



**Petition to List the Hermes Copper Butterfly
(*Hermelycaena [Lycaena] hermes*) as Endangered Under
the
Endangered Species Act**

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INTRODUCTION

The Hermes copper butterfly (*Hermelycaena [Lycaena] hermes*) is An imperiled species endemic to San Diego County and northern Baja California, west of the Peninsular mountain ranges. Hermes copper has been recognized as unique and imperiled for decades, and is dependent on patches of its spiny redberry (*Rhamnus crocea*) host plant for survival.

Early southern California butterfly enthuthiasts were enchanted by Hermes copper. Comstock wrote in 1927, “It is a fascinating little sprite as it darts about in the sunlight, or sports its showy colors while balanced on a tuft of wild buckwheat.” Yet Comstock and others also recognized the creeping threat of urbanization to the species.

It will always be a rarity, and may, in fact, some day become extinct, if San Diego continues to expand at its present rate. (Comstock 1927)

Its trysting places are being rapidly taken over by realtors and the species may soon become extinct ... (W.S. Wright 1930)

Although there are numerous extant colonies of [Hermes copper] in San Diego County, this species occupies less than half of it’s former range. Because continued development in San Diego County threatens to eliminate additional colonies of this insect, [Hermes copper] is considered highly sensitive and vulnerable to extirpation. (Brown 1991)

[Hermes copper] has been virtually extirpated in nearly all of its best known historical localities around the city of San Diego. (Murphy 1991)\

Only 15 populations of Hermes copper are know to remain in existence in the United States following the large San Diego County fires of 2003. Three other populations in Baja California are presumed extant in this petition, but their actual status is unknown.

Hermes copper is highly vulnerable to extinction due to the threat of fire. Excessive, human-induced fire poses a significant threat to the survival of the species, even on lands otherwise protected from development.

Hermes copper populations were devastated by fire in October 2003. The 2003 Paradise, Cedar, and Mine fires burned an estimated 39% of Hermes copper habitat (Betzler *et al.* 2003). By far the largest concentration of the species ever documented was lost when the Cedar Fire burned nearly all of the Crestridge Ecological Reserve in the unincorporated San Diego County community of Crest. 2001 surveys at the reserve found approximately 52 Hermes copper colonies with a total estimated population of 1,000 butterflies (California Department of Fish and Game 2002). The October 2003 Cedar Fire appears to have destroyed every colony within the reserve (M. Klein, pers. comm.).

At least 15 other Hermes copper populations were lost to the 2003 Cedar and Mine fires, including the second largest concentration of the species when the Cedar Fire burned through four populations in Mission Trails Regional Park in the City of San Diego. At least three Hermes copper populations were likely lost to past fires on Bernardo Mountain near Escondido, Dictionary Hill in Spring Valley, and San Marcos Creek. The number of fires burning through Hermes copper habitat appears to exceed pre-European settlement fire frequency in southern California chaparral ecosystems, and poses a significant threat to the survival of the species.

Urban development is a significant threat to Hermes copper. Past losses of the species to urban development are exceeded only by losses to fire, and include many populations recorded from El Cajon, Fairmont Canyon, Kearny Mesa, Scripps Gateway, and numerous sites near the City of San Diego urban core. Several remaining known populations are located in areas like Jamul and Fallbrook facing significant urban development pressure.

Hermes copper is also endangered by prescribed fire, global climate change, and delayed federal protection. Existing conservation laws, regulations, and policies like the San Diego Multiple Species Conservation Plan provide few protections for the species.

Hermes copper has never received formal Endangered Species Act (also “ESA”) protection despite 20 years of official knowledge of the species’ imperiled status. Significant impacts to Hermes copper from the 2003 fires were widely publicized, yet the Bush administration has taken no action over the following year to provide protections for the species.

Inaction by the Bush administration to protect Hermes copper is unfortunately entirely consistent with its other continuing political efforts to undermine the Endangered Species Act and limit effectiveness of this landmark conservation law. As of August 2004, the Bush administration has extended ESA protection to only 31 plants and animals. This is the lowest endangered species listing rate in the history of the Endangered Species Act. At the same time, the Bush administration has the highest rate of delisting – removing plants and animals from the endangered species list.

	Listings	Delistings
Nixon / Ford	46	0
Carter	151	1
Reagan	253	1
Bush I	234	13
Clinton	521	10
Bush II	31	8

The Bush administration is the only presidency in the history of the ESA to have not listed a single species except in response to petitions and/or lawsuits by scientists and citizen groups. The Bush administration is the only presidency in the history of the ESA to have declared that a species is going extinct, but should not be listed because it is “insignificant” – Puget Sound orcas, Lower Kootenai River burbot, and Western gray

squirrel. The Bush administration has decided against listing 45 species, and listed only 31 species. This ratio is unmatched by any other administration.

Specific neglect of Hermes copper reaches back as far as the Reagan administration. The species was designated as a category 2 candidate for listing by the U.S. Fish and Wildlife Service (also “Service”) as early as 1984 and maintained on subsequent candidate lists through 1994. But the species’ candidacy was removed when the agency unilaterally abolished the category 2 candidates list in 1996.

The San Diego Biodiversity Project submitted a petition to list Hermes copper as an endangered species under the Endangered Species Act in May 1991 (Hogan 1991). The Service rejected the petition on a cynical technicality in 1993, alleging that the petition lacked necessary substantial information while simultaneously acknowledging the agency actually already possessed the missing information (U.S. Fish and Wildlife Service 1993).

Despite the Service’s negative conclusion on the petition, the agency nevertheless concluded that listing the species as endangered may be warranted, and promised to conduct a status review. However, a Freedom of Information Act request to the Service in 2004 revealed no evidence of any status review for Hermes copper. The Service has apparently taken no further action to protect the species despite huge impacts from the 2003 fires, years of concern over its conservation status, a well-documented and significant trend toward extinction, and the availability of substantial information in support of listing.

Formal recognition of Hermes copper as an endangered species should increase available conservation resources and education on the status of the species. Increased conservation and education should include improved recognition by responsible agencies of the species’ imperiled status and of the significant threat posed by fire and urban development. Formal listing protection should result in preparation of a recovery plan for Hermes copper by the U.S. Fish and Wildlife Service. Formal listing protection should

also result in increased funding availability for recovery activities, and increased conservation activities by the U.S. Army Corps of Engineers, U.S. Fish and Wildlife Service, U.S. Forest Service, the City and County of San Diego, and others.

Conservation activities should include expanded limits on urban development, improved fire suppression in and around remaining populations, restoration of spiny redberry stands, patrols for unauthorized campfires and arsonists, efforts to increase the number of Hermes copper populations and individuals, and other specific recovery measures.

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I. TAXONOMY

The Hermes copper butterfly was first described as *Chrysophanus hermes* by W. H. Edwards (1870). W. G. Wright re-described it as *delsud* (1906), apparently based on a single worn specimen. Both Holland (1898) and W.S. Wright (1907) considered *delsud* a synonym of *hermes*. W. S. Wright (1907; 1930), Comstock (1927), and Comstock and Dammens (1935) stood by *hermes*, but under the genus *Tharsalea* (= *Tharsalia*). Hoffman (1940) placed it in the genus *Lycaena*, where it remained for years (Thorne (1963; Emmel and Emmel 1973; Howe 1975). Miller and Brown (1979) erected the monotypic genus *Hermelycaena* on the basis of *hermes*' unique morphology and ecological characteristics. A genetic review of North American coppers by Pratt and Wright (2002) supported Miller and Brown when it concluded, "Allozyme evidence suggests that [*Lycaena hermes*] could belong to a separate genus or subgenus ... these species seem to require a different grouping above the species level."

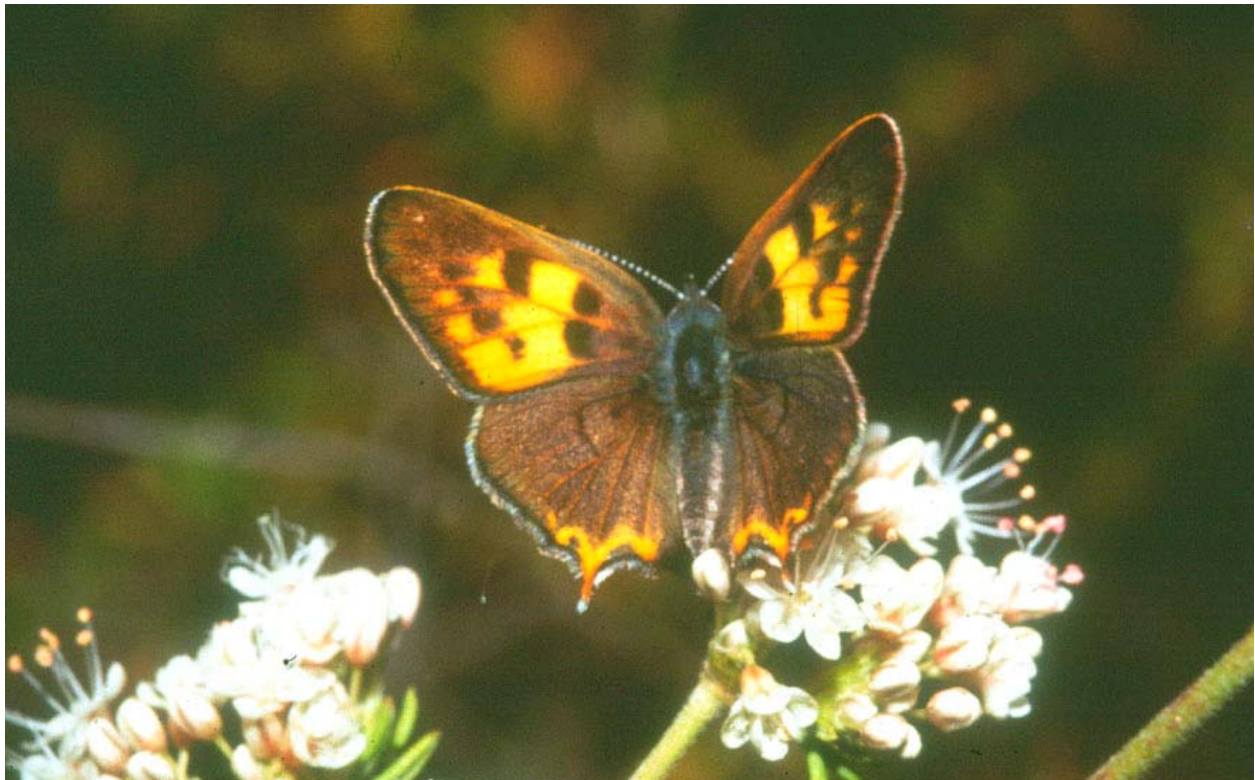


Figure 1
Male Hermes copper (*Hermelycaena [Lycaena] hermes*)
on California buckwheat (*Eriogonum fasciculatum*)
Photo by Claude Edwards

II. DESCRIPTION

Adults are a brown and yellow butterfly about 1 to 1 ¼ inches in wingspan. The upperside forewings are brown with a yellow center and small brown spots within that cell. The upperside hindwings are also brown with a small tail that has yellow within it. The underside forewings are yellow with 4-6 brownish spots and the underside hindwings are also yellow with 3-6 brownish spots.

Mature larvae are about 13 mm. Emmel and Emmel (1973) describe “early stages” of the species:

The white, echinoid egg is covered with deep pits between high, irregular walls. The mature larvae is apple-green, with a middorsal band of darker green bordered with yellowish green. On each side there are two indistinct longitudinal bands, interrupted at each segmental suture. The body is sparingly covered with minute, silvery white, pillar-shaped stout projections with rounded ends. The head is soiled yellow. The cervical shield has a distinctive, double diamond-shape and is brown, bisected by a blueish white bar across the center. Pupation occurs on the foodplant; the pupa is supported by a delicate girdle and a cremaster attached to a silken pad. It is grass green, with a narrow mid-dorsal yellow stripe on the abdomen as well as other faint yellow diagonal bars. There are minute, silvery white processes which resemble trumpet-shaped projections.

III. LIFE HISTORY

Biology

“Colonies of the Hermes Copper are closely confined to the vicinity of the host plant *Rhamnus crocea* Nutt.” (Thorne 1963) Eggs are laid singly on stems of the host plant, with winter diapaus occurring in the egg stage. Larvae hatch and mature through five instars over approximately 14 days, with larvae feeding on the leaves of its host. Pupation occurs over approximately 10 to 14 days. Pupae are about 11 mm in length. A cremaster and silken girdle attach the pupa to the hostplant. Pupation is very cryptic at the base of the redberry.

Hermes Copper is univoltine (Comstock and Dammens 1935) with the adult flight period from mid-May through early July depending on elevation. Peak flight times are recorded for approximately June 10 for males and June 20 for females. The earliest known emergence record was established on May 12, 2004, breaking a record set the previous year of May 16 (Klein pers. comm.).

According to Thorne (1963), “The males practice territorialism, but are not very aggressive about it.” Emmel and Emmel (1973) related that “Males are mildly territorial.” Again according to Thorne, “They will patrol a section of flyway, or watch it from a vantage point, often on the host plant, but from any suitable perch. There is no observable tendency to migrate, to “hilltop,” or otherwise stray from these colonies, although there must be some intercolony movement, probably by the males.”

Thorne (1963) noted Hermes copper’s unique use of *Rhamnus* as a host plant when other known North American *Lycaena* use *Polygonaceae* extensively, and intermittently use *Rosaceae*, *Saxifragaceae*, and *Ericaceae*.

According to Emmel and Emmel (1973), “Both sexes avidly visit flowers, especially that of *Eriogonum fasciculatum* [flat-topped buckwheat].” Hermes copper adults have been observed nectaring on chamise (*Adenostoma fasciculatum*), golden yarrow (*Eriophyllum confertiflorum*), slender sunflower (*Helianthus gracilentus*), poison oak (*Toxicodendron diversilobum*) and even short-podded mustard (*Hirshfeldia incana*) (Klein pers. comm.). The chamise, yarrow and mustard observations are from June 2003, and the poison oak observation is from 2004 (Klein pers. comm.).

Field observations in 2003 suggests an extended drought diapause in Hermes Copper as eggs. The Crestridge Ecological Reserve supports the largest known population of the species, and field surveys of the reserve between 1999 and 2001 revealed population fluctuations ranging from 1,000 butterflies in 2001, to one single butterfly in 2002 (Klein pers. comm.). San Diego County recorded lower than normal winter rains in 2001, but rains were timely and appeared to stimulate a significant Hermes copper emergence. 2002 recorded the lowest rainfall in the San Diego

County's 150-year history of weather records, apparently triggering the Hermes diapause. 2003 brought an average amount of timely winter rains, with cool late winter and early spring temperatures. Approximately 400 Hermes were observed in 2003, down from high 2001 numbers, but with an early emergence record of May 16th.

Hermes copper dispersal behavior is not well known. Thorne (1963) and others (Klein pers. comm.) have rarely observed the species away from host or nectar plants, so populations appear largely isolated and independent, even in close proximity. Nevertheless, Thorne (1963) speculated:

... there must be some inter-colony movement, probably by the males. ... The basis for this is that differences among the populations are not readily observable, if indeed any exist. It must be admitted that no effort has been made to compare adequate series from different colonies to see if any segregation is evident. This would be an interesting study, but until it is made, it seems best to assume that gene flow throughout the entire range is adequate to prevent segregation.

