

not provide information indicating how climate change might potentially impact the prairie chub. The prairie chub has persisted for millennia with periods of extreme weather events, such as droughts and floods. If climate change causes more extreme weather events, there is no information to indicate that such events will have a negative impact on the prairie chub. At this time, we lack sufficient certainty to know specifically how climate change will affect the species. We are not aware of any data at an appropriate scale to evaluate habitat or population trends for the prairie chub within its range, make predictions about future trends, or determine whether the species will actually be impacted. Therefore, based on information presented by the petitioner and readily available in our files, we do not consider climate change to be a threat to the species; however, we intend to investigate this factor more thoroughly in our status review of the species.

In summary, we find that the petition, along with information readily available in our files, has not presented substantial information that the prairie chub may warrant listing due to other natural or manmade factors.

### Finding

On the basis of our determination under section 4(b)(3)(A) of the Act, we have determined that the petition presents substantial scientific or commercial information indicating that listing the prairie chub throughout its entire range may be warranted. This finding is based on information provided under factors A and D about the potential threats from altered stream flows and degraded water quality, and inadequacy of existing regulatory mechanisms to protect prairie chubs from altered stream flows or degraded water quality. We determine that the information provided under factors B, C, and E is not substantial. In considering what factors might constitute threats, we must look beyond the mere exposure of the species to the factor to determine whether the species responds to the factor in a way that causes actual impacts to the species. If there is exposure to a factor, but no response, or only a positive response, that factor is not a threat. If there is exposure and the species responds negatively, the factor may be a threat and we then attempt to determine how significant a threat it is. If the threat is significant, it may drive or contribute to the risk of extinction of the species such that the species may warrant listing as threatened or endangered as those terms are defined by the Act. This does not necessarily

require empirical proof of a threat. The combination of exposure and some corroborating evidence of how the species is likely impacted could suffice. The mere identification of factors that could impact a species negatively may not be sufficient to compel a finding that listing may be warranted. The information must contain evidence sufficient to suggest that these factors may be operative threats that act on the species to the point that the species may meet the definition of threatened or endangered under the Act.

Because we have found that the petition presents substantial information indicating that listing the prairie chub may be warranted, we are initiating a status review to determine whether listing the prairie chub as threatened or endangered under the Act is warranted.

The "substantial information" standard for a 90-day finding differs from the Act's "best scientific and commercial data" standard that applies to a status review to determine whether a petitioned action is warranted. A 90-day finding does not constitute a status review under the Act. In a 12-month finding, we will determine whether a petitioned action is warranted after we have completed a thorough status review of the species, which is conducted following a substantial 90-day finding. Because the Act's standards for 90-day and 12-month findings are different, as described above, a substantial 90-day finding does not mean that the 12-month finding will result in a warranted finding.

### References Cited

A complete list of references cited is available on the Internet at <http://www.regulations.gov> and upon request from the Oklahoma Ecological Services Field Office (see **FOR FURTHER INFORMATION CONTACT**).

### Author

The primary author of this notice is the staff of the Oklahoma Ecological Services Field Office (see **FOR FURTHER INFORMATION CONTACT**).

### Authority

The authority for this action is the Endangered Species Act of 1973, as amended (16 U.S.C. 1531 *et seq.*).

Dated: April 4, 2011.

**Rowan W. Gould,**

*Acting Director, U.S. Fish and Wildlife Service.*

[FR Doc. 2011-9089 Filed 4-13-11; 8:45 am]

**BILLING CODE 4310-55-P**

## DEPARTMENT OF THE INTERIOR

### Fish and Wildlife Service

#### 50 CFR Part 17

[Docket No. FWS-R8-ES-2010-0031; MO 92210-0-0008-B2]

### Endangered and Threatened Wildlife and Plants; 12-Month Finding on a Petition To List Hermes Copper Butterfly as Endangered or Threatened

**AGENCY:** Fish and Wildlife Service, Interior.

**ACTION:** Notice of 12-month petition finding.

**SUMMARY:** We, the U.S. Fish and Wildlife Service (Service), announce a 12-month finding on a petition to list Hermes copper butterfly (*Hermelycaena [Lycaena] hermes*) as endangered and to designate critical habitat under the Endangered Species Act of 1973, as amended (Act).

After review of all available scientific and commercial information, we find that listing Hermes copper butterfly as endangered or threatened is warranted. Currently, however, listing Hermes copper butterfly is precluded by higher priority actions to amend the Lists of Endangered and Threatened Wildlife and Plants. Upon publication of this 12-month petition finding, we will add Hermes copper butterfly to our candidate species list. We will develop a proposed rule to list Hermes copper butterfly as our priorities allow. We will make any determination on critical habitat during development of the proposed listing rule. During any interim period, we will address the status of the candidate taxon through our annual Candidate Notice of Review (CNOR).

**DATES:** The finding announced in this document was made on April 14, 2011.

**ADDRESSES:** This finding is available on the Internet at <http://www.regulations.gov> at Docket Number FWS-R8-ES-2010-0031. Supporting documentation we used in preparing this finding is available for public inspection, by appointment, during normal business hours at the Carlsbad Fish and Wildlife Office, U.S. Fish and Wildlife Service, 6010 Hidden Valley Road, Suite 101, Carlsbad, CA 92011. Please submit any new information, materials, comments, or questions concerning this finding to the above internet address or the mailing address listed under **FOR FURTHER INFORMATION CONTACT**.

**FOR FURTHER INFORMATION CONTACT:** Jim Bartel, Field Supervisor, Carlsbad Fish

and Wildlife Office, U.S. Fish and Wildlife Service, 6010 Hidden Valley Road, Suite 101, Carlsbad, CA 92011; by telephone at 760-431-9440; or by facsimile at 760-431-9624. If you use a telecommunications device for the deaf (TDD), please call the Federal Information Relay Service (FIRS) at 800-877-8339.

#### SUPPLEMENTARY INFORMATION:

##### Background

Section 4(b)(3)(B) of the Act (16 U.S.C. 1531 *et seq.*) requires that, for any petition to revise the Federal Lists of Threatened and Endangered Wildlife and Plants that contains substantial scientific or commercial information that listing a species may be warranted, we make a finding within 12 months of the date of receipt of the petition. In this finding, we determine whether the petitioned action is: (a) Not warranted, (b) warranted, or (c) warranted, but immediate proposal of a regulation implementing the petitioned action is precluded by other pending proposals to determine whether species are endangered or threatened, and expeditious progress is being made to add or remove qualified species from the Federal Lists of Endangered and Threatened Wildlife and Plants. Section 4(b)(3)(C) of the Act requires that we treat a petition for which the requested action is found to be warranted but precluded as though resubmitted on the date of such finding, that is, requiring a subsequent finding to be made within 12 months. We must publish these 12-month findings in the **Federal Register**.

##### Previous Federal Actions

On October 26, 2004, we received a petition dated October 25, 2004, from the Center for Biological Diversity (CBD) and David Hogan, requesting that Hermes copper butterfly be listed as endangered under the Act and that critical habitat be designated. Included in the petition was supporting information regarding the species' taxonomy, biology, ecology, historical and current distribution, status of population, and actual and potential threats affecting the species and its habitat.

On August 8, 2006, we published a 90-day finding for Hermes copper butterfly in the **Federal Register** (71 FR 44966). The finding concluded that the petition and information in our files did not present substantial scientific or commercial information indicating that listing Hermes copper butterfly may be warranted. For a detailed history of Federal actions involving Hermes copper butterfly prior to the 2006 90-day finding, please see the August 8,

2006, **Federal Register** finding (71 FR 44966).

On March 17, 2009, CBD and David Hogan filed a complaint for declaratory and injunctive relief challenging the Service's decision not to list Hermes copper butterfly as endangered or threatened under the Act. In a settlement agreement dated October 23, 2009, (Case No. 09-0533 S.D. Cal.), the Service agreed to submit a new 90-day petition finding to the **Federal Register** by May 13, 2010, for Hermes copper butterfly. As part of the settlement agreement, we agreed to evaluate the October 25, 2004, petition filed by CBD and David Hogan, supporting information submitted with the petition, and information available in the Service's files, including information that has become available since the August 8, 2006, publication of the negative 90-day finding (71 FR 44966). If the 90-day finding determined that listing may be warranted, we agreed to submit a 12-month finding for Hermes copper butterfly to the **Federal Register** by April 15, 2011.

On May 4, 2010, we published a 90-day finding in the **Federal Register** (75 FR 23654) that determined listing of Hermes copper butterfly as endangered or threatened may be warranted. This notice constitutes the 12-month finding on the October 25, 2004, petition to list Hermes copper butterfly as endangered.

##### Species Information

It is our intent to discuss only those topics directly relevant to the listing of Hermes copper butterfly under the Act in this 12-month finding. For more information on the taxonomy, biology, and ecology of Hermes copper butterfly, please refer to the 90-day finding published in the **Federal Register** on May 4, 2010 (75 FR 23654). That document is available on the Internet at <http://www.regulations.gov> under docket number FWS-R8-ES-2010-0031.

##### Taxonomy and Species Description

Hermes copper butterfly was first described as *Chrysophanus hermes* by Edwards (1870, p. 21). Scudder (1876, p. 125) placed this species in the genus *Tharsalea* based on the presence of hindwing tails. Freeman (1936, p. 279) placed Hermes copper butterfly in the genus *Lycaena* as *L. hermes* based on the assessment of the male genitalia, finding that *L. hermes* was distinctly a lycaenid and not typical of the other taxa of *Tharsalea*. Miller and Brown (1979, p. 22) erected a monotypic genus to accommodate Hermes copper butterfly as *Hermelycaena hermes*. This segregation appears to be supported by

allozyme data presented by Pratt and Wright (2002, p. 223); although these authors did not recommend separate genus or subgenus placement (Pratt and Wright 2002, p. 225). The broadly based morphological assessment of Miller and Brown (1979) coupled with the more recent allozyme work of Pratt and Wright (2002) support recognition of Hermes copper butterfly as a distinct genus; however, *Lycaena hermes* is the name predominantly used in recent literature (Scott 1986, p. 392; Faulkner and Brown 1993, p. 120; Emmel 1998, p. 832; Opler and Warren 2005, p. 22), and we recognize it as such for the purposes of this finding. Any data or information relevant to the taxonomic status of Hermes copper butterfly will be fully addressed in any proposed rule, and as such will be available for public comment. However, there is no question that as a unique species, Hermes copper butterfly is a listable entity under the Act.

Hermes copper butterfly is a small, brightly-colored butterfly approximately 1 to 1.25 inches (2.5 to 3.2 centimeters (cm)) in length, with one tail on the hindwing. On the upperside, the forewing is brown with a yellow or orange area enclosing several black spots, and the hindwing has orange spots that may be merged into a band along the margin. On the underside, the forewing is yellow with four to six black spots, and the hindwing is bright yellow with three to six black spots (USGS 2006). Mean last instar (period between molts) larval body length is 0.6 inches (in) (15 millimeters (mm)) (Ballmer and Pratt 1988, p. 4). Emmel and Emmel (1973, pp. 62, 63) provide a full description of the early stages of the species (eggs, larvae, and pupae).

##### Biology

Females deposit single eggs on *Rhamnus crocea* (spiny redberry) in the early summer, often where a branch splits or on a leaf (Marschalek and Deutschman 2009, p. 401). Eggs overwinter, with larvae reported from mid-April to mid-May (Marschalek and Deutschman 2009, p. 400) followed by pupation on the host plant (Emmel and Emmel 1973, p. 63). Not much is known regarding larval biology, as this life stage is little-studied and extremely difficult to find in the field (Marschalek and Deutschman 2009, pp. 400, 401). Hermes copper butterflies have one flight period (termed univoltine) typically occurring in mid-May to early July, depending on weather conditions and elevation (Marschalek and Deutschman 2008, p. 100; Marschalek and Klein 2010, p. 5). Emergence appears to be influenced by weather;

however this relationship is not well understood. For example, weather conditions in the spring of 2010 were cool and moist and resulted in a late emergence; however, the spring of 2006 was hot and dry and also resulted in a late emergence period (Deutschman *et al.* 2010, p. 4). We have no information regarding the ability of immature life stages to undergo multiple-year diapause (a low metabolic rate resting stage) during years with poor conditions (Deutschman *et al.* 2010, p. 4). Multiple year diapause is rare and can occur in stages more advanced than the egg, such as pupae or larvae, after larvae have fed and accumulated energy reserves (Gullan and Cranston 2010, p. 169, Service 2003, p. 8); it is less likely to occur with Hermes copper butterflies because they overwinter (diapause) as eggs.

Deutschman *et al.* (2010, p. 8) used 145 Amplified Fragment Length Polymorphism (AFLP) markers to estimate fundamental Hermes copper butterfly population genetic parameters (i.e., polymorphism, expected heterozygosity,  $F_{ST}$  values, and private alleles) that allowed them to evaluate the magnitude of genetic differentiation within and among sampled populations, an indicator of dispersal ability (gene flow). The AFLP process was able to detect genetic differences among individuals, even those captured within several meters of each other. Deutschman *et al.* (2010, pp. 8–17) indicated that butterflies can show differentiation even when close in proximity, presumably due to physical barriers. Alternately, butterflies sampled at locations that are not close have shown little differentiation, indicating that butterflies can also disperse long distances under the right conditions. Deutschman *et al.* (2010, pp. 8–17) sampled at one location (Wildwood Glen) before and after a fire and found genetically differentiated groups, indicating that Hermes copper butterfly individuals are capable of movement between populations. Landscape features may enhance or restrict dispersal which overall, may have several implications regarding population structure and dynamics (Deutschman *et al.* 2010, p. 16). Genetic differentiation of individuals from proximal locations could be a result of dispersal barriers, genetic drift, original colonizers, or a combination of factors (Deutschman *et al.* 2010, p. 16). The genetic similarity of widely geographically separate sample locations indicates that recolonization events by females occur at much further distances than implied by previous

studies that suggest most individuals move less than 656 ft (200 m) (Marschalek and Deutschman 2008, p. 102; Marschalek and Klein 2010, p. 7). Deutschman *et al.* (2010, p. 16) noted the majority of genetically similar individuals were territorial males, so it is possible Hermes copper butterfly exhibits sex-biased long-distance dispersal by females, as has been noted for other lycaenids (Robbins and Small 1981, pp. 312–313). In general, Hermes copper butterflies have limited directed movement ability (Marschalek and Klein 2010, p. 1), though lycaenids can be dispersed by the wind (Robbins and Small 1981 p. 312). Deutschman *et al.* (2010, p. 16) analysis also showed the genetic composition of individuals at any location exhibited a high degree of temporal variability, possibly due to biotic (drift, dispersal) and abiotic (landscape, fire regime) influences.

#### Habitat

Hermes copper butterfly inhabits coastal sage scrub and southern mixed chaparral (Marschalek and Deutschman 2008, p. 98). Hermes copper butterfly larvae use only *Rhamnus crocea* as a host plant (Thorne 1963, p. 143; Emmel and Emmel 1973, p. 62). The range of *R. crocea* extends throughout coastal northern California, as far north as San Francisco (Consortium of California Herbaria 2010); however, Hermes copper butterfly has never been documented north of San Diego County (Carlsbad Fish and Wildlife Office (CFWO) GIS database). Therefore, some factor other than host plant availability apparently has historically limited or currently limits the range of the species. Researchers report adults are rarely found far from *R. crocea* (Thorne 1963, p. 143) and take nectar almost exclusively from *Eriogonum fasciculatum* (California buckwheat) (Marschalek and Deutschman 2008, p. 5). The densities of host plants and nectar sources required to support a Hermes copper population are not known. Recent research has not added much to Thorne's (1963, p. 143) basic description of Hermes copper butterfly habitat: "It is very difficult to analyze the complex factors which determine why a certain plant has been successful in a given spot \* \* \* In the case of *Rhamnus crocea*, the only consistent requirement seems to be a well-drained soil of better than average depth, yet not deep enough to support trees. Such soils occur along canyon bottoms and on hillsides with a northern exposure; therefore, it is in these situations that [Hermes copper butterfly] is generally found."

