



**Emergency Petition to List the Thorne's hairstreak
Butterfly (*Callophrys [Mitoura] thornei* or *Callophrys*
[Mitoura] grynea thornei) as Endangered Under the
Endangered Species Act**

Petitioners

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INTRODUCTION

The Thorne's hairstreak butterfly (*Callophrys [Mitoura] thornei* or *Callophrys [Mitoura] grynea thornei*) is an extremely imperiled species (or subspecies) known only from the San Ysidro Mountains (a.k.a. Otay Mountains) in southwest San Diego County, California. Thorne's hairstreak has been recognized as unique and imperiled for over 20 years, since it was first described as a species in 1983, and is dependent on its host plant for survival - the rare Tecate cypress (*Cupressus forbesii*).

Thorne's hairstreak is on the brink of extinction. Only five, small populations of Thorne's hairstreak are known to remain in existence following the large Mine Fire of 2003. All five populations are located inside of the U.S. Bureau of Land Management's Otay Mountains Wilderness, yet this has provided little insurance against a significant trend towards extinction. Designated wilderness cannot protect the species from the primary threat of excessive, human-induced wildfire.

Thorne's hairstreak is imminently threatened by fire. One single, new fire could cause extinction of the species. The 2003 Mine Fire provided a clear example of the threat of wildfire to the species when it burned approximately 68% of Thorne's hairstreak habitat (Betzler *et al.* 2003). At least 58 other fires have burned through and near Thorne's hairstreak and Tecate cypress populations in the San Ysidro Mountains over the last century, according to California Department of Forestry and U.S. Forest Service records. This number greatly exceeds pre-European settlement fire frequency in southern California chaparral ecosystems, and poses a highly significant threat to the survival of Thorne's hairstreak and its Tecate cypress habitat.

Thorne's hairstreak and Tecate cypress are also endangered by prescribed fire, livestock grazing, vehicle access, recreation, global climate change, and delayed federal protection. The San Diego Multiple Species Conservation Plan and other existing government regulations provide few if any protections for the species.

Thorne's hairstreak has never received formal Endangered Species Act (also "ESA") protection despite 20 years of official knowledge of the species' perilous status. Extensive speculation spread on the possible extinction of Thorne's hairstreak following the Mine Fire. Yet the Bush administration has taken no action over the following year to provide protections for the species.

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

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

The Bush administration is the only presidency in the history of the ESA to have not listed a single species except in response to petitions and/or lawsuits by scientists and citizen groups. The Bush administration is the only presidency in the history of the ESA to have declared that a species is going extinct, but should not be listed because it is "insignificant" – Puget Sound orcas, Lower Kootenai River burbot, and Western gray squirrel. The Bush administration has decided against listing 45 species, and listed only 31 species. This ratio is unmatched by any other administration.

Specific neglect of Thorne's hairstreak reaches back as far as the Reagan administration. The species was designated as a category 2 candidate for listing by the U.S. Fish and Wildlife Service (also "Service") in 1984 and maintained on subsequent candidate lists through 1994. But the species' candidacy was removed when the agency unilaterally abolished the category 2 candidates list in 1996. Candidate 2 status was also removed for Tecate cypress in 1996.

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

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

Formal, emergency recognition of Thorne's hairstreak as an endangered species should increase available conservation resources and education on the status of the species. Increased conservation and education should include improved recognition by responsible agencies of the species' imperiled status and of the significant threat posed by wildfire. Formal listing protection should result in preparation of a recovery plan for Thorne's hairstreak by the U.S. Fish and Wildlife Service. Formal listing protection should also result in increased funding availability for recovery activities, and increased conservation activities by the U.S. Bureau of Land Management, California Department

of Forestry, U.S. Immigration and Naturalization Service, and others. Conservation activities should include improved fire suppression in and around San Ysidro Mountains Tecate cypress stands, restoration of Tecate cypress habitat, resident wilderness managers and fire fighters, patrols for unauthorized campfires and arsonists, efforts to increase the number of Thorne's hairstreak populations and individuals, and other specific recovery measures.