Ecology

Hermes copper ecology is inseparably linked to that of its spiny redberry host plant, yet the butterfly is restricted to only a small portion of the range of the redberry for unknown reasons.

Spiny redberry is a common plant of cismontane California coastal sage scrub and chaparral vegetation communities. The spiny redberry occurs south-to-north from roughly 100 miles south of the International Boundary in Baja California to Mt. Diablo in the San Francisco Bay Area. The species occurs east-to-west from the Sierra Nevada foothills to Santa Barbara Island.

Hermes copper is found only in San Diego County and northern Baja California, and generally appears to utilize redberry stands growing in deeper, well drained soils of canyon bottoms and north-facing hillsides (Thorne 1963), with host and nectar plants intermixed or in close proximity (Klein pers. comm.).

Anecdotal evidence suggests that Hermes copper utilizes only mature, spiny redberry. Some speculate that this is the result of some repellent physical or chemical redberry conditions, while others suggest this reflects limited Hermes dispersal behavior. Larvae have not been observed on new growth redberry, including those recovering from fire. In one example, a 1982 fire burned through a large, Mission Valley Hermes copper population. Annual, post-fire surveys revealed no evidence of the species at this site until June 2000, 18 years after the fire.

Hermes copper and spiny redberry occupy a landscape shaped by fire. Several authors have reviewed the effects of fire on coastal sage scrub and chaparral vegetation. Fire patterns and intensity, and metapopulation dynamics likely dictate the persistence of Hermes copper populations. According to Brown (1991), “Fire is an integral element in the succession of the chaparral community and has been known to eliminate large stands of the larval host ...”

Thorne (1963) commented that the species “... is in a good state of balance in its environment,” though he was not necessarily addressing the species’ relationship with fire. Nevertheless, Thorne’s comments appear relevant to Hermes persistence in a fire-adapted ecosystem: “It is an insect which seems to exhibit stability due to long occupation of its present habitat.” After all, Hermes copper has likely long co-existed with natural fire.

Yet Thorne’s comfort with apparent stability of Hermes copper populations 1963 would likely be shaken by modern habitat loss to rapid urbanization and associated, excessive fire in coastal sage scrub and chaparral vegetation. According to Brown (1991), “Even after recovery of the host, the sedentary behavior of the butterfly may make natural colonization a very slow process, especially where sources of potential colonists previously have been extirpated.”

No information is available regarding any parasites or predators on Hermes copper, though they are likely to exist and are expected to be other invertebrates and birds.

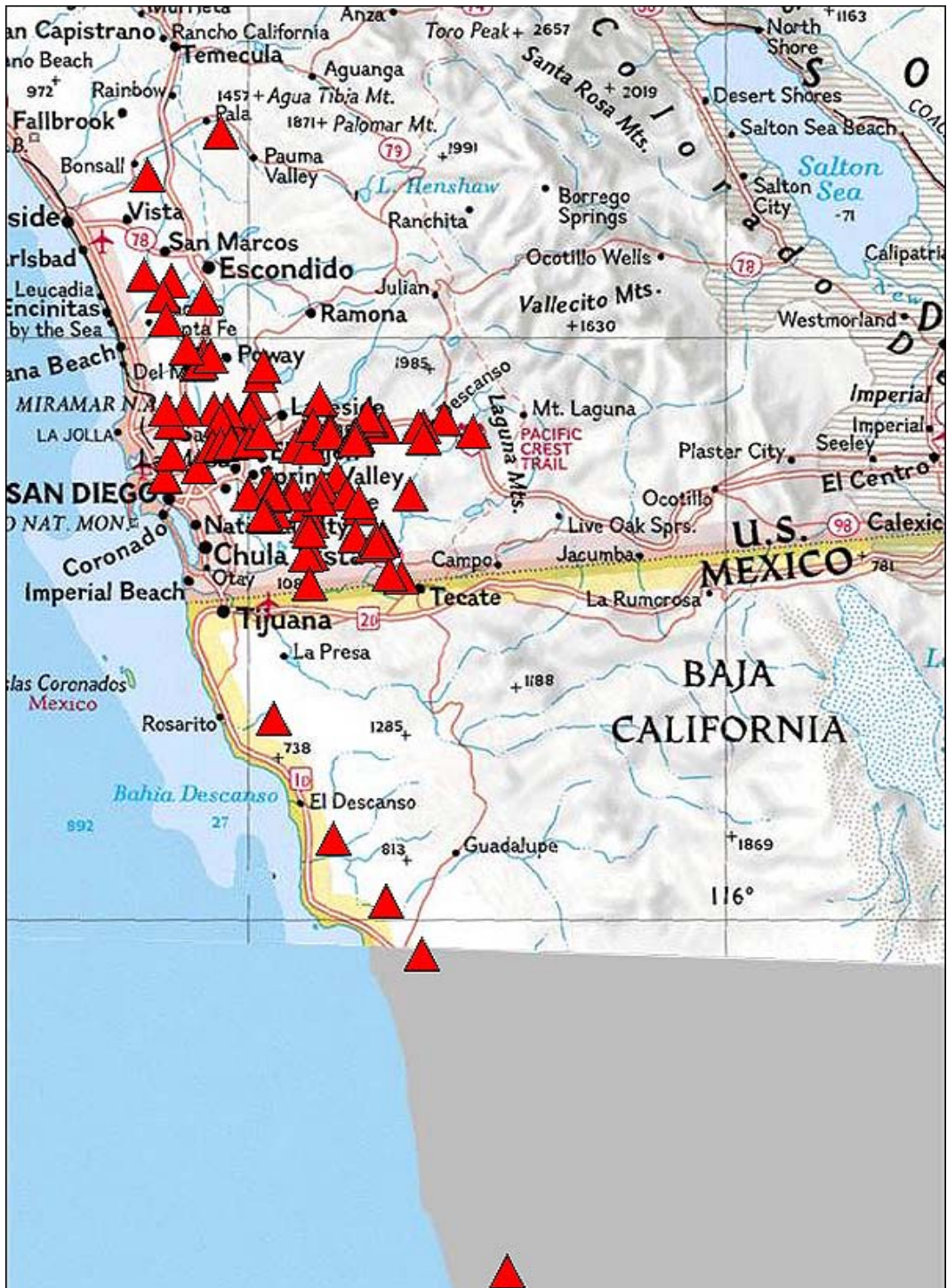
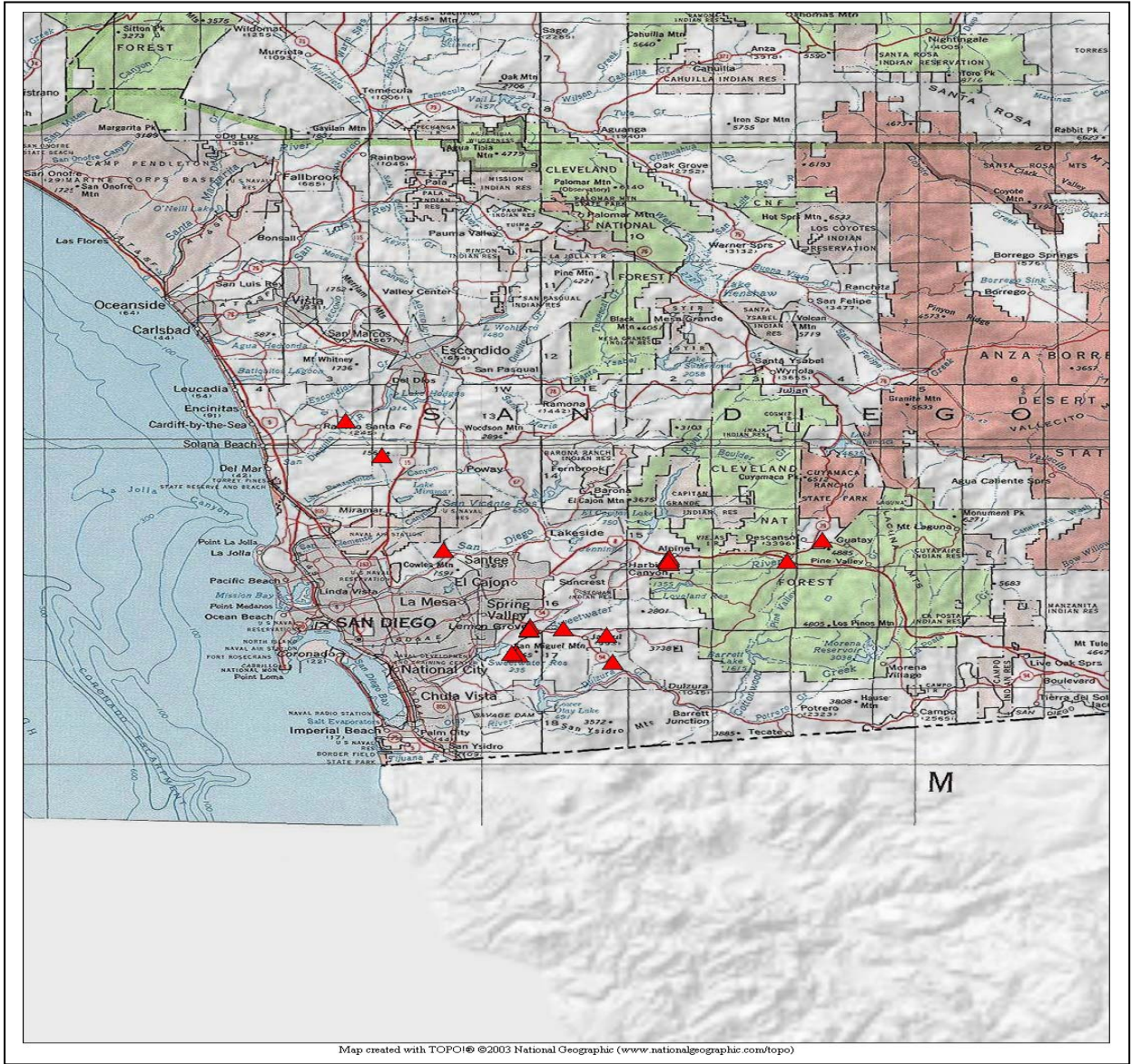


Figure 2
Historical Hermes Copper Sites
 Map by Michael Klein

Figure 3
Post-fire Hermes copper locations
 Map by Michael Klein



Map created with TOPO!® ©2003 National Geographic (www.nationalgeographic.com/topo)

Distribution

Table 1 provides a summary of Hermes copper population locations.

The range of Hermes copper appears much smaller than that of its spiny redberry host plant. Hermes copper ranges over 150 miles from the vicinity of Fallbrook in northern San Diego County, south to roughly 100 miles south of the International Boundary, near Santo Tomas in Baja California, Mexico. Hermes copper occupied many coastal areas prior to extensive urbanization, and still occupies foothill and mountain areas up to 45 miles from the ocean at Pine Valley, just west of the Laguna Mountains.

Hermes copper has been reported approximately 100 miles south of the International Boundary, yet only three populations have been identified (Brown *et al.* 1992). The lack of Baja California populations may reflect both a dearth of suitable habitat and survey effort. Surveys by Faulkner (pers. comm.) revealed no Hermes coppers east of Tecate despite extensive stands of high quality redberry habitat. Faulkner also points out the difficulty of locating native Baja vegetation that hasn't been burned at least once in a ten year period, and speculates that frequent fire may have eliminated some Baja Hermes copper populations. Irrespective of the cause, only three populations of the species have been identified in Baja, and this must be considered the best data available regarding the status of the species in Mexico.

IV. POPULATION STATUS

Hermes copper is in danger of extinction throughout all or a significant portion of its range. Brown (1991) concluded that, "Although there are numerous extant colonies of [Hermes copper] in San Diego County, the species occupies less than half of its former range."

The status of Hermes copper has significantly declined since the time of Brown's comment. Thirteen subsequent years of continuing urban development and the huge wildfires of 2003 have reduced the species to approximately 18 known populations. 2004 post-fire surveys revealed a significant decline in population numbers – the total 2004 population of fewer than 100 individual butterflies (Klein, pers. comm.) stands in stark contrast to the approximately 400

Table 1

Hermes copper populations and status

Red entries – Presumed lost to fire

Orange entries – Presumed lost to urban development

Blue entries – Unknown specific locations and unknown status

Yellow entries – Identified during environmental review of development projects

<u>Site Location</u>	<u>Estimated Population</u>	<u>Current Land Manager</u>	<u>Years Observed</u>
1 mile west of Lake Hodges ¹	1 ²	River Park JPA	1982
1 mile east of Lyons Peak ³	10	Private	1960, 1963, 1966 – 1967
3 miles south of El Cajon ⁴	3	Private	1958
8.2 miles east of Dulzura	1	Private	1980
12 miles north of Ensenada ⁵	1	Private	1936
18 miles south of Santo Tomas, Baja CA ⁶	Unknown	Private	Unknown
Anderson Road, Alpine	50+	U.S. Forest Service	1998 – 2003
Bajamar, Baja CA	Unknown	Private	Unknown
Black Mountain	1	City of San Diego ⁷	2004
Boulder Creek Road	5	U.S. Forest Service	1981
Crestridge Ecological Reserve ⁸	1,000+	CA Fish & Game	1941, 1958, 1960, 1964, 1965, 1966, 1967, 1969, 1996, 1999 – 2003
Deerhorn Valley ⁹	9	Private	1967, 1970
Descanso (Wildwood Glen)	10+	U.S. Forest Service	1980 – 2003

¹ Bernardo Mountain (Klein, pers. comm.).

² Estimated population numbers reflect highest number of specimens observed or collected in one year. Total population numbers may have exceeded small numbers reflected in museum collections at the San Diego Natural History Museum and Los Angeles County Museum of Natural History.

³ Four museum specimens.

⁴ Near intersection of Highway 94 and Jamacha Boulevard (Klein, pers. comm.).

⁵ Brown *et al.* 1992 mapped 3 Baja California populations, but specific locations are unknown.

⁶ Cited in Thorne (1963), and Emmel and Emmel (1973).

⁷ Black Mountain Open Space Park.

⁸ 13 museum specimens labeled “Suncrest” and “El Cajon/Suncrest.” 35 colonies with more than 1,000 individuals observed in 2000 and 2001 (Klein pers. com.).

⁹ 4 museum specimens labeled “Deerhorn Valley” and “Deerhorn, 9 miles northwest of Tecate.”

