California forests, scientists have documented approximately 180 species-at-risk, including 76 species listed under the California or federal Endangered Species Acts.



Boulder Basin, San Jacinto Mountains, San Bernardino National Forest. This area is home to California spotted owls, southern rubber boas, and other imperiled species. Photo by Monica Bond

This report documents and describes localized biological diversity hotspots and areas of high ecological significance, based on available scientific literature and the subjective expert opinions of scientists contacted by our staff biologists. The Center believes these hotspots deserve the highest levels of protection under the new Land and Resource Management Plans – as Critical Biological Zones (“CBZs”).

Most of the areas we are urging the Forest Service to designate as CBZs in the final management plans have long been recognized by leading scientists as key habitats for rare, declining, and gravely imperiled plants and animals in the four forests. Historical losses of sensitive habitats and the rapidly growing human population in our region means these areas now represent the last, best



places for our native species in southern California. As such, they deserve special consideration as localized biological diversity hotspots worthy of the highest levels of protection.

By providing the highest levels of conservation (i.e., allowing only activities that are neutral or beneficial to biological resources) in areas of high ecological significance, the Forest Service will fulfill its legal duty to conserve federally listed endangered and threatened species under the Endangered Species Act, as well as its duty to maintain viable populations of vertebrates on national forest lands under the National Forest Management Act. In doing so, our native plants and wildlife will be assured a future so that generations to come can continue to discover and explore the wonders of nature.



Parish's rockcress, found on the pebble plains in the San Bernardino Mountains. Pebble plains are treeless remnants of an ancient lake bed, typified by high clay content in the soil. These habitats support numerous unique plants and insects, including three federally endangered plants: Bear Valley sandwort, southern mountain buckwheat, and ash-gray paintbrush. Photo by William Taylor.



Introduction and Methods

We approached ten scientists who conduct research on or are familiar with biodiversity issues in the four southern California national forests, by telephone and electronic mail. Seven of these scientists responded to our query (listed above). We conducted phone and electronic mail interviews with these seven scientists to obtain their input regarding identification and description of biodiversity hotspots and critical biological areas. Subjective input, such as stream reaches with few exotic species or locations with habitat features unique or rare in the south coast ecoregion, was taken into account.

We also consulted the published scientific literature, including U.S. Forest Service General Technical Reports and National Forest survey reports, to obtain supplementary information on these areas or to identify additional critical biological areas. These areas are described in the forest-specific sections below. Where new hotspots were identified here that were not included in the Mountains and Foothills Assessment, it was so noted. The numbers in parentheses after each recommended Critical Biological Zone correspond to its location on the maps at the end of the report (pages 24 and 25).



Deep Creek supports a wide array of native plants and wildlife, including arroyo toads and Mojave tui chubs, as well as California spotted owls and San Bernardino flying squirrels in the upland forests. Deep Creek has some of the finest riparian habitat in the San Bernardino National Forest. Photo by Robert Reed.



Los Padres National Forest

CUESTA RIDGE (1)

Southern Santa Lucia Range

Cuesta Ridge, north of San Luis Obispo, is a unique botanical hotspot, supporting the Cuesta Pass checkerbloom (*Sidalcea hickmanii anomala*), a serpentine endemic plant species, as well as numerous sensitive plants such as San Luis mariposa lily (*Calochortus obispoensis*), San Luis Obispo sedge (*Carex obispoensis*), Brewer's spineflower (*Chorizanthe breweri*), San Benito fritillary (*Fritillaria viridea*), and hooked popcorn-flower (*Plagiobothrys uncinatus*); all are CNPS List 1B species (Stephenson and Calcarone 1999). A 1,330-acre area has been established as a Special Interest Area (Cuesta Botanical Area). Because the area is important for a high number of sensitive plant species which continue to be impacted by recreation and mining, Cuesta Ridge should be designated a Critical Biological Zone on top of its Special Interest Area¹ status.

UPPER ALAMO CREEK AND BRANCH CANYON (2)

Southern Santa Lucia Range

Branch Canyon is a tributary of Alamo Creek, which in turn flows into the Cuyama River at Twitchell Reservoir. Upper Alamo Creek above Branch Canyon as well as Branch Canyon itself are biodiversity hotspots. The upper third of the Salinas River once drained south via Alamo Creek into the Cuyama before tectonic movements raised the area which is now the head of Alamo Creek. As a result, certain fish species from the Central Salinas Valley are present in the Alamo Creek, such as *Hesperoleucus symmetricus* and *Rhinichthys osculus* (S. Sweet, personal communication 2005).

Branch Canyon supports high densities of California red-legged frogs (*Rana aurora draytonii*) and southwestern pond turtles (*Clemmys marmorata pallida*), and is unusual in that water flows are permanent and the remote drainage contains few exotic species. The road that follows the bed of Branch Canyon Creek was closed to off-road vehicle use, and should remain so. There are a number of privately held inholdings in the area, which should be high-priority acquisitions for the Forest Service. *This area was not described in the Mountains and Foothills Assessment nor in the Draft LRMP.* These two drainages should be designated as Critical Biological Zones.

UPPER SANTA CRUZ CREEK (3)

Southern Coast Ranges

Upper Santa Cruz Creek is located northeast of Lake Cachuma and southwest of Big Pine Mountain. The upper portion of Santa Cruz creek drains Pine Ridge (between Big Pine Mountain and San Rafael Mountain, and Santa Cruz Peak), and forms a narrow gorge that hosts California red-legged frogs and southwestern pond turtles, with California spotted owls (*Strix occidentalis occidentalis*) in the uplands. This area is well-protected because it is a very steep drainage. However, too much

¹ Special Interest Areas may be designated by the Regional Forester to protect and manage for public use and enjoyment those special recreation areas with scenic, geological, botanical, zoological, paleontological, archaeological or other special characteristics or unique values. Draft LRMP at page 2-15.



prescribed burning of the slopes where it borders the San Rafael wilderness may threaten the area. The Upper Santa Cruz Creek was proposed as wild and scenic in the Conservation Alternative. *The creek was not described in the Mountains and Foothills Assessment and not given any special consideration in the Draft LRMP.* The Forest Service should consider designating the upper Santa Cruz Creek as a Critical Biological Zone.