Hermes copper butterflies exhibit a preference for micro-sites within stands of *Rhamnus crocea*, which may be related to temperature because adults become active around 72 degrees Fahrenheit (°F) (22 degrees Celsius (°C)) (Marschalek and Deutschman 2008, p. 5). Marschalek and Deutschman (2008, p. 3) recorded densities of Hermes copper butterflies on paired transects along edges and within the interior of host plant stands in rural areas. Their study indicates that Hermes copper butterfly densities are significantly higher near host plant stand edges than in the interior (Marschalek and Deutschman 2008, p. 102). Adult males have a strong preference for openings in the vegetation, including roads and trails, specifically for the north and west sides of canopy openings (Marschalek and Deutschman 2008, p. 102). These areas capture the first morning light and reach the temperature threshold for activity more quickly than other areas (Deutschman *et al.* 2010, p. 4). Hermes copper butterflies tend to remain inactive under conditions of heavy cloud cover and cooler weather (Marschalek and Deutschman 2008, p. 5). Across all four sites sampled by Marschalek and Deutschman, Hermes copper butterfly presence was positively associated with *Eriogonum fasciculatum*, but negatively associated with *Adenostema fasciculatum* (chamise) (Marschalek and Deutschman 2008, p. 102). Therefore, woody canopy openings with a northern exposure in stands of *R. crocea* and adjacent stands of *Eriogonum fasciculatum* appear to be components of suitable habitat for Hermes copper butterfly.

Marschalek and Klein (2010) studied intra-habitat movement of Hermes copper butterflies using mark-release-recapture techniques. They found the highest median dispersal distance for a given site in a given year was 146 ft (44.5 m), and their maximum recapture distance was 0.7 miles (mi) (1.1 kilometers (km)) (Marschalek and Klein 2010, p. 1). They also found no adult movement across non-habitat areas, such as type-converted grassland or riparian woodland (Marschalek and Klein 2010, p. 6). Hermes copper butterfly is typically relatively sedentary (Marschalek and Klein 2010, p. 1), although winds may aid dispersal (Robbins and Small 1981, p. 312). Studies to date infer that most individuals typically move less than 656 ft. (200 m) (Marschalek and Deutschman 2008, p. 102, Marschalek and Klein 2010, pp. 725–726), supporting the assumption that Hermes copper butterflies are typically sedentary

compared to other butterfly species such as painted ladies—(*Vanessa cardui*). However, as discussed above, genetic research indicates that females may disperse longer distances than males (Deutschman *et al.* 2010, p. 16) contradicting previous methods used such as mark-release-recapture (Marschalek and Deutschman 2008, p. 102) that may not detect the movement of females and over sample territorial males. More information is needed to fully understand movement patterns of Hermes copper butterfly; however, dispersal is likely inhibited by lack of available habitat in many areas (Deutschman *et al.* 2010, p. 17).

#### Range and Population Distribution Status

Hermes copper butterfly is endemic to the southern California region, primarily occurring in San Diego County, California (Thorne 1963, p. 143). All records of Hermes copper butterflies in the United States are within San Diego County, with most occurrences concentrated in the southwest portion of the County (Marschalek and Klein 2010, p. 4). Notable exceptions to the “southwestern distribution pattern” are two old museum specimens collected in north San Diego County, one from the vicinity of the community of Bonsall in 1934, and another from the vicinity of the community of Pala in 1932. Historical data indicate Hermes copper butterflies ranged from the vicinity of the community of Pala, California, in northern San Diego County (CFWO GIS database) to approximately 18 mi (29 km) south of Santo Tomas in Baja California, Mexico, and from Pine Valley in eastern San Diego County to Mira Mesa, Kearny Mesa, and Otay Mesa in western San Diego County (Thorne 1963, pp. 143, 147). They have never been recorded immediately adjacent to the coast, and have not been found east of the western slopes of the Cuyamaca Mountains above approximately 4,264 ft (1,300 m) (Marschalek and Klein 2010, p. 4).

The distribution of Hermes copper butterfly in Mexico is not well-known and researchers have not explored this area (Marschalek and Klein 2010, p. 4). Of the two museum specimens from Mexico, one collected in 1936 was

labeled “12 miles north of Ensenada,” and another collected in 1983 was labeled “Salsipuedes” (Marschalek and Klein 2010, p. 4). Assuming older specimens were usually collected relatively close to roads that existed at the time (Thorne 1963, p. 145), these Mexican locations probably were collected from approximately the same location, which is a popular surf destination known as Salsipuedes, located approximately 12 mi (19 km) north of Ensenada off the Esconica Tijuana-Ensenada (coastal highway to Ensenada). The known distribution in Mexico of *Rhamnus crocea* is relatively contiguous with that in the U.S., extending to approximately 190 mi (312 km) south of the border into Mexico along the western Baja California Peninsula (Little 1976, p. 150). Hermes copper butterflies have been recorded as far south into Mexico as 18 mi (29 km) south of Santo Tomas, which is approximately half the distance of the extent of *Rhamnus crocea*’s Mexican range; (Thorne 1963, p. 143). As stated in our 2006, 90-day finding (71 FR 44969; August 8, 2006), there have been recent discoveries (post-1993) of extant populations within the species’ known historical range in the United States. These include Black Mountain, Crestridge and two populations on the San Diego National Wildlife Refuge. However, there is still uncertainty as to the distribution of Hermes copper butterfly within the known historical range because we have very little information on the status of the species in Mexico.

A species’ range can be defined at varying relevant scales of resolution, from maximum geographic range capturing all areas within the outermost record locations (coarsest scale, hereafter called “known historical range”), to the scale of individual population distributions (finest scale, hereafter called “population distributions”). This concept was discussed by Thorne (1963, p. 143): “However within this range [Hermes copper butterfly] distribution is limited to pockets where the larval food plant occurs, so that the total area where the insect actually flies is probably not more than a fraction of one percent of the maximum area.”

To more precisely determine the historical range of Hermes copper butterfly, we entered all Hermes copper butterfly observation records that had information about collection location in our GIS database, and mapped all observed and museum specimen records with an appropriate level of detail and location description. To better determine the geographic locations of historical Hermes copper butterfly records mapped by Thorne (1963, p. 147), we overlaid a transparent image of his map on Google Earth imagery, and scaled it appropriately to ensure that geographic features and community locations corresponded with those of the imagery. Examination of Thorne’s (1963 p. 147) map expanded the known historical range as described by Deutschman *et al.* (2010, p. 3) to the southeast in the vicinity of the community of Pine Valley and Corte Madera Valley. The resulting known historical range of Hermes copper butterfly within the United States can be described as comprised of a narrow northern portion within the Central Valley and Central Coast ecoregions, north of Los Penasquitos Canyon and Scripps Poway Parkway (latitude midway between the northernmost record location and the international border), and a wider southern portion encompassing the Southern Coast, Southern Valley, and Southern Foothills ecoregions (see Figure 1 and Table 1 below; San Diego County Plant Atlas 2010). Although the distribution of Hermes copper butterfly populations in Mexico is not well understood, United States populations minimally encompass half the species’ known historical latitudinal range. The results of our population distribution analysis indicate areas in the United States most likely to harbor possible extant undiscovered Hermes copper butterfly populations within the known historical range are primarily limited to a relatively narrow area within the southern portion of the range bordered on the north and south by the 2003 Cedar Fire and 2007 Harris Fire perimeters, and on the west and east roughly by Sycuan Peak and Long Valley (see Figure 1 and Table 1 below).

TABLE 1—ALL KNOWN HERMES COPPER BUTTERFLY POPULATIONS IN THE UNITED STATES AND MEXICO

Map No.	Population name (other names)	Last observed	Presumed status	Extant in 2000 *	Fire	Extirpated why?
1 .....	Elfin Forest (Onyx Ridge) .....	2002 .....	Unknown .....	Y	2007	
2 .....	Rancho Santa Fe (Del Dios) .....	2004 .....	Extirpated .....	Y	2007	Fire, Development.
3 .....	Black Mountain .....	2004 .....	Unknown .....	Y		
4 .....	Van Dam Peak (Meadowbrook) .....	2003 .....	Extirpated .....	Y	.....	Isolation (Development).
5 .....	Lopez Canyon .....	2008 .....	Extant .....	Y		

TABLE 1—ALL KNOWN HERMES COPPER BUTTERFLY POPULATIONS IN THE UNITED STATES AND MEXICO—Continued

Map No.	Population name (other names)	Last observed	Presumed status	Extant in 2000 *	Fire	Extirpated why?
6 .....	Sycamore Canyon .....	2003 .....	Extirpated .....	Y	2003	Fire.
7 .....	North Santee (Fanita Ranch) .....	2005 .....	Unknown .....	Y	2003	
8 .....	Mission Trails (Mission Gorge, Mission Dam).	2010 .....	Extant .....	Y	2003	
9 .....	Crestridge .....	2007 .....	Extirpated*** .....	Y	2003	Fire.
10 .....	Anderson Truck Trail .....	2003 .....	Extirpated .....	Y	2003	Fire.
11 .....	Alpine (Wright's Field) .....	2010 .....	Extant .....	Y		
12 .....	North McGinty Mountain .....	2010 .....	Extant .....	Y		
13 .....	South McGinty Mountain .....	2010 .....	Extant .....	Y		
14 .....	Los Montanas .....	2010 .....	Extant .....	Y		
15 .....	Rancho San Diego .....	2009 .....	Extant .....	Y	2007	
16 .....	San Miguel Mountain .....	2006 .....	Extirpated .....	Y	2007	Fire.
17 .....	Rancho Jamul .....	2007 .....	Extirpated .....	Y	2003, 2007	Fire.
18 .....	North Jamul .....	2004 .....	Unknown .....	Y	2003	
19 .....	East McGinty Mountain .....	2001 .....	Unknown .....	Y		
20 .....	Loveland Reservoir .....	2010 .....	Extant .....	Y		
21 .....	Sycuan Peak .....	2010 .....	Extant .....	Y		
22 .....	Skyline Truck Trail (Lawson Valley) .....	2010 .....	Extant .....	Y		
23 .....	Lyons Peak .....	2003 .....	Unknown .....	Y	2007	
24 .....	Hollenbeck Canyon .....	2007 .....	Extirpated .....	Y	2003, 2007	Fire.
25 .....	Dulzura (Near Marron Valley Road) .....	2005 .....	Extirpated .....	Y	2003, 2007	Fire.
26 .....	Lawson Valley (Lawson Peak) .....	2010 .....	Extant .....	Y	2006, 2007	
27 .....	Hidden Glen (Japutal Valley, Lyons Valley Road).	2008 .....	Extant .....	Y		
28 .....	Willows (Viejas Grade Road) .....	2003 .....	Extirpated .....	Y	2003	Fire.
29 .....	North Guatay Mountain .....	2004 .....	Unknown .....	Y	2003	
30 .....	North Descanso (Wildwood Glen, Descanso).	2010 .....	Extant .....	Y	2003	
31 .....	South Descanso (Roberts Ranch) ..	2010 .....	Extant .....	Y	2003	
32 .....	Japutal (Japutal Valley) .....	2009 .....	Extant .....	Y		
33 .....	South Guatay Mountain .....	2008 .....	Extant .....	Y		
34 .....	Hartley Peak (Portrero) .....	2010 .....	Extant .....	Y	2007	
35 .....	Pala .....	1932 .....	Extirpated .....			Unknown.
36 .....	Bonsall .....	1934 .....	Extirpated .....			Unknown.
37 .....	San Elijo Hills (San Marcos Creek, San Elijo Road and Questhaven Road).	1979 .....	Extirpated .....			Development.
38 .....	Lake Hodges .....	1982 .....	Extirpated .....		2007	Fire.
39 .....	Sabre Springs (Poway Road and 395).	2001 .....	Extirpated .....	Y		Development.
40 .....	Miramar .....	1996 .....	Extirpated .....			Development.
41 .....	Mira Mesa .....	Prior to 1963 .....	Extirpated .....			Development.
42 .....	Cowles Mountain (Big Rock Road Park).	1973 .....	Extirpated .....			Isolation.
43 .....	Kearny Mesa .....	1939 .....	Extirpated .....			Development.
44 .....	Mission Valley (Fairmont Canyon, Canyons near Mission Valley).	1908 .....	Extirpated .....			Development.
45 .....	San Diego State University (San Diego State College).	1957 .....	Extirpated .....			Development.
46 .....	El Monte (El Monte Park, El Monte Road).	1960 .....	Extirpated .....			Fire, Development.
47 .....	Pine Valley .....	Pre-1963 .....	Unknown.			
48 .....	Corte Madera .....	Pre-1963 .....	Unknown.			
49 .....	Tecate Peak .....	1980 .....	Extirpated .....		2007	Fire.
50 .....	Deerhorn Valley .....	1970 .....	Extirpated .....		2007	Fire.
51 .....	Dictionary Hill .....	1962 .....	Extirpated .....			Isolation (Development).
52 .....	Otay Mountain (Little Cedar Canyon, Otay foothill).	1979 .....	Extirpated .....		2003, 2007	Fire.
53 .....	South Otay Mesa .....	Pre-1920 .....	Extirpated .....			Development.
54 .....	Salsipuedes (12 miles North of Ensenada)**.	1983 .....	Unknown.			
55 .....	Santo Tomas (18 miles south of Santo Tomas)**.	Pre-1920 .....	Unknown.			
56 .....	South Santee .....	1967 .....	Extirpated .....			Development.
57 .....	North Ensenada (Bajamar)** .....	1936 .....	Unknown.			

\* Populations with last observation prior to 2000 have lower geographic accuracy.

\*\* Map Nos. 54, 55, and 57 are populations in Mexico that are not represented on Figure 1 in this document.

\*\*\* Extirpation was a result of high mortality from fire, followed by reduced population density. Only one male was observed in 2007, and none after that.

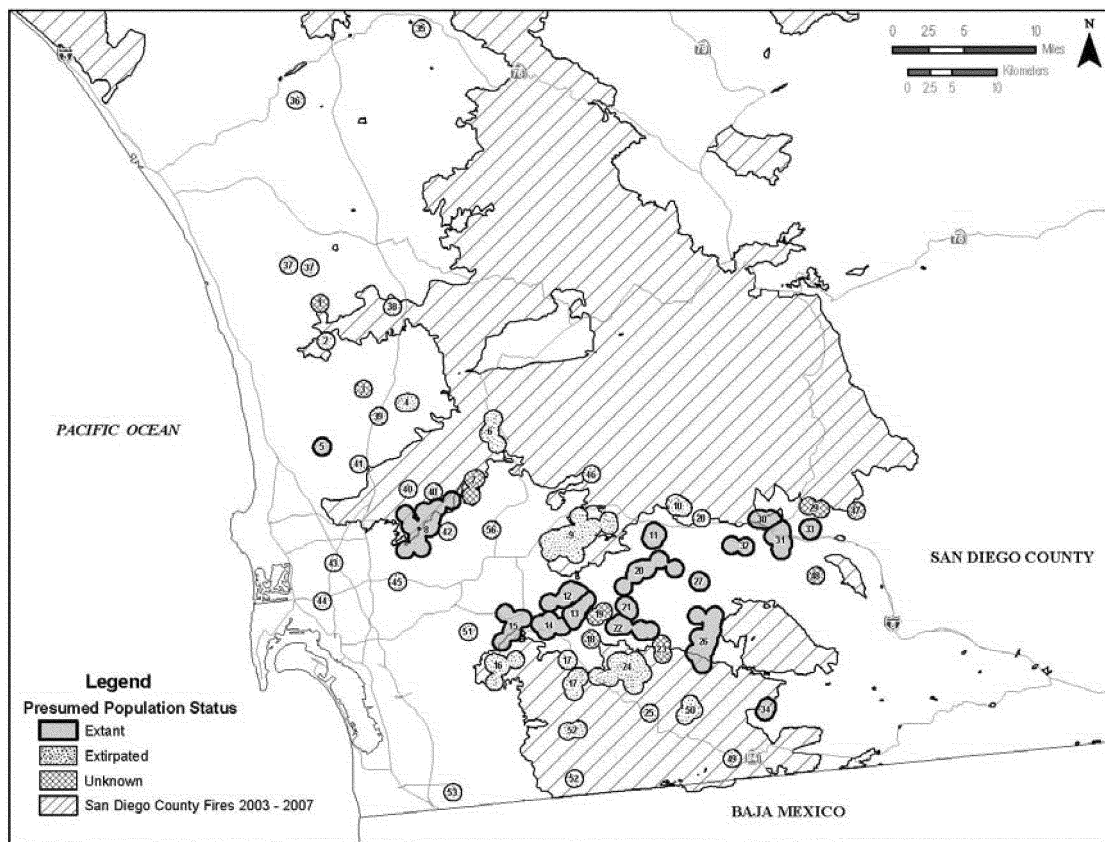


Figure 1. Hermes copper butterfly populations in the United States and their current presumed status.