Lane)			
El Cajon ¹⁰	4	Private	1959 – 1960
El Monte	1	County of San Diego	1960
Fairmont Canyon	1	Private	1952
Flinn Springs	1	County of San Diego	1981
Gooden Ranch	12+	County of San Diego	1998, 2003
Guatay ¹¹	8	U.S. Forest Service	1979 – 1980, 1982, 1983, 1990 – 2002, 2004
Harbison Canyon	5+	Private	2003
Harmony Grove	1	Private	2000
Jamul Highlands Road	28	Private	2003 – 2004
Kearny Mesa ¹²	1	Private	1938 – 1939
Lawson Valley	2	Private	2003
Little Cedar Creek	1	U.S. BLM	1978 – 1979
Lyons Valley	5	Private	2003
McGinty Mountain	5+	County of San Diego CA Fish & Game Nature Conservancy Private ¹³	1995 – 1996
Miramar ¹⁴	1	U.S. Navy	1960, 1971, 1996, 2003
Mission Dam ¹⁵	1	City of San Diego	1971, 1977, 1979
Mission Gorge ¹⁶	29	City of San Diego	1958 – 1962, 1965 – 1967, 1971, 1977 – 1978
Mission Valley	1	Unknown	1953
Mt. Miguel ¹⁷	4	U.S. Fish & Wildlife	1958
Oak Creek ¹⁸	12	City of San Diego	1959
Old Viejas Grade Road ¹⁹	4	U.S. Forest Service	1981 – 2003
Otay-Foothill area ²⁰	1	Unknown	1938 – 1939
Pine Valley	1	U.S. Forest Service	Unknown

¹⁰ Six museum specimens.

¹¹ Eight museum specimens labeled “Guatay” and “1.3 miles west of Guatay.”

¹² Three museum specimens.

¹³ County of San Diego McGinty Mountain Park, McGinty Mountain Ecological Reserve and other protected lands.

¹⁴ Three museum specimens, U.S. Department of the Navy 1999, and U.S. Department of the Navy 2004.

¹⁵ Mission Trails Regional Park. Four museum specimens labeled “Mission Dam” and “Old Mission Dam.”

¹⁶ Mission Trails Regional Park. 38 museum specimens labeled “Mission Gorge” and “Mission Gorge, San Diego County.”

¹⁷ Two museum specimens.

¹⁸ Mission Trails Regional Park. Two museum specimens.

¹⁹ Three museum specimens.

²⁰ Three museum specimens labeled “Otay-Foothill area,” “Foothill area,” and “Foothill area, San Diego, Otay.”

Poway Road and 395, San Diego	7	Private	1965
Poway	10	CA Fish & Game	2003
Rancho Jamul Ecological Reserve ²¹	50+	CA Fish & Game	2003 – 2004
Roberts Ranch	7	U.S. Forest Service	2003 – 2004
Salsi Puedes, Baja CA	1	Private	1983
San Diego ²²	3	Private	1907 – 1908, 1929, 1933, 1935 – 1938, 1948 – 1949, 1952, 1958, 1962
San Diego NWR	15	U.S. Fish & Wildlife	2004
San Marcos Creek	3	Private	1979
Santee (Fanita Ranch area) ²³	3	Private	1966 – 1967, 1969, 1971, 1997
Santee (Big Rock Road area) ²⁴	200+	City of San Diego	1971, 1973
Scripps Gateway ²⁵	Unknown	Private	1996
Sequan Peak	5+	Private	1995 – 1996
Skyline Truck Trail	3+	Private	2003
Spring Canyon ²⁶	200+	City of San Diego	1971
Spring Valley (Dictionary Hill) ²⁷	17	Private	1960, 1962
Spring Valley	2	Private	2001
Steel Canyon	3	Private	2003 – 2004
Sycamore Canyon ²⁸	1	County of San Diego	2003
The Crosby	2	Private	2004
Wright's Field	12+	Back Country Land Trust	1997 – 2004

individuals observed the previous year at Crestridge Ecological Reserve alone. Special protection from fire and development is urgently needed for remaining Hermes copper

²¹ Three populations (Marschalek 2003)

²² 46 museum specimens, collected from unknown locations. Sites are presumed lost to urban development due to likelihood of early collection location proximity to City of San Diego urban core.

²³ Eight museum specimens labeled “Santee,” “Santee, San Diego County,” “NR Santee,” “4 miles northwest of Santee,” “Mast C, NW Santee,” “Carlton Hills/ Santee,” “Mast C. 4 miles northwest of Santee” and “Fanita Ranch, Santee.”

²⁴ Three museum specimens labeled “Big Rock Road Canyon, Santee,” “Big Rock Road, Fletcher Hills,” and “Big Rock Road, Santee.”

²⁵ Cited by U.S. Fish and Wildlife Service (1996).

²⁶ Mission Trails Regional Park. Two museum specimens labeled “Spring Canyon Area, Mission Valley, San Diego CA, resting on Rhamnus crocea” and “Spring Canyon/Mission Valley.”

²⁷ Dictionary Hill (Klein pers. comm.). Three museum specimens.

²⁸ (Marschalek 2003)

populations, especially the largest known population located near Santee’s Big Rock Road on the northern slopes of Cowles Mountain inside Mission Trails Regional Park.

Perhaps most disturbing, several populations naively considered by some to be protected from harm were lost to fire the 2003 wildfires – important populations at Crestridge Ecological Reserve, Descanso and Viejas Mountain (Cleveland National Forest), Jamul Ranch Ecological Reserve, Marine Corps Air Station Miramar, Mission Trails Regional Park, and elsewhere. The combined effects of the species’ limited dispersal behavior, urban development, and excessive fire have greatly reduced the availability of suitable habitat, greatly limited the likelihood of recolonization of extirpated populations, and greatly increased the vulnerability of remaining populations.

The status of the three Baja California Hermes copper populations is unknown but presumed extant for the purposes of this petition.

V. HERMES COPPER WARRANTS RECOGNITION AS AN ENDANGERED SPECIES

The U.S. Fish and Wildlife Service should grant Hermes copper ESA protection as an endangered species for a number of reasons. Hermes copper is a “species” as defined by the ESA. See 16 U.S.C. § 1532(16). See also 50 CFR 424.02(k). Hermes copper should be recognized as an “endangered species” as defined by the ESA because it “...is in danger of extinction throughout all or a significant portion of its range...” See 16 U.S.C. § 1532(6). See also 50 CFR 424.02(e).

Hermes copper is clearly a “species” as defined by the ESA according to the best available scientific data (Edwards 1870; W.G. Wright 1906; Holland 1898; W.S. Wright 1907 and 1930; Comstock 1927; Comstock and Dammens 1935; Hoffman 1940; Thorne 1963; Emmel and Emmel 1973; Howe 1975; Miller and Brown 1979; Pratt *et al.* 2003).

Hermes copper should be recognized as endangered according to a number of ESA factors. Species shall be recognized as threatened or endangered based on application of any one or more of the following factors:

- (A) the present or threatened destruction, modification, or curtailment of habitat or range;
- (B) overutilization for commercial, recreational, scientific, or educational purposes;
- (C) disease or predation;
- (D) the inadequacy of existing regulatory mechanisms; and
- (E) other natural or manmade factors affecting its continued existence.

See 16 U.S.C. § 1533(a)(1). See also 50 CFR 424.11(c) *et seq.*

Hermes copper is imminently endangered by present and threatened destruction, modification, or curtailment of range or habitat

Urban development

Hermes copper is highly vulnerable to extinction due to loss of populations and dispersal habitat to expanding urban development in San Diego County and northern Baja California. The threat of urban development is compounded by the additional threat of wildfire.

Comstock (1927) was the first of early collectors to recognize the threat of development and a megalopolis future when he wrote of Hermes copper, “It will always be a rarity, and may, in fact, some day become extinct, if San Diego continues to expand at its present rate.” W.S. Wright (1930) wrote, “Its trysting places are being rapidly taken over by realtors and the species may soon become extinct ...” Brown (1991) provided a more current view, “Because continued development in San Diego County threatens to eliminate additional colonies of this insect, [Hermes copper] is considered highly sensitive and vulnerable to extirpation.”

Past Hermes copper losses to urban development are exceeded only by losses to fire, and include many populations recorded from El Cajon, Fairmont Canyon, Kearny Mesa, Scripps Gateway, and numerous sites near the City of San Diego urban core. According to Murphy (1991), “[Hermes copper] has been virtually extirpated in nearly all of its best known historical localities around the city of San Diego.”

Loss of populations and dispersal habitat to urban development appears to pose a significant current threat to the species in foothill areas of the unincorporated County west of the Cleveland National Forest, especially in remaining, unburned areas near Jamul and North County. Ongoing urban development of burned areas in Harbison Canyon, Marine Corps Station Miramar (for military family housing), San Marcos Creek, and Santee forecloses the likelihood of recolonization by the species. Hermes copper populations identified during recent development project biological resource surveys at Harmony Grove, Jamul Highlands Road, Lawson Valley, Lyons Valley, Spring Valley, Steel Canyon, and The Crosby may not persist following completion of construction, especially considering resulting habitat fragmentation and increased risk of fire with an expanded, proximate human population.

Wildfire

Hermes copper is highly vulnerable to extinction due to the threat of fire. Excessive, human-induced fire poses a significant threat to the survival of the species, even on lands otherwise protected from development.

Hermes copper populations were devastated by fire in October 2003. The 2003 Paradise, Cedar, and Mine fires burned an estimated 39% of Hermes copper habitat (Betzler *et al.* 2003). By far the largest concentration of the species ever documented was lost when the Cedar Fire burned nearly all of the Crestridge Ecological Reserve in the unincorporated San Diego County community of Crest. 2001 surveys at the reserve found approximately 52 Hermes copper colonies with a total estimated population of 1,000 butterflies (California Department of Fish and Game 2001). The October 2003 Cedar Fire appears to have destroyed every colony within the reserve (M. Klein, pers. comm.).

The second largest concentration of Hermes coppers was similarly impacted when the Cedar Fire burned through four populations in Mission Trails Regional Park in the City of San Diego – Mission Gorge, Mission Dam, Oak Creek, and Spring Canyon. At least 15 other Hermes copper populations were lost to the 2003 Cedar and Mine fires, including those at Anderson Road (Viejas Mountain), Boulder Creek Road, Descanso, El Monte County Park, Flinn Springs, Gooden Ranch reserve, Harbison Canyon, Little Cedar Canyon, Miramar, Old Viejas Grade

Road, Otay-Foothill area, Rancho Jamul, Santee (Fanita Ranch area), and Sycamore Canyon reserve. At least three Hermes copper populations were likely lost to past fires on Bernardo Mountain near Escondido, Dictionary Hill in Spring Valley, and San Marcos Creek.

Hermes copper biology appears to reduce the likelihood of escape from fire burning through occupied spiny redberry habitat. Eggs, larvae, and pupae are likely killed when fire burns redberry plants and other nearby coastal sage scrub or chaparral vegetation. Adults are also likely killed by fire due to their habit of remaining close to the redberry, as well as the likelihood of their escape being outpaced by approaching fire.

Excessive fire appears to be a significant threat to Hermes copper. Increased human populations and utilization of wild lands correlate with an increased southern California wildfire frequency (Keeley and Fotheringham 2002; Keeley *et al.* 1999; Wells *et al.* 2004). According to Keeley (2001, citations omitted), "... fire management is challenged with an ever-increasing rate of fire incidence which parallels the exponential rate of human population growth in an environment with the worst fire weather in the country." A very close proximity to large human populations increases the vulnerability of Hermes copper and spiny redberry populations to excessive fire.

Excessive fires occurring over the last several decades have reduced patches of mature spiny redberry utilized by Hermes copper, thereby reducing Hermes copper population numbers and disrupting metapopulation dynamics and stability. Any butterflies escaping fire are unlikely to locate other suitable habitat given the reduced availability of nearby, mature spiny redberry plants due to other past fires, as well as the likelihood of future redberry losses to fire.

Hermes copper recovery following fire is confounded by very slow recovery of its host plant, and very slow recolonization by the butterfly. According to Zedler *et al.* (1983), "... few [spiny redberry seedlings] are found in recent burns or other disturbed areas, and we suspect that their rate of invasion would be slow." According to Brown (1991), "Even after recovery of the host, the sedentary behavior of the butterfly may make natural colonization a very slow process, especially where sources of potential colonists previously have been extirpated."

Excessive fire harms chaparral ecosystems and dependent species in a number of ways (Keeley and Fotheringham 2003; Brooks *et al.* 2002). According to Keeley and Fotheringham, "... ecosystem health of shrublands is threatened not by lack of fire but by high fire frequencies that exceed the resilience of many species." Excessive fire may prevent chaparral and coastal sage scrub plant species like spiny redberry from reaching maturity, thereby reducing or eliminating reproduction and recruitment of replacement chaparral plants.

Excessive fire also leads to well-documented type conversion - replacement of chaparral ecosystems with exotic plant species (Keeley and Fotheringham 2003; Keeley 2001). Excessive fire contributes to expansion of highly flammable, exotic, invasive grasses (D' Antonio and Vitousek 1992) and herbs, contributing in turn to an even greater fire frequency. Excessive fires tend to burn at cooler temperatures, leaving intact exotic species' seed banks, and allowing fast-growing exotics to out compete slower natives for limited moisture and nutrients. Exotic species expand periods of seasonal flammability , contributing further to excessive fire frequency (Keeley and Fotheringham 2003). According to Keeley and Fotheringham,

As a consequence [of increasing exotic herbaceous cover and expanded seasonal window of flammability] exotic grasslands tend to replace shrublands in the proximity to urban environments, where the higher ignition sources in the company of flashy fuels have the potential for even greater fire frequency.

Keeley and Fotheringham conclude,

Because fire prevention has been ineffective at eliminating human fires, presently and for the foreseeable future, fire suppression is required just to maintain some semblance of the natural fire regime.

Fire related type-conversion of coastal sage scrub and chaparral to vegetation dominated by invasive alien plant species reduces Hermes copper habitat through loss of host and nectar resource plants. In one example, occupied Hermes copper habitat was lost to fire and subsequent

type-conversion at Bernardo Mountain, near Lake Hodges in the City of Escondido. Guy Bryeau collected Hermes coppers on the south-east slopes of the mountain in 1981 and 1982, with his 1982 collections cataloged at San Diego Natural History Museum (Bryeau, pers. comm.). The area was subsequently burned in 1986. Michael Klein visited the site in 2002 and found the area dominated by weedy exotic herbs and grasses with no spiny redberry plants or Hermes coppers. (Klein, pers. comm.).

Prescribed fire

Prescribed fire is also likely to harm vulnerable Hermes copper populations by further contributing to excessive fire. Hermes coppers are vulnerable to fire throughout their life cycle, as discussed above. Controlled burning often differs from natural fires in frequency, intensity, timing, and patchiness (Schlicht and Orwig 1999), and these factors could reduce the likelihood of Hermes survival through prescribed fire.

A number of Hermes copper populations are located within areas under the jurisdiction of the Cleveland National Forest, as well as the County of San Diego. The Cleveland National Forest has aggressively pursued prescribed fire as a vegetation management tool in a misguided attempt to benefit native wildlife and vegetation. The County of San Diego has recently increased fire safety efforts, often in coordination with the Forest Service. But the County has generally rejected effective fire safety techniques of limiting poorly planned rural and retrofitting existing structures with fire resistant materials. The County has instead focused on politically expedient, misguided, and excessive brush clearing around homes and communities, and has pushed for expanded prescribed fire on both National Forest and private land.

Hermes copper may be endangered by overutilization for commercial purposes

At least one commercial enterprise may contribute to the imperiled status of Hermes copper. A company called “Morningstar Flower and Vibrational Essences” markets a Hermes copper “butterfly essence” over the internet. See <http://morningstar.netfirms.com/butrflly.html>. It is unclear how the butterfly essences are manufactured or obtained, though flower essences are traditionally extracted by soaking plant materials in water, alcohol, or vinegar. According to the website,

The Butterfly Essences are powerful catalysts for transformation and change. They help us to liberate ourselves from limiting beliefs and behaviours that keep us from living as fully and joyfully as the creator intended. All of these essences are available in 2 oz and 4 oz sizes by special order.