TABLE OF CONTENTS

INTRODUCTION

I. TAXONOMY	3
Figure 1 – <i>Callophrys [Mitoura] thornei</i> <u>or</u> <i>Callophrys [Mitoura] grynea thornei</i>	4
II. DESCRIPTION	4
III. LIFE HISTORY	5
Biology	5
Figure 2 – Female Thorne’s hairstreak nectaring on Ramona lilac (<i>Ceanothus</i> <i>tommentosus</i>).....	6
Figure 3 – 2004 location of single male hairstreak in young cypress recovering from fire, 100 meters from population in older cypress population	7
Ecology	8
Figure 4 – Tecate cypress locations	8
Figure 5 – Example of a mature Tecate Cypress woodland	10
Distribution	10
IV. POPULATION STATUS	11
Figure 6 – Historical Thorne’s hairstreak locations.....	11
Figure 7 – Pre- 2003 Mine Fire Thorne’s hairstreak population	12
Figure 8 – Post- 2003 Mine Fire Thorne’s hairstreak populations	13
V. THORNE’S HAIRSTREAK WARRANTS EMERGENCY RECOGNITION AS AN ENDANGERED SPECIES	13
Thorne’s hairstreak is imminently endangered by present and threatened destruction, modification, or curtailment of range or habitat	14
Wildfire	14
Figure 9 – Tecate Cypress recovering from 1996 Otay Fire, 2004	15
Figure 10 – New 2004 Thorne’s hairstreak location recovering from 1996 Otay Fire	15

Prescribed fire	17
Grazing.....	18
Vehicle access and recreation	19
Thorne’s hairstreak may be endangered by predation	19
Thorne’s hairstreak is endangered due to the inadequacy of existing regulatory mechanisms.....	19
Wilderness Act.....	20
Bureau of Land Management activities	20
San Diego Multiple Species Conservation Plan	21
Other natural or manmade factors affecting the continued existence of Thorne’s hairstreak.....	23
Habitat fragmentation	23
Vulnerability of small and isolated populations	24
Global climate change.....	25
Delayed Protection.....	26
VI. CRITICAL HABITAT.....	26
VII. ECOSYSTEM PROTECTION UNDER THE ESA	30
VIII. BENEFITS OF ENDANGERED SPECIES ACT PROTECTION	32
IX. 90-90-DAY FINDING	33
X. REFERENCES CITED	34

APPENDIX 1 – Fire perimeters and the Thorne’s hairstreak butterfly metapopulation

I. TAXONOMY

The Thorne's hairstreak butterfly is either a distinct species or subspecies, according to the best available scientific data; (*Callophrys [Mitoura] thornei* or *Callophrys [Mitoura] grynea thornei*).

Thorne's hairstreak is a small butterfly of the family *Lycaenidae* (Gossamer-wings) and subfamily *Theclinae* (hairstreaks). The first, peer-reviewed, detailed taxonomic treatment concluded that Thorne's hairstreak is a distinct species, *Mitoura thornei* (Brown 1983). The only subsequent detailed treatment found Thorne's to be a subspecies, *Mitoura loki thornei* (Shields 1984).

The Nearctic genus *Mitoura* frequently is considered a subgenus of *Callophrys*, identified as *Callophrys [Mitoura]* (Brown 1991).

The majority of authors have supported Brown's position that Thorne's hairstreak is a distinct species (Tilden and Smith 1986; Garth and Tilden 1988; Balmer and Pratt, 1989; Ferris 1989; Murphy 1995; Emmel *et. al.* 1998; Opler 1999; Opler and Warren 2003; and Faulkner and Klein 2003). Others have supported the subspecies conclusions, but as *Callophrys [Mitoura] grynea thornei* instead of Shield's *Mitoura loki thornei* (Scott 1986, Glassberg 2001, and Kaufmann and Brock 2003).

The Lepidopterist's Society's "Committee on scientific names of North American butterflies" reviewed taxonomy and came to an "intentionally conservative" conclusion of Thorne's status as the subspecies *Callophrys [Mitoura] grynea thornei*. VanBuskirk (2004) reached a similar conclusion in a review of the species' taxonomy for the U.S. Fish and Wildlife Service.