INDIAN AND MONO CREEKS (4,5)

Tributaries to Santa Ynez River, Coast/Transverse ranges

The combined drainages of Mono and Indian Creeks (north of Gibraltar Reservoir on the Santa Ynez River, above the city of Santa Barbara) support a complete assemblage of native aquatic species (e.g., California red-legged frogs; arroyo toads, *Bufo californicus*; southwestern pond turtles; and trout). The two creeks join together about one-half mile upstream of the Mono debris dam. Invasive species have been unable to colonize the streams above the debris dam, rendering these combined drainages the largest to be free of exotic aquatic species in southern California (S. Sweet, personal communication, 2005). The area also supports one of the largest and most intact cottonwood/willow riparian woodlands in southern California, and hosts more than 100 breeding or migrating bird species including southwestern willow flycatchers (*Empidonax traillii extimus*) and the largest population of least Bell's vireos (*Vireo bellii pusillus*) on the four southern California national forests (Los Padres National Forest Strategy, Appendix A-17).

Upper Mono Canyon has a dirt road that winds five miles to the historic Ogilvy Ranch and then another five miles to the Mono Narrows. Ogilvy Ranch should be a top priority for acquisition to the National Forest, as fires have spread from the property onto the National Forest and resulted in a purported need to conduct fuel treatments in the area. Road access to Ogilvy Ranch is currently limited to the rugged Hildreth Peak fire trail, but private ownership maintains pressures to reopen the Mono Canyon road, which has multiple stream crossings. Annual repair work on Mono Canyon road previously caused severe resource damage to the lower portion of Mono Creek.



The least Bell's vireo is a migratory bird that lives along rivers and streams in southern California. It has made a remarkable comeback thanks to the protections of the Endangered Species Act. Photo by James Gallagher.

The Draft LRMP proposed a Critical Biological Zone at "Mono Creek Road Crossing" for arroyo toads, California red-legged frogs, and least Bell's vireo, but this proposal was not included under the preferred alternative. The Draft LRMP proposed the 3,078-acre Mono Basin as a Special Interest Area (Los Padres National Forest Strategy, Appendix A-17), and the roadless portion has been proposed for Wilderness (Los Padres National Forest Strategy, Appendix A-9). While laudable, both the Mono and Indian Creek basins unequivocally should be designated Critical Biological Zones in addition to Special Interest Areas and Wilderness, and afforded the highest levels of protection for this critically important biodiversity hotspot.



MOUNT PINOS AND MOUNT ABEL (6,7)

Transverse Ranges

Mount Pinos and Mount Abel (or Cerro Noroeste) are situated on the border between Kern and Ventura Counties, south of the San Emigdio Mountains and west of the Tehachapi Range. These mountain peaks have been described as unique “montane islands” that host a number of endemic subspecies including Mount Pinos blue grouse (*Dendragapus obscurus*; the southwestern limit of the full species’ distribution), Tehachapi white-eared pocked mouse (*Perognathus alticola inexpectatus*), and Mount Pinos lodgepole chipmunk (*Tamias speciosus callipeplus*), as well as population of rubber boas (*Charina bottae*) intermediate between the northern and southern subspecies (Stephenson and Calcarone 1999). The area also supports a population of northern goshawks (*Accipiter gentilis*).

Threats to the native species of the Mount Pinos and Mount Abel areas are timber harvest, recreational impacts, fire suppression and potential catastrophic fire, development, and the loss of habitat connectivity. Despite recognition of the ecological significance of these montane islands in the Mountains and Foothills Assessment, the Draft LRMP provides no special protection for these areas. The Center recommends designation of portions of these peaks as Critical Biological Zones.

ALAMO MOUNTAIN (9)

Transverse Ranges

Alamo Mountain is located south of Frazier Mountain and north of the Sespe Condor Sanctuary (just north of the Sespe Wilderness) in northeast Ventura County. The southeastern upper portion of Alamo Mountain, together with nearby Sewart Mountain, White Mountain, and Snowy Peak to the southeast, supports mesic coniferous forest similar to the wet forests of the western Sierra Nevada – a rare habitat type in southern California. The headwaters of Buck Creek, Snowy Creek, and Frazier Creek begin here, all of which flow northeast into Piru Creek (another biodiversity hotspot, see below). Buck Creek is the largest of the drainages, running through a gently sloping saddle with large conifers, deep soil, and dense leaf litter. As a result of these habitat elements, the area supports state-threatened southern rubber boas and high numbers of forest-sensitive yellow-blotched salamanders (*Ensatina eschscholtii croceater*). These species thrive in mature coniferous or mixed conifer-oak forests with deep litter/duff layers. Alamo Mountain also hosts historically productive deer populations (DFG 2004).

Off-road vehicle use is threatening this area, exacerbated by its proximity to the Hungry Valley SVRA and the construction of off-road vehicle trails linking Hungry Valley to the Gold Hill-Alamo Mountain area. Proposed prescribed burnings by the Forest Service could remove important habitat elements and potentially threaten the species that occur there. *This area was not included in the list of ecologically significant areas in the Mountains and Foothills Assessment nor in the Draft LRMP.* The Center recommends Buck Creek and other portions of Alamo Mountain be designated as Critical Biological Zones.



PIRU CREEK (8)

Transverse Ranges

Piru Creek is a biodiversity hotspot both from around Gold Hill road to Pyramid Lake, and south of Pyramid Lake to Lake Piru. The Piru Creek watershed contains arroyo toads, and its tributaries support California red-legged frogs, southwestern pond turtles, and southern steelhead trout (*Oncorhynchus mykiss*), with California spotted owls in the uplands.

Management of the creek for native aquatic species is complicated by the existence of Pyramid Lake, including both flow management and the introduction of exotic species carried by California Aqueduct water, but certain measures could be taken to benefit these native species. For example, in the upper section of Piru Creek, suction dredging along a series of recreational gold mining claims was eliminating arroyo toad reproduction. However, about five years ago, suction dredging was prohibited in the area and Hard Luck Campground was closed. These measures greatly benefited the local fauna, including arroyo toads. In fact, desert spiny lizards (*Sceloporus magister*) have repopulated the rocks at Hard Luck Campground, which is the westernmost location where the species comes into contact with coastal herpetofauna (S. Sweet, personal communication, 2005).