To evaluate the status of Hermes copper butterfly's current range and populations, we considered all available historical data and recent research results, including record locations (CFWO GIS databases), monitoring data, (Marschalek and Deutschman 2008; Marschalek and Klein 2010), movement data (Marschalek and Deutschman 2009; Marschalek and Klein 2010), and data from a recent distribution study (Deutschman *et al.* 2010). To estimate the geographic population distribution of Hermes copper butterfly, we used all occurrence records and mapped areas within approximately 0.6 mi (1 km) of known observation sites. This distance is greater than the average recapture distance recorded by Marschalek and Klein (2010, p. 1), but just under the maximum recorded recapture distance, an approximate within-population movement distance further supported by Deutschman *et al.*'s (2010, p. 26) genetic data (see *Habitat* section above). Locations within approximately 1.2 mi (2 km) (where 0.6 mi (1 km) movement distances overlapped) were considered part of the same population, unless topographic or genetic information

indicated the possibility of barriers to movement. We used recent fire footprint data and aerial GIS information, in addition to the information referenced above, to determine which Hermes copper butterfly populations may be extant, extirpated, or of unknown status. A Hermes copper population was considered to be "extant" if the species was recorded based on recent survey records and not affected by recent fires. A Hermes copper population was considered to be extirpated if the area had been developed and no habitat remained, a fire footprint encompassed the area and subsequent surveys were negative, or if the record was very old with no recent detections. In some instances, we had no recent information to make a determination on Hermes copper butterfly's current status and it was therefore classified as "unknown." See Figure 1 and Table 1 above for a list of populations and information used to determine population status.

In summarizing the results of our analysis of Hermes copper butterfly's current range and population distributions (see Figure 1 and Table 1 above), we estimated there were at least

57 known separate historical populations throughout the species' range since the species was first described. In the year 2000, 35 populations were thought to be extant. Since that time, 11 populations have been extirpated (2 by development, 1 by fire and development, 8 by fire alone) and 7 are of unknown status. As of 2011, of the 57 known populations, 17 Hermes copper butterfly populations are extant, 28 populations are believed to have been extirpated, and 12 populations are of unknown status. In the northern portion of the range, most remaining suitable habitat is limited to the relatively isolated and fragmented undeveloped lands between the cities of San Marcos, Carlsbad, and Escondido and the community of Rancho Santa Fe, and the habitat "islands" containing the Black Mountain and Van Dam Peak observation locations; however, no new populations have been discovered. In the southern portion of the range, all extant populations except Lopez Canyon and the southern portion of Mission Trails Park (both isolated from other extant populations by development and fire) are within

relatively well-connected undeveloped lands east of the City of El Cajon between the 2003 Cedar Fire and 2007 Harris Fire perimeters (see Figure 1 and Table 1 above). The Mission Trails Park population remains extant even after approximately 74 percent of the population area burned in 2003, presumably because burned areas were recolonized (after host plant and nectar sources regrew) by Hermes copper butterflies from nearby unburned areas. The best information available leads us to conclude that the northern portion of the species' known historical range has contracted or may no longer exist, and we estimate that approximately 27 percent of the populations within the southern portion of the species' known historical U.S. range that were extant in 2000 have been extirpated (see Figure 1 and Table 1 above; Map #s 6, 9, 10, 16, 17, 24, 25, 28). Further investigation is needed to accurately determine the status of Hermes copper butterfly in Mexico (Marschalek and Klein 2010, p. 2). Klein (2010a, p. 1) visited the Salsipuedes location in the first week of June 2005 for approximately 30 minutes. He did not observe any Hermes copper butterflies; however, he described the habitat as having a "decent number of [*Rhamnus crocea*], a large amount of *Eriogonum fasciculatum*," and said he felt the area was "very good" for Hermes copper butterfly (Klein 2010, p. 1).

#### Summary of Information Pertaining to Five Factors

Section 4 of the Act (16 U.S.C. 1533) and implementing regulations (50 CFR part 424) set forth procedures for adding species to, removing species from, or reclassifying species on the Federal Lists of Endangered and Threatened Wildlife and Plants. Under section 4(a)(1) of the Act, a species may be determined to be endangered or threatened based on any of the following five factors:

(A) The present or threatened destruction, modification, or curtailment of its habitat or range;

(B) Overutilization for commercial, recreational, scientific, or educational purposes;

(C) Disease or predation;

(D) The inadequacy of existing regulatory mechanisms; or

(E) Other natural or manmade factors affecting its continued existence.

In making this finding, information pertaining to Hermes copper butterfly in relation to the five factors provided in section 4(a)(1) of the Act is discussed below.

In considering whether a species warrants listing under any of the five

factors, we look beyond the species' exposure to a potential threat or aggregation of threats under any of the factors, and evaluate whether the species responds to those potential threats in a way that causes actual impact to the species. The identification of threats that might impact a species negatively is not sufficient to compel a finding that the species warrants listing. The information must include evidence indicating that the threats are operative and, either singly or in aggregation, affect the status of the species. Threats are significant if they drive, or contribute to, the risk of extinction of the species, such that the species warrants listing as endangered or threatened, as those terms are defined in the Act.

#### Factor A. The Present or Threatened Destruction, Modification, or Curtailment of Its Habitat or Range

Here we describe the primary threats that result in Hermes copper butterfly habitat destruction and modification, describe how those threats interact to cause long-term or permanent range curtailment, and provide an assessment of the likelihood of those threats continuing into the foreseeable future.

##### Development

The current distribution of Hermes copper butterfly habitat in San Diego County is largely due to previous urban development within coastal and interior San Diego County which resulted in the loss and fragmentation of Hermes copper butterfly habitat (CalFlora 2010; Consortium of California Herbaria 2010; San Diego Plant Atlas 2010). Of the 28 known extirpated Hermes copper butterfly populations, loss and fragmentation of habitat as a result of development has contributed to the extirpation of 14 populations (50 percent) (see **Background** section above and, Table 1 above, and Factor E discussion below). Since the year 2000, occupied habitats containing Hermes copper butterfly's host plant, *Rhamnus crocea*, in Rancho Santa Fe and Sabre Springs were lost due to urban development. In the City of San Marcos, one *R. crocea* stand near Jacks Pond was lost to development (Anderson 2010a, pp. 1, 2) and another *R. crocea* stand was significantly reduced in the vicinity of Palomar College (Anderson 2010b, pp. 1, 2). The *R. crocea* stand in Lopez Canyon is currently found within a relatively small preserve (roughly rectangular area 0.4 mi (0.6 km) by 0.5 mi (0.8 km)) that is contiguous with suitable Hermes copper butterfly habitat in Del Mar Mesa where development is ongoing. This stand of *R. crocea* is likely

all that remains of what was once a wider distribution, encompassing the community of Mira Mesa and the western portion of Miramar Naval Air Station (per Thorne's 1963 map, p. 147).

Although a significant amount of habitat has been lost due to development throughout the range of Hermes copper butterfly within the United States, the remaining currently occupied population areas are protected from destruction by development due to their presence on federally owned lands, on lands conserved under regional habitat conservation plans, or on lands subject to local resource protection ordinances in San Diego County (approximately 66 percent of the total area currently occupied by Hermes copper butterfly populations occurs on federal and non-federal conserved lands; see Figure 1 above) and the remaining 34 percent of occupied habitat occurs on lands subject to local resource protection ordinances in San Diego County. Our GIS analysis indicates that of the total conserved area discussed above (66 percent of all occupied areas), approximately 27 percent (encompassing portions of 10 populations) is located within established regional habitat conservation plan preserve lands (see Factor D San Diego Multiple Species Conservation Program (MSCP) discussion below), approximately 38 percent (encompassing portions of 7 populations) falls within U.S. Forest Service lands, and approximately 1 percent (encompassing portions of 3 populations) falls within Bureau of Land Management (BLM) land. These lands are therefore afforded protection from development. Additionally, as described in Factor D below, the County of San Diego now has in place two ordinances that restrict new development or other proposed projects within sensitive habitats. The Biological Mitigation Ordinance of the County of San Diego Subarea Plan (County of San Diego, 1998b, Ord. Nos. 8845, 9246) regulates development within coastal sage scrub and mixed chaparral habitats that currently support portions of 10 extant Hermes copper butterfly populations on non-Federal land within the boundaries of the County's MSCP subarea plan. The County of San Diego Resource Protection Ordinance (County of San Diego 2007) restricts development within coastal sage scrub and mixed chaparral habitats that currently support all extant Hermes copper butterfly populations on non-Federal lands throughout the county. These ordinances provide some regulatory measures of protection for the



remaining 34 percent of extant Hermes copper butterfly habitat throughout the species occupied range. Although past development in occupied Hermes copper butterfly habitat resulted in a substantial number of extirpations of Hermes copper butterfly populations, restrictions are in place to limit development and the corresponding destruction and modification of Hermes copper butterfly habitat in the future. Therefore, we do not believe future development alone will significantly reduce or fragment remaining Hermes copper butterfly habitat on non-federal lands. However, as discussed below under "Habitat Fragmentation," we believe that the combined impacts of existing development, limited future small-scale development, existing dispersal barriers, and megafires could further fragment Hermes copper butterfly habitat and threaten the species. Within U.S. Forest Service lands, we anticipate that future development, if any, will be limited, and the Forest Service has incorporated measures to address threats to Hermes copper butterfly and its habitat as it implements specific activities within forest lands (see Factor D below for additional discussion). The very limited number of Hermes copper butterfly populations within BLM lands are unlikely to face future development pressure. Therefore, we conclude that Hermes copper butterfly is not currently threatened by habitat loss due to future development alone.

#### Wildfire

The historical fire regime in southern California likely was characterized by many small lightning-ignited fires in the summer and a few, infrequent large fires in the fall of varying fire intensity (Keeley and Fotheringham 2003, p. 242–243). These infrequent, large, high-intensity wildfires, so-called "megafires" (greater than 123,553 ac (50,000 ha) in size), burned the landscape long before Europeans settled the Pacific coast (Keeley and Zedler 2009, p. 90). As such, modern fire regimes in southern California "have much in common with historical regimes" (Keeley and Zedler 2009, p. 69). While some researchers claim that the fire regime of chaparral growing in adjacent Baja California is not affected by megafires due to a lack of fire suppression activities (cf. Minnich and Chou 1997, Minnich 2001), Keeley and Zedler (2009, p. 86) believe that the fire regime in Baja California similarly consists of "small fires punctuated at periodic intervals by large fire events." The current fire regime in southern California consists of numerous small fires that are

periodically impacted by megafires that are generally driven by extreme "Santa Ana" weather conditions of high temperatures, low humidity, and strong erratic winds (Keeley and Zedler 2009, p. 90). The primary difference between the current fire regime and historical fire regimes in southern California is that human-induced or anthropogenic ignitions have increased the frequency of fires, and in particular, megafires, far above historical levels. While this change may not have demonstrably affected the nectar sources of Hermes copper butterfly in San Diego County, especially within chaparral (Franklin *et al.* 2004, p. 701), frequent fires open up the landscape, particularly coastal sage scrub, making the habitat more vulnerable to invasive, nonnative plants (Keeley *et al.* 2005, p. 2117). However the primary concern with frequent megafires is the Hermes copper butterfly mortality associated with these extensive and intense events (see Factor E discussion below) which precludes recolonization of burned areas by Hermes copper butterfly.

The significance of this concern can be seen in the current distribution of the species in southern California. Analysis of GIS information indicates approximately 66 percent of the extant occurrences are found within the footprint of the 1970 Laguna Fire, which Minnich and Chou (1997, p. 240) reported last burned in 1920. In contrast, the areas north and south of the extant Hermes copper butterfly occurrences reburned several times between 2001 and 2007 (Keeley *et al.* 2009, pp. 287, 293). We examined maps of current high fire threat areas in San Diego County based on recent reports by the Forest Area Safety Task Force (Jones 2008, p. 1; SANDAG 2010, p. 1). Areas identified as most vulnerable include all occupied and potentially occupied Hermes copper butterfly habitats in San Diego County within the species' known historical range, with the exception of Black Mountain, Van Dam Peak, Lopez Canyon, and the unburned southern portion of Mission Trails Park. In light of the recent spate of drought-influenced wildfires in southern California, especially the 2007 fires, a future megafire affecting most or all of the area burned by the Laguna Fire in 1970 (40-year chaparral) is likely to occur and would pose a significant threat to Hermes copper butterfly in the United States because it would encompass the majority of extant populations (see Factor E below for direct mortality effects discussion).

As described in our August 8, 2006, 90-day finding (71 FR 44966), *Rhamnus crocea* are "obligate resprouters" after

fires and are resilient to frequent burns (Keeley 1998, p. 258). Additionally, although Keeley and Fotheringham (2003, p. 244) indicated that continued habitat disturbance, such as fire, will result in conversion of native shrublands to nonnative grasslands, Keeley (2004, p. 7) also noted that invasive, nonnative plants will not typically displace obligate resprouting plant species in mesic shrublands that burn once every 10 years. Therefore, because *R. crocea* is an obligate resprouter, it will likely recover in those areas that retain this burn frequency. Specific information regarding Hermes copper butterfly's primary nectar source (*Eriogonum fasciculatum* (California buckwheat)) is less understood. *Eriogonum fasciculatum* is a facultative seeder and high proportions of this nectar source are likely killed by fire, and densities are reduced the following year within burned areas (Zedler *et al.* 1983, p. 814); however, *E. fasciculatum* does show minimal resprouting capability (approximately 10 percent) if individuals are young (Keeley 2006, p. 375). The extent of invasion of nonnative plants and type conversion in areas specifically inhabited by Hermes copper butterfly are unknown. However, information clearly indicates that wildfire results in at least temporary reductions in suitable habitat for Hermes copper butterfly and may result in lower densities of *E. fasciculatum* (Zedler *et al.* 1983, p. 814; Keeley 2006, p. 375; Marschalek and Klein 2010, p. 728). In areas where *R. crocea* is capable of resprouting, the quantity of *E. fasciculatum* nectar source necessary to support a persisting Hermes copper butterfly population may be temporarily unavailable due to recent fire impacts. If areas are repeatedly burned, *E. fasciculatum* will not have the time necessary to become reestablished, rendering the habitat unsuitable for Hermes copper butterfly (Marschalek and Klein 2010, p. 728). Increased fire frequency may also pose a threat to Hermes copper butterfly through loss of host plant and nectar source habitat, and fire management plans are not expected to provide protection from megafires such as those that occurred in 2003 and 2007. Based on the above, we consider wildfire, specifically megafires that encompass vast areas and are increasing in frequency, a significant threat to Hermes copper butterfly.