Irrespective of this debate, Brown (1991) concluded that Thorne's hairstreak "... is part of a 'superspecies' complex in which the degree of morphological divergence and genetic isolation among taxa do not conform well with our fixed system of binomial (or trinomial) nomenclature

...,” and that Thorne’s is ecologically distinct and geographically isolated from its nearest congeners.



Figure 1

Callophrys [Mitoura] thornei or *Callophrys [Mitoura] grynea thornei*

Photo by Michael Klein

II. DESCRIPTION

Thorne’s hairstreak was first described in 1983 from a 1972 collection by Fred Thorne (Brown 1983). The wingspan of adults is 11.5 to 14.0 millimeters (Brown 1983). The dorsal surface of adult male forewing is a rich reddish brown with dark brown shading on the costal margin, basal and postbasal areas, apical and subapical areas, and along the outer margin. It has two tails, one very short near the C_{u1} and a longer one near C_{u2} . The scent patch is well developed. The ventral surface is with concolorous forewings and extensive basal and marginal darkening. There is a fine white submarginal line between Cu_2 and 2ndA. Also a very short, slender, black hair-like tail at the end of Cu_1 , tipped with white; and a longer tail at the end of Cu_2 . The ventral surface forewing is mahogany brown with faint traces of lavender overscaling, heavier near apical and basal areas. A well defined white submarginal line composing of five dashes is interrupted only by the major forewing veins. Offset basally is an additional longer, faint, white curved dash just below the well defined line. Hindwings are lustrous grayish

lavender below, with a broad maroon-to-brown discal band. An irregular, though well defined, white postmedian line is at the outer edge of the discal band. A submarginal row of 6 (variable from 4 to 7) black terminal spots present in the light limbal zone. “Thecla” spot well defined. Terminal area between the row of black spots and the outer margin inconsistently marked with areas of heavy iridescent pale blue scaling. The female is similar in color and maculation to the male, without scent pad on upper surface forewing (Brown 1983).

Mature larvae are vivid green with two irregular white crescents on each segment, one on each side of the middorsal crest. The markings form a longitudinal white stripe above the prolegs on each side of the larvae. Close inspection of mature larvae will reveal minute brown hairs covering its entire body.

Pupae are dark chestnut brown with fine mottling, and are covered with fine brown hairs. Eggs are light green in color and echinoid in shape.

III. LIFE HISTORY

Biology

Thorne’s hairstreak eggs are laid singly on the new growth of established Tecate cypress host plants (*Cupressus forbesii*) and will incubate in 7-14 days. Pupation is in the duff and leaf litter at the base of the host plant, and larvae feed on young cypress stems (Klein, pers. comm.). Adults regularly perch near the top of the cypress and are very rarely observed far from the tree (Brown 1991).

Thorne’s hairstreak is bivoltine and overwinters in the pupal stage. First generation pupation is approximately 10-15 days. First generation emergence is late February through March, and second generation emergence is June through July. First instar larvae initially bore into the young stems of the host plant but later instars become external feeders. Larval stage is 26-35 days.

The use of Coniferae as a larval host is unusual among Nearctic butterflies. Only *Neophasia* (Pieridae), *Incisalia* (Lycaenidae), and *Mitoura* are known to utilize Pinaceae and Cupresaceae.

Within San Diego County, its congeners *Callophrys loki* and *Callophrys nelsoni* are host specific to California juniper (*Juniperus californica*) and California Incense Cedar (*Calocedrus decurrens*), respectively. Another closely related species, *Callophrys muri* of northern California uses *Cupressus stephensonii*. Brown (1983) discussed a single *Mitoura* specimen collected on Isla Guadalupe by Powell in 1958 that was later determined to be *Mitoura nelsoni muri* and apparently used *Cupressus guadalupensis*.

Thorne's hairstreak is double-brooded, with the first flight season in late February through March, and the second in June (Brown 1993). Also according to Brown, "The emergence of laboratory reared individuals in August suggests the presence of a third brood in the fall," but this is yet to be documented in the field.