The rest of Piru Creek is critical for the arroyo toad and other native species. The arroyo toad is highly sensitive to management at Pyramid Lake, where accidental water releases for testing at inopportune times has washed out toad reproduction for the year. Releases of water from Pyramid Lake downstream throughout the summer and fall to maintain a trout fishery in Piru Creek has created a series of connected ponds that allow bullfrogs, bass, sunfish, crayfish, and other invasive species to persist and decimate native aquatic species. The maintenance of these ponds has enticed native anadromous fish into staying in the creek and not returning to the lake, but the ponds warm up over the season and cannot then support the fish. Proper management of Piru Creek would entail mimicking natural flows: the creek should be allowed to dry up in summer when there is no inflow from Piru Creek above Pyramid Dam, thus eliminating invasive species and encouraging native fish to reach the lake, and flood peaks should be released during the winter months, thus scouring out non-native riparian vegetation and returning the habitat to a braided stream. Specifically, the practice of releasing baseflow from Pyramid Dam during the summer and fall to maintain a trout fishery near Frenchman's Flat should be terminated. Water from this release maintains both excessive growth of vegetation and creates ideal habitat for exotic crayfish, fish and bullfrogs in all of Piru Creek below Pyramid Dam, to the great detriment of native species.

“Upper Piru Creek” was proposed as a Critical Biological Zone in Alternative 6 of the Draft LRMP, but was not recommended under the preferred alternative. The Upper and Lower portions of Piru Creek both should be designated as Critical Biological Zones.



The arroyo toad is found only in washes, streams, rivers, and arroyos in semi-arid parts of southern California. It is listed as an endangered species under the federal Endangered Species Act.

Photo by Sam Sweet.



Angeles National Forest

CASTAIC CREEK AND ELIZABETH LAKE CANYON (10)

Castaic Ranges

Castaic Creek and Elizabeth Lake Canyon flow south out of the Liebre and Sawmill mountains, which rise dramatically out of the Antelope Valley. The construction of Castaic Reservoir submerged much of these drainages. The reach of Castaic Creek above Castaic Lake is occupied by arroyo toads and southwestern pond turtles. Elizabeth Lake Canyon supports Swainson's thrushes (*Catharus ustulatus*) and yellow-breasted chats (*Icteria virens*); historically it also contained Tehachapi white-eared pocket mice and foothill yellow-legged frogs (*Rana boylei*).

The presence of Castaic Reservoir and high levels of recreational use threaten the imperiled species found within these drainages. The spread of exotic species is exacerbated by these detrimental impacts. The Mountains and Foothills Assessment described the high ecological significance of these two drainages. Only upper Castaic Creek was proposed as a Critical Biological Zone in the preferred alternative of the Draft LRMP. The Center supports the designation of upper Castaic Creek as a Critical Biological Zone for the arroyo toad (the designation should also include southwestern pond turtle). Lower Castaic Creek should also be designated as a Critical Biological Zone because this will allow for appropriate management of flows from Castaic Reservoir and reduction of negative recreational impacts. Furthermore, Elizabeth Lake Canyon was not proposed as a Critical Biological Zone in any of the alternatives in the Draft LRMP. Elizabeth Lake Canyon should be designated as a Critical Biological Zone in addition to upper and lower Castaic Creek.

SAN FRANCISQUITO CREEK (11)

Castaic Ranges

San Francisquito Creek contains rare high-quality, low-elevation riparian and aquatic habitats that support an array of native species, including arroyo toad, unarmored threespine stickleback (*Gasterosteus aculeatus williamsoni*), California red-legged frog, southwestern willow flycatcher, Swainson's thrush, yellow-breasted chat, and Nevin's barberry (*Berberis nevinii*; an extremely endangered plant) (Stephenson and Calcarone 1999). A paved road extends the length of the creek, and the spread of non-native species is a major threat to the biological resources of the creek.

The Mountains and Foothills Assessment highlighted San Francisquito Creek as an area of high ecological significance. The Center supports the designation of portions of San Francisquito Creek as Critical Biological Zones for the California red-legged frog and the unarmored threespine stickleback in the preferred alternative of the Draft LRMP, as well as the proposed designation of the canyon as Wild and Scenic. However, we urge the Forest Service to consider extending the Critical Biological Zone designation to additional areas of the creek, to maintain the ecological integrity of this important watershed. Management actions to consider would include monitoring and eradicating non-native species, fencing off portions of the creek occupied by endangered species, and re-routing the road if necessary.



BIG TUJUNGA CREEK AND TRIBUTARIES (12)

San Gabriel Mountains

Big Tujunga Creek flows southwest from the steep interior of the San Gabriel Mountains, into the Los Angeles River. The creek contains important habitat for highly endangered native fish, including the Santa Ana Sucker, arroyo chub (*Gila orcutti*), and the (probably extirpated) Santa Ana speckled dace (*Rhinichthys osculus*) (Stephenson and Calcarone 1999). Arroyo toads and southwestern pond turtles also occupy the creek and tributaries. In 2001, the U.S. Fish and Wildlife Service designated portions of Big Tujunga, Mill, and Alder creeks, and adjacent uplands, as critical habitat for the arroyo toad. The critical habitat included a stretch of the creek from Big Tujunga Dam downstream to Hansen Lake (excluding Big Tujunga Reservoir), as well as a stretch of the creek upstream from the reservoir to about a mile above the confluence with Alder Creek, Mill Creek from the Monte Cristo Creek confluence downstream to Big Tujunga Creek, and Alder Creek from the Mule Fork confluence downstream to Big Tujunga Creek.

There are numerous threats to this critical watershed. A dam and reservoir halfway up Big Tujunga Creek on the National Forest has resulted in the spread of non-native aquatic species into the upper and lower reaches, and the California Department of Fish and Game continues to stock trout into the creek. Unpredictable and sometimes very high releases of water from the dam threaten downstream fish and amphibians. The Fish and Wildlife Service considered Big Tujunga Creek below the reservoir as an area with high potential for expanding toad numbers through careful management of land use activities and water releases from the dam.

The Mountains and Foothills Assessment recognized the high ecological significance of Big Tujunga Creek. Alternative 6 in the Draft LRMP proposed a Critical Biological Zone in the upper reach of the creek, but the preferred alternative did not recommend any of the Upper Big Tujunga sections as Critical Biological Zones. All the Upper Big Tujunga Critical Biological Zone sections recommended in Alternative 6 should be adopted in the Final LRMP.