#### Habitat Fragmentation

Habitat fragmentation can result in smaller, more vulnerable Hermes copper butterfly populations (see Factor E discussion below). The presence of suitable habitat on which Hermes



copper butterflies depend often determines the size and range of the local population. Wildfires and past development have caused habitat fragmentation that separates populations and inhibits movement by creating a gap in area that Hermes copper butterflies are not capable of traversing. The connectivity of habitat occupied by a butterfly population is not defined by host plant distribution at the scale of host plant stands or patches, but rather by adult butterfly movement that results in interbreeding (see Service 2003, pp. 22, 162–165). Any loss of resource contiguity on the ground that does not affect butterfly movement, such as burned vegetation, may degrade habitat, but may not fragment habitat. Therefore, in order for habitat to be fragmented, movement must be prevented by a barrier, or the distance between remaining host plants where larvae develop must be greater than adult butterflies will move to mate or deposit eggs. Genetic analysis (Deutschman *et al.* 2010; p. 16) indicates that butterflies can show differentiation even when close in proximity, presumably due to physical barriers that may be a result of development or a landscape feature (i.e., the three McGinty Mountain sites that are on opposite sides of the mountain may be separated by topography). Alternately, sampling locations that are not close have shown little genetic differentiation, indicating that butterflies can also disperse long distances under the right conditions. Sampling at one location before and after a fire found genetically differentiated groups. Deutschman *et al.* (2010, p. 16) concluded their findings supported the idea that Hermes copper butterfly individuals are capable of long-distance movement, but developed areas and natural landscape features may enhance or restrict dispersal. It is important to note that although movement may be possible, the habitat must be suitable at the time Hermes copper butterflies arrive to ensure successful recolonization.

As described in our 90-day finding published in 2010 (75 FR 23658, May 4, 2010) Hermes copper butterfly habitat has become fragmented by both past urban development (permanently) and wildfires. Comparison of Hermes copper butterfly occurrences and host plant distribution with mapped wildfire perimeters indicates that wildfires cause short-term fragmentation of habitat, and, historically, Hermes copper butterfly habitat in San Diego County has been fragmented and lost due to the progression of development over the last

50 years. Analysis of the Hermes copper butterfly populations indicates that in the northern portion of the U.S. range, the habitat has been fragmented (and lost) permanently by development and further fragmented temporally by wildfires, resulting in extirpation of at least four Hermes copper butterfly populations (see Table 1 above). As described in the Background section above and Factor E below, two historical Hermes copper butterfly populations (Rancho Santa Fe and Van Dam Peak) in the northern portion of the range have been lost since the year 2000, presumably because the habitat became isolated to an extent that connectivity with other populations was lost. Neither the Rancho Santa Fe habitat area nor Van Dam Peak habitat area is expected to be recolonized because the distance to the next nearest source population (13 mi (20 km) and 7 mi (11 km), respectively) exceeds the dispersal capability of the species. In the southern portion of the range, Lopez Canyon and the extant portion of Mission Trails Park are both isolated (7 mi (11 km) separation) from other extant populations by development and burned areas that are no longer likely occupied. Although the Mission Trails Park population remains extant this population was likely reduced up to 74 percent by the 2003 fire, and remaining unburned habitat is surrounded by development, functionally isolating it from any potential source populations thought to be extant (see Figure 1 above). While we do not expect future development alone to threaten Hermes copper butterfly habitat, we believe that the combined impacts attributable to wildfire and small scale development may fragment habitat further and hence, threaten the species' continued existence. Based on the above, we consider habitat fragmentation, due to the combined impact of existing development, possible future (limited) development, existing dispersal barriers, and megafires, a significant threat to Hermes copper butterfly.

#### Summary of Factor A

Based on the above information, we consider Hermes copper butterfly to be threatened by the present or threatened destruction, modification, or curtailment of the species habitat or range. Specifically, we consider Hermes copper butterfly threatened by habitat fragmentation and wildfire. The combination of habitat fragmentation (as a result of past and potential limited future urban development), existing dispersal barriers, and megafires (that encompass vast areas and are increasing in frequency) that fragment, limit, and

degrade Hermes copper butterfly habitat threaten the species with extirpation throughout its range. These threats are evidenced by the loss and isolation of many populations throughout the range; those remaining extant populations fall within areas of high megafire risk. Thus, we consider threats under this factor to be significant.

#### *Factor B. Overutilization for Commercial, Recreational, Scientific, or Educational Purposes*

We found two Internet postings (accessed in June 2004) offering to sell specimens of Hermes copper butterfly (Martin 2004, pers. comm.). We found no evidence that Hermes copper butterflies, whole or in parts, were being used in a commercial "butterfly essence" process (Morning Star Essences 2006, pers. comm.) and we have no other information to indicate that other commercial business activities are a threat to Hermes copper butterfly. Neither of these previously viewed Web sites offered Hermes copper butterfly for sale during a more recent search (November 22, 2010), nor did we locate any additional commercially available specimens. We found no other information to indicate Hermes copper butterfly is used for commercial, scientific, or educational purposes. Therefore, based on our review of the best available scientific and commercial information, we do not consider overutilization for commercial, recreational, scientific, or educational purposes a current threat to Hermes copper butterfly.

#### *Factor C. Disease or Predation*

##### Disease

We evaluated the potential of disease to threaten Hermes copper butterfly rangewide and found no information indicating disease to be current threat to Hermes copper butterfly.

##### Predation

Predation (including parasitism) is a factor that is known to cause mortality in butterflies, and therefore could potentially threaten any butterfly species. Faulkner and Klein (2005, p. 26) stated that "no papers have reported any parasites or predators for the Hermes copper butterfly, though they obviously exist." Birds may consume Hermes copper butterfly larvae, although we are not aware of any data that indicate bird predation is a significant threat to Hermes copper butterfly. Furthermore, heavy predation of adult insects and their progeny is a common ecological phenomenon, and most species have evolved under

conditions where high mortality due to natural enemies has shaped their evolution (see Ehrlich *et al.* 1988). However, we found no information to indicate predation to be current threat to Hermes copper butterfly.

Therefore, based on our review of the best available scientific and commercial information, we do not consider disease or predation a current threat to Hermes copper butterfly.

#### *Factor D. The Inadequacy of Existing Regulatory Mechanisms*

The Act requires us to examine the adequacy of existing regulatory mechanisms, with respect to threats, that may ameliorate the danger of Hermes copper butterfly becoming either endangered or threatened. Existing regulatory mechanisms that may have an effect on potential threats to Hermes copper butterfly can be placed into two general categories: (1) Federal mechanisms, and (2) State and local mechanisms.

##### *Federal Mechanisms*

There are five primary Federal regulatory mechanisms that we discuss below: the National Forest Management Act (16 U.S.C. 1600 *et seq.*); the Federal Land Policy and Management Act; the Sikes Act as amended (16 U.S.C. 670a *et seq.*); the Healthy Forests Restoration Act of 2003 (16 U.S.C. 6501 *et seq.*); and the National Environmental Policy Act (NEPA; 42 U.S.C. 4321 *et seq.*).

Under the National Forest Management Act of 1976, the U.S. Forest Service (Forest Service) is required to prepare a comprehensive land and natural resource management plan for each unit of the Forest Service, in accordance with NEPA's procedural requirements, to guide the maintenance and use of resources within national forests. The plans require an interdisciplinary approach, including a provision providing for diversity for plant and animal communities (16 U.S.C. 1604(g)(3)(B)). The Forest Service is currently operating under the transition provisions of the 2000 Planning Rule (65 FR 67514; November 9, 2000) as an interim measure until a new planning rule is issued (see 74 FR 67059; December 18, 2009). The 2000 rule allows forests to develop, revise and amend forest plans using the procedures of the 1982 Rule (47 FR 43037; September 30, 1982). All existing forest plans have been developed using the 1982 Planning Rule procedures, including the Cleveland National Forest Plan.

In preparing the Cleveland National Forest (CNF) Plan, the Forest Service evaluated and identified Hermes copper

butterfly as a species of concern and then evaluated this species relative to its potential of risk from Forest Service activities and plan decisions in its 2005 Final Environmental Impact Statement (USFS 2005). Hermes copper butterfly, along with 148 other species, was defined as a "species-at-risk" (USFS 2005, Appendix B, p. 36), requiring a further individual viability assessment. The subsequent threat category identified for Hermes copper butterfly was "5" or "Uncommon, narrow endemic, disjunct, or peripheral in the plan area with substantial threats to persistence or distribution from Forest Service activities" (USFS 2005, Appendix B, p. 43). The specific threat associated with Hermes copper butterfly and Forest Service management activities is described as "Prescribed fire or fuel reduction projects in habitat (affecting host plant, *Rhamnus crocea*)" (USFS 2005, Appendix B, p. 52). There are approximately 7,860 acres (ac) (3,181 hectares (ha)) of extant Hermes copper butterfly habitat (encompassing 7 populations) within the CNF and approximately 2,100 ac (850 ha) of Hermes copper butterfly habitat that has been extirpated or is of unknown status. The Forest Service incorporates measures into its planning efforts to address identified threats as it implements specific activities on forest lands. As an example, in 2007, measures were included to protect Hermes copper butterfly habitat ahead of the Horsethief Fuels Reduction Project (Jennings 2007, pers. comm.). Although the proposed project has not yet been implemented, the recommendations of flagging and avoidance of all *R. crocea* bushes are standard management measures for relevant CNF activities (Winter 2010, pers. comm.).

The CNF has also initiated two projects for restoration of habitat at Barber Mountain related to impacts from the Harris Fire (Metz 2010, pers. comm.). In an effort to restore nectar and host plants at this site, seeds from both *Eriogonum fasciculatum* and *Rhamnus crocea* plants have been collected locally and *E. fasciculatum* seeds have already been planted (Metz 2010, pers. comm.).

Because fires, particularly recent wildfires (megafires), have been identified as a factor affecting the distribution of this species, the CNF has been monitoring Hermes copper butterfly populations in burned and unburned areas of CNF to assist in monitoring the recovery and management of this species on its lands (HDR and E2M, 2009, p. 1). As part of the Forest Service's approach to management of Hermes copper butterfly

and its habitat, the Forest Service commissioned a 2009 survey to determine the current status of Hermes copper butterfly populations at eight locations in the Descanso Ranger District of the CNF. A total of 16 Hermes copper butterflies were observed at 12 locations at 5 study sites (HDR and E2M, 2009, p. 11). The 2009 study concluded that the low number of observations were reflective of the ongoing recovery of Hermes copper butterfly habitats from the effects of wildfires, the precipitation pattern in Hermes copper butterfly habitat in 2009, and host plant health (HDR and E2M, 2009, p. 25).

Previous monitoring surveys conducted on CNF lands include a 2005 survey for assessment of recolonization at Viejas Mountain, an area impacted by the Cedar Fire in 2003, in which no Hermes copper butterflies were observed (Klein 2005, pers. comm.). Additionally, a 2005 survey at Barber Mountain, an area that had not recently burned, revealed 95 specimens of Hermes copper butterflies (Faulkner 2005, pers. comm.), while a wider 2008 survey of the area after the Witch Fire in 2007 found scattered populations with only two sites containing more than a single specimen (Faulkner 2008 pers. comm.). Locations were marked for revegetation with *Eriogonum fasciculatum* and *Rhamnus crocea* in an attempt to extend the unburned chaparral habitat so as to expand the existing Hermes copper butterfly populations or establish new populations (Faulkner 2008, pers. comm.).

Recent fire events appear to have negatively affected the current occupancy of Hermes copper butterfly at the surveyed locations on CNF lands. The 2009 survey results indicate that of the study sites affected by fires in 2003 and 2007, Hermes copper butterfly was only found at one site (North Descanso), an area located on the southern edge of the area affected by the 2003 Cedar Fire and adjacent to unburned private lands, which the authors speculate contain a source population of Hermes copper butterflies (HDR and E2M, 2009, p. 25). The current monitoring, management efforts, and conservation measures implemented and planned by the Forest Service indicate that the CNF is actively working towards conservation of Hermes copper butterfly and its habitat.

The Federal Land Policy and Management Act of 1976 (FLPMA) governs the management of public lands under the jurisdiction of the BLM. The legislative goals of FLPMA are to establish public land policy; to establish guidelines for its [BLM's]

administration; and to provide for the management, protection, development and enhancement of the public lands. While FLPMA generally directs that public lands be managed on the basis of multiple use, the statute also directs that such lands be managed to "protect the quality of scientific, scenic, historical, ecological, environmental, air and atmospheric, water resource, and archeological values; \* \* \* [to] preserve and protect certain public lands in their natural condition; [and to] provide food and habitat for fish and wildlife \* \* \*." (43 U.S.C. 1701(a)(8)). Although the BLM has a multiple-use mandate under the FLPMA which allows for grazing, mining, and off-road vehicle use, the BLM also has the ability under the FLPMA to establish and implement special management areas such as Areas of Critical Environmental Concern, wilderness areas, research areas, etc. BLM's South Coast Resource Management Plan covers the San Diego County area. Approximately 1 percent, or 411 ac (166 ha) of the total Hermes copper butterfly habitat occupied by extant populations (3 populations in this case) occur within the BLM owned lands. An additional approximately 289 ac (117 ha) of Hermes copper butterfly habitat that supported populations believed to have been extirpated or that are of unknown status (encompassing 3 populations) also occurs on BLM lands. Hermes copper butterfly was a species considered but not addressed in the BLM's South Coast Resource Management Plan (SCRMP; BLM 1994, p. 76) but many components of Hermes copper butterfly habitat (coastal sage scrub and chaparral) are contained within the SCRMP planning area, and receive some regulatory protection under the plan. Approximately half of Hermes copper butterfly habitat supporting extant populations on BLM lands, a 201 ac (81 ha) portion of the Descanso South population (see Table 1 and Figure 1 above; Map #31) falls within the Pine Creek Wilderness Area and therefore benefits from BLM's wilderness protection policies. The Pine Creek Wilderness Area is managed in accordance with the provisions of the Wilderness Act of 1964 (16 U.S.C. 1131 *et seq.*). The Wilderness Act of 1964 strictly limits use of wilderness areas, imposing restrictions on use of vehicles, new developments, chainsaw use, mountain bike use, leasing, and mining, in order to protect the natural habitats of the areas, maintain species diversity, and enhance biological values. Lands acquired by BLM within wilderness area boundaries become part of the designated wilderness area and are

managed in accordance with all provisions of the Wilderness Act and applicable laws. We believe existing BLM regulations provide adequate protection from the threat of development described in Factor A above, but not from mortality and habitat fragmentation due to megafire as described in Factors A above and E below. However, megafire is not a threat that is susceptible to reduction or elimination by regulatory mechanisms.

The Sikes Act requires the Department of Defense to develop and implement integrated natural resources management plans (INRMPs) for military installations across the United States. We are not aware of any currently extant Hermes copper butterfly populations on military installations; however there are historical Hermes copper butterfly observation locations and potential Hermes copper butterfly habitat (see Table 1 and Figure 1 above, Map #40) on Miramar Naval Air Station and the adjacent Mission Gorge Recreational Facility (MGRF) (also known as Admiral Baker Field). Through the 2002 Naval Base San Diego INRMP, which is currently under revision, the Navy manages its open space areas using an ecosystem-level approach that includes invasive species removal, habitat restoration and enhancement, and natural resource inventories (Stathos 2010, pers. comm.). In the 2002 INRMP, the Navy identified the following focus areas for management actions: Wildlife conservation and management, rare wildlife species, exotic vegetation control, habitat restoration, and fire management (U.S. Navy 2002, section 3, pp. 37–40 and 45–47). Hermes copper butterfly is not identified as a rare species in the INRMP; however, some existing management recommendations and actions may also be beneficial to Hermes copper butterfly, if it is rediscovered on Navy lands. The INRMPs are reviewed every year by military installations and modified as needed, and are reviewed at least every 5 years with the Service and States.