The U.S. Fish and Wildlife Service also recognized the potential threat of overcollection to the species. According to the agency (U.S. Fish and Wildlife Service 1996),

Over-collection is a potential threat to the Hermes Copper because of their value to butterfly collectors. There is an extensive commercial trade for many imperiled or rare butterflies [cites Fish and Wildlife Service employees]. For example, a female Hermes Copper was worth up to \$20.00 in 1986. For many species of butterflies, as the number of colonies is reduced, lepidopterists may collect individuals in order to include rare species in their collections or to obtain surplus specimens for exchange or sale. The remaining Hermes Copper colonies continue to be threatened by over-collection.

Hermes copper may be endangered by predation

Experts suspect that birds, predatory insects, parasitic insects, and spiders prey upon Hermes copper. Birds may prey on either larvae or adults. The harmful effects of otherwise normal predation or parasitism might be exacerbated by population reduction from urban development and excessive fires.

Hermes copper is endangered due to the inadequacy of existing regulatory mechanisms

Very few regulatory mechanisms exist that might conserve Hermes copper and its chaparral and coastal sage scrub habitat. At least five regulatory mechanisms provide some potential for Hermes copper conservation – California Environmental Quality Act, National Environmental Policy Act, Forest Service management, the San Diego Multiple Species Conservation Plan, and County of San Diego Resource Protection Ordinance. None of these mechanisms have proven effective in reducing the primary threats to Hermes copper from urban development, fire, and related habitat degradation.

California Environmental Quality Act & National Environmental Policy Act

The U.S. Fish and Wildlife Service has previously provided extensive discussion of the inadequacy of the California Environmental Quality Act to protect imperiled species. The Service's previous conclusions are fully applicable in consideration protections afforded under CEQA to the Hermes copper. See e.g. [Determination of Endangered Status for the Laguna Mountains Skipper Butterfly and Quino Checkerspot Butterfly](#) (62 Fed. Reg. 2318). [See also Determination of Endangered Status for the San Diego Fairy Shrimp](#) (62 Fed. Reg. 4935); [Determination of Threatened Status for the California Red-legged Frog](#) (61 Fed. Reg. 25829); and [Determination of Threatened Status for the California Tiger Salamander](#) (69 Fed. Reg. 47236).

Forest Service management

Forest Service regulations and management activities appear to provide few protections to Hermes copper. The Cleveland National Forest is the only forest containing populations of the species. Three populations of the species are known from the Cleveland National Forest following the 2003 fires – Guatay, Pine Valley, and Roberts Ranch. Aside from monitoring survey results by others, the Cleveland National Forest does not appear to be actively engaged in Hermes copper conservation.

Designation of Hermes copper as a “Sensitive Species” is the only legal mechanism available for conservation of the species on Forest Service lands. Yet Hermes copper is not formally recognized as a sensitive species (Winter, pers. comm.), so the Cleveland National Forest bears no responsibility to monitor or maintain the species' viability.

In the event Hermes copper is ever recognized as a covered species, Forest Service laws, regulations, and policies provide some limited potential for monitoring of the species status and protection from specific harmful projects. But recognition of Hermes copper as a sensitive species is unlikely to generate any important, pro-active conservation activities necessary to improve the status of the species.

Management regimes established under Forest Service laws, regulations, and policies appear to operate under the assumption that species are viable unless otherwise recognized as threatened or endangered under the Endangered Species Act (or “ESA”). Accordingly, the Forest Service only assesses populations of species recognized as sensitive and identifies minimum population levels to maintain species viability and prevent listing under the ESA. These provisions do not provide for or require activities to recover species viability or identify the means of recovery activity implementation. Instead, the overall Forest Service regulatory regime is structured in such a way that pro-active conservation will only be carried out after a species is listed under the ESA.

Please see Appendix 1 for a presentation of Forest Service laws, regulations, and policies applicable to sensitive species.

San Diego Multiple Species Conservation Plan

The San Diego Multiple Species Conservation Plan (or “San Diego MSCP) is neither intended nor designed to protect the Hermes copper. Hermes copper is not recognized as a “covered species” under the San Diego Multiple Species Conservation Plan. See San Diego MSCP at page 3-61. The San Diego MSCP specifically recognized that Hermes copper received an “[u]nknown conservation level and [was] therefore not covered by the Plan based on insufficient distribution and life history data.” *Id.*

If adequately implemented, the San Diego MSCP might provide some serendipitous benefits to Hermes copper, but these are speculative in the absence of any analysis. Moreover, the San Diego MSCP cannot provide necessary specific management benefiting the species because none is planned, described or required by the Plan. The San Diego MSCP can benefit Hermes copper only in the event of collaterally beneficial conservation activities for other species and habitats. Given the lack of intent, the San Diego MSCP provides little assurance against extinction of Hermes copper.

In a somewhat confusing maneuver, the County of San Diego asserts that Hermes copper populations will still be conserved under the San Diego MSCP, apparently irrespective of the

species lack of formal coverage under the plan. See County of San Diego Subarea Plan (also “County Subarea Plan”) Table 1-3 at 1-15. The County focuses on only three Hermes copper populations located within the “Metro-Lakeside-Jamul Segment” of the County Subarea. See Table 4-3 at 4-12. Conservation for Hermes copper under the County’s Subarea Plan is presumably provided through the County’s Biological Mitigation Ordinance, consistent with treatment of covered species.

Informal treatment of Hermes copper under the County’s Subarea Plan provides few conservation benefits, and may place the species at greater risk than were it not addressed in the Plan. For example, formal treatment as a covered species under the San Diego MSCP and County Subarea Plan would likely have resulted in recognition of Hermes copper as a “narrow endemic species,” requiring avoidance of impacts to the maximum extent practicable. But informal treatment of Hermes copper under the Plan provides a much lower standard of conservation for any populations discovered outside of conserved lands. Also, planners relying on County Subarea Plan information relating to Hermes copper might incorrectly conclude that there were only three Hermes copper populations within the County Subarea, inside only the Metro-Lakeside-Jamul Segment when in fact there were many more at the time of Plan approval in both the Metro-Lakeside-Jamul and South County segments. Lacking recognition as a “covered species” or “narrow endemic species,” Hermes copper is only collaterally conserved through implementation of the Biological Mitigation Ordinance.

Please see Appendix 2 for an extended discussion of the inadequacy of the San Diego MSCP to protect covered species.

Biological Mitigation Ordinance

In and of itself, the County’s Subarea Plan of the San Diego MSCP does not restrict any land development rights or require actions to recover species. Rather, land use restrictions are defined by an ordinance implementing the County Subarea Plan, called the Biological Mitigation Ordinance (also “BMO”). Urban development and conservation of the remainder of the private lands within the subareas will proceed based on preserve design criteria implemented through the BMO, which establishes mitigation ratios and conditions.

The County of San Diego's Biological Mitigation Ordinance (BMO) applies to more species than those covered by the MSCP. In particular, the Project Design Criteria contained in BMO Section 86.505 and the habitat-based and species-based mitigation requirements contained in BMO Sections 86.506 and 86.507, respectively, may require mitigation for impacts to land that supports "sensitive species" as defined by the California Environmental Quality Act (CEQA), provided such land is within particularly circumscribed areas, e.g. the County Subarea Plan's Biological Resources Core Area.

BMO Section 86.508(s)(3) defines "sensitive species" to include, among other things, "Those species that meet the definition of 'Rare or Endangered Species' under Section 15380 of the State CEQA Guidelines." In turn, Section 15380 of the CEQA Guidelines states in full:

15380. Endangered, Rare or Threatened Species

(a) "Species" as used in this section means a species or subspecies of animal or plant or a variety of plant.

(b) A species of animal or plant is:

(1) "Endangered" when its survival and reproduction in the wild are in immediate jeopardy from one or more causes, including loss of habitat, change in habitat, overexploitation, predation, competition, disease, or other factors; or

(2) "Rare" when either:

(A) Although not presently threatened with extinction, the species is existing in such small numbers throughout all or a significant portion of its range that it may become endangered if its environment worsens; or

(B) The species is likely to become endangered within the foreseeable future throughout all or a significant portion of its range and may be considered "threatened" as that term is used in the Federal Endangered Species Act.

(c) A species of animal or plant shall be presumed to be endangered, rare or threatened, as it is listed in:

(1) Sections 670.2 or 670.5, Title 14, California Code of Regulations; or

(2) Title 50, Code of Federal Regulations Section 17.11 or 17.12 pursuant to the Federal Endangered Species Act as rare, threatened, or endangered.

(d) A species not included in any listing identified in subsection (c) shall nevertheless be considered to be endangered, rare or threatened, if the species can be shown to meet the criteria in subsection (b).

(e) This definition shall not include any species of the Class Insecta which is a pest whose protection under the provisions of CEQA would present an overwhelming and overriding risk to man as determined by:

- (1) The Director of Food and Agriculture with regard to economic pests; or
- (2) The Director of Health Services with regard to health risks.

Subsection (d) of the foregoing makes clear that even those species not formally listed “shall” be considered endangered, rare or threatened if the record shows them to be so. Assuming for the sake of argument that the Hermes copper is endangered, rare, or threatened according to this definition, then the benefits provided by BMO Sections 86.505, 86.506 and 86.507 may apply to urban development in some, but not all, Hermes copper habitat.

The Project Design Criteria of BMO Section 86.505 apply to non-listed sensitive species only within Biological Resource Core Areas. BMO Section 86.506 defines such areas in part by their relationship to “sensitive species.” BMO Sections 86.506(a)(1)(a)(ii), (v), and (vi) require mitigation for land:

which contains biological resources that support or contribute to the long-term survival of Sensitive Species . . . and is adjacent or contiguous to preserved habitat that is within the preapproved mitigation area on the wildlife agencies’ preapproved mitigation map . . . ;

within “a block of habitat greater than 500 acres in area of diverse and undisturbed habitat that contributes to the conservation of Sensitive Species;

which “contains a high number of Sensitive Species and is adjacent or contiguous to surrounding undisturbed habitats, or contains soil derived from the following geologic formations which are know to support Sensitive Species:

- A. gabbronic rock;
- B. Metavolcanic rock;
- C. Clay;
- D. Coastal sandstone.”

This provision makes clear that any Hermes copper populations, habitat, and dispersal corridors outside of the Biological Resource Core Area are not protected.

In the event Hermes copper populations or habitat are located in the Biological Resource Core Area, the BMO requires that the County impose project design criteria under BMO Section 86.505. These criteria include the following:

- Development sited to minimize habitat impacts;
- Clustering to achieve avoidance;
- Encroachments into steep slopes to avoid habitat impacts;
- Reduction in road standards; and/or
- Compliance with County Subarea Plan design criteria.

None of these criteria require avoidance of important Hermes copper populations, habitat, or dispersal corridors. Nor are they designed to improve the status of the species as necessary to prevent extinction. As such, they can only vaguely minimize additional losses of populations and dispersal habitat, and even then only in the Biological resource Core Area.

Likewise, the habitat-based and species-based mitigation requirements of BMO Sections 86-506 and 507 provide only a scheme for calculating mitigation ratios to offset destruction of sensitive species habitat. But habitat mitigation alone will not necessary minimize harm to

specific species, especially those lacking any conditions of coverage as covered species, and cannot increase species' populations.

Worse, mitigation need not necessarily benefit the particular habitats or species impacted by urban development. BMO Section 86-507(a)(2)(e) specifies that habitat mitigation must be “in kind” only if the “mitigation would have the effect of substantially reducing the viability of the affected population of the species . . . as determined by a biological analysis approved by the Director.”

The BMO mitigation scheme therefore allows additional losses of Hermes copper populations and dispersal habitat, and at best requires in-kind habitat mitigation only with a finding that the species' viability is substantially reduced.

In the end, the BMO is not intended to recover species from a threat of extinction. Rather, it is intended to condense development footprints and to contribute to establishment of a MSCP preserve. Given the lack of coverage for Hermes copper, the MSCP preserve and conditions were not and could not have been designed to protect the species.

City of San Diego and County open space parks

Remaining Hermes copper populations are not necessarily protected by nature of their location on some open space park lands managed by either the City or County of San Diego under the San Diego MSCP – Black Mountain, McGinty Mountain, Mission Trails Regional Park. Conservation of San Diego MSCP covered species is promised under conditions of coverage, a framework management plan, and area-specific management directives. Lacking formal coverage, Hermes copper cannot directly benefit from this regime.

Covered species and non-covered species alike both suffer from funding shortfalls for promised management of conserved land under the San Diego MSCP. MSCP documents appear to suggest that pro-active conservation activities benefiting specific species are only carried out as funding is secured, pending establishment of the now mythological “regional funding source:”

Until a regional funding source is in place, management for biological resources has been focused on maintaining the existing biological values of the habitat land under City control. Opportunities for specific biological management activities have been pursued when local or grant funding can be obtained.

See 2003 MSCP Annual Public Workshop – Summary Report at page 5. Management plans and area-specific management directives do not appear to have been prepared for two City open space parks supporting remaining Hermes copper populations – Black Mountain, Mission Trails Regional Park. Lacking any plans, these populations will remain vulnerable to significant potential edge effects, fire, and even possible park development activities such as trail construction or others.

The County of San Diego appears to have similarly failed to prepare area-specific management directives for McGinty Mountain open space. Please see Appendix 2 for discussion of the failure of the County of San Diego to provide promised conservation management for San Diego MSCP conserved lands – Critique of the South County Subarea Plan, section d. Conservation management and monitoring plans may never be prepared for many MSCP preserve areas.

County of San Diego Resource Protection Ordinance

The County of San Diego’s Resource Protection Ordinance (also “RPO”) imposes controls on development of wetlands, floodplains, steep slopes, sensitive biological habitats, and prehistoric and historic sites. RPO provisions addressing biological resources apply only outside of the boundaries of the County’s Subarea Plan under the San Diego MSCP. The RPO does not directly protect species or impose any species-specific management efforts, but rather only attempts to minimize the impacts of urban development on habitat.

In particular, the RPO Article III requires that permit applicants conduct a Resource Protection Study, the contents of which are determined at the discretion of the County Director of Planning and Land Use. If the study identifies the presence of “environmentally sensitive

lands” Article III, Section 3 states that the County may at its discretion condition a development permit on one of the following actions:

- a. Apply open space easements to portions of the project site that contain sensitive lands;
- b. Rezone the entire project site through the application of a special area designator for sensitive lands; or
- c. Other actions as determined by the decision-making body.

Article II, Section 3 defines “environmentally sensitive lands” as follows:

Environmentally Sensitive Lands: These lands shall consist of wetlands, floodplains, steep slope lands, sensitive habitat lands, and lands containing significant prehistoric and historic sites as defined by this Ordinance.