LITTLE ROCK CREEK (13)

San Gabriel Mountains

Little Rock Creek flows north out of the San Gabriel Mountains into the desert east of Palmdale and Lancaster. The drainage supports a significant population of arroyo toads along the lower reaches, and one of the few remaining mountain yellow-legged frog (*Rana muscosa*) in southern California in the remote, unroaded headwaters (Stephenson and Calcarone 1999; Conservation Alternative).

The Mountains and Foothills Assessment recognized Little Rock Creek as an area of high ecological significance due to the high-quality riparian habitat. Both the north and south stretches of Little Rock Creek have been proposed as Critical Biological Zones under the preferred alternative of the Draft LRMP; the Center strongly supports these designations.



UPPER SAN GABRIEL RIVER (16)

San Gabriel Mountains

The East, North and West Forks of the San Gabriel River, as well as tributaries such as Devil's Canyon, are some of the most important aquatic and upland habitats in the four southern California forests. Numerous imperiled species are found along the extent of this river system, including the Santa Ana sucker, Santa Ana speckled dace, and arroyo chub (Stephenson and Calcarone 1999). The San Gabriel Mountains slender salamander (*Batrachoseps gabrieli*) is only known from the San Gabriel Canyon system above 1,000 meters (U.S.G.S. Western Ecological Research Center), including the north-facing slopes above the West Fork, from west of Mount Wilson to just east of Monrovia Peak (Stephenson and Calcarone 1999). The West Fork also supports an important population of western pond turtles (Stephenson and Calcarone 1999), and Devil's Canyon contains mountain yellow-legged frogs (Backlin et al. 2002).

The Mountains and Foothills Assessment described the ecological value of the upper San Gabriel River system, noting that threats to this extremely significant ecological area include unpredictable releases from Cogswell Dam on the West Fork, suction dredging on the East Fork, and intensive recreational use on the East and North Forks. Alternative 6 of the Draft LRMP recommended substantial portions of the West, North, and East Forks of the San Gabriel River as Critical Biological Zones, but the preferred alternative did not designate a single stretch of the river as a Critical Biological Zone (although the preferred alternative did recommend the North and East Forks as Wild and Scenic). The Center strongly recommends the adoption of the Critical Biological Zones recommended in Alternative 6 for the San Gabriel River.

BEAR GULCH-VINCENT GULCH (14,15)

San Gabriel Mountains

Together, Bear Gulch and Vincent Gulch above Prairie Fork support the largest known extant mountain yellow-legged frog population in southern California. Backlin et al. (2002) found 37 adults, 9 juveniles, 15 metamorphs, and 17 larvae in three surveys at Bear Gulch, and 4 adults, 1 juvenile, and 50 larvae at Vincent Gulch. Mountain yellow-legged frogs are perhaps the most endangered amphibians in California, if not the entire United States.

Backlin et al. (2002) recommended closing the jeep trail along Prairie Fork, and removing introduced trout from Bear Gulch. *Bear Gulch-Vincent Gulch was not described in the Mountains and Foothills Assessment, nor was it considered in the Draft LRMP as a Critical Biological Zone in any of the alternatives.* The Center strongly recommends designating the stream reaches supporting this vital population of mountain yellow-legged frogs as Critical Biological Zones in the Final LRMP.

MOUNT SAN ANTONIO (17)

San Gabriel Mountains

Both the summit and the slopes of Mount San Antonio are important for biological diversity in the Angeles National Forest. The summit area of Mount San Antonio has at least four endemic plant



species, including the San Antonio milk-vetch (*Astragalus lentiginosus* var. *antoni*), a CNPS List 1B species. The eastern, southern, and western slopes around Mount San Antonio are crucial habitat for an isolated and imperiled population of Nelson's bighorn sheep (*Ovis canadensis nelsoni*), also known as desert bighorn. Mount San Antonio itself provides summer habitat for bighorn, and San Antonio Canyon on the southern slope of the mountain, as well as the upper East Fork of the San Gabriel River and Cattle Canyon to the southwest of the mountain (both in Sheep Mountain Wilderness) support distinct herds of bighorn. Cucamonga Peak, southeast of Mount San Antonio, supports bighorn sheep herds in Cucamonga Canyon on the southern slope and in the South and Middle Forks of Lytle Creek to the east (see hotspot below).

The Mount San Antonio area was recognized in the Mountains and Foothills Assessment as an area of high ecological significance. However, the Draft LRMP makes no mention of Mount San Antonio as a Critical Biological Zone in any of the alternatives. A 164-acre area on Mount San Antonio is an established Special Interest Area, but additional protection should be allocated to the area to protect the rare plants which are vulnerable to trampling and impacts from foot traffic on the loose subalpine scree along the summit ridge (T. Krantz, personal communication, 2005). The summit of the mountain should be designated as a Critical Biological Zone on top of its designation as a Special Interest Area. Furthermore, the Forest Service must commit to fully implementing the recovery plan for the Nelson's bighorn sheep.

LYTLE CREEK AND CAJON WASH (18,19) ***San Gabriel Mountains***

The three forks of Lytle Creek originate around the steep slopes of Mount San Antonio in the eastern San Gabriel Mountains. The upper forks of Lytle Creek support habitat for the Nelson's bighorn sheep, and the low-elevation alluvial fans of Lytle and Cajon Creeks (the washes and uplands) contain coastal sage scrub habitat that supports numerous endangered species that are rare on national forest land. The San Bernardino kangaroo rat (*Dipodomys merriami parvus*), California gnatcatcher (*Poliophtila californica*), slender-horned spineflower (*Dodecahema leptoceras*), and Santa Ana woollystar (*Eriastrum densifolium sanctorum*) occur in the washes of Lytle and Cajon creeks, and the area historically contained the Los Angeles pocket mouse (*Perognathus longimembris brevinasus*), San Diego black-tailed jackrabbit (*Lepus californicus bennettii*), and America badger (*Taxidea taxus*) (Stephenson and Calcarone 1999).

The coast horned lizard is found on sandy, loose soils in open areas of coastal sage, grassland, chaparral, oak woodland, riparian woodland, and coniferous forests in the Central Valley and southern California. It is a Forest Service Sensitive species. Photo by Monica Bond.