The Healthy Forests Restoration Act of 2003 includes the first meaningful statutory incentive for the U.S. Forest Service and the Bureau of Land Management to give consideration to prioritized fuel reduction projects identified by local communities. In order for a community to take advantage of this opportunity, a Community Wildfire Protection Plan (CWPP) must be prepared. The process of developing a CWPP can help a community identify and clarify priorities for the protection of life, property and critical infrastructure in the wildland-urban

interface (WUI) (Fire Safe Council of San Diego County 2011). See our discussion of CWPPs below under the State and Local Regulations subsection. Combined, the Healthy Forests Restoration Act and the Community Wildfire Protection Plan emphasize the need for federal, state and local agencies to work collaboratively with communities in developing hazardous fuel reduction projects, and place priority on treatment areas identified by the communities themselves in a CWPP (Fire Safe Council of San Diego County 2011). While these regulations reduce the impact of wildfire to some extent, especially with regard to human property and safety, the impact of megafires on wildlands is not a threat that is susceptible to elimination by such regulatory mechanisms.

All Federal agencies are required to adhere to the National Environmental Policy Act (NEPA) of 1970 for projects they fund, authorize, or carry out. The Council on Environmental Quality's regulations for implementing NEPA (40 CFR parts 1500–1518) state that in their environmental impact statements agencies shall include a discussion on the environmental impacts of the various project alternatives (including the proposed action), any adverse environmental effects which cannot be avoided, and any irreversible or irretrievable commitments of resources involved (40 CFR part 1502). NEPA itself is a disclosure law that provides an opportunity for the public to submit comments on the particular project and propose other conservation measures that may directly benefit listed species; however, it does not require subsequent minimization or mitigation measures by the Federal agency involved. Although Federal agencies may include conservation measures for listed species as a result of the NEPA process, Hermes copper butterfly may be provided indirect protections due to its co-occurrence with listed species. Any such measures are typically voluntary in nature and are not required by the statute. Additionally, activities on non-Federal lands are subject to NEPA if there is a Federal nexus.

As stated above, land and resource management plans prepared by the Forest Service and BLM must be developed in accordance with NEPA requirements and, as noted above, the Forest Service prepared an environmental impact statement for its 2005 Land Management Plans (including the Cleveland National Forest Plan) and will be required to meet NEPA requirements in preparing its revised plan. Similarly, the U.S. Navy must meet the procedural

requirements of NEPA in developing its INRMPs.

#### State and Local Mechanisms

The California Environmental Quality Act (CEQA) (Public Resources Code 21000–21177) and the CEQA Guidelines (California Code of Regulations, Title 14, Division 6, Chapter 3, sections 15000–15387) requires State and local agencies to identify the significant environmental impacts of their actions and to avoid or mitigate those impacts, if feasible. CEQA applies to projects proposed to be undertaken or requiring approval by State and local government agencies and the lead agency must complete the environmental review process required by CEQA, including conducting an initial study to identify the environmental impacts of the project and determine whether the identified impacts are “significant.” If significant impacts are determined, then an environmental impact report must be prepared to provide State and local agencies and the general public with detailed information on the potentially significant environmental effects (CERES 2010). “Thresholds of Significance” are comprehensive criteria used to define environmental significant impacts based on quantitative and qualitative standards and include impacts to biological resources such as candidate, sensitive, or special status species identified in local or regional plans, policies, or regulations, or by the California Department of Fish and Game (CDFG) or the Service; or impacts to any riparian habitat or other sensitive natural community identified in local or regional plans, policies, regulations or by the CDFG or Service (Appendix G, CEQA 2010). Defining these significance thresholds helps ensure a “rational basis for significance determinations” and provides support to the final determination and appropriate revisions or mitigation actions to a project in order to develop a mitigated negative declaration rather than an environmental impact report (Governor’s Office of Planning and Research, 1994, p. 5).

The County of San Diego has developed the *Guidelines for Determining Significance and Report Format and Content Requirements—Biological Resources* (Guidelines) (County of San Diego, 2010) to review discretionary projects and environmental documents pursuant to the CEQA. The Guidelines provide guidance for evaluating adverse environmental effects that a proposed project may have on biological resources and are consulted during the evaluation of any biological resource pursuant to

CEQA. Included in the specific guidelines, under Special Species Status, is a determination as to whether a project will impact occupied Hermes copper butterfly habitat. Section 4.1 K (p. 14) of the guidelines states:

“Though not state or federally listed, the Hermes copper meets the definition of endangered under CEQA Sec. 15380 because 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.’ The County’s determination that the Hermes copper meets the definition of endangered under CEQA is based on the loss of Hermes copper populations by development and wildfire, and the review of published and unpublished literature. Interim guidelines for surveying, assessing impacts, and designing mitigation for Hermes copper are provided in Attachment C of the Report Format and Content Requirements—Biological Resources.” (County of San Diego, 2010, p. 14).

The newly added Hermes copper butterfly section of the guidelines offers a proactive requirement for project review under CEQA that can provide a specific protective measure to the species and its habitat.

The San Diego Multiple Species Conservation Program (MSCP) is a subregional habitat conservation plan (HCP) and Natural Community Conservation Plan (NCCP) made up of several subarea plans that have been in place for more than a decade. Under the umbrella of the MSCP, each of the 12 participating jurisdictions is required to prepare a subarea plan that implements the goals of the MSCP within that particular jurisdiction. The MSCP covers 582,243 ac (235,625 ha) and the County of San Diego Subarea Plan covers 252,132 ac (102,035 ha) of unincorporated county lands in the southwestern portion of the MSCP plan area. The County subarea plan is implemented in part by the Biological Mitigation Ordinance (BMO), which outlines specific project design criteria and species and habitat protection and mitigation requirements for projects within subarea boundaries (see MSCP Subarea Plan, County of San Diego 2007, and Biological Mitigation Ordinance (Ord. Nos. 8845, 9246), County of San Diego 1998b). All projects within the County’s subarea plan boundaries must comply with both the MSCP requirements and the County’s policies under CEQA. Hermes copper butterfly is not a covered species under any MSCP subarea plans; however, the protections afforded by the BMO

indirectly benefit the species by establishing mitigation ratios and project development conditions that restrict development within coastal sage scrub and mixed chaparral habitats. Of the 17 currently extant Hermes copper butterfly populations, the BMO affords some indirect protection to the 10 that fall all or partially within the County’s subarea plan boundaries.

The County of San Diego Resource Protection Ordinance (RPO) (County of San Diego 2007) applies to all non-federal lands within the County located within and outside of the County of San Diego subarea plan boundaries. The RPO imposes restrictions on development to reduce impacts to natural resources including sensitive habitat lands. Sensitive habitat lands are those that support unique vegetation communities or those that are either necessary to support a viable population of sensitive species, are critical to the proper functioning of a balanced natural ecosystem, or which serve as a functioning wildlife corridor (County of San Diego, 2007, p. 3). They can include areas that contain maritime succulent scrub, southern coastal bluff scrub, coastal and desert dunes, calcicolous scrub, and maritime chaparral, among others. Impacts to RPO sensitive habitat lands, which include lands with potential host and nectar plant habitat for Hermes copper butterfly (i.e., scrub and chaparral), are only allowed when all feasible measures have been applied to reduce impacts and when mitigation provides an equal or greater benefit to the affected species (County of San Diego, 2007, p. 13).

The California Department of Forestry and Fire Protection (CAL FIRE) is an emergency response and resource protection department. CAL FIRE protects lives, property and natural resources from fire, and protects and preserves timberlands, wildlands, and urban forests. The CAL FIRES’s varied programs work together to plan protection strategies incorporating concepts of the National Fire Plan, the California Fire Plan, individual CAL FIRE Unit Fire Plans, and Community Wildfire Protection Plans (CWPPs). Fire Plans outline the fire situation within each CAL FIRE Unit, and CWPPs do the same for communities (CALFIRE 2011a, p. 1; County of San Diego 2011a). Each plan identifies prevention measures to reduce risks, informs and involves the local communities in the area, and provides a framework to diminish potential wildfire losses and implement all applicable fire management regulations and policies (CALFIRE 2011b; County of San Diego 2011a). Planning includes other state, federal

and local government agencies as well as Fire Safe Councils (CALFIRE 2011a, p. 1). Cooperative efforts via contracts and agreements between state, federal, and local agencies are essential to respond to wildland fires (CALFIRE 2011a, p. 1). Because of these types of cooperative efforts, fire engines and crews from many different agencies may respond at the scene of an emergency (CALFIRE 2011a, p. 1); however CALFIRE typically takes the lead with regard to planning for megafire, prevention, management, and suppression, and CAL FIRE is in charge of incident command during a wildfire. The San Diego County Fire Authority (SDCFA), local governments, and CAL FIRE cooperatively protect 1.42 million acres of land with 54 fire stations throughout San Diego County (County of San Diego 2011b, p. 1). Wildfire management plans and associated actions can help to reduce the impacts of wildfire on natural resources, including Hermes copper butterfly, but their first priority is human health and safety. While these plans and associated measures ameliorate the impacts of wildfire to some extent, especially with regard to human property and safety, the impact of megafires on wildlands is not a threat that is susceptible to elimination by such regulatory mechanisms.

#### Summary of Factor D

In summary, we considered the adequacy of existing regulatory mechanisms to protect Hermes copper butterfly. On Forest Service lands, the Cleveland National Forest Plan addresses the conservation of natural resources, including Hermes copper butterfly, and specific management practices have been identified and are being implemented to conserve existing populations of Hermes copper butterfly and its habitat. Approximately 1 percent of Hermes copper butterfly habitat occurs on BLM lands and is afforded some protection through the South Coast Management Plan and Wilderness Area designation through management of habitat areas for listed and other sensitive species and land use limitation. Although the Navy has not recorded extant populations of Hermes copper butterfly on their lands in San Diego County, we believe the management measures identified in their INRMP for the Mission Gorge Recreational Facility provides an adequate protective mechanism for existing coastal sage habitat suitable for Hermes copper butterfly. Hermes copper butterfly and its habitat may also receive protection under NEPA as land management plans, INRMPs, and

activity level plans are developed on Forest Service, BLM and U.S. Navy lands either occupied by or that contain suitable habitat for the species.

On State and county lands occupied by Hermes copper butterfly or containing its habitat, we believe the requirements of CEQA and the two County ordinances are adequate regulatory mechanisms that protect the species and its habitat from development related impacts. The Biological Mitigation Ordinance of the County of San Diego Subarea Plan and the County of San Diego Resource Protection Ordinance impose restrictions on development within coastal sage scrub and mixed chaparral habitats that support half of the historical distribution of Hermes copper butterfly populations. Although Federal, State, and local regulatory mechanisms help to reduce wildfire impacts, primarily to property and human safety, they do not adequately protect Hermes copper butterfly from direct mortality or habitat fragmentation due to megafires. However, we do not consider the impact of megafire on wildlands to be a threat that is susceptible to elimination by regulatory mechanisms.

Therefore, based on our review of the best available scientific and commercial information, we do not consider the inadequacy of existing regulatory mechanisms to be a threat to Hermes copper butterfly.

#### Factor E. Other Natural or Manmade Factors Affecting the Species' Continued Existence

##### Wildfire

As discussed in the **Background** section and Factor A discussions above, wildfire can result in temporal loss of Hermes copper butterfly habitat. However, the most significant threat posed by wildfire to Hermes copper butterfly is the direct loss (*i.e.*, mortality) of butterflies associated with extensive and intense fire events. The magnitude of this threat is increased by the periodic occurrence of megafires, which are typically created by extreme "Santa Ana" weather conditions of high temperatures, low humidity, and strong erratic winds (see **Background** section and Factor A's wildfire discussion above; Keeley and Zedler 2009, p. 90). Human-induced or anthropogenic ignitions have increased the frequency of fire far above historical levels (Keeley and Fotheringham 2003, p. 240). Recolonization of burned areas by Hermes copper butterfly can be precluded when fires, and particularly megafires, occur too frequently. The significance of this concern can be seen

in the current distribution of the species in southern California; analysis of GIS information indicates approximately 66 percent of the extant occurrences are found within the footprint of the 1970 Laguna Fire, which Minnich and Chou (1997, p. 240) reported last burned in 1920. In contrast, the areas north and south of the extant Hermes copper butterfly occurrences burned several times from 2001 to 2007 (Keeley *et al.* 2009, pp. 287, 293). A single megafire burning most or all of the 40-year old chaparral in the footprint of the Laguna fire would likely imperil the species in the United States (see Figure 1 above). Additionally, as discussed in the **Background** section above, the 2003 Otay and Cedar fires and the 2007 Harris and Witch fires in particular have negatively impacted the species, resulting in or contributing to the extirpation of 9 of 35 populations (see Table 1 above).

It is well-documented that wildfires that occur in occupied Hermes copper butterfly habitat result in loss of Hermes copper butterflies (Klein and Faulkner 2003, pp. 96, 97; Marschalek and Klein 2010, pp. 4, 5). The butterflies rarely survive wildfire because life stages of the butterfly inhabit host plant foliage, and *Rhamnus crocea* typically burns to the ground and resprouts from stumps (Deutschman *et al.* 2010, p. 8; Marschalek and Klein 2010, p. 8). This results in at least the temporal loss of both the habitat (until the *R. crocea* and nectar source regrowth occurs) and the presence of butterflies (occupancy) in the area. Wildfires can also leave patches of unburned occupied habitat that are functionally isolated (*e.g.*, further than the dispersal distance of the butterfly) from other occupied habitat. Furthermore, large fires can eliminate source populations before previously burned habitat can be recolonized, and can result in long-term or permanent loss of butterfly populations. For example, in Mission Trails Park the 7,303 ac (2596 ha) "Assist #59" Fire in 1981 and the smaller 126 ac (51 ha) "Assist #14" Fire in 1983 (no significant overlap between fires), resulted in an approximate 18-year extirpation of the Mission Trails Park Hermes copper butterfly population (Klein and Faulkner 2003, pp. 96, 97). More recent examples include extirpations of the monitored Crestridge, Rancho Jamul, Anderson Road, Hollenbeck Canyon, and San Miguel Mountain populations, as well as other less-monitored populations (Marschalek and Klein 2010, pp. 4, 5; Deutschman *et al.* 2010, p. 36). After the 2003 Cedar Fire, Hermes copper butterfly records at the

regularly monitored Crestridge population, once considered the largest and most robust population within the species' range (Klein and Faulkner 2003, p. 86), were limited to presumably the same male for a 6-day period in 2005, and another single male observed in 2007 (Marschalek and Klein 2010, p. 4; Deutschman *et al.* 2010, p. 33). Marschalek (2010a, p. 2) described how when his study "colonies" in the Rancho Jamul population were extirpated by fire in 2003, he discovered additional occupied habitat on the other side of a nearby firebreak in 2004; however the remaining population distribution was extirpated in the 2007 Harris Fire (Marschalek 2010a, p. 1). Data indicate all historical populations burned in both the 2003 and 2007 fires were extirpated except North Descanso, where record locations were within a narrow extension of the fire perimeter surrounded on three sides by unburned habitat (see Table 1 and Figure 1 above). We know this habitat was recolonized because genetic research determined the colonizing individuals were not related to those collected before the fire (Deutschman *et al.* 2010, p. 26). These facts underscore the importance of having available Hermes copper butterfly source populations to recolonize habitat after fire. As discussed in the **Background** section above, of the 35 known Hermes copper butterfly populations in 2000, 1 northern Hermes copper butterfly population and 8 southern populations are believed to have been extirpated by fire or a combination of fire and development since 2003 (see Table 1 above).