Figure 2
Female Thorne's hairstreak nectaring on Ramona lilac (*Ceanothus tomentosus*).
Photo by Michael Klein.

Thorne's hairstreak nectar resources during its first flight season include manzanita (*Arctostaphylos otayensis*), California buckwheat (*Eriogonum fasciculatum*), yerba santa (*Eriodictyon* sp.) (Brown 1983), Ramona lilac (*Ceanothus tomentosus*), and deerweed (*Lotus*

sp.) (Klein, pers. comm.). California buckwheat appears to be the primary nectar resources during the second flight season in June.



Figure 3
2004 location of single male hairstreak in young cypress recovering from fire, 100 meters from
population in older cypress population
Photo by John Martin

Thorne's hairstreak dispersal behavior is not well known. The species' limited San Ysidro Mountain range suggests significant limits in dispersal. Adults are observed close to cypress with few exceptions, and regularly perch in the tops of the tree (Brown 1983). Anecdotal information suggests limited hairstreak dispersal amidst proximate cypress stands, possibly during searches for nectar resources (Klein, pers. comm.). A single male was observed in 2004 patrolling a young stand of cypress recovering from fire, approximately 100 meters from a hairstreak population in an older cypress population (Klein, pers. comm.). This male may have dispersed from the older to younger cypress and established a new territory. Thorne's have been observed nectaring on buckwheat approximately 20-50 m from the nearest cypress stands (Martin 2004), and on deerweed approximately ¼ mile from the nearest stands (Brown and Faulkner 2003).

Ecology

Thorne's hairstreak ecology is inseparably linked to that of its Tecate cypress host. Tecate cypress is also an imperiled species. The species is a closed-cone conifer occurring on xeric slopes in chaparral. Tecate cypress is limited to a few highly restricted populations, endangered throughout its range, and is rare outside of California, according to the California Native Plant Society and others (California Native Plant Society 2001). The species is known only from Coal Canyon in Orange County, Guatay Peak, Tecate Peak and Otay Mountain in San Diego County, and scattered patches in northern Baja California, Mexico (Brown 1991; Faulkner and Klein 2003). The range of the species was possibly more widespread in the Neocene period (Axelrod 1967).



Figure 4

Tecate cypress locations

Map by Michael Klein

Fire frequency is just as important a factor in persistence of Thorne's hairstreak as that of its host (Brown 1991). Occasional fire appears necessary to maintain the species' Tecate cypress

habitat. But too frequent fire reduces available cypress habitat and therefore Thorne's population numbers.

No clear evidence is available resolving the issue of cypress age when utilization begins by Thorne's hairstreak. According to Klein (pers. comm.), some anecdotal evidence suggests that Tecate cypress must reach a certain threshold of maturity prior to utilization by Thorne's hairstreak. Young Tecate cypress do not appear to be utilized by the species, and Klein and others speculate that pointed needles on young or sprouting Tecate cypress may discourage hairstreak utilization, while rounded needles on mature or maturing cypress provide more suitable larval habitat.

Three Thorne's hairstreak pairs were observed mating on a seven year old cypress with cones. However, neither ovipositioning, eggs, nor larvae were observed (Klein, pers. comm.). According to field notes from U.S. Fish and Wildlife Service employee John Martin (2004), Thorne's hairstreaks were viewed during post-2003 Mine Fire surveys, "... sunning, perching territorially, and apparently exploring places to deposit eggs, on trees of varying diameter, height, and cone bearing status." One adult female was also viewed "... apparently scouting for a location to lay eggs (perching on various distal green twigs, curling abdomen under twigs) ... on a tree about 3 m tall and maybe 7 cm diameter," though no egg laying was observed.

Thorne's hairstreak and Tecate cypress occupy a landscape shaped by fire. Several authors have reviewed the effects of fire on the cypress and its habitat (Zedler 1977; Dunn 1986; Ansary *in print*). A less frequent, past fire regime appears to benefit Tecate cypress, while the excessive, current fire regime appears harmful to both Thorne's hairstreak and the Tecate cypress.