Article II, Section 13, in turn, defines “sensitive habitats lands” as follows:

Sensitive Habitat Lands: Land which supports unique vegetation communities, or the habitats of rare or endangered species or sub-species of animals or plants as defined by Section 15380 of the State California Environmental Quality Act (CEQA) Guidelines (14 Cal. Admin. Code Section 15000 *et seq.*). “Sensitive Habitat Lands” includes the area which is necessary to support a viable population of any of the above species in perpetuity, or which is critical to the proper functioning of a balanced natural ecosystem or which serves as a functioning wildlife corridor.

“Unique vegetation community” refers to associations of plant species which are rare or substantially depleted due to development. These may contain rare or endangered species, but other species may be included because they are unusual or limited due to a number of factors, for example:

- (a) they are only found in the San Diego region;

(b) they are a local representative of a species or association of species not generally found in San Diego County; or

(c) they are outstanding examples of the community type as identified by the California Department of Fish and Game listing of community associations.

Thus, the County RPO protects land that supports those species defined as “sensitive species” by CEQA and also species that are unique or otherwise significant to the San Diego region.

The degree of protection provided to these lands, however, is limited. Article IV, Section 6 of the RPO and Section 5307(e) of the County’s Special Area Regulations (SAR) (which defines the “special area designator” referenced by RPO Article III, Section 3(b), above) as shown below are identical in operative language and describe the full extent of the County’s protection of these lands. Article IV, Section 6 states in full:

Sensitive Habitats Lands. Development, grading grubbing, clearing or any other activity or use damaging to sensitive habitat lands shall be prohibited. The authority considering an application listed at Article III, Section 1 above may allow development when all feasible measures necessary to protect and preserve the sensitive habitat lands are required as a condition of permit approval and where mitigation provides an equal or greater benefit to the affected species.

SAR Section 5307(e) states in full:

Sensitive Habitat Lands. Development, grading, grubbing, clearing or any other activity or use damaging to sensitive habitat lands shall be prohibited. The Board of Supervisors may allow development when all feasible measures necessary to protect and preserve the sensitive habitat lands are required as a condition of permit approval and where mitigation provides an equal or greater benefit to the affected species.

These provisions require only that (1) “all feasible measures” be taken to protect and preserve the land, without further defining the term “feasible;” and that (2) mitigation provide an equal or greater benefit to the affected species, without defining the scope of the term “benefit” or the scope of required mitigation.

The RPO regulatory regime does not adequately protect Hermes copper from significant impacts. Habitat that supports the species is sensitive habitat land within the meaning of the RPO because Hermes copper falls within the RPO’s definition of sensitive species or “rare and endangered” species. Therefore, this habitat may be developed only where the County imposes all feasible measures to protect this habitat and where species-specific mitigation is required.

Unfortunately, the scope of feasibility imposed by the County is variable and difficult to predict, and this vagueness is unlikely to benefit Hermes copper. Ironically, the County RPO may provide greater benefit to Hermes copper than the MSCP and BMO because the RPO requires species specific mitigation, which could include species management measures (predator control, reintroduction, etc.) in addition to habitat preservation. In contrast, the MSCP and BMO require only the preservation of habitat without species-specific management mitigation permit conditions, and the habitat preservation may be either in-kind or out-of-kind, depending on species viability.

Ultimately, the County RPO is merely a land protection ordinance and does not require measures necessary to prevent extinction of the species – requirements that new urban development avoid remaining Hermes copper populations and dispersal corridors. Nor does RPO provide for measures necessary to improve the status of the species – special conservation management of Hermes copper populations, habitat, and dispersal corridors. Instead, RPO can only serve to slow the rate of decrease in Hermes populations and habitat loss.

Other natural or manmade factors affecting the continued existence of the Hermes copper

Habitat fragmentation

Fragmentation of Hermes copper populations – urban development, fire, type-conversion, roads, and others – poses a significant threat to the species. Habitat fragmentation reduces the area of original Hermes copper habitat, and isolates populations from one another. Fragmentation also expands edge habitat, resulting in further stress on fragmented or small populations.

Habitat fragmentation is the process where a continuous area of habitat is both reduced in area and divided into two or more fragments (Wilcove et al. 1986; Schonewald-Cox and Buechner 1992; Reed et al. 1996). Habitat specialists like Hermes copper are more vulnerable to extinction than habitat generalists when habitat has been degraded and fragmented (Sarre *et al.* 1995, Fischer and Stocklin 1997, Henein *et al.* 1998). The likelihood of habitat specialists locating suitable habitat are much less than those of habitat generalists that are capable of inhabiting a variety of habitat types.

Habitat fragmentation also establishes barriers to normal dispersal and colonization processes when intervening habitat is degraded and unusable to individuals of a particular species. Habitat fragmentation-induced isolation of populations reduces the likelihood that immigrants from other populations will re-colonize adjacent, extirpated populations (Bleich et al. 1990).

Habitat fragmentation also changes the micro-environment at the fragment edge. Important edge effects include microclimatic changes in light, temperature, wind, humidity, and incidence of fire (Schelhas and Greenberg 1996; Laurance and Bierregaard 1997). Increased wind, lower humidity, and higher temperatures increase the likelihood of fire. Habitat fragmentation also increases the vulnerability of fragments to invasion by exotic and native pest species. Habitat fragment edges provide high-energy, high-nutrient, disturbed environments where pest plant and animal species can increase in numbers and then disperse into the interior of the fragment (Janzen 1983; Paton 1994).

The U.S. Fish and Wildlife Service (1996) has summarized the effects of habitat fragmentation on the Hermes copper.

... the potential loss of dispersal corridors and habitat fragmentation by residential and commercial development, and road and highway construction may further isolate certain colonies. Isolation increases the chances for inbreeding depression by preventing individuals from moving among colonies and eliminates exploratory and colonizing movements into new or formerly occupied habitat.

Vulnerability of small and isolated populations

Endemic species like Hermes copper are generally considered more prone to extinction than widespread species due to their restricted geographic ranges (Rabinowitz 1981). Three common factors increase the vulnerability of small and isolated population to extinction: Demographic fluctuation; environmental stochasticity; reduced genetic diversity.

Demographic fluctuation (i.e. random changes in birth and death rates) can have detrimental effects on a small population where every individual counts (Richter-Dyn and Goel 1972; Lacy and Lindenmayer 1995). Many species' social structure and reproductive functions require a certain density of individuals. For example, many insect species communicate with one another by chemical odors or pheromones. As population density decreases, chances decrease that an insect's chemical message will reach a potential mate, and reproductive rates may decline. Similarly, as individual plants in a population become more rare, and become distributed further apart from one another, pollination becomes less likely (Santos and Telleria 1994).

Environmental stochasticity can also have a lasting effect on a population's viability. Environmental stochasticity is caused by random changes in weather and food supply. A single natural disaster like a fire, flood, or drought can eliminate all the individuals in a population confined to a small area.

A small population and isolation suggest that Hermes copper populations are subject to genetic drift and restricted gene flow that may decrease genetic variability over time and could adversely affect the species' viability. Hermes copper could be exposed to a number of harmful genetic effects, including inbreeding depression and loss of evolutionary flexibility. Inbreeding is characterized by higher mortality of offspring, fewer offspring, or offspring that are weak,

sterile, or have low mating success (Ralls et al. 1988). Loss of genetic variability in a small population may limit its ability to respond to new conditions and long-term changes in the environment – pollution, new diseases, global climate change (Allendorf and Leary 1986; Falk and Holsinger 1991). The tendency of small populations to decline toward extinction as a result of these factors has been likened to a vortex. Once caught in the vortex, it is difficult for a species to resist the pull toward extinction (Gilpin and Soule 1986).

Global climate change

Butterflies are particularly sensitive to small changes in microclimates, such as fluctuations in moisture, temperature, or sunlight (Raloff, 1996). Studies of Edith's checkerspot (*E. chalcedona edithi*) have confirmed speculations that whole ecosystems may move northward or shift elevationally as the Earth's climate warms.

The Uncompahgre fritillary butterfly (*Boloria acronema*) in Colorado is restricted to the coolest, moistest habitat available in the southern latitudes it inhabits. The hot dry summers of the 1980's were reportedly devastating for this federally threatened species (Mlot, 1991). These examples suggest that other specialized butterfly species like Hermes copper may suffer similar harm from climate change.

Delayed protection

Hermes copper has never received formal Endangered Species Act protection despite over 20 years of official knowledge of the species' perilous status. Over these years, the species has suffered significant harm that may otherwise have been prevented with formal listing protection.

Hermes copper was recognized as a category 2 candidate for listing by the U.S. Fish and Wildlife Service since at least 1984 and maintained on subsequent candidate lists (U.S. Fish and Wildlife Service 1984; 1989; 1991; 1994). The Service took no action to list the species as endangered despite continuing population losses and habitat fragmentation to urban development and fire. Worse, the species' candidacy was removed when the agency unilaterally abolished the category 2 candidates list in 1996 (U.S. Fish and Wildlife Service).

The San Diego Biodiversity Project submitted a petition to list Hermes copper as an endangered species under the Endangered Species Act in May 1991 (Hogan 1991). The Service rejected the petition on a cynical technicality in 1993, alleging that the petition lacked necessary substantial information while simultaneously acknowledging the agency actually already possessed the missing information (U.S. Fish and Wildlife Service 1993).

Despite the Service's negative conclusion on the petition, the agency nevertheless concluded that listing Hermes copper as endangered may be warranted, and promised to conduct a status review. However, a Freedom of Information Act request to the Service in 2004 revealed no evidence of any status review for the species. The Service has apparently taken no further action to protect Hermes copper despite years of concern over its conservation status, the availability of substantial information in support of listing, and a well-documented and significant trend toward extinction.

VI. CRITICAL HABITAT

The Service should designate critical habitat for Hermes copper concurrent with ESA listing as an endangered species for a number of reasons.

Critical habitat is clearly required at the time of a species listing, according to the ESA. 16 U.S.C. § 1533(a)(3).

Critical habitat also provides very significant conservation benefits for listed species like Hermes copper. Critical habitat is an essential tool for species recovery because it mandates a higher habitat conservation standard during section 7 consultations, and because it provides detailed, practical guidance on the location of areas essential to the conservation of listed species. Critical habitat will assist the Army Corps of Engineers, Federal Emergency Management Agency, Forest Service, Fish and Wildlife Service, and other agencies in identifying and adjusting necessary management activities in and around Hermes copper habitat, including limits on urban development, fire suppression, and others.

Critical habitat has proven to be a very effective conservation tool: species with critical habitat are less likely to be declining, and over twice as likely to be recovering as those without. See Taylor *et al.* (2003); Critical habitat significantly enhances endangered species recovery (attached as Exhibit 1). See also Bush Administration Attacks Endangered Species Act paper (attached as Exhibit 2).

Critical habitat is first and foremost a recovery tool. Recognizing that habitat loss is the primary threat to 85% of all endangered species, Congress amended the ESA in 1978 to require the designation of mapped critical habitat areas for all listed species. Congress envisioned critical habitat as a recovery tool, requiring that it encompass all lands and water essential to the recovery of listed species. Congress clearly intended that critical habitat do more than other sections of the ESA devoted to preventing extinction.

It is the Committee's view that classifying a species as endangered or threatened is only the first step in insuring its survival. Of equal or more importance is the determination of the habitat necessary for that species' continued existence If the protection of endangered and threatened species depends in large measure on the preservation of the species' habitat, then the ultimate effectiveness of the Endangered Species Act will depend on the designation of critical habitat.

See House Committee on Merchant Marine and Fisheries, H.R. Rep. No. 887, 94th Cong. 2nd Sess. at 3 (1976). See also 124 Cong. Rec. S21, 575 (daily ed. July 19, 1978) ("[T]he designation of critical habitat is more important than the designation of an endangered species itself."). The courts have reached similar conclusions.

[T]he designation of critical habitat serves as 'the principal means for conserving an endangered species, by protecting not simply the species, but also the ecosystem upon which the species depends.

See Center for Biological Diversity *et. al. v. Norton*, 240 F. Supp. 2d 1090, 1101 (D. Ariz. 2003) (citation omitted). The court further noted that 14 courts have rejected the Service's

argument that other provisions of the ESA provide equivalent protection to critical habitat. *Id.* at 14. According to the Tenth Circuit,

[C]ritical habitat designations serve to protect species vulnerable to extinction. Without a designated critical habitat, the ESA's requirement that "[e]ach Federal agency shall ... insure that any [of its actions] is not likely to ... result in the destruction or adverse modification of [critical] habitat," 16 U.S.C. § 1536(a)(2), becomes unenforceable. Congress expressed its opinion regarding the importance of critical habitat designations by requiring, with limited exception, a contemporaneous designation of critical habitat at the time of listing a species as either endangered or threatened. See 16 U.S.C. § 1533(b)(6)(C). Delaying a decision on the Secretary's duties regarding designation of critical habitat – a designation already 3 ½ years overdue—for over a year more could result in continued and potentially irreparable loss of the [species].

See Forest Guardians v. Babbitt, 174 F.3d 1178, 1185-86 (10th Cir. 1999) (petition for rehearing and rehearing en banc denied).

Designation of critical habitat adds a level of protection not otherwise available to species like Hermes copper threatened by habitat destruction or modification. These species are protected by provisions which apply to all listed species, but are further protected by a set of provisions which apply only to designated critical habitat. According to the Service,

The designation of critical habitat ... is one of several measures available to contribute to the conservation of a species. Critical habitat helps focus conservation activities by identifying areas that contain essential habitat features (primary constituent elements) regardless of whether or not they are currently occupied by the listed species. Such designations alert Federal Agencies, States, the public, and other entities about the importance of an area for the conservation of a listed species. Critical habitat can also identify areas that may require special management or protection. Areas designated as critical habitat receive protection under Section 7 of the Act with regard to actions carried out, funded, or authorized by a Federal Agency

which are likely to adversely modify or destroy critical habitat. The added protection of these areas may shorten the time needed to achieve recovery.

See Determination of critical habitat for the Northern spotted owl (57 Federal Register 1796).

Section 7 of the Endangered Species Act contains two distinct mandates. First, it requires that all federal agencies insure that their actions are "not likely to jeopardize the continued existence of any endangered species or threatened species." Second, it mandates that agencies refrain from taking actions likely to "result in the destruction or adverse modification of habitat" that has been determined by the Secretary of the Interior to be critical. 16 U.S.C. § 1536(a)(2). According to the current definition of "jeopardy," the first mandate prohibits only those actions which threaten the survival of an entire species. In contrast, the ESA defines critical habitat as an area essential to the recovery of a species. Thus, the Section 7 mandate prohibiting destruction or adverse modification of critical habitat forbids any agency actions that are likely to threaten either the survival or the recovery of listed species.

Critical habitat also carries a very valuable, practical educational value. Many agencies actively rely on critical habitat as guidance to conserve listed species. For example, the San Bernardino National Forest and Bureau of Land Management have discontinued grazing in Peninsular bighorn sheep critical habitat. The Bureau of Land Management has scaled back grazing, mining and off-highway vehicle use in desert tortoise critical habitat. The Gila National Forest has discontinued grazing in Southwestern willow flycatcher and loach minnow and spikedace critical habitat, among many other examples.