As discussed above under Factor A, we examined maps of current high fire threat areas in San Diego County based on recent reports by the Forest Area Safety Task Force (Jones 2008; SANDAG 2010). Areas identified as most vulnerable include all occupied and potentially occupied Hermes copper butterfly habitats in San Diego County within the species' known historical range, with the exception of Black Mountain, Van Dam Peak, Lopez Canyon, and the unburned southern portion of Mission Trails Park. Nineteen potential source populations for recolonization of habitats burned in the past 10 years (extant or of unknown status) fall within a contiguous area that has not recently burned (southeastern populations in Figure 1), and where the threat of fire is considered high (SANDAG 2010). All except 3 of these potential source populations (North Descanso, Hartley Peak, and North Guatay Mountain) also fall within the

174,026 ac (70,426 ha) 1970 Laguna Fire perimeter (similar in size to the 2003 and 2007 fires), and the 3 that do not fall within the Laguna Fire perimeter fall partially within the 2003 and 2007 fire perimeters. This analysis of current fire danger and fire history illustrates the potential for permanent loss of the majority, if not all, remaining butterfly populations should another large fire occur prior to recolonization of burned habitats (per discussion above, recolonization may not occur for up to 18 years). As discussed by Marschalek and Klein (2010, p. 9) and Deutschman *et al.* (2010, p. 42), there is a risk that one or more wildfires could extirpate the majority of extant Hermes copper butterfly populations. Based on the above, we consider wildfire, specifically megafires that encompass vast areas and are increasing in frequency, a significant threat to Hermes copper butterfly.

#### Vulnerability of Small and Isolated Populations

Small population size, low population numbers, and population isolation are not necessarily independent factors that threaten a species. Typically, it is the combination of small size and number and isolation of populations in conjunction with other threats (such as the present or threatened destruction and modification of the species' habitat or range) that may significantly increase the probability of species' extinction.

Population isolation renders smaller populations more vulnerable to stochastic extirpation. Small populations and isolation could also subject Hermes copper butterfly to genetic drift and restricted gene flow that may decrease genetic variability over time and could adversely affect species' viability (Allee 1931, pp. 12–37; Stephens *et al.* 1999, pp. 185–190; Dennis 2002, pp. 389–401). The best available scientific information indicates adult Hermes copper butterfly densities have been reduced to low or no detectability, or occupancy has been entirely eliminated in some burned areas (for example Crestridge, see Factor A discussion above), and habitat has been fragmented and isolated by development (Deutschman *et al.* 2010, p. 33). As discussed in the Background section and Factor A discussion above, most remaining northern habitats are limited to the relatively isolated and fragmented undeveloped lands between the cities of San Marcos, Carlsbad, and Escondido and the community of Rancho Santa Fe. The nearest occupied Hermes copper butterfly location (Mission Trails) to the habitat "islands" containing the Black Mountain and Van Dam Peak observation locations are

approximately 9 mi (14 km) and 7 mi (11 km) away, respectively, and separated by highly developed areas. Future recolonization of Hermes copper butterfly to these areas, which appear to contain suitable habitat, is not likely due to their isolation. One population isolated by development was extirpated due to the 2007 Witch Fire (Rancho Santa Fe), and a second isolated population was extirpated for unknown reasons (Van Dam Peak). As discussed above under Factor A, neither the Rancho Santa Fe habitat area nor the Van Dam Peak habitat area is expected to be recolonized because the distance to the next nearest source population exceeds the dispersal capability of the species. In the southern portion of the range, Lopez Canyon and the extant portion of Mission Trails Park are both isolated from other extant populations by development and burned areas that are no longer likely occupied. Although the Mission Trails Park population remains extant this population was likely reduced up to 74 percent by the 2003 fire, and remaining unburned habitat is surrounded by development, functionally isolating it from any potential source populations thought to be extant (see Figure 1 above). Therefore, we consider the effects of restricted geographical range, population isolation, and reduced population size a significant threat to Hermes copper butterfly.

#### Global Climate Change

Evaluations by Parmesan and Galbraith (2004, pp. 1–2, 29–33) indicate whole ecosystems may be shifting northward and upward in elevation, or are otherwise being altered by differing climate tolerance among species within communities. Climate change may be causing changes in the arrangement and community composition of occupied habitat patches. Current climate change predictions for terrestrial areas in the Northern Hemisphere and the southwestern United States indicate warmer air temperatures, more intense precipitation events, and increased summer drying (Field *et al.* 1999, pp. 1–3; Hayhoe *et al.* 2004, p. 12422; Cayan *et al.* 2005, p. 6; Intergovernmental Panel on Climate Change (IPCC) 2007, p. 11). However, predictions of climatic conditions for smaller subregions, such as San Diego County, remain less certain. Tabor and Williams (2010, p. 562) summarized the four major sources of uncertainty in downscaled climate projections: (1) Uncertainties in future greenhouse gas emissions and atmospheric composition (scenario uncertainty); (2) uncertainties in

modeling the climate response (Global Circulation Model uncertainty); (3) uncertainties in the observational data sets used as the basemap for the debiasing procedure (historical observational uncertainty); and (4) uncertainty over the validity of assumptions underlying the change-factor approach (change-factor uncertainty). These uncertainties are a general phenomenon of climate model downscaling and they can be substantial, especially the first two (Tabor and Williams 2010, pp. 562, 564). Thus, discretion is necessary when using downscaled climate projections, because downscaling Global Circulation Models to the finest available resolution may produce misleading results (Tabor and Williams 2010, p. 564). Southern California has a unique and globally rare Mediterranean climate. Summers are typically dry and hot while winters are cool, with minimal rainfall averaging about 10 inches per year. The maritime influence of the Pacific Ocean combined with the coastal and inland mountain ranges creates an inversion layer typical of Mediterranean-like climates, particularly in southern California. These conditions also create microclimates, where the weather can be highly variable within small geographic areas at the same time. These microclimates are difficult to model and make it even more difficult to predict meaningful changes in climate for this region, specifically for small local areas, and the resultant impact on the Hermes copper butterfly and its habitat.

We evaluated the available historical weather data and the species biology to determine the likelihood of effects assuming the climate has been and will continue to change. The typical effect of a warmer climate, as observed with Hermes copper butterfly in lower, warmer elevation habitats compared to higher, cooler elevations, is an earlier flight season by several days (Thorne 1963, p. 146; Marschalek and Deutschman 2008, p. 98). Marschalek and Klein (2010, p. 2) noted that past records suggest a slightly earlier flight season in recent years compared to the 1960s. The earliest published day of flight prior to 1963, after “30 years of extensive collecting,” was May 20 (Thorne 1963, pp. 143, 146), but adults began flying on May 16 and May 12 in 2003 and 2004, respectively (Marschalek and Deutschman 2008, p. 100), and were reported as early as April 29 in 2003, and May 14 in 2008 (CFWO GIS database). The record early observation on April 29, 2003, was from Fortuna Mountain in Mission Trails Park, a well-collected population with

records dating back to 1958, including collections by Thorne (called “Mission Gorge” or “Mission Dam” on museum specimen labels) where May 21 was the earliest documented record from the 1960s and early 1970s (before climate change trends were reasonably detectable as described by the IPCC (2007, pp. 2, 4)). The historical temperature trend in Hermes copper butterfly habitats for the month of April (when larvae are typically developing and pupating) from 1957 to 2006 can be calculated with relatively high confidence ( $p$  values from 0.001 to 0.05). The rate of temperature change has been an increase of 0.04 to 0.07 °F (0.07 to 0.13 °C) per year (Climate Wizard 2010), a total increase of which could explain the earlier than average flight seasons. The latest published observation date (presumed end of flight season) of an adult prior to 1970 was on July 30, 1967 (museum specimen collected by Thorne at “Suncrest”); however, the latest observation date from monitoring and data and other records in the past 10 years was on July 2 in 2010, despite an uncharacteristically late start to the flight season (May 29). Shorter flight seasons are also consistent with higher average temperatures, as a higher metabolism in these exothermic short-lived invertebrates typically results in faster growth and earlier death. Nevertheless, given the temporal and geographical availability of their widespread perennial host plant, and exposure to extremes of climate throughout their known historical range (Thorne 1963, p. 144), Hermes copper butterfly and its host and nectar plants are not likely to be negatively affected throughout the majority of the species’ range by phenological shifts in development of a few days (unlike species such as Edith’s checkerspot (*Euphydryas editha*) that depend on annual host plants; Service 2003, pp. 63, 64). While it is possible the species’ climatic tolerance, such as temperature thresholds for activity (see **Background** section above), could result in a change in the species niche and distribution of suitable habitat as the climate changes, predicting any such changes would be speculative because we do not understand what currently limits the species’ range to a much smaller geographic area than its host plant. Based on the above, we do not consider global climate change a current threat to Hermes copper butterfly.

#### Mexico Populations

Although wildfire and isolation of small populations may be threats to Hermes copper butterfly and its habitat

in Mexico, especially near the U.S. border where the human population and development is most concentrated (see for example National Aeronautics and Space Administration’s 2010 October 24 update wildfire satellite imagery that includes Baja California, Mexico), these threats are likely of less magnitude because there is far less development in the more remote areas of Baja California that may support Hermes copper butterfly. We are not aware of any conservation activities related to Hermes copper butterfly in Mexico.

#### Summary of Factor E

In summary, we consider Hermes copper butterfly threatened by other natural or manmade factors affecting the species’ continued existence. Specifically, Hermes copper butterfly is threatened with extirpation due to wildfire (megafire), restricted geographical range, and population isolation. The loss of populations, due to megafires and population fragmentation and isolation, inhibits the ability of Hermes copper butterfly to rebound from stochastic events such as megafires. These threats are evidenced by the loss of populations in the north and south of the U.S. range and subsequent isolation of other populations throughout the range. The remaining extant populations fall within a restricted area bounded by development and face high megafire risk. Thus, we consider threats under this factor to be significant.

#### Finding

As required by the Act, we conducted a review of the status of the species and considered the five factors in assessing whether Hermes copper butterfly is endangered or threatened throughout all or a significant portion of its range. We examined the best scientific and commercial information available regarding the past, present, and future threats faced by Hermes copper butterfly. We reviewed the petition, information available in our files, other available published and unpublished information, and we consulted with Hermes copper butterfly experts and other Federal, State, and local jurisdictions.

This status review identified threats to Hermes copper butterfly attributable primarily to “megafires” (large wildfires) and small and isolated populations (Factor E), and to a lesser extent, habitat loss due to increased wildfire frequency and due to fragmentation resulting from the combined impacts of existing development, possible future (limited) development, existing dispersal barriers, and megafires (Factor A). The primary



threats to the species are mortality from wildfire and small population size. These threats increase the risk of extirpation of *Hermes copper butterfly* populations rangewide. *Hermes copper butterfly* occupies scattered areas of sage scrub and chaparral habitat in an arid region susceptible to wildfires of increasing frequency and size. The likelihood that the species will be burned by catastrophic wildfires, combined with the isolation and small size of extant populations makes *Hermes copper butterfly* particularly vulnerable to population extirpation rangewide. Therefore, we find that there are threats of sufficient imminence, intensity, or magnitude to indicate that *Hermes copper butterfly* is in danger of extinction (endangered), or likely to become endangered within the foreseeable future (threatened), throughout its range or a significant portion of its range based on the threats described above.

On the basis of the best scientific and commercial information available, we find that the petitioned action to list *Hermes copper butterfly* is warranted. We will make a determination on the status of the species as endangered or threatened when we do a proposed listing determination. However, as explained in more detail below, immediate proposal of a regulation to implement this finding is precluded by higher priority listing actions, and we are making expeditious progress to add or remove qualified species from the Lists of Endangered and Threatened Wildlife and Plants.

We reviewed the available information to determine if the existing and foreseeable threats render *Hermes copper butterfly* at risk of extinction now such that issuing an emergency regulation temporarily listing the species under section 4(b)(7) of the Act is warranted. We determined that issuing an emergency regulation temporarily listing the species is not warranted at this time, because the threat of extinction is not immediate. However, if at any time we determine that issuing an emergency regulation temporarily listing the species is warranted, we will initiate such action at that time.

#### Listing Priority Number

The Service adopted guidelines on September 21, 1983 (48 FR 43098) to establish a rational system for utilizing available resources for the highest priority species when adding species to the Lists of Endangered or Threatened Wildlife and Plants or reclassifying species listed as threatened to endangered status. The system places

the greatest emphasis on taxonomic distinctiveness by assigning priority in descending order to monotypic genera (genus with one species), full species, and subspecies.

Using the Service's LPN guidance, we assign each candidate an LPN of 1 to 12, depending on the magnitude of threats (high vs. moderate to low), immediacy of threats (imminent or nonimminent), and taxonomic status of the species (in order of priority: Monotypic genus (a species that is the sole member of a genus), species, or part of a species (subspecies, distinct population segment, or significant portion of the range)). The lower the listing priority number, the higher the listing priority (that is, a species with an LPN of 1 would have the highest listing priority).

Under the Service's guidelines, the magnitude of threat is the first criterion we look at when establishing a listing priority. The guidance indicates that species with the highest magnitude of threat are those species facing the greatest threats to their continued existence. These species receive the highest listing priority. The threats that *Hermes copper butterfly* faces are high in magnitude because the major threats (particularly mortality due to wildfire and increased wildfire frequency) occur throughout all of the species' range and are likely to result in adverse impacts to the status of the species. Based on an evaluation of all known historical populations, approximately 49 percent are believed to have been extirpated. Historical records indicate that development has isolated and modified habitats in the northern portion of the U.S. range. The isolation of these habitats has inhibited the species' ability to recolonize after stochastic events such as wildfires. When a wildfire passes through an occupied area, it is highly likely that all individuals or eggs, if present, within the area are killed (see discussion under Factor E: Wildfire above). As populations become more isolated from other occupied areas, their ability to recolonize after such events is lost. As described in the discussions of wildlife under Factors A and E above, wildfires are increasing in frequency and magnitude which increases the potential for isolation of populations and, in turn, increases the risk of extirpation rangewide.

Under our LPN guidelines, the second criterion we consider in assigning a listing priority is the immediacy of threats. This criterion is intended to ensure that the species that face actual, identifiable threats are given priority over those for which threats are only potential or that are intrinsically

vulnerable but are not known to be presently facing such threats. *Hermes copper butterfly* faces actual, identifiable threats as discussed under Factors A and E of this finding, including the threat of a large, high-intensity wildfire (megafire) capable of killing *Hermes copper butterfly* populations and destroying or modifying the species' habitat in a way that would cause a rangewide reduction in populations; however, the impact of wildfire to *Hermes copper butterfly* and its habitat occurs on a sporadic basis and we do not have the ability to predict when wildfires will occur. While we conclude that listing *Hermes copper butterfly* is warranted, an immediate proposal to list this species is precluded by other higher priority listings, which we address below.

The third criterion in our LPN guidance is intended to devote resources to those species representing highly distinctive or isolated gene pools as reflected by taxonomy. *Hermes copper butterfly* is a valid taxon at the species level. *Hermes copper butterfly* faces high magnitude, non-imminent threats, and is a valid taxon at the species level. Thus, in accordance with our LPN guidance (48 FR 43098, September 21, 1983), we have assigned *Hermes copper butterfly* an LPN of 5.