Figure 5

Example of a mature Tecate Cypress woodland

Photo by Michael Klein

Tecate cypress require approximately 25 years to begin cone production at reproductive maturity (Zedler 1977), though field observations in 2004 of seven year old trees with cones suggests an earlier maturity. Fire is necessary to open cones and disperse seeds, and to reduce the density of competing chaparral vegetation (Zedler 1977, Dunn 1986). Seedlings sprout in new chaparral openings created by fire.

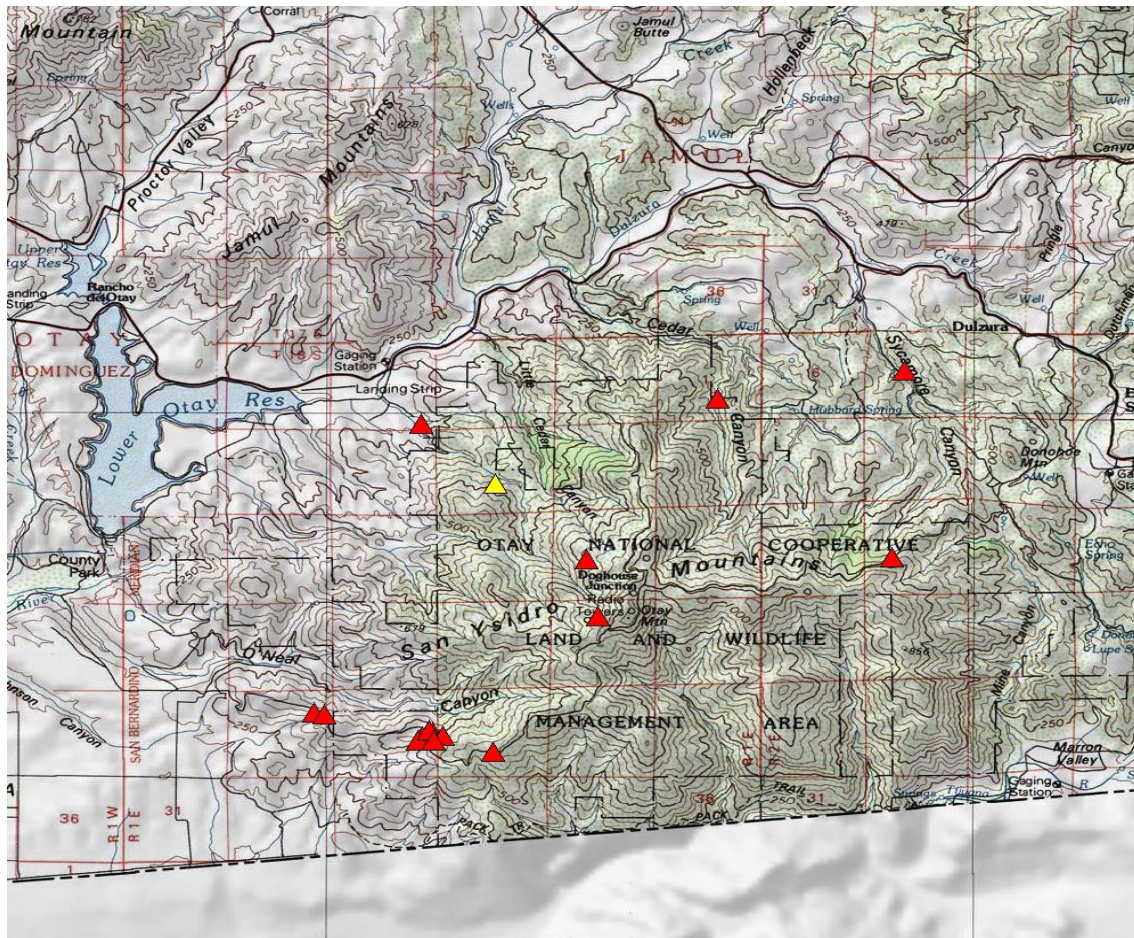
However, excessive wildfire occurring over the last century reduces the number of Tecate cypress reaching cone-bearing maturity, ultimately reducing reproduction and the already limited range and distribution of both the cypress (Zedler 1977; Dunn 1986) and Thorne's hairstreak.