VII. ECOSYSTEM PROTECTION UNDER THE ESA

The purpose of the ESA, as described by the Act itself, is to "provide a means whereby the ecosystems upon which endangered species and threatened species depend may be conserved..." (16 U.S.C. § 1531(b)). The ESA was specifically intended to prevent the extinction of species such as the Hermes copper, which now faces a high risk of extinction due to the combined threats of urban development, excessive fire, and others.

Moreover, the ecosystem protection dimension of the ESA's purpose was not anomalous or unintentional (Rosmarino 2002). Committee reports leading up to the passage of the Act in 1973 consistently endorsed the ecosystem protection goal. A July 1973 House Report commented that "the ecologists' shorthand phrase 'everything is connected to everything else' is nothing more than cold, hard fact" (H. Rep. 93-412: 6) and a Senate Report similarly indicated that species need to be protected due to their "vital biological services to maintain a 'balance of nature'" (Sen. Rep. 93-307: 2).

In the major subsequent amendments – in 1978, 1982, and 1988 – Congress and the Supreme Court have affirmed this ecosystem protection purpose. In 1978, when the Tellico Dam controversy erupted, pitting a three-inch species of perch against a \$100-million dam, the Supreme Court ruled that a species' value is incalculable, in part, because of the "unforeseeable place such creatures may have in the chain of life on this planet" (Tennessee Valley Authority v. Hiram Hill (437 US 153 (1978)), pp. 178-179). In short, given the possibility of species extinction causing ecosystem collapse and the likelihood that humans may not know about such consequences before they occur, the value of a species is incalculable and no costs should be spared in preventing its extinction (Rosmarino 2002).

In that same year, although under great pressure by economic interests to exclude "insignificant" species from the ESA's protections, Congress held firm to its commitment to prevent any species – charismatic or obscure – from being driven into extinction. In large part, Congress made this choice because of the argument that all species play roles in their native ecosystems. Senate bill manager John Culver (D-IA) stated that all species should be protected due to their participation in a "seamless web of interdependency" (1978 Floor: 21287). Sen. John Chafee (R-RI) similarly articulated the purpose of the Act as two-fold, including ecosystem protection and the conservation of endangered species and argued that charismatic species could not be protected unless one safeguarded "the network of life upon which they depend" (1978 Floor: 21147).

In 1982, Congress chastised the U.S. Fish and Wildlife Service for discrimination against so-called "lower life forms," in listing decisions and was influenced, in part, by the argument that

such discrimination was indefensible on ecological grounds. Scientists in the hearings leading up to the 1982 amendments vociferously criticized taxonomic discrimination, arguing that it violated Aldo Leopold's view that "To keep every cog and wheel is the first precaution of intelligent tinkering" (Leopold 1966). The cogs and wheels of which Leopold spoke were species, and the implicit machine of which they were a part (i.e., the subject of one's tinkering) was the ecosystem. Leopold was metaphorically rebuking the view that any species is insignificant, and his rebuke was made on eco-systemic grounds. Heeding Leopold's metaphor, House Subcommittee Chairman John Breaux (D-LA) explicitly lamented the loss of "'cogs and wheels' of the biological mechanism that sustains life on Earth" on the House Floor (1982 Floor: 12957).

In the most recent set of amendments to the ESA, in 1988, House Subcommittee chairman Gerry Studds (D-MA) endorsed the ecosystem protection purpose of the ESA by quoting John Muir, "[w]henever we try to pick up anything by itself, we find it attached to everything in the universe.'" Sen. John Chafee (R-RI) invoked the same sentiment in the Senate (1988 Floor: 18570-71).

Despite the ecosystem protection purpose of the ESA being a prominent part of the Act's legislative history, at no point has a congressperson questioned the validity of that purpose. Nor has the ESA's purpose been altered, despite attempts to dilute it with human welfare concerns. Under the present terms of the ESA, the ecosystem protection purpose would be served by listing species like the Hermes copper, which is an obligate of high-quality, mature coastal sage scrub and chaparral habitat and a strong indicators of this ecosystem's health.

Recognizing Hermes copper as an endangered species under the ESA would thus further two primary purposes of the law – to prevent the extinction of native species and to protect the ecosystems on which they depend. The Service should therefore provide Hermes copper listing protection as an endangered species and designate critical habitat to protect the ecosystems on which it depends.

VIII. BENEFITS OF ENDANGERED SPECIES ACT PROTECTION

Formal, recognition of Hermes copper as an endangered species and designation of critical habitat should substantially increase available conservation resources and education on the status of the species.

Formal listing protection should compel expanded limits on urban development. Listing should also result in preparation of a recovery plan for Hermes copper by the U.S. Fish and Wildlife Service and increase the availability of funding for recovery activities – improved fire suppression in and around remaining populations, restoration of spiny redberry stands, patrols for unauthorized campfires and arsonists, efforts to increase the number of Hermes copper populations and individuals, and other specific recovery measures.

Increased conservation and education should include improved recognition by responsible agencies – the U.S. Army Corps of Engineers, U.S. Fish and Wildlife Service, U.S. Forest Service, the City and County of San Diego, and others - of the species' perilous status and of the significant threats posed by urban development, fire.

Formal listing protection should also compel and motivate responsible agencies to initiate pro-active conservation activities to benefit Hermes copper, and to insure that any authorized activities – Clean Water Act permits for urban development, CEQA project review, prescribed fire, and others – will not jeopardize the continued existence of the species or adversely modify critical habitat, as required by Section 7 of the Endangered Species Act.

IX. 90-DAY FINDING

Petitioners expect to receive a formal acknowledgement of this petition, expeditious finalization of a formal listing proposal and rule, and designation of critical habitat concurrent with a final rule. Petitioners expect to receive a formal acknowledgment of this petition and a decision within 90 days of its receipt.

X. REFERENCES CITED

Petitioners hereby incorporate by reference every document cited in this petition and/or cited in the References below.

Allendorf, F.W. and R. F. Leary. 1986. Heterozygosity and fitness in natural populations of animals. In M.E. Soule (ed.), *Conservation Biology: The Science of Scarcity and Diversity*, pp 57-76. Sinauer Associates, Sunderland, MA.

Betzler, J., J. Diffendorfer, S. Fleury, M.A. Hawke, M. Klein, S. Morrison, G. Nichols, T. Oberbauer, C. Rochester, MDefault Text + Left: 0", Hanging: 0.25". Webb, and K. Williams. 2003. A summary of affected flora and fauna in the San Diego County fires of 2003. 36 pp.

Bleich, V.C., J.D. Wehausen and S. A. Holl. 1990. Desert-dwelling mountain sheep: Conservation implications of a naturally fragmented distribution. *Conservation Biology* 4: 383-389.

Brooks, M.L., C.M. D'Antonio, D.M. Richardson, J.B. Grace, J.E. Keeley, J.M. DiTomaso, R.J. Hobbs, M. Pellant, and D. Pyke. 2002. Effects of invasive alien plants on fire regimes. *Bioscience* 54(7): 677 – 688.

Brown, J.W. 1991. Sensitive and Declining Butterfly Species (Insecta: Lepidoptera) in San Diego County, California. Dudek and Associates, Inc., Unpublished

Brown *et al.* 1992. *Butterflies of Baja California*.

Brown, J.W., and D.K. Faulkner. 1993. The Hermes Copper, *Lycaena hermes* (Edwards) Conservation Biology of Lycaenidae (Butterflies). The IUCN Species Survival Commission, 120-121 pp.

Brown, J.W., and K. Bash. 2000. The lepidoptera of Marine Corps Air Station Miramar: Calculating faunal similarity among sampling sites and estimating total species richness. *Journal of Reserch on the Lepidoptera*, 36: 45-78

California Department of Fish and Game. 2002. Habitat Management and Monitoring Plan for the Crestridge Ecological Reserve (Draft).

- Comstock, J.A. 1927. *Butterflies of California*. Priv. publ., Los Angeles, California. 172 pp.
- Comstock, J.A. and Dammens, C.M. 1935. *Bull. South Calif. Acad. of Sci.*, 13:33-45.
- 1932. *Bull. South Calif. Acad. of Sci.*, 13:88-100.
- 1935. Notes on the early stages of three butterflies and six moths from California. *Bull. South Calif. Acad. of Sci.*, 34:124-126.
- Couvet, D. 2002. Deleterious effects of restricted gene flow in fragmented populations. *Conservation Biology* 16(2):369-376.
- D'Antonio, C.M., and P.M. Vitousek. 1992. Biological invasions by exotic grasses, the grass/fire cycle, and global change. *Annual Review of Ecology and Systematics*. 23: 63-87.
- Edwards, W.H., Trans. Amer., 1870. Description of a new species of Lepidoptera found within the United States. *Trans Amer. Entomol. Soc.* 3:21.
- Emmel and Emmel, 1973. *The Butterflies of Southern California*.
- Emmel, T.C. 1998. *Systematics of Western North American butterflies*. Mariposa Press, Gainesville, Florida.
- Falk, D. A. and K.E. Holsinger (eds.). 1991. *Genetics and Conservation of Rare Plants*. Oxford University Press, New York.
- Faulkner, D.K. & M. Klein, 2003. San Diego's Sensitive Butterflies A Workshop Focusing on Nine Local Species. Nature Festivals of San Diego County.
- Gilpin, M.E. and M.E. Soule. 1986. Minimum viable populations: Processes of species extinction. In M.E. Soule (ed.), *Conservation Biology: The Science of Scarcity and Diversity*, pp. 19-34. Sinauer Associates, Sunderland, MA.
- Hogan, D. 1991. Letter to Mr. William E. Martin, Acting Regional Director, U.S. Fish and Wildlife Service requesting federal listing protection of the Laguna Mountains skipper, Hermes copper, Dunn's skipper, and Thorne's hairstreak butterflies as endangered species.
- Holland, W. J., 1898. *The Butterfly Book – A Popular Guide to a Knowledge of the Butterflies of North America*.
- Holland, R., Preliminary descriptions of the terrestrial natural communities of California, State of California, Department of Fish and Game, pg.156.
- Howe, W. H., 1975. *Butterflies of North America*.

- Janzen, D. H. 1986. the eternal external threat. *In* M. Soule (ed.), *Conservation Biology: The Science of Scarcity and Diversity*, pp. 286-303. Sinauer Associates, Sunderland, MA.
- Keeley, J.E. C. J. Fotheringham, and M. Morais. 1999. Reexamining fire suppression impacts on brushland fire regimes. *Science* 284: 1829-1832.
- Keeley, J.E. 2001. Fire and invasive species in Mediterranean-climate ecosystems of California. Page 81-94 *In* K.E.M. Galley and T.P. Wilson (eds.). Proceedings of the invasive species workshop: The role of fire in the control and spread of invasive species. Fire Conference 2000: The first national congress on fire ecology, prevention and management. Micellaneous publication No. 11., Tall Timbers Research Station, Tallahassee FL.
- Keeley, J.E., and C.J. Fotheringham. 2003. Impact of past, present, and future fire regimes on North American Mediterranean shrub lands. *In* T.T. Veblen, W.L. Baker, G. Montenegro, and T.W. Swetnam (eds.). *Fire Regimes and Climatic Changes in Temperate Ecosystems of the Western Americas*. Springer-Verlag, New York, NY.
- Kremen, C. 1992. Butterflies as Ecological and Biodiversity Indicators. *Wings* 16(3):14-17. The Xerces Society, Portland, OR. 4828 SE Hawthorne Boulevard, Portland, OR 97215.
- Lacy, R. C. and D. B. Lindenmayer. 1995. A simulation study of the impacts of population subdivision on the mountain brushtail possum *Trichosurus caninus* Ogilby (Phalangeridae: Marsupialia), in south-eastern Australia: Loss of genetic variation within and between subpopulations. *Biological Conservation* 73: 131-142
- Lande, R. 1993. Risks of population extinction from demographic and environmental stochasticity and random catastrophes. *American Naturalist*. 142:911-927.
- Laurace, W.F. and R.O. Bierregaard, Jr. (eds.) 1997. *Tropical Forest Remnants: Ecology, Management and Conservation of Fragmented Communities*. The University of Chicago Press, Chicago.
- Leopold, A. 1966. *A Sand County Almanac*. Ballantine Books, NY. 190 p.
- Marschalek, D.A. 2004. Factors Influencing Population Viability of Hermes Copper (*Lycaena hermes*): Larval Parasitoids, Population Size Estimates, Movement and Dispersal Patterns, and Habitat Characteristics. Master Thesis through San Diego State University.
- Miller, L.D. and Brown, F.M., 1979. A revision of the American coppers (Lepidoptera : Lycaenidae). *Bull. Allyn Mus.* 51:22-23.
- Miller, B., R. Reading, J. Strittholt, C. Carroll, R. Noss, M. Soule, O. Sanchez, J. Terborgh, D. Brightsmith, T. Cheeseman, and D. Foreman. 1998/99. Using focal species in the design of nature reserve networks. *Wild Earth* Winter 1998/99. Pp. 81 – 92.

- Mlot, C. 1991. Extinction by Global Warming? *BioScience* 42 (11).
- Murphy, D.D. 1991. A Report on the California Butterflies Listed as Candidates for Endangered Status by the United States Fish and Wildlife Service. (Abstract: Unpublished).
- Noss, R.F., E.T. LaRoe III and J.M. Scott. 1995. Endangered ecosystems of the United States: a preliminary assessment of loss and degradation. USDI Biological Report 28. 58 p.
- Opler, P.A. and A.D. Warren. 2004. Lepidoptera of North America. 2. Scientific Names List for Butterfly Species of North America, north of Mexico. Contributions to C.P. Gillette Museum of Arthropod Diversity, Colorado State University, Fort Collins, Colo. 81 pages.
- Opler, P.A., 1999. *Pettersson Field Guides - Western Butterflies*.
- Orsak, L.J., 1977. *Butterflies of Orange County*.
- Orwig, T. and D. Schlicht. 1999. The last of the Iowa skippers. *American Butterflies* 7(1):4-12.
- Paton, P.W.C. 1994. The effect of edge on avian nest success: How strong is the evidence? *Conservation Biology* 8: 17-26.
- Petersson, B. 1985. Extinction on an isolated population of the middle-spotted woodpecker *Dendrocopus medius* in Sweden and its relation to genome theories on extinctions. *Biological Conservation* 32:335-353.
- Pratt, G.F., Wright, D.M., 2002. Allozyme Phylogeny of North American Coppers (Lycaeninae: Lycaenidae). *The Pan-Pacific Entomologist* Vol. 78 No. 4 pp. 219-229, Pacific Coast Entomological Society.
- Ralls, K., J. D. Ballou and A. Templeton. 1988. Estimates of lethal equivalents and the cost of inbreeding in mammals. *Conservation Biology* 2: 185-193.
- Raloff, J. 1996. Butterfly Displacement by Climate Change? *Science News* 150 (9).
- Reed, R. A., J. Johnson-Barnard and W.L. Baker. 1996. Contribution of roads to forest fragmentation in the Rocky Mountains. *Conservation Biology* 10: 1098-1107.
- Richter-Dyn, N. and N.S. Goel. 1972. On the extinction of a colonizing species. *Population Biology* 3: 406-433.
- Rosmarino, N. J. 2002. Endangered Species Act Under Fire: Controversies, Science, Values, & the Law. Ph.D. Dissertation, University of Colorado at Boulder. 497 pp.
- Ruggiero, L.F., G.D. Hayward, J.R. Squires. 1994. Viability analysis in biological evaluations: concepts of population viability analysis, biological population, and ecological scale. *Conservation Biology* 8(2):364-372.