As a result of our analysis of the best available scientific and commercial information, we assigned *Hermes copper butterfly* a Listing Priority Number of 5, based on species level taxonomic classification and high magnitude but nonimminent threats. *Hermes copper butterfly* is threatened by megafires, habitat fragmentation, and the effects of restricted range and small population size throughout all of the known populations in the United States. The effect of past habitat fragmentation is considered irreversible and has continuing impacts over the range of the species. The threat of wildfire continues to exist throughout the species range; however, the impact of wildfire on *Hermes copper butterfly* and its habitat occurs on a sporadic basis and we do not have the ability to predict when wildfires will occur. While we conclude that listing *Hermes copper butterfly* is warranted, an immediate proposal to list this species is precluded by other higher priority listings, which we address below.

We will continue to monitor the threats to *Hermes copper butterfly*, and the species' status on an annual basis, and should the magnitude or the imminence of the threats change, we will revisit our assessment of the LPN.

Work on a proposed listing determination for *Hermes copper*

butterfly is precluded by work on higher priority listing actions with absolute statutory, court-ordered, or court-approved deadlines and final listing determinations for those species that were proposed for listing with funds from Fiscal Year 2011. This work includes all the actions listed in the tables below under expeditious progress.

#### *Preclusion and Expeditious Progress*

Preclusion is a function of the listing priority of a species in relation to the resources that are available and the cost and relative priority of competing demands for those resources. Thus, in any given fiscal year (FY), multiple factors dictate whether it will be possible to undertake work on a listing proposal or whether promulgation of such a proposal is precluded by higher priority listing actions.

The resources available for listing actions are determined through the annual Congressional appropriations process. The appropriation for the Listing Program is available to support work involving the following listing actions: Proposed and final listing rules; 90-day and 12-month findings on petitions to add species to the Lists of Endangered and Threatened Wildlife and Plants (Lists) or to change the status of a species from threatened to endangered; annual "resubmitted" petition findings on prior warranted-but-precluded petition findings as required under section 4(b)(3)(C)(i) of the Act; critical habitat petition findings; proposed and final rules designating critical habitat; and litigation-related, administrative, and program-management functions (including preparing and allocating budgets, responding to Congressional and public inquiries, and conducting public outreach regarding listing and critical habitat). The work involved in preparing various listing documents can be extensive and may include, but is not limited to: Gathering and assessing the best scientific and commercial data available and conducting analyses used as the basis for our decisions; writing and publishing documents; and obtaining, reviewing, and evaluating public comments and peer review comments on proposed rules and incorporating relevant information into final rules. The number of listing actions that we can undertake in a given year also is influenced by the complexity of those listing actions; that is, more complex actions generally are more costly. The median cost for preparing and publishing a 90-day finding is \$39,276; for a 12-month finding, \$100,690; for a proposed rule

with critical habitat, \$345,000; and for a final listing rule with critical habitat, \$305,000.

We cannot spend more than is appropriated for the Listing Program without violating the Anti-Deficiency Act (see 31 U.S.C. 1341(a)(1)(A)). In addition, in FY 1998 and for each fiscal year since then, Congress has placed a statutory cap on funds that may be expended for the Listing Program, equal to the amount expressly appropriated for that purpose in that fiscal year. This cap was designed to prevent funds appropriated for other functions under the Act (for example, recovery funds for removing species from the Lists), or for other Service programs, from being used for Listing Program actions (see House Report 105-163, 105th Congress, 1st Session, July 1, 1997).

Since FY 2002, the Service's budget has included a critical habitat subcap to ensure that some funds are available for other work in the Listing Program ("The critical habitat designation subcap will ensure that some funding is available to address other listing activities" (House Report No. 107-103, 107th Congress, 1st Session, June 19, 2001)). In FY 2002 and each year until FY 2006, the Service has had to use virtually the entire critical habitat subcap to address court-mandated designations of critical habitat, and consequently none of the critical habitat subcap funds have been available for other listing activities. In some FYs since 2006, we have been able to use some of the critical habitat subcap funds to fund proposed listing determinations for high-priority candidate species. In other FYs, while we were unable to use any of the critical habitat subcap funds to fund proposed listing determinations, we did use some of this money to fund the critical habitat portion of some proposed listing determinations so that the proposed listing determination and proposed critical habitat designation could be combined into one rule, thereby being more efficient in our work. At this time, for FY 2011, we do not know if we will be able to use some of the critical habitat subcap funds to fund proposed listing determinations.

We make our determinations of preclusion on a nationwide basis to ensure that the species most in need of listing will be addressed first and also because we allocate our listing budget on a nationwide basis. Through the listing cap, the critical habitat subcap, and the amount of funds needed to address court-mandated critical habitat designations, Congress and the courts have in effect determined the amount of money available for other listing activities nationwide. Therefore, the

funds in the listing cap, other than those needed to address court-mandated critical habitat for already listed species, set the limits on our determinations of preclusion and expeditious progress.

Congress identified the availability of resources as the only basis for deferring the initiation of a rulemaking that is warranted. The Conference Report accompanying Public Law 97-304 (Endangered Species Act Amendments of 1982), which established the current statutory deadlines and the warranted-but-precluded finding, states that the amendments were "not intended to allow the Secretary to delay commencing the rulemaking process for any reason other than that the existence of pending or imminent proposals to list species subject to a greater degree of threat would make allocation of resources to such a petition [that is, for a lower-ranking species] unwise." Although that statement appeared to refer specifically to the "to the maximum extent practicable" limitation on the 90-day deadline for making a "substantial information" finding (see 16 U.S.C. 1533(b)(3)(A)), that finding is made at the point when the Service is deciding whether or not to commence a status review that will determine the degree of threats facing the species, and therefore the analysis underlying the statement is more relevant to the use of the warranted-but-precluded finding, which is made when the Service has already determined the degree of threats facing the species and is deciding whether or not to commence a rulemaking.

In FY 2011, on March 18, 2010, Congress passed a continuing resolution which provides funding at the FY 2010 enacted level through April 8, 2011. Until Congress appropriates funds for FY 2011 at a different level, we will fund listing work based on the FY 2010 amount. Thus, at this time in FY 2011, the Service anticipates an appropriation of \$22,103,000 based on FY 2010 appropriations. Of that, the Service must dedicate \$11,632,000 for determinations of critical habitat for already listed species. Also \$500,000 is appropriated for foreign species listings under the Act. The Service thus has \$9,971,000 available to fund work in the following categories: compliance with court orders and court-approved settlement agreements requiring that petition findings or listing determinations be completed by a specific date; section 4 (of the Act) listing actions with absolute statutory deadlines; essential litigation-related, administrative, and listing program-management functions; and high-priority listing actions for some of our

candidate species. In FY 2010, the Service received many new petitions and a single petition to list 404 species. The receipt of petitions for a large number of species is consuming the Service's listing funding that is not dedicated to meeting court-ordered commitments. Absent some ability to balance effort among listing duties under existing funding levels, it is unlikely that the Service will be able to initiate any new listing determinations for candidate species in FY 2011.

In 2009, the responsibility for listing foreign species under the Act was transferred from the Division of Scientific Authority, International Affairs Program, to the Endangered Species Program. Therefore, starting in FY 2010, we used a portion of our funding to work on the actions described above for listing actions related to foreign species. In FY 2011, we anticipate using \$1,500,000 for work on listing actions for foreign species, which reduces funding available for domestic listing actions; however, currently only \$500,000 has been allocated for this function. Although there are no foreign species issues included in our high-priority listing actions at this time, many actions have statutory or court-approved settlement deadlines, thus increasing their priority. The budget allocations for each specific listing action are identified in the Service's FY 2011 Allocation Table (part of our administrative record).

For the above reasons, funding a proposed listing determination for the Hermes copper butterfly is precluded by court-ordered and court-approved settlement agreements, listing actions with absolute statutory deadlines, work on final listing determinations for those species that were proposed for listing with funds from FY 2011, and work on proposed listing determinations for those candidate species with a higher listing priority (i.e., candidate species with LPNs of 1 to 4).

Based on our September 21, 1983, guidelines for assigning an LPN for each

candidate species (48 FR 43098), we have a significant number of species with a LPN of 2. Using these guidelines, we assign each candidate an LPN of 1 to 12, depending on the magnitude of threats (high or moderate to low), immediacy of threats (imminent or nonimminent), and taxonomic status of the species (in order of priority: monotypic genus (a species that is the sole member of a genus); species; or part of a species (subspecies, distinct population segment, or significant portion of the range)). The lower the listing priority number, the higher the listing priority (that is, a species with an LPN of 1 would have the highest listing priority).

Because of the large number of high-priority species, we have further ranked the candidate species with an LPN of 2 by using the following extinction-risk type criteria: International Union for the Conservation of Nature and Natural Resources (IUCN) Red list status/rank; Heritage rank (provided by NatureServe); Heritage threat rank (provided by NatureServe); and species currently with fewer than 50 individuals, or 4 or fewer populations. Those species with the highest IUCN rank (critically endangered); the highest Heritage rank (G1); the highest Heritage threat rank (substantial, imminent threats); and currently with fewer than 50 individuals, or fewer than 4 populations, originally comprised a group of approximately 40 candidate species ("Top 40"). These 40 candidate species have had the highest priority to receive funding to work on a proposed listing determination. As we work on proposed and final listing rules for those 40 candidates, we apply the ranking criteria to the next group of candidates with an LPN of 2 and 3 to determine the next set of highest priority candidate species. Finally, proposed rules for reclassification of threatened species to endangered are lower priority, because as listed species, they are already afforded the protections of the Act and implementing regulations. However, for

efficiency reasons, we may choose to work on a proposed rule to reclassify a species to endangered if we can combine this with work that is subject to a court-determined deadline.

With our workload so much bigger than the amount of funds we have to accomplish it, it is important that we be as efficient as possible in our listing process. Therefore, as we work on proposed rules for the highest priority species in the next several years, we are preparing multi-species proposals when appropriate, and these may include species with lower priority if they overlap geographically or have the same threats as a species with an LPN of 2. In addition, we take into consideration the availability of staff resources when we determine which high-priority species will receive funding to minimize the amount of time and resources required to complete each listing action.

As explained above, a determination that listing is warranted but precluded must also demonstrate that expeditious progress is being made to add and remove qualified species to and from the Lists of Endangered and Threatened Wildlife and Plants. As with our "warranted-but-precluded" finding, the evaluation of whether progress in adding qualified species to the Lists has been expeditious is a function of the resources available for listing and the competing demands for those funds. (Although we do not discuss it in detail here, we are also making expeditious progress in removing species from the list under the Recovery program in light of the resource available for delisting, which is funded by a separate line item in the budget of the Endangered Species Program. So far during FY 2011, we have completed one delisting rule; see 76 FR 3029.) Given the limited resources available for listing, we find that we are making expeditious progress in FY 2011. This progress includes preparing and publishing the following determinations:

#### FY 2011 COMPLETED LISTING ACTIONS

Publication date	Title	Actions	FR pages
10/6/2010 .....	Endangered Status for the Altamaha Spiny mussel and Designation of Critical Habitat.	Proposed Listing, Endangered ....	75 FR 61664–61690.
10/7/2010 .....	12-Month Finding on a Petition to list the Sacramento Splittail as Endangered or Threatened.	Notice of 12-month petition finding, Not warranted.	75 FR 62070–62095.
10/28/2010 ...	Endangered Status and Designation of Critical Habitat for Spikedace and Loach Minnow.	Proposed Listing, Endangered (uplisting).	75 FR 66481–66552.
11/2/2010 .....	90-Day Finding on a Petition to List the Bay Springs Salamander as Endangered.	Notice of 90-day Petition Finding, Not substantial.	75 FR 67341–67343.
11/2/2010 .....	Determination of Endangered Status for the Georgia Pigtoe Mussel, Interrupted Rocksnail, and Rough Hornsnail and Designation of Critical Habitat.	Final Listing, Endangered .....	75 FR 67511–67550.

## FY 2011 COMPLETED LISTING ACTIONS—Continued

Publication date	Title	Actions	FR pages
11/2/2010 .....	Listing the Rayed Bean and Snuffbox as Endangered .....	Proposed Listing, Endangered ....	75 FR 67551–67583.
11/4/2010 .....	12-Month Finding on a Petition to List <i>Cirsium wrightii</i> (Wright's Marsh Thistle) as Endangered or Threatened.	Notice of 12-month petition finding, Warranted but precluded.	75 FR 67925–67944.
12/14/2010 ...	Endangered Status for Dunes Sagebrush Lizard .....	Proposed Listing, Endangered ....	75 FR 77801–77817.
12/14/2010 ...	12-Month Finding on a Petition to List the North American Wolverine as Endangered or Threatened.	Notice of 12-month petition finding, Warranted but precluded.	75 FR 78029–78061.
12/14/2010 ...	12-Month Finding on a Petition to List the Sonoran Population of the Desert Tortoise as Endangered or Threatened.	Notice of 12-month petition finding, Warranted but precluded.	75 FR 78093–78146.
12/15/2010 ...	12-Month Finding on a Petition to List <i>Astragalus microcymbus</i> and <i>Astragalus schmollii</i> as Endangered or Threatened.	Notice of 12-month petition finding, Warranted but precluded.	75 FR 78513–78556.
12/28/2010 ...	Listing Seven Brazilian Bird Species as Endangered Throughout Their Range.	Final Listing, Endangered .....	75 FR 81793–81815.
1/4/2011 .....	90-Day Finding on a Petition to List the Red Knot subspecies <i>Calidris canutus roselaari</i> as Endangered.	Notice of 90-day Petition Finding, Not substantial.	76 FR 304–311.
1/19/2011 .....	Endangered Status for the Sheeppose and Spectaclecase Mussels	Proposed Listing, Endangered ....	76 FR 3392–3420.
2/10/2011 .....	12-Month Finding on a Petition to List the Pacific Walrus as Endangered or Threatened.	Notice of 12-month petition finding, Warranted but precluded.	76 FR 7634–7679.
2/17/2011 .....	90-Day Finding on a Petition to List the Sand Verbena Moth as Endangered or Threatened.	Notice of 90-day Petition Finding, Substantial.	76 FR 9309–9318.
2/22/2011 .....	Determination of Threatened Status for the New Zealand-Australia Distinct Population Segment of the Southern Rockhopper Penguin.	Final Listing, Threatened .....	76 FR 9681–9692.
2/22/2011 .....	12-Month Finding on a Petition to List <i>Solanum conocarpum</i> (maroon bacora) as Endangered.	Notice of 12-month petition finding, Warranted but precluded.	76 FR 9722–9733.
2/23/2011 .....	12-Month Finding on a Petition to List Thorne's Hairstreak Butterfly as Endangered.	Notice of 12-month petition finding, Not warranted.	76 FR 991–1003.
2/23/2011 .....	12-Month Finding on a Petition to List <i>Astragalus hamiltonii</i> , <i>Penstemon flowersii</i> , <i>Eriogonum soredium</i> , <i>Lepidium ostleri</i> , and <i>Trifolium friscanum</i> as Endangered or Threatened.	Notice of 12-month petition finding, Warranted but precluded & Not Warranted.	76 FR 10166–10203.
2/24/2011 .....	90-Day Finding on a Petition to List the Wild Plains Bison or Each of Four Distinct Population Segments as Threatened.	Notice of 90-day Petition Finding, Not substantial.	76 FR 10299–10310.
2/24/2011 .....	90-Day Finding on a Petition to List the Unsilvered Fritillary Butterfly as Threatened or Endangered.	Notice of 90-day Petition Finding, Not substantial.	76 FR 10310–10319.
3/8/2011 .....	12-Month Finding on a Petition to List the Mt. Charleston Blue Butterfly as Endangered or Threatened.	Notice of 12-month petition finding, Warranted but precluded.	76 FR 12667–12683.
3/8/2011 .....	90-Day Finding on a Petition to List the Texas Kangaroo Rat as Endangered or Threatened.	Notice of 90-day Petition Finding, Substantial.	76 FR 12683–12690.
3/10/2011 .....	Initiation of Status Review for Longfin Smelt .....	Notice of Status Review .....	76 FR 13121–31322.
3/15/2011 .....	Withdrawal of Proposed Rule to List the Flat-tailed Horned Lizard as Threatened.	Proposed rule withdrawal .....	76 FR 14210–14268.
3/22/2011 .....	12-Month Finding on a Petition to List the Berry Cave Salamander as Endangered.	Notice of 12-month petition finding, Warranted but precluded.	76 FR 15919–15932.
4/1/2011 .....	90-Day Finding on a Petition to List the Spring Pygmy Sunfish as Endangered.	Notice of 90-day Petition Finding, Substantial.	76 FR 18138–18143.
4/5/2011 .....	12-Month Finding on a Petition to List the Bearmouth Mountainsnail, Byrne Resort Mountainsnail, and Meltwater Ledian Stonefly as Endangered or Threatened.	Notice of 12-month petition finding, Not Warranted and Warranted but precluded.	76 FR 18684–18701.
4/5/2011 .....	90-Day Finding on a Petition To List the Peary Caribou and Dolphin and Union population of the Barren-ground Caribou as Endangered or Threatened.	Notice of 90-day Petition Finding, Substantial.	76 FR 18701–18706.