Despite the recognized high ecological significance of Lytle Creek and Cajon Wash in the Mountains and Foothills Assessment, the Draft LRMP did not consider this area for designation as a Critical Biological Zone in any of the alternatives. Given the extremely high ecological value of alluvial fan sage scrub habitats and their rarity on national forest lands, the lower-elevation portions of Lytle Creek and Cajon wash should be designated as Critical Biological Zones. Roads and human use should be limited within this area due to the extremely sensitive nature of these habitats to fire, invasion of weeds, and other impacts.



San Bernardino National Forest

BIG BEAR-BALDWIN LAKE-UPPER HOLCOMB VALLEY (22, 23, 24) ***San Bernardino Mountains***

The Big Bear-Baldwin Lake-Upper Holcomb Valley area supports unique, biologically rich habitats with numerous rare and endemic species. The area in general supports the largest concentration of endemic plants in California, with 11 federally listed species (Stephenson and Calcarone 1999).

The San Bernardino National Forest manages 514 acres of “pebble plains” habitat. Occurring within a 92-square-mile area around Big Bear Lake, pebble plains are treeless remnant patches of an ice-age lake bottom consisting of deep clay and quartzite pebble and gravel deposits (Stephenson and Calcarone 1999). These patches, typically surrounded by Jeffrey pine forests or pinyon pine and juniper woodlands, support a rare suite of plants similar to alpine flora, with cushion-formers, annuals, grasses, and succulents. Three federally threatened plants inhabit the pebble plains: Bear Valley sandwort (*Arenaria ursina*), southern mountain buckwheat (*Eriogonum kennedyi* var. *austromontanum*) and ash-gray paintbrush (*Castilleja cinerea*). Pebble plain complexes include Big Bear Lake, Sawmill, Gold Mountain, North Baldwin, Arrastre/Union Flat, Holcomb Valley, South Baldwin Ridge, Onyx Peak, Sugarloaf Mountain, Coxey Meadow, Pan Hot Springs, Aspen Glen, Metcalf Bay, Eagle Point, and Lightning Gulch.

Baldwin Lake, a large ephemeral lake east of Big Bear Lake, and its main tributary Shay Creek, host an isolated endemic population (undescribed subspecies) of unarmored threespine stickleback (*Gasterosteus aculeatus williamsoni*). The Baldwin Lake area and nearby Coxey Meadow support one of the few known populations of verner blue butterfly (*Euphilotes baueri vernalis*) (Stephenson and Calcarone 1999). The endemic Dammer’s blue butterfly (*E. enoptes dammersi*) is found only at Baldwin Lake and Arrastre Flat, where it is associated with the southern mountain buckwheat, and Arrastre Creek, where it is associated with *Eriogonum davidsonii* (Stephenson and Calcarone 1999).



Baldwin Lake under snow, San Bernardino Mountains, San Bernardino National Forest.
Photo by Robert Reed.



The pebble plains are seriously threatened by roads and utility corridors, off-road vehicles, trampling, trash dumping, and livestock grazing (USFWS 2001). The Mountains and Foothills Assessment highlighted the ecological significance of the Big Bear-Baldwin Lake-Holcomb Valley area. The Draft LRMP preferred alternative established a Critical Biological Zone in the “Coxy Pebble Plain” for verner blue butterfly (and Erlich’s checkerspot butterfly, however the Center for Biological Diversity was unable to locate information on this species). Alternative 6 of the Draft LRMP proposed an additional Critical Biological Zone at “Arrastre/Union Flat” for plants (and the Arrastre Creek blue butterfly; the Center for Biological Diversity assumes this butterfly is the same as the Dammer’s blue), and at “Gold Mountain” for plants and the bald eagle (*Haliaeetus leucocephalus*). While laudable, Critical Biological Zones should encompass all pebble plains on national forest lands, and allow only activities that are compatible with the persistence of the species dependent upon this habitat type – particularly given that much of this unique habitat is on public lands and is rapidly being degraded. As such, the Final LRMP should designate Coxy Meadow, Arrastre/Union Flat, Gold Mountain, and Onyx Meadow as Critical Biological Zones. In addition, it is recommended that the Forest Service, together with local conservation organizations, develop a public educational campaign about the unique botanical treasures of the San Bernardino National Forest. Furthermore, portions of the existing Baldwin Lake-Holcomb Valley Special Interest Area should be designated as a Critical Biological Zone, as the Special Interest Area designation has been insufficient to protect the biological values of the area.

DEEP CREEK (20)

San Bernardino Mountains

Deep Creek flows north and west into the Mojave River out of the San Bernardino Mountains east of Lake Arrowhead. Deep Creek provides a long stretch of excellent aquatic and riparian habitat, as well as hot springs popular with recreationists. Coastal, desert, and mountain ecosystems converge at the Deep Creek hot springs area, supporting what Brown and Fisher (2002) describe as a “large and unique faunal and floral assemblage.” These researchers identified numerous rare native reptiles and amphibians at Deep Creek including arroyo toads, western blind snakes (*Leptotyphlops humilis*), and western patch nose snakes (*Salvadora hexalepis*), as well as western toads (*Bufo boreas*) California treefrogs (*Hylla cadaverina*), western whiptails (*Cnemidophorus tigris*), western fence lizards (*Sceloporus occidentalis*), zebra-tailed lizards (*Callisaurus draconoides*), and side-blotched lizards (*Uta stansburiana*). The creek historically contained California red-legged frogs. A hybridized population of federally endangered Mojave tui chub (*Gila bicolor mohavensis*) occurs in the lower portion of the creek. San Bernardino flying squirrels (*Glaucomys sabrinus californicus*), California spotted owls, and northern goshawks occur in the upland forests.

Deep Creek is seriously impacted by intensive recreational use, including off-road vehicles near the Mojave Dam at the lower end of the creek, as well as impoundments and water diversions in the upper watershed which reduce stream flow (Stephenson and Calcarone 1999). Off-road vehicle trespass should be consistently monitored and prevented in the Mojave Dam area. Additional protections for this biological diversity hotspot would include strict retention standards for fuels treatments along the upper reaches of Deep Creek as well as the prohibition of ski area expansions and reconsideration of permits to extract water for snow creation, particularly given current and projected water shortages in the southwestern United States.