Distribution

The range of the single known Thorne's hairstreak metapopulation appears much smaller than that of its imperiled host plant. Thorne's hairstreak is known only from San Ysidro Mountain stands of Tecate cypress, based on surveys of other known Tecate cypress populations in both the

United States and Baja California (Orsak 1977; Brown 1983; Brown 1991; Klein, pers. comm.).

IV. POPULATION STATUS



additional fire could cause extinction of the species. The species' apparent reliance on only mature or maturing cypress and excessive, recent fires greatly reduces the availability of suitable habitat, and greatly increases threats to remaining populations.

Thorne's hairstreak occurred in approximately eight populations prior to the October 2003 Mine Fire in the San Ysidro Mountains. This fire resulted in significant losses of mature or maturing Tecate cypress, placing in clear focus the vulnerability of the hairstreak to a single, catastrophic, fire event. The 2003 Mine Fire burned approximately 68% of Thorne's hairstreak habitat (Betzler *et al.* 2003). Fire perimeter maps appeared to show the loss of all then-known Thorne's hairstreak populations, resulting in extensive speculation on possible extinction of the species.

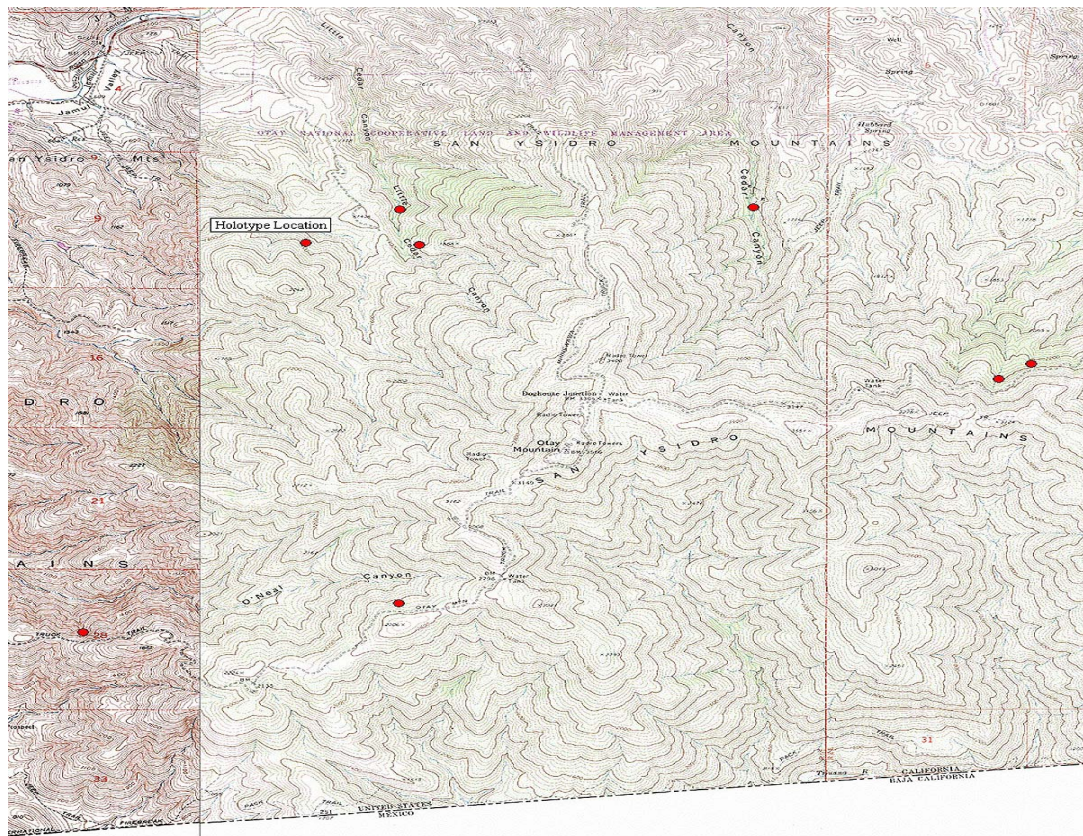


Figure 7
Pre- 2003 Mine Fire Thorne's hairstreak population
Map by Michael Klein

Motivated in part by the apparent tenuous status of Thorne's hairstreak, 2004 field surveys revealed five populations surviving the 2003 Mine Fire. Four of these populations were previously undocumented, while one persisted in a patch of unburned Tecate cypress within the fire perimeter. Two of these were located in mature cypress stands, and two others were located in stands that appear to be recovering from the 1996 Otoy Fire.

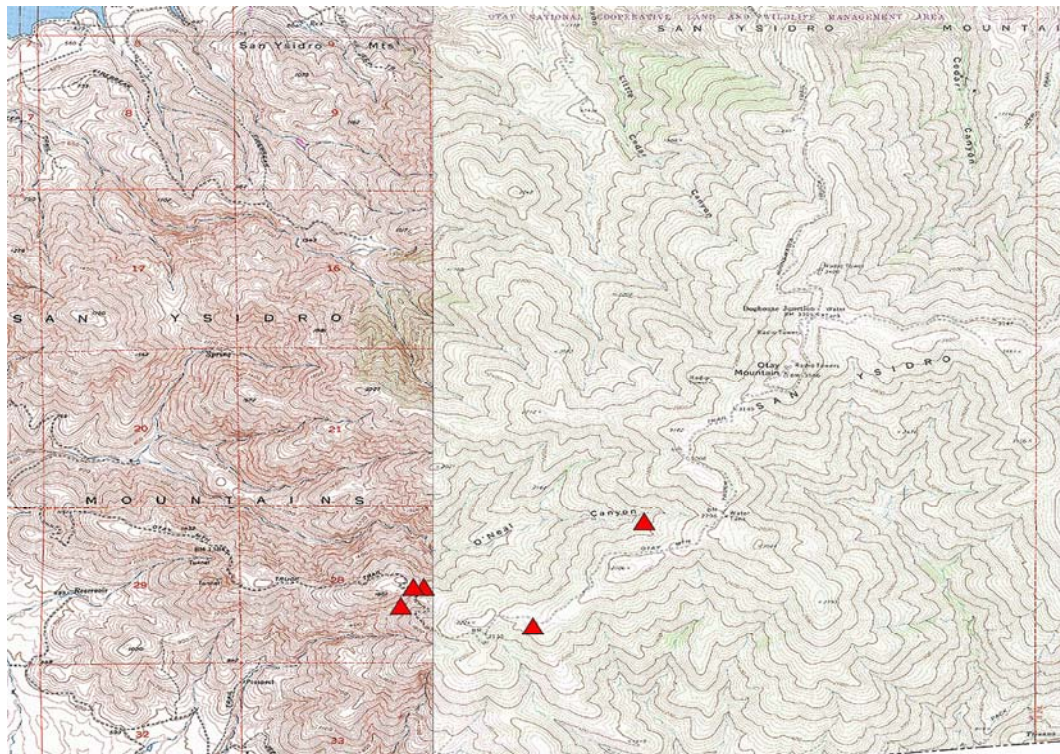


Figure 8

Post- 2003 Mine Fire Thorne's hairstreak populations

Map by Michael Klein

V. THORNE'S HAIRSTREAK WARRANTS EMERGENCY RECOGNITION AS AN ENDANGERED SPECIES

The U.S. Fish and Wildlife Service should grant Thorne's hairstreak emergency Endangered Species Act (also "ESA") protection as an endangered species for a number of reasons. Thorne's hairstreak is a "species" as defined by the ESA. See 16 U.S.C. § 1532(16).