Our expeditious progress also includes work on listing actions that we funded in FY 2010 and FY 2011 but have not yet been completed to date. These actions are listed below. Actions in the top section of the table are being conducted under a deadline set by a court. Actions in the middle section of the table are being conducted to meet

statutory timelines, that is, timelines required under the Act. Actions in the bottom section of the table are high-priority listing actions. These actions include work primarily on species with an LPN of 2, and, as discussed above, selection of these species is partially based on available staff resources, and when appropriate, include species with

a lower priority if they overlap geographically or have the same threats as the species with the high priority. Including these species together in the same proposed rule results in considerable savings in time and funding, when compared to preparing separate proposed rules for each of them in the future.

## ACTIONS FUNDED IN FY 2010 AND FY 2011 BUT NOT YET COMPLETED

Species	Action
<b>Actions Subject to Court Order/Settlement Agreement</b>	
Mountain plover <sup>4</sup> .....	Final listing determination.

## ACTIONS FUNDED IN FY 2010 AND FY 2011 BUT NOT YET COMPLETED—Continued

Species	Action
Hermes copper butterfly <sup>3</sup>	12-month petition finding.
4 parrot species (military macaw, yellow-billed parrot, red-crowned parrot, scarlet macaw) <sup>5</sup>	12-month petition finding.
4 parrot species (blue-headed macaw, great green macaw, grey-cheeked parakeet, hyacinth macaw) <sup>5</sup>	12-month petition finding.
4 parrots species (crimson shining parrot, white cockatoo, Philippine cockatoo, yellow-crested cockatoo) <sup>5</sup>	12-month petition finding.
Utah prairie dog (uplisting)	90-day petition finding.
<b>Actions With Statutory Deadlines</b>	
Casey's june beetle	Final listing determination.
6 Birds from Eurasia	Final listing determination.
5 Bird species from Colombia and Ecuador	Final listing determination.
Queen Charlotte goshawk	Final listing determination.
5 species southeast fish (Cumberland darter, rush darter, yellowcheek darter, chucky madtom, and laurel dace) <sup>4</sup>	Final listing determination.
Ozark hellbender <sup>4</sup>	Final listing determination.
Altamaha spiny mussel <sup>3</sup>	Final listing determination.
3 Colorado plants ( <i>Ipomopsis polyantha</i> (Pagosa Skyrocket), <i>Penstemon debilis</i> (Parachute Beardtongue), and <i>Phacelia submutica</i> (DeBeque Phacelia)) <sup>4</sup>	Final listing determination.
Salmon crested cockatoo	Final listing determination.
6 Birds from Peru & Bolivia	Final listing determination.
Loggerhead sea turtle (assist National Marine Fisheries Service) <sup>5</sup>	Final listing determination.
2 mussels (rayed bean (LPN = 2), snuffbox No LPN) <sup>5</sup>	Final listing determination.
CA golden trout <sup>4</sup>	12-month petition finding.
Black-footed albatross	12-month petition finding.
Mojave fringe-toed lizard <sup>1</sup>	12-month petition finding.
Kokanee—Lake Sammamish population <sup>1</sup>	12-month petition finding.
Cactus ferruginous pygmy-owl <sup>1</sup>	12-month petition finding.
Northern leopard frog	12-month petition finding.
Tehachapi slender salamander	12-month petition finding.
Coqui Llanero	12-month petition finding/ Proposed listing.
Dusky tree vole	12-month petition finding.
5 WY plants ( <i>Abronia ammophila</i> , <i>Agrostis rossiae</i> , <i>Astragalus proimanthus</i> , <i>Boechere</i> ( <i>Arabis</i> ) <i>pusilla</i> , <i>Penstemon gibbensii</i> ) from 206 species petition.	12-month petition finding.
Leatherside chub (from 206 species petition)	12-month petition finding.
Frigid ambersnail (from 206 species petition) <sup>3</sup>	12-month petition finding.
Platte River caddisfly (from 206 species petition) <sup>5</sup>	12-month petition finding.
Gopher tortoise—eastern population	12-month petition finding.
Grand Canyon scorpion (from 475 species petition)	12-month petition finding.
<i>Anacronuria wipukupa</i> (a stonefly from 475 species petition) <sup>4</sup>	12-month petition finding.
3 Texas moths ( <i>Ursia furtiva</i> , <i>Sphingicampa blanchardi</i> , <i>Agapema galbina</i> ) (from 475 species petition)	12-month petition finding.
2 Texas shiners ( <i>Cyprinella</i> sp., <i>Cyprinella lepida</i> ) (from 475 species petition)	12-month petition finding.
3 South Arizona plants ( <i>Erigeron piscaticus</i> , <i>Astragalus hypoxylus</i> , <i>Amoreuxia gonzalezii</i> ) (from 475 species petition).	12-month petition finding.
5 Central Texas mussel species (3 from 475 species petition)	12-month petition finding.
14 parrots (foreign species)	12-month petition finding.
Striped newt <sup>1</sup>	12-month petition finding.
Fisher—Northern Rocky Mountain Range <sup>1</sup>	12-month petition finding.
Mohave ground squirrel <sup>1</sup>	12-month petition finding.
Puerto Rico harlequin butterfly <sup>3</sup>	12-month petition finding.
Western gull-billed tern	12-month petition finding.
Ozark chinquapin ( <i>Castanea pumila</i> var. <i>ozarkensis</i> ) <sup>4</sup>	12-month petition finding.
HI yellow-faced bees	12-month petition finding.
Giant Palouse earthworm	12-month petition finding.
Whitebark pine	12-month petition finding.
OK grass pink ( <i>Calopogon oklahomensis</i> ) <sup>1</sup>	12-month petition finding.
Ashy storm-petrel <sup>5</sup>	12-month petition finding.
Honduran emerald	12-month petition finding.
Southeastern pop snowy plover & wintering pop. of piping plover <sup>1</sup>	90-day petition finding.
Eagle Lake trout <sup>1</sup>	90-day petition finding.
Smooth-billed ani <sup>1</sup>	90-day petition finding.
32 Pacific Northwest mollusks species (snails and slugs) <sup>1</sup>	90-day petition finding.
42 snail species (Nevada & Utah)	90-day petition finding.
Peary caribou	90-day petition finding.
Spring Mountains checkerspot butterfly	90-day petition finding.
Spring pygmy sunfish	90-day petition finding.
Bay skipper	90-day petition finding.
Spot-tailed earless lizard	90-day petition finding.
Eastern small-footed bat	90-day petition finding.
Northern long-eared bat	90-day petition finding.
Prairie chub	90-day petition finding.
10 species of Great Basin butterfly	90-day petition finding.
6 sand dune (scarab) beetles	90-day petition finding.

## ACTIONS FUNDED IN FY 2010 AND FY 2011 BUT NOT YET COMPLETED—Continued

Species	Action
Golden-winged warbler <sup>4</sup> .....	90-day petition finding.
404 Southeast species .....	90-day petition finding.
Franklin's bumble bee <sup>4</sup> .....	90-day petition finding.
2 Idaho snowflies (straight snowfly & Idaho snowfly) <sup>4</sup> .....	90-day petition finding.
American eel <sup>4</sup> .....	90-day petition finding.
Gila monster (Utah population) <sup>4</sup> .....	90-day petition finding.
Arapahoe snowfly <sup>4</sup> .....	90-day petition finding.
Leona's little blue <sup>4</sup> .....	90-day petition finding.
Aztec gilia <sup>5</sup> .....	90-day petition finding.
White-tailed ptarmigan <sup>5</sup> .....	90-day petition finding.
San Bernardino flying squirrel <sup>5</sup> .....	90-day petition finding.
Bicknell's thrush <sup>5</sup> .....	90-day petition finding.
Chimpanzee .....	90-day petition finding.
Sonoran talussnail <sup>5</sup> .....	90-day petition finding.
2 AZ Sky Island plants ( <i>Graptopetalum bartrami</i> & <i>Pectis imberbis</i> ) <sup>5</sup> .....	90-day petition finding.
I'iwi <sup>5</sup> .....	90-day petition finding.
<b>High-Priority Listing Actions</b>	
19 Oahu candidate species <sup>2</sup> (16 plants, 3 damselflies) (15 with LPN = 2, 3 with LPN = 3, 1 with LPN = 9) .....	Proposed listing.
19 Maui-Nui candidate species <sup>2</sup> (16 plants, 3 tree snails) (14 with LPN = 2, 2 with LPN = 3, 3 with LPN = 8) .....	Proposed listing.
2 Arizona springsnails <sup>2</sup> ( <i>Pyrgulopsis bernadina</i> (LPN = 2), <i>Pyrgulopsis trivialis</i> (LPN = 2)) .....	Proposed listing.
Chupadera springsnail <sup>2</sup> ( <i>Pyrgulopsis chupaderae</i> (LPN = 2)) .....	Proposed listing.
8 Gulf Coast mussels (southern kidneyshell (LPN = 2), round ebonyshell (LPN = 2), Alabama pearlshell (LPN = 2), southern sandshell (LPN = 5), fuzzy pigtoe (LPN = 5), Choctaw bean (LPN = 5), narrow pigtoe (LPN = 5), and tapered pigtoe (LPN = 11)) <sup>4</sup> .....	Proposed listing.
Umanum buckwheat (LPN = 2) and white bluffs bladderpod (LPN = 9) <sup>4</sup> .....	Proposed listing.
Grotto sculpin (LPN = 2) <sup>4</sup> .....	Proposed listing.
2 Arkansas mussels (Neosho mucket (LPN = 2) & rabbitsfoot (LPN = 9)) <sup>4</sup> .....	Proposed listing.
Diamond darter (LPN = 2) <sup>4</sup> .....	Proposed listing.
Gunnison sage-grouse (LPN = 2) <sup>4</sup> .....	Proposed listing.
Coral Pink Sand Dunes Tiger Beetle (LPN = 2) <sup>5</sup> .....	Proposed listing.
Miami blue (LPN = 3) <sup>3</sup> .....	Proposed listing.
Lesser prairie chicken (LPN = 2) .....	Proposed listing.
4 Texas salamanders (Austin blind salamander (LPN = 2), Salado salamander (LPN = 2), Georgetown salamander (LPN = 8), Jollyville Plateau (LPN = 8)) <sup>3</sup> .....	Proposed listing.
5 SW aquatics (Gonzales Spring Snail (LPN = 2), Diamond Y springsnail (LPN = 2), Phantom springsnail (LPN = 2), Phantom Cave snail (LPN = 2), Diminutive amphipod (LPN = 2)) <sup>3</sup> .....	Proposed listing.
2 Texas plants (Texas golden gladebush ( <i>Leavenworthia texana</i> ) (LPN = 2), Neches River rose-mallow ( <i>Hibiscus dasycalyx</i> ) (LPN = 2)) <sup>3</sup> .....	Proposed listing.
4 AZ plants (Acuna cactus ( <i>Echinomastus erectocentrus</i> var. <i>acunensis</i> ) (LPN = 3), Fickeisen plains cactus ( <i>Pediocactus peeblesianus fickeiseniae</i> ) (LPN = 3), Lemmon fleabane ( <i>Erigeron lemmonii</i> ) (LPN = 8), Gierisch mallow ( <i>Sphaeralcea gierischii</i> ) (LPN = 2)) <sup>5</sup> .....	Proposed listing.
FL bonneted bat (LPN = 2) <sup>3</sup> .....	Proposed listing.
3 Southern FL plants (Florida semaphore cactus ( <i>Consolea corallicola</i> ) (LPN = 2), shellmound applecactus ( <i>Harrisia</i> (= <i>Cereus</i> ) <i>aboriginum</i> (= <i>gracilis</i> )) (LPN = 2), Cape Sable thoroughwort ( <i>Chromolaena frustrata</i> ) (LPN = 2)) <sup>5</sup> .....	Proposed listing.
21 Big Island (HI) species <sup>5</sup> (includes 8 candidate species—5 plants & 3 animals; 4 with LPN = 2, 1 with LPN = 3, 1 with LPN = 4, 2 with LPN = 8) .....	Proposed listing.
12 Puget Sound prairie species (9 subspecies of pocket gopher ( <i>Thomomys mazama</i> ssp.) (LPN = 3), streaked horned lark (LPN = 3), Taylor's checkerspot (LPN = 3), Mardon skipper (LPN = 8)) <sup>3</sup> .....	Proposed listing.
2 TN River mussels (fluted kidneyshell (LPN = 2), slabside pearlymussel (LPN = 2)) <sup>5</sup> .....	Proposed listing.
Jemez Mountain salamander (LPN = 2) <sup>5</sup> .....	Proposed listing.

<sup>1</sup> Funds for listing actions for these species were provided in previous FYs.

<sup>2</sup> Although funds for these high-priority listing actions were provided in FY 2008 or 2009, due to the complexity of these actions and competing priorities, these actions are still being developed.

<sup>3</sup> Partially funded with FY 2010 funds and FY 2011 funds.

<sup>4</sup> Funded with FY 2010 funds.

<sup>5</sup> Funded with FY 2011 funds.

We have endeavored to make our listing actions as efficient and timely as possible, given the requirements of the relevant law and regulations, and constraints relating to workload and personnel. We are continually considering ways to streamline processes or achieve economies of scale, such as by batching related actions together. Given our limited budget for implementing section 4 of the Act, these actions described above collectively constitute expeditious progress.

The Hermes copper butterfly will be added to the list of candidate species upon publication of this 12-month finding. We will continue to monitor the status of this species as new information

becomes available. This review will determine if a change in status is warranted, including the need to make prompt use of emergency listing procedures.

We intend that any proposed classification of the Hermes copper butterfly will be as accurate as possible. Therefore, we will continue to accept additional information and comments from all concerned governmental agencies, the scientific community, industry, or any other interested party concerning this finding.

#### References Cited

A complete list of references cited is available on the internet at <http://www.regulations.gov> and upon request

from the Carlsbad Fish and Wildlife Office (see **ADDRESSES**).

#### Authors

The primary authors of this notice are the staff members of the Carlsbad Fish and Wildlife Office.

#### Authority

The authority for this action is section 4 of the Endangered Species Act of 1973, as amended (16 U.S.C. 1531 *et seq.*).

Dated: March 29, 2011.

**Rowan W. Gould,**

*Acting Director, Fish and Wildlife Service.*

[FR Doc. 2011-9028 Filed 4-13-11; 8:45 am]

**BILLING CODE 4310-55-P**