- Santos, T and J.L. Telleria. 1994. Influence of forest fragmentation on seed consumption and dispersal of Spanish juniper *Juniperus thurifera*. *Biological Conservation* 70: 129-134.
- Schelhas, J. and R. Greenberg (eds.). 1996. *Forest Patches in Tropical Landscapes*. Island Press, Washington, D.C.
- Schemske, D.W., and R Lande. 1985. The evolution of self-fertilization and inbreeding depression in plants. II. Empirical observations. *Evolution* 39: 41-52.
- Schonewald-Cox, C.M. and M. Buechner. 1992. Park protection and public roads. In P.L. Fiedler and S.K. Jain (eds.), *Conservation Biology: The Theory and Practice of Nature Conservation, Preservation and Management*, pp. 373-396. Chapman and Hall, New York.
- Thorne, F.T., 1963. The distribution of an endemic butterfly, *Lycaena hermes*. *Journal of Research of Lepidoptera* 2:143-150.
- U.S. Department of the Navy. 1999. Integrated Natural Resources Management Plan for Marine Corps Air Station Miramar.
- U.S. Department of the Navy. 2004. Final Environmental Impact Statement for Military Family Housing in the San Diego Region.
- U.S. Fish and Wildlife Service. 1984. Endangered and Threatened Wildlife and Plants; Notice of Final Decision on Identification of Candidates for Listing as Endangered or Threatened. Federal Register 49: 21664
- U.S. Fish and Wildlife Service. 1989. Endangered and Threatened Wildlife and Plants; Animal Candidate Review for Listing as Endangered or Threatened Species. Federal Register 54: 554.
- U.S. Fish and Wildlife Service. 1991. Endangered and Threatened Wildlife and Plants; Animal Candidate Review for Listing as Endangered or Threatened Species. Federal Register 56: 58804-58830.
- U.S. Fish and Wildlife Service. 1993. Endangered and Threatened Wildlife and Plants; 90-Day Finding for a Petition to List Four California Butterflies as Endangered and Continuation of Status Review. Federal register 58: 38549-38552.
- U.S. Fish and Wildlife Service. 1994. Endangered and Threatened Wildlife and Plants; Animal Candidate Review for Listing as Endangered or Threatened Species. Federal Register 59: 58982
- U.S. Fish and Wildlife Service. 1996. Endangered and Threatened Wildlife and Plants; Notice of Final Decision on Identification of Candidates for Listing as Endangered or Threatened. Federal register 61: 64481-64485.

- WallisDeVries, M.F. 2004. A Quantitative Conservation Approach for the Endangered Butterfly *Maculinea alcon*. *Conservation Biology* 18(2), pages 489-499.
- Wells, M.L., J.F. O'Leary, J. Franklin, J. Michaelsen, and D.E. MacKinsey. 2004. Variations in a regional fire regime related to vegetation type in San Diego County, California (USA). *Landscape Ecology* 19: 139-152.
- Wilcove, D. S., C.H. McLellan and A.P. Dobson. 1986. Habitat fragmentation in the temperate zone. In M. E. Soule (ed.), *Conservation Biology: The Science of Scarcity and Diversity*, pp. 237—256. Sinauer Associates, Sunderland, MA.
- Wright, W.S. 1907. Annotated List of the Diurnal Lepidoptera of San Diego County, Based on Collections during 1906 and 1907. San Diego Society of Natural History.
- 1930. An Annotated List of the Butterflies of San Diego County, California, Transactions of the San Diego Society of Natural History, Vol. VI, No. 1, pp. 1 – 40.
- Zedler, P.H., C.R. Gautier, and G.S. McMaster. 1983. Vegetation change in response to extreme events: The effects of a short interval between fires in California chaparral and coastal scrub. *Ecology* 64(4): 809 - 818.

APPENDIX 1

Forest Service laws, regulations, and policies applicable to sensitive species

In the absence of ESA protection, the Forest Service manages sensitive species in accordance with the broad forest management prescriptions included in the Forest and Rangeland Renewable Resources Planning Act of 1974 (or “RPA”) as amended by the National Forest Management Act of 1976 (NFMA), as well as in the National Forest System Land and Resource Management Planning Regulations issued pursuant to these acts. See 36 CFR Part 219 (Forest Planning Regulations). In addition, the Forest Service has clarified its species management responsibilities in the Forest Service Manual, which contains explanatory guidance for Forest Service personnel.

The RPA and the NFMA do not contain provisions specifically related to endangered species protection. However, the Forest Planning Regulations implement the Forest Service’s obligations under the Endangered Species Act in addition to the RPA and NFMA and so contain a number of provisions related to species conservation, including conservation of species at risk of future listing under the ESA. These regulations emphasize carrying out status assessments of sensitive species, but remain silent on limiting harm from projects or pro-active conservation activities. In particular, 36 CFR §219.20(a)(2)(ii) provides as follows:

Evaluations of species diversity. Evaluations of species diversity must include, as appropriate, assessments of the risks to species viability and the identification of ecological conditions needed to maintain species viability overtime based on the following:

- (A) The viability of each species listed under the Endangered Species Act as threatened, endangered, candidate, and proposed species must be assessed. Individual species assessments must be used for these species.

(B) For all other species, including other species-at-risk and those species for which there is little information, a variety of approaches may be used, including individual species assessments and assessments of focal species or other indicators used as surrogates in the evaluation of ecological conditions needed to maintain species viability.

(C) Except as provided in paragraph (a)(2)(ii)(A) of this section, for species groups that contain many species, assessments of functional, taxonomic, or habitat groups rather than individual species may be appropriate.

(D) In analyzing viability, the extent of information available about species, their habitats, the dynamic nature of ecosystems and the ecological conditions needed to support them must be identified. Species assessments may rely on general conservation principles and expert opinion. When detailed information on species habitat relationships, demographics, genetics, and risk factors is available, that information should be considered.

(Emphasis added.) Also, 36 CFR §219.36 defines “species-at-risk” and “species viability” as follows:

Species-at-risk: Federally listed endangered, threatened, candidate, and proposed species and other species for which loss of viability, including reduction in distribution or abundance, is a concern within the plan area. Other species-at-risk may include sensitive species and state listed species. A species-at-risk also may be selected as a focal species.

Species viability: A species consisting of self-sustaining and interacting populations that are well distributed through the species’ range. Self-sustaining populations are those that are sufficiently abundant and have sufficient diversity to display the array of life history strategies and forms to provide for their long-term persistence and adaptability over time.

(Emphasis added.) The preamble to the final Forest Planning Regulations clarify that the regulations do not define the term “sensitive species,” 65 Fed. Reg. 67565, however, as described below the Forest Service Manual in §2672.11 states that Regional Foresters are responsible for identifying these species.

The Forest Service’s obligations to protect wildlife in general and species-at-risk in particular are further described by a number of policy documents. These policies require maintenance of viable populations and articulate vague limits on activities that might harm sensitive species. However, these policies do not mandate pro-active conservation activities. Overall policy guidance on wildlife management throughout the Department of Agriculture is provided by Policy 9500-4 paragraph 3(a)(1), which states in relevant part:

Habitats for all existing native and desired non-native plants, fish, and wildlife species will be managed to maintain at least viable populations of such species. In achieving this objective, habitat must be provided for the number and distribution of reproductive individuals to ensure the continued existence of a species throughout its geographic range.

Habitat goals for threatened or endangered plants and animals, species with special habitat needs, species in demand for hunting, fishing, and trapping, and for other species as appropriate, will be established and implemented. This will be accomplished through the Forest planning process in response to targets identified in the Forest and Rangeland Renewable Resources Planning Act (RPA) program and public issues and concerns brought up in the planning process, consistent with available resources. Habitat goals will be coordinated with State Comprehensive Plan developed cooperatively under Sikes Act authority and carried out in forest management plans with State cooperators. Monitoring activities will be conducted to determine results in meeting population and habitat goals.

Specific Forest Service policy guidance on threatened, endangered and sensitive species is contained within Chapter 2670 of the Forest Service Manual. The Forest Service Manual contains the following provisions related to sensitive species:

2670.2 - Objectives.

* * *

2670.22 - Sensitive Species.

1. Develop and implement management practices to ensure that species do not become threatened or endangered because of Forest Service actions.
2. Maintain viable populations of all native and desired nonnative wildlife, fish, and plant species in habitats distributed throughout their geographic range on National Forest System lands.
3. Develop and implement management objectives for populations and/or habitat of sensitive species.

2670.3 - Policy.

* * *

2670.32 - Sensitive Species.

1. Assist States in achieving their goals for conservation of endemic species.
2. As part of the National Environmental Policy Act process, review programs and activities, through a biological evaluation, to determine their potential effect on sensitive species.
3. Avoid or minimize impacts to species whose viability has been identified as a concern.
4. If impacts cannot be avoided, analyze the significance of potential adverse effects on the population or its habitat within the area of concern and on the species as a whole. (The line officer, with project approval authority, makes the decision to allow or disallow impact, but the decision must not result in loss of species viability or create significant trends toward Federal listing.)
5. Establish management objectives in cooperation with the States when projects on National Forest System lands may have a significant effect on sensitive species

population numbers or distributions. Establish objectives for Federal candidate species, in cooperation with the FWS or NMFS and the States.

2670.5 - Definitions.

* * *

19. Sensitive Species. Those plant and animal species identified by a Regional Forester for which population viability is a concern, as evidenced by:

- a. Significant current or predicted downward trends in population numbers or density.
- b. Significant current or predicted downward trends in habitat capability that would reduce a species' existing distribution.

2672 - PLANNING FOR MANAGEMENT AND RECOVERY.

2672.1 - Sensitive Species Management. Sensitive species of native plant and animal species must receive special management emphasis to ensure their viability and to preclude trends toward endangerment that would result in the need for Federal listing.

There must be no impacts to sensitive species without an analysis of the significance of adverse effects on the populations, its habitat, and on the viability of the species as a whole. It is essential to establish population viability objectives when making decisions that would significantly reduce sensitive species numbers.

2672.11 - Identification of Sensitive Species. Regional Foresters shall identify sensitive species occurring within the Region. They shall examine the following sources as possible candidates for listing as sensitive species:

1. Fish and Wildlife Service or National Marine Fisheries Service candidates for Federal listing (categories 1 and 2) under Federal Register Notice of Review.
2. State lists of endangered, threatened, rare, endemic, unique, or vanishing species, especially those listed as threatened under State law.
3. Other sources as appropriate in order to focus conservation management strategies and to avert the need for Federal or State listing as a result of National Forest management activities.

2672.12 - Conservation Agreements. Regional Foresters, in cooperation with the Fish and Wildlife Service (FWS), shall identify sensitive species that qualify for conservation agreements. Such agreements provide the Forest Service an opportunity to take the initiative in removing any threats to FWS "Federal candidate species," so that they no longer qualify under the Endangered Species Act criteria for formal listing as threatened or endangered. The FWS has developed policy, criteria, and a sample format to assist in developing conservation agreements.

* * *

2672.32 - Forest Plan Objectives for Sensitive Species. For sensitive species, include objectives in Forest plans to ensure viable populations throughout their geographic ranges. Once the objectives are accomplished and viability is no longer a concern, species shall not have "sensitive" status.

2673 - TAKINGS

* * *

2673.2 - Sensitive Species

1. Wildlife and Fish. The Forest Service shall cooperate with States in their enforcement of State laws that protect wildlife species from illegal taking. All permits for taking are issued under the authority of State law. The Forest Service shall aid enforcement for protection of species in Convention on International Trade in

Endangered Species appendixes, State-listed species, and other species protected under State law (Lacey Act amendments of 1981).

APPENDIX 2

Critique of the San Diego MSCP County of San Diego Subarea Plan

Introduction

The San Diego Multiple Species Conservation Program has significant potential to apply meaningful conservation ecosystem planning over a broad area of San Diego County. Yet a number of problems have limited the ability of the program to achieve this vision. These problems reduce the County's ability to minimize and mitigate impacts on covered species to the maximum extent practicable, and to ensure that the program will not reduce the likelihood of survival and recovery of covered species in the wild.

The following sections address a number of these problems. These comments are intended in the spirit of cooperation and constructive criticism, and we hope any errors will be brought to our attention. The MSCP is an excellent concept and should be improved so as to reach its full potential.

a. **Long-term MSCP funding is not assured**

Of all the deficiencies of the South County subarea plan, the lack of assured, long-term MSCP funding is perhaps the most significant. The majority of long-term preserve acquisition and conservation management costs were to be covered by a regional funding program and state and federal contributions, according to the South County subarea plan, MSCP plan and other documents.¹ Yet none of these funding sources should be considered assured consistent with those required by the Endangered Species Act.

A regional funding source that may or may not be approved by voters or by other means at some date after approval of the plan is not an assured funding source by any stretch of the imagination. The same is true for state or federal agency budgets or grants.

¹ See MSCP plan section 7 at 7-2 and 7.2.1 at 7-5 through 7-8, and implementing agreement section 11.2 C. at 33 through 34 for discussion of the regional funding source. See also MSCP plan section 7.5 at 7-26 through 7-27, and implementing agreement section 15 at 40 through 41 for discussion of state and federal funding contributions.

The federal anti-deficiency act expressly prohibits federal agency funding commitments absent congressional budget approval.

The long-term regional funding program was to be established within 3 years of approval of the MSCP. But no regional funding program has been established to date, 5 years after program approval. County conservation activities, and especially conservation management activities on preserved land will continue to be limited by insufficient funding.

The absence of a regional funding program is likely to result in significant harm to species and habitats covered by the South County subarea plan. For example, as much as 22,450 acres might never receive essential conservation management because the County is only required to manage these lands dedicated through the development process after approval of the regional funding program according to the implementing agreement,² and because the biological mitigation ordinance contains no provision for conservation management financial contributions by property owners. Also, a number of County-owned lands preserved at the time of plan approval and counted towards total land preservation obligations still lack area-specific management directives, presumably the result of funding deficiencies.

b. The rarest covered species are not provided necessary conservation

The rarest covered species³ suffer from a number of flaws in the South County subarea plan. These species' rarity means they suffer disproportionate harm from general problems discussed elsewhere in this letter (e.g. inadequate conservation management,

² Implementing agreement section 10.4 at 26, “. . . application of the Biological Mitigation Ordinance and the criteria in the Subarea Plan are expected to result in 22,450 acres of preserved land.” See also *Id.* section 10.9 C, “The County shall ensure the management of lands described in this paragraph 10.9 C. . . . pending sufficient funding from the regional funding source . . .” emphasis added.

³ The rarest species covered by the South County subarea plan include those identified in attachments C, D, and E of the biological mitigation ordinance, for the purpose of this discussion.

limited assured program funding, etc.). The plan’s special management measures for these species are also inadequate to ensure conservation.