The Conservation Alternative recommended designating Deep Creek as Wild and Scenic along the total length, 25.5 miles from the source to the high-water limit of the Mojave dam. “Lower Deep Creek” was recommended as a Critical Biological Zone in the preferred alternative of the Draft LRMP for arroyo toads and southwestern willow flycatchers. The upper portion of the creek should also be designated as a Critical Biological Zone.

SANTA ANA RIVER AND SOUTH FORK (25) ***San Bernardino Mountains***

The Santa Ana River flows west and south out of the San Bernardino Mountains. The upper Santa Ana River, from its source to its confluence with Bear Creek, flows through one of the largest expanses of conifer forest in southern California (Stephenson and Calcarone 1999). These productive mixed-conifer stands support a relatively high number of California spotted owls, southern rubber boas, San Bernardino flying squirrels, flammulated owls (*Otus flammeolus*) and other species dependent upon mature forests.

The mid-elevation conifer forests in this portion of the Santa Ana River drainage are threatened by development on private lands interspersed within the national forest, and high recreational use (Stephenson and Calcarone 1999). Inappropriate fuels treatments are also potential threats to the area, especially given the widespread tree mortality due to drought and bark beetles that occurred in the early part of the decade. Strict protective measures for key habitat elements during fuels treatments should be adopted in this area.

The Mountains and Foothills Assessment identified these mid-elevation conifer forests as an area of high ecological significance. The Conservation Alternative also recommended designation of the Santa Ana River from the source to Bear Creek as well as the South Fork three miles from the source to the main stem, as Wild and Scenic. The Draft LRMP does not consider this drainage for designation as a Critical Biological Zone. We recommend designation of the river as Wild and Scenic as proposed in the Conservation Alternative, well as designation of the upper Santa Ana River and associated upland conifer forests as a Critical Biological Zone.

EAST FORK CITY CREEK (21) ***San Bernardino Mountains***

East Fork of City Creek is the last known place in the San Bernardino Mountains where the mountain yellow-legged frog survived. The creek experienced fire during October 2003, but will be an important site for re-introduction of the species (D. Goodward, personal communication, 2005). Backlin et al. (2002) reported that 16 adults, 2 juveniles, and 4 larvae were detected during four visits to East Fork City Creek in 2001. The frogs were found above the confluence between the East Fork and West Fork and Schenk Creek, northwest of Harrison Mountain. The creek supported the second-highest abundance of adult frogs in all seven sites known to support the species in southern California (after Bear Gulch in the Angeles National Forest; see above).

East Fork City Creek was not described in the Mountains and Foothills Assessment, but was proposed as a Critical Biological Zone under the preferred alternative in the Draft LRMP, for mountain yellow-legged frogs. The Center supports this designation.



DARK CANYON- FULLER MILL CREEK-NORTH FORK SAN JACINTO RIVER (27,28)

San Jacinto Mountains

The North Fork San Jacinto River and its tributaries on the western slopes of the San Jacinto Mountains, north of Idyllwild, is a biological diversity hotspot for mixed-conifer forest species. The drainage and its upper tributaries support the only remaining population of mountain yellow-legged frogs in the San Jacinto Mountains, as well as the southernmost population of southern rubber boa (Stephenson and Calcarone 1999). The population of California spotted owls in the San Jacinto Mountains has declined dramatically in the past decade, and perhaps one-third of historic owl territories in the mountain range occur in the North Fork area.

The North Fork drainage experienced significant tree mortality due to the recent drought and bark beetle epidemic. This disturbance is a natural part of forest dynamics. Inappropriate fuels treatments that would remove too many dead trees and logs and cause long-term soil compaction due to heavy machinery are potential threats to the area. High recreational use of the streams, particularly around campgrounds, seriously impacts sensitive aquatic resources.

Backlin et al. (2002) recommended re-introducing mountain yellow-legged frogs into the North Fork San Jacinto River and Dark Canyon. The North Fork was described in the Mountains and Foothills Assessment as an area of high ecological significance. The Conservation Alternative recommended designating the North Fork of the San Jacinto River (including Black and Fuller Mill Creeks) 12 miles from its source to its confluence with the South Fork as Wild and Scenic. Some stretches of "Dark Canyon/Fuller Mill" were proposed as Critical Biological Zones in the Draft LRMP preferred alternative, but the area is of such high ecological value that the upland forest habitat of the drainage also should be included as a Critical Biological Zone for California spotted owls and southern rubber boas. Strict protective measures for key habitat elements during fuels treatments should be adopted in this area.

BAUTISTA CREEK (29)

San Jacinto Mountains

Bautista Creek is located in the western foothills of the San Jacinto Mountains, with its headwaters in the northwestern part of Thomas Mountain and flowing into the San Jacinto River near Hemet. The Draft LRMP recognized that Bautista Creek contains some of the highest quality riparian habitat on the entire San Bernardino National Forest: the largest number of endangered and forest-sensitive wildlife species occurs here (San Bernardino National Forest Strategy-40), including southwestern willow flycatchers, Swainson's thrushes, yellow-breasted chats, and possibly greenest tiger beetles (*Cicindela tranquebarica virudissima*) (Stephenson and Calcarone 1999). Seven arroyo toads were found downstream of Hixon trail during surveys in 2001, in addition to federally and state sensitive western spadefoot toads (*Spea hammondi*) and red-diamond rattlesnakes (*Crotalus ruber ruber*). Bautista Creek supports the only population of the federally endangered slender horned spine-flower on the national forest.

Bautista Creek is impacted by invasions of non-native species such as tamarisk, as well as recreational activities including off-road vehicles. A road follows the length of the creek from Anza



to Hemet, threatening a number of species including the arroyo toad (Brown and Fisher 2002). Three sections of Bautista Creek were proposed as Critical Biological Zones under Alternative 6 of the Draft LRMP for arroyo toads, San Bernardino kangaroo rats, and the slender horned spineflower, but not recommended in the preferred alternative. The creek was considered eligible as a Recreational river, but the scientifically recognized value of the area for federally and state protected species renders the roughly entire 8-mile stretch of Bautista Creek that flows through the national forest worthy of designation as a Critical Biological Zone.

GARNER VALLEY (30) ***San Jacinto Mountains***

Garner Valley is a large montane meadow in the southern San Jacinto Mountains. Garner Valley supports a diversity of high-ranking rare plants (F. Roberts, personal communication, 2005) and is one of the only known locations of the Johnston's rock cress (*Arabis johnstonii*), a CNPS 1B species found on eroded clay soils in chaparral and lower montane coniferous forests. Furthermore, a population of Quino checkerspot butterfly (*Euphydryas editha quino*) was recently discovered at the junction of highways 371 and 74. This is an important new location for the species, as the higher-elevation populations may be more stable than those at lower elevation (G. Pratt, personal communication, 2004).

The biological resources of Garner Valley are threatened by cattle grazing, recreation, and development on private lands interspersed within the national forest. Garner Valley was recognized as an ecologically significant area in the Mountains and Foothills Assessment but not given any special consideration in the Draft LRMP. Portions of the valley supporting rare plants should be designated Critical Biological Zones.



Cleveland National Forest

ELSINORE PEAK (32)

Santa Ana Mountains

Elsinore Peak is located in the eastern Santa Ana Mountains, to the south of Lake Elsinore, in western Riverside County. Elsinore Peak supports one federally listed plant species (Munz's onion; *Allium munzii*) and potentially a dozen CNPS List 1B or List 2 plants because of the prevalence of clay soils. One species, Hammitt's clay-cress (*Sibaropsis hammittii*) is known only from this site and just two others (F. Roberts, personal communication, 2005).

Elsinore Peak has been degraded by a road and communication facilities, but the relatively high density of rare and sensitive plant species renders it deserving of designation as a Critical Biological Zone. *This area was not described in the Mountains and Foothills Assessment nor in the Draft LRMP.*

SAN JUAN CREEK (31)

Santa Ana Mountains

San Juan Creek flows down the western slopes of the Santa Ana Mountains to the north of Sitton Peak. San Juan Creek contains important populations of arroyo toad, as well as numerous rare plants. One of the Santa Ana's biggest populations of San Miguel savory (*Satureja chandleri*), a rare shrub, is found at Chiquito Springs. Chiquito Springs was proposed as a Special Interest Area in the preferred alternative of the Draft LRMP, but deserves designation as a Critical Biological Zone. Furthermore, according to the California Native Plant Society, three CNPS List 1B species occur in the San Juan Creek area: sticky dudleya (*Dudleya viscida*), Robinson's pepper-grass (*Lepidium virginicum* var. *robinsonii*), and Parry's tetracoccus (*Tetracoccus dioicus*).

This creek was included in the Mountains and Foothills Assessment as a highly significant ecological area, but was not proposed for any special consideration in the Draft LRMP.

MENDENHALL VALLEY (33)

San Diego Ranges

Mendenhall Valley is located on the southeastern slopes of Palomar Mountain. Mendenhall Meadow supports the largest known population of the Laguna Mountain skipper (*Pyrgus ruralis lagunae*), one of the rarest butterflies in San Diego County (Stephenson and Calcarone 1999). The valley also hosts San Bernardino bluegrass (*Poa atropurpurea*), Parish's meadowfoam (*Limnanthes gracilis* var. *parishii*), and Mount Laguna aster (*Machaeranthera asteroides* var. *lagunensis*) as well as other rare montane meadow species.

Some measures have been taken to protect the Laguna Mountains skipper in Mendenhall Meadow, including the exclusion of livestock grazing and recreational activities in some areas. However, non-native plants may be affecting native plant composition in the meadow (Stephenson and Calcarone



1999). “Mendenhall” was proposed as a Critical Biological Zone under Alternative 6 of the Draft LRMP, but the preferred alternative does not include this designation. We recommend designating Mendenhall Meadow as a Critical Biological Zone.

SAN LUIS REY RIVER (34) ***San Diego Ranges***

The San Luis Rey River contains some of the best remaining riparian habitat in the Cleveland National Forest. The upper San Luis Rey River system consists of several creeks draining into Lake Henshaw. In the West Fork, North Fork, and Agua Caliente Creek, important populations of arroyo toad, southwestern pond turtle, and arroyo chub (*Gila orcutti*) occur. The West Fork, also known as Barker Valley, is one of the only locations with native rainbow trout in the Cleveland National Forest (according to the CNDDDB). Grasslands in the Warner Springs area around Lake Henshaw support an isolated population of Stephens’ kangaroo rat (*Dipodomys stephensi*) within the national forest boundaries.



The Stephen’s kangaroo rat, a federally endangered species, is found only in southwestern California. It is associated with open grasslands and sparse coastal sage scrub. Photo by Shauna McDonald.

The main stem of the San Luis Rey River extends from below Henshaw dam to the Pacific, with a 4-mile stretch within the national forest boundary. This stretch of riparian habitat, regulated by water releases from the dam, partially hosts the largest southwestern willow flycatcher population in southern California, and the only known population on the Cleveland National Forest. This population of willow flycatchers is one of the most important in the entire range of the species due to the high numbers of birds and the high reproductive rates of greater than 60 percent (see Conservation Alternative, page 210).

This highly significant ecological hotspot is threatened by water extractions and cattle grazing (with subsequent spread of brown-headed cowbirds) above the lake, and recreational impacts below the lake. Both the upper San Luis Rey drainages and the stretch below Henshaw dam unequivocally should be designated as Critical Biological Zones. Despite the entire area being proposed as such under Alternative 6 of the Draft LRMP, the preferred alternative only recommended the West Fork of the San Luis Rey (Barker Valley) Special Interest Area as a Critical Biological Zone and recommended the main stem as a Wild and Scenic.

VIEJAS MOUNTAIN AND POSER MOUNTAIN (35,36) ***San Diego Ranges***

The Viejas and Poser Mountain hotspots are adjacent to the Viejas Indian Reservation east of Alpine. Both mountains support iron- and magnesium-rich heavy clay soils derived from its gabbro rocks, which provide habitat for a number of plant species that are mostly restricted to this environment. The area supports the largest population of the federally threatened San Diego thornmint (*Acanthomintha ilicifolia*) as well as other rare plants on the mountain, such as the chocolate lily, tiger lily, cleveland sage, and creeping sage (M. Wangler, personal communication,



2005). Twelve animal species of concern are found here. Because all the populations of the rare San Diego thornmint occur near the urban interface, they are vulnerable to impacts by off-road vehicles and bicycles as well as cattle.