The MSCP plan contained an important commitment – all vernal pools and narrow endemic species were to be avoided to the maximum extent practicable. According to the plan:

For vernal pools and narrow endemic species, the jurisdictions and other participants will specify measures in their subarea plans to ensure that impacts to these resources are avoided to the maximum extent practicable.⁴

This commitment – referred to hereafter as the “avoidance standard” – was absolutely essential to show that impacts to the rarest covered species would be minimized and mitigated to the maximum extent practicable, and to ensure that the program would not reduce the likelihood of survival and recovery of these species in the wild, consistent with Endangered Species Act requirements.

The County deserves praise for extending the avoidance standard in the South County subarea plan to a much longer list of narrow endemic species than that presented in the MSCP plan, as well as to Sensitive Plant Species. Unfortunately, the South County subarea plan contains flaws undermining the extent of protections provided by the avoidance standard.

Article VII of the biological mitigation ordinance and the implementing agreement require avoidance to the maximum extent practicable of narrow endemic plant and animal species, sensitive plants, critical populations of sensitive plant species, and vernal pools. Yet the term “avoidance to the maximum extent practicable” is never defined, thereby greatly reducing its effectiveness. The ordinance also provides a 20% allowable impact percentage for Narrow Endemic Plant Species and Sensitive Plant Species, and a

⁴ MSCP plan section 3.3.3. at 3-27.

provision that projects may alternatively be designed “to avoid any significant reduction in [Narrow Endemic Animal] species viability.” These provisions undermine the avoidance standard in the absence of details specifying when exemptions from the standard may be appropriate, such as in cases where the avoidance standard will preclude essential public health and safety projects, a minimum constitutional property use, and biologically superior alternatives.

The subarea plan contains a number of other exemptions undermining the effectiveness of the avoidance standard and limiting protections for the rarest species. Examples of these exemptions and others are provided below and together illustrate a potentially significant departure from the avoidance standard envisioned in the South County subarea plan and MSCP plan.

- Article III(A)(8) of the biological mitigation ordinance exempts brushing and clearing of properties under 10 acres with a dwelling unit from this standard.
- Articles III(A)9 and 10 provide exemptions for recreational and other undefined “essential” facilities and sand, gravel or mineral extraction projects from the avoidance standard for wetlands, including vernal pools, if these do not contain narrow endemic species and others.
- Article III(A)11 exempts agricultural clearing outside of flood plains.
- Article III(A)(12) exempts clearing of up to 2 acres or 5 acres (plus additional clearing as necessary for fire safety) on parcels less than 10 acres zoned for single family residential uses inside or outside of the Pre-Approved Mitigation Area, respectively.
- Article VII requires avoidance of vernal pools yet inexplicably excludes other important wetlands.

A closely related South County subarea plan flaw is found in the biological mitigation ordinance where County staff can only require surveys for sensitive species when “a site is likely to support Sensitive Species.”⁵ This is an unreasonably high threshold for necessary surveys. Science-based indicators of a species’ presence such as soils, vegetation community, and location would provide a sound regulatory trigger for Sensitive Species surveys. Such criteria would increase the likelihood of discovery of new populations of the rarest species, remove potential inadvertent County staff bias, and reduce the opportunity of property owners to allege arbitrary County decision making.

The rarest covered species in the South County subarea also suffer for lack of promised area-specific management directives for existing protected areas and necessary management funding, as discussed above and below. Area-specific management directives will provide crucial details for management of specific populations of the rarest covered species, and the continuing absence of these suggests a significant failure to fully conserve the rarest species.

c. Mitigation outside of Pre-Approved Mitigation Areas produces a fragmented preserve system

One of the primary goals of the MSCP plan is preservation of a viable and interconnected preserve system. According to the MSCP plan,

The MSCP preserve system will replace the currently fragmented, project-by-project biological mitigation areas, which by themselves do not contribute adequately to the continued existence of sensitive species or to maintenance of natural biodiversity.⁶

One of the goals of the plan is also to “Preserve as much of the core biological resource areas and linkages as possible.”⁷ The MSCP plan Multi-Habitat Planning Area

⁵ See biological mitigation ordinance Article IV.A. at 7, emphasis added.

⁶ MSCP plan section 1.1 at 1-1.

⁷ *Id.* section 3.0 at 3-1.

inside the City of San Diego, and the County's Pre-approved Mitigation Areas encompass many of these core resource areas and linkages.

Yet the South County plan and biological mitigation ordinance inexplicably undermine these goals when they allow mitigation outside of Biological Resource Core Areas.⁸ Higher ratios may discourage mitigation outside of core areas, but non-core mitigation acquisition is likely to occur, and each instance is a missed opportunity to contribute to a consolidated and viable preserve system. There may be some limited circumstances where mitigation outside of core areas might be appropriate (e.g. for conservation of narrow endemic species), but these should be limited exceptions to a general rule that mitigation should always occur inside core areas. County data showing the location of mitigation lands acquired since South County subarea plan approval may shed light on the extent and significance of this problem.

d. Conservation management and monitoring plans may never be prepared for many MSCP preserve areas

The U.S. Fish and Wildlife Service's approval of the South County subarea plan was primarily conditioned on the County's commitment to permanently preserve roughly 101,268 acres. 44,988 acres were already set-aside on County and private land at the time of plan approval,⁹ and 41,300 acres were to be protected through acquisition by the County and others, and County regulations.¹⁰

But acquisitions and set-asides are only one step towards land preservation. Maintenance of covered species populations and other MSCP ecological values is virtually impossible in this urbanizing landscape absent permanent and active conservation management.

⁸ Biological mitigation ordinance Article VI.A.4. at 10 and Attachment M.

⁹ Implementing agreement section 10.3 at 26.

¹⁰ *Id.* section 10.4 at 26. This 41,300 acres includes the 18,850 acres to be acquired with federal, state and local public funds, and 22,450 acres to be preserved through application of the biological mitigation ordinance.

Despite this, an enormous 24,268 acres of private lands already set-aside at the time of subarea plan approval¹¹ will likely never receive necessary conservation management due to implementing agreement limits on the County's responsibility to manage these lands.¹² Thousands of additional acres – as much as 22,450 acres – might never receive conservation management absent a regional MSCP funding source because the implementing agreement conditions management of these areas on the regional funding source,¹³ and because the biological mitigation ordinance contains no provision for property owner contributions to conservation management.

Other lands that were in fact intended to receive conservation management¹⁴ appear never to have received this management. Of particular concern is the apparent continuing lack of area-specific management directives for many existing protected County lands counted towards the preservation totals at the time of South County subarea plan approval.¹⁵ Firm schedules are also apparently lacking for preparation of area-specific management directives for these existing County lands and others preserved since South County subarea plan approval. A number of covered species populations are found in areas owned by the County, but lack necessary area-specific management directives

¹¹ *Id.* section 10.3 at 26.

¹² *Id.* section 10.9 at 31. Private land protected at the time of approval of the South County subarea plan is apparently not subject to implementing agreement preserve management requirements. U.S. Fish and Wildlife Service staff have stated that the County will not receive credit towards its total North County subarea land preservation obligation for private land where management access has not been granted. Management access will be granted for MSCP open space lacking County rights to access will not be credited towards the County's total land preservation obligation under the North County subarea plan.

¹³ *Id.* section 10.9 C. at 31.

¹⁴ See South County subarea plan section 1.7 at 1-18 through 1-19. See also implementing agreement section 10.10 at 31 through 32.

¹⁵ Implementing agreement section 10.3 at 26. 5,461 acres of “currently preserved lands” were in County ownership at the time of South County subarea plan approval.

identified in the biological goals and objectives document and MSCP plan Table 3-5.¹⁶ These areas include the McGinty Mountain Park, Sweetwater Regional Park, El Capitan Preserve, Oakoasis Preserve, and Sycamore Canyon Open Space Preserve.

e. Preserve management costs are underestimated

The cost of preserve management in the unincorporated County was estimated at an average of \$37 per acre per year, according to the MSCP plan. This figure was apparently based on County natural open space management expenditures at the time of plan preparation.¹⁷

It appears as if the estimate of \$37 per acre per year was significantly lower than the actual amount necessary to ensure conservation management of preserved land, as suggested by the number of “preserved” areas lacking area-specific management directives, among other indicators. This estimate may have been flawed as a result of focusing analysis of expenditures on underfunded preserve areas at the time of plan preparation instead of cataloguing actual conservation management needs.

A recent open space management plan funding analysis conducted by the Center for Natural Lands Management on behalf of the City of Carlsbad for the Carlsbad Habitat Management Plan estimated costs at approximately \$167 per acre per year. This analysis may provide a more accurate assessment of the costs of conservation management in the highly fragmented North County subarea.

f. Important biological goals and objectives are not reflected in the South County subarea plan

¹⁶ MSCP plan at 3-32 through 3-92.

¹⁷ MSCP plan section 7.3.2. at 7-17.

The MSCP plan contains a number of biological goals and objectives,¹⁸ yet many of these are not reflected in South County subarea plan implementing details.

In just one example, the biological goals and objectives document recommends that studies be carried out to identify viable habitat and populations of coastal cactus wrens, that populations be stabilized, maintained, and increased through protection of breeding populations, removal of threats and impacts, and habitat enhancement and restoration.¹⁹ Yet the MSCP plan and South County subarea plan contain no provisions for carrying out studies of cactus wren population viability, the County's pre-approved mitigation areas exclude at least 2 "major populations" identified in the MSCP plan at Sweetwater Regional Park and Lake Jennings, the biological mitigation ordinance doesn't define "avoidance" of cactus wren populations and allows some ill-defined impacts, and conservation management may never occur at cactus wren populations depending on their location and approval of regional funding.

g. Contingency funding and contingency management planning are not addressed

The County must meet certain habitat protection goals through acquisition and regulation, and provide or ensure conservation management for some preserved areas, according to the South County subarea plan. Yet the plan does not appear to contain any provisions for contingency funding or management planning in the event of foreseeable harm that might occur to covered species.

There are any number of foreseeable scenarios whereby the County should have included commitments of contingency funding or conservation management in the South County subarea plan. For example, what if recent fires or fire-fighting activities destroy a critical covered plant species population? Will the County bank seed from these critical

¹⁸ *Id.* Appendix A-9, Biological Goals, Standards, and Guidelines for Multiple Species Preserve Design.

¹⁹ Biological goals and objectives document Policy 4.31 at A-9-115.

populations for safekeeping in the event of harm? Will the County attempt to re-contour and re-plant a critical population on a hillside scarred by a fire-fighting bulldozer blade? Will the County weed around the seeded area to facilitate recovery? If the answer to these questions is yes, how will the County pay for this expensive, intensive management?

In another example, what if the California Department of Transportation elects to construct a new north-south freeway east of Interstate 15 through Pre-approved Mitigation Areas and Sycamore Canyon Open Space Preserve and Goodan Ranch County Park? What if Caltrans determines that impacts to biological resources cannot be mitigated to below a level of significance?

In fact, a situation similar to this has already occurred with Caltrans and a private developer's planned 125 toll-road. Coverage for the Coastal cactus wren under the South County subarea plan is conditioned on avoidance of major cactus wren populations and conservation management of all protected areas. The toll-road will destroy a major population inside the County's Sweetwater Regional Park, and toll-road agencies will not mitigate impacts to below a level of significance given the extremely imperiled status of the species. Yet the South County subarea plan contains no contingency funding or planning to respond to this corresponding increased obligation to protect cactus wrens in order to maintain the legitimacy of coverage for this species.

Ultimately, the County should not rely on the good will of other agencies to implement its own Endangered Species Act Section 10 obligations as reflected in the South County subarea plan. Nor should the County be exempt from provision of additional conservation measures to meet subarea plan commitments when other agencies' mitigation measures for harmful projects fall short of those required by the subarea plan. The County must therefore provide contingency funding and planning in the event additional land acquisition, management or other conservation measures are necessary to mitigate any foreseeable harm.

h. Conservation commensurate with harm is not assured

The South County subarea plan requires specific total habitat protection goals and identifies a need for conservation management. Some of the total habitat protection goals will be accomplished through mitigation as a condition of future project approvals. Yet the subarea plan appears to neglect measures necessary to ensure that other important conservation activities are carried out at the same time as harm to covered species and habitat loss.

Exclusion of conservation management for private lands already protected at the time of subarea plan approval as well as others contributed through development pending a regional funding source is the primary limitation to ensuring conservation commensurate with development harm. Conservation of covered species and habitats generally cannot be assured in the absence of active conservation management, even if lands have been set-aside from development. Conservation should not be considered commensurate with development harm without implementation of conservation management for all lands counted towards the South County subarea plan total land preservation obligation according to a set schedule.

i. Conservation commitments are vague and discretionary, while development assurances are precise and absolute

The South County subarea plan and implementing agreement provide both the County and third party beneficiary property owners with extremely specific and carefully defined “no surprises” assurances against any additional conservation land dedications or funding beyond that contemplated in the plan, among others.²⁰ These clear and binding assurances stand in contrast to the often vague and discretionary language applying to conservation of the covered species and habitats.

²⁰ Implementing agreement section 9 at 12 through 26.

In one example, the South County subarea plan calls for avoidance of a number of the rarest resources “to the maximum extent practicable,”²¹ but never defines the term. In another, the South County subarea plan incorporates by reference MSCP plan Table 3-5 language that 88% of vernal pool habitat will be protected.”²² But a lack of any definition of the term “vernal pool” leaves it unclear whether critical watersheds and buffers are included, and no baseline acreage is provided as a point from which to measure permitted losses. A number of other habitats are protected only by similar vague conservation language and ill-defined allowances for harm.

j. Important MSCP documents were never subject to public review

Several documents containing important details of the South County subarea plan were not distributed for public review and comment prior to plan approval. These include the implementing agreement, Framework Management Plan, area-specific management directives for lands preserved at the time of plan approval, biological opinion, and Section 10 Findings. Some of these documents were prepared long after approval of the program, and some have yet to be prepared. As a result, the public was not provided an opportunity during the formal comment period to determine whether technical MSCP implementation details were consistent with general MSCP plan and South County subarea plan commitments.²³ Many technical implementation details unfortunately are not consistent with general commitments, a deficiency that may have been resolved with more rigorous public review.

²¹ Biological mitigation ordinance Article VII at 10 through 12. See also implementing agreement section 10.8 C., E., and F. at 30 through 31.

²² MSCP plan Table 3-5 at 3-46 and elsewhere. In contrast, the U.S. Fish and Wildlife Service concluded that vernal pool species would not be killed or harmed under the MSCP because vernal pools were to be avoided to the maximum extent practicable. See biological opinion discussion of Riverside and San Diego fairy shrimp at page 111.

²³ See e.g. the discrepancy between South County subarea plan commitments to avoid certain resources to the maximum extent practicable vs. the lack of definition of this term in the implementing agreement and biological mitigation ordinance. See also e.g. subarea plan preserve management commitments vs. implementing agreement exemptions for thousands of acres from preserve management.

k. The prohibition on condemnation precludes necessary conservation

Condemnation of private land for conservation purposes is expressly prohibited under the MSCP.²⁴ This measure limits the County's ability to conserve covered species, especially the rarest covered species, in those circumstances when a property owner claims County regulations remove all constitutional property rights but yet is unwilling to sell the property for conservation at appraised fair market value. Covered species are the automatic losers in the event of this possible scenario, according to this measure.

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²⁴ See South County subarea plan section 1.13 at 1-29. See also MSCP plan section 4.1 at 4-1.