Viejas Mountain is proposed as a Research Natural Area in the Draft LRMP preferred alternative, but the ecological importance of these sites renders them both worthy of designation as Critical Biological Zones.

LAGUNA MEADOWS-OBSERVATORY CAMPGROUND (39)
San Diego Ranges

Laguna Meadow is situated on the top of Laguna Mountain in the southern San Diego Ranges. The meadow is one of the few large montane meadows in the San Diego Ranges that is on public lands, and supports a number of rare plants as well as one of only three remaining populations of the Laguna Mountain skipper (Stephenson and Calcarone 1999). The meadow is severely impacted by recreation and cattle grazing. There is evidence suggesting that cattle eat the food plant, particularly during drought years.

Laguna Meadow and the meadow at Observatory Campground was proposed as a Critical Biological Zone only under Alternative 6 of the Draft LRMP, but received no such designation in the preferred alternative. The Final LRMP should designate both meadows as Critical Biological Zones.

GUATAY MOUNTAIN-PINE VALLEY-ROBERTS RANCH (37,38)
San Diego Ranges

Guatay Mountain and Pine Valley are located in the southern San Diego Ranges, southwest of the Laguna Mountains. The mountain is encircled by highway 79, with the I-8 freeway to the south. Guatay Mountain supports an old stand of Tecate cypress and other sensitive plants, including the Dunn's mariposa lily (*Calochortus dunnii*). Tecate cypress trees grow in gabbro- or metavolcanic-derived clay soils; they were once more widespread but are now restricted to these soils where they lack competition (Stephenson and Calcarone 1999). Arroyo toads are found in Pine Valley, from Noble Canyon and from a small tributary west of Scove Canyon, and significant populations of least Bell's vireos and southwestern pond turtles are found in the drainage. Stephenson and Calcarone (1999) noted that Pine Valley Creek hosts the largest population of arroyo toads on the Cleveland National Forest (there are only 10 known locations as of 2000), and possibly the largest population of southwestern pond turtles in southern California. Both Guatay and Pine Valley support the only known Hermes copper butterfly (*Lycaena hermes*) populations on the national forest.

Guatay Mountain has been established as a Special Interest Area. Given the extremely significant biological values of Pine Valley and Guatay Mountain, these areas should be designated as Critical Biological Zones.



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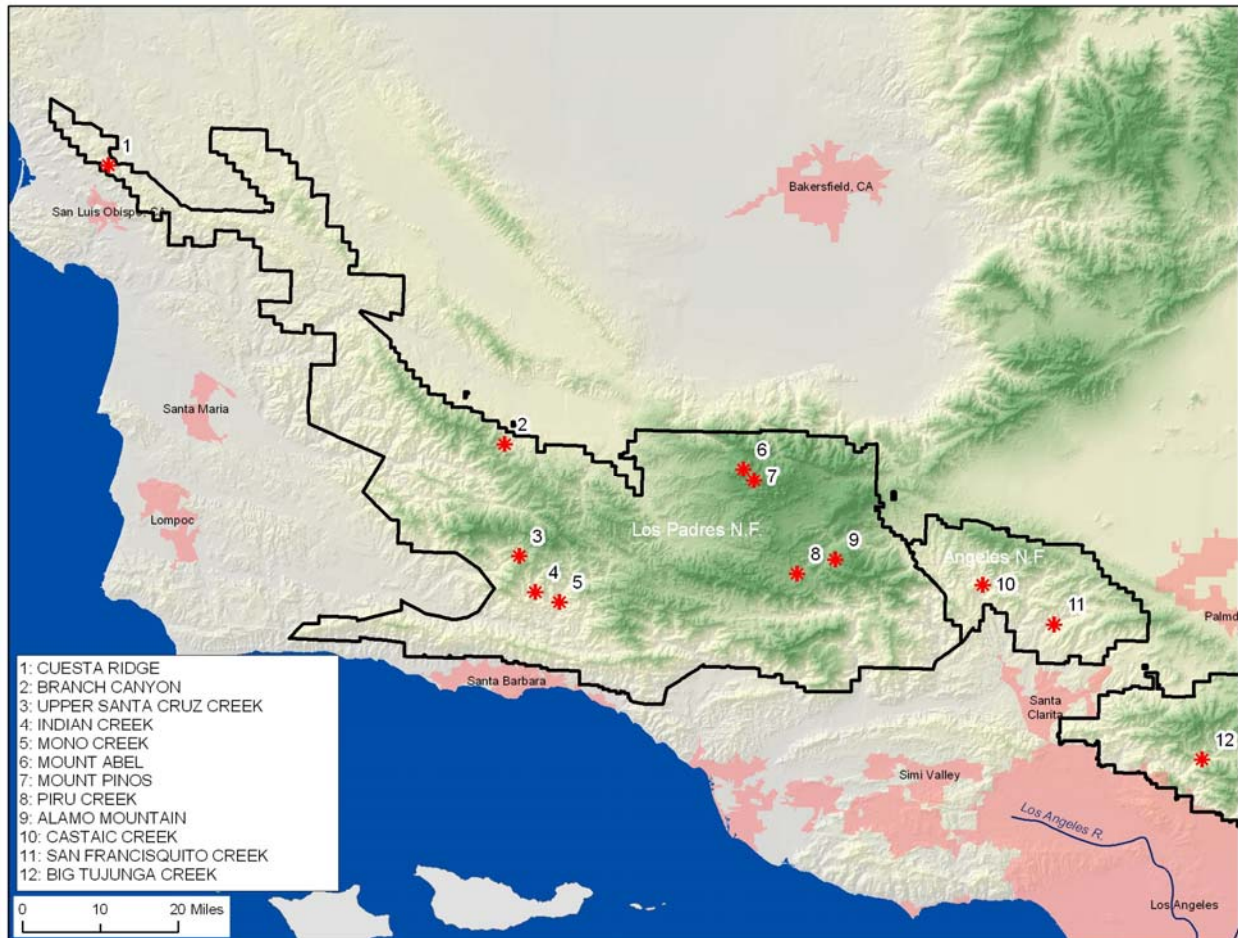
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Biodiversity Hotspots in the four southern California national forests

Northern Region



Biodiversity Hotspots in the four southern California national forests

Southern Region