See also 50 CFR 424.02(k). Thorne's hairstreak should be recognized as an "endangered species" as defined by the ESA because it "...is in danger of extinction throughout all or a significant portion of its range..." See 16 U.S.C. § 1532(6). See also 50 CFR 424.02(e). And Thorne's hairstreak should be recognized as endangered on an emergency basis because it faces "...an emergency posing a significant threat to the well-being of a species..." See 16 U.S.C. § 1533(7). See also 50 CFR 424.20.

Thorne's hairstreak is a "species" as defined by the ESA because the butterfly is either a distinct species or subspecies, according to the best available scientific data; (*Callophrys [Mitoura] thornei* or *Callophrys [Mitoura] grynea thornei*).

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

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

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

Thorne's hairstreak is imminently endangered by present and threatened destruction, modification, or curtailment of range or habitat

Wildfire

Thorne's hairstreak is highly and immediately vulnerable to extinction due to the threat of wildfire. "Chaparral fires probably represent the greatest threat to ... [Tecate] cypress and its associated insect fauna, including Thorne's hairstreak," according to Brown (1993).

One single, new fire could cause extinction of Thorne's hairstreak. The 2003 Mine Fire served as a devastating example of the threat of fire to the species when it burned approximately 68% of the Thorne's hairstreak habitat (Betzler *et al.* 2003). At least 58 other fires have burned through and near Thorne's hairstreak and Tecate cypress populations in the San Ysidro Mountains over the last century, according to California Department of Forestry and U.S. Forest Service records. Please see Appendix 1, Fire perimeters and the Thorne's hairstreak butterfly metapopulation. Many of these fires appear to have spread from Mexican migrant's campfires while others were arson, according to fire management agencies. This number greatly exceeds natural fire frequencies in southern California chaparral ecosystems and poses a highly significant and immediate threat to the survival of Thorne's hairstreak and its Tecate cypress habitat.

Thorne's hairstreak biology appears to reduce the likelihood of escape from fire burning through occupied Tecate cypress habitat. Pupae and larvae are likely killed when fire burns cypress trees and nearby chaparral. Adults are also likely killed by fire due to their habit of remaining close to cypress, and the likelihood of their escape being outpaced by approaching fire.



Figure 9
Tecate Cypress recovering from
1996 Otay Fire, 2004
Photo by Michael Klein



Figure 10
New 2004 Thorne's hairstreak location
recovering from 1996 Otay Fire
Photo by Michael Klein

Excessive fire appears to be a significant threat to Thorne's hairstreak. Increased human populations and utilization of wild lands correlate with an increased southern California wildfire

frequency (Keeley and Fotheringham 2002; Keeley *et al.* 1999; Wells *et al.* 2004). According to Keeley (2001, citations omitted), "... fire management is challenged with an ever-increasing rate of fire incidence which parallels the exponential rate of human population growth in an environment with the worst fire weather in the country." A very close proximity to large human populations increases the vulnerability of Thorne's hairstreak and Tecate cypress populations to excessive fire.

Excessive fires over the last several decades have reduced stands of mature Tecate cypress utilized by Thorne's hairstreak, thereby reducing hairstreak population numbers and disrupting metapopulation dynamics and stability. Any butterflies escaping fire are unlikely to locate other suitable habitat given the reduced availability of nearby, mature Tecate cypress due to other past fires, as well as the likelihood of future Tecate cypress losses to fire. Thorne's hairstreak recovery following fire is also confounded by slow recovery of its host plant.

Thorne's hairstreak populations in the San Ysidro Mountains face an additional unique risk of excessive fire as U.S. border enforcement has directed Mexican migrant crossings away from coastal urban areas and towards wild land areas east of Otay Mesa. Fire and land management agencies frequently point to migrant's camp fires and arson as the cause of border-area wildfires. Whatever the cause, dozens of fires have burned through or near Thorne's hairstreak populations over the last century, greatly reducing the extent of Thorne's hairstreak habitat and serving as evidence of the imminent threat posed to the species by future fire.

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

Excessive fire also leads to well-documented type conversion - replacement of chaparral ecosystems with exotic plant species (Keeley and Fotheringham 2003; Keeley 2001). Excessive

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

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

Keeley and Fotheringham conclude,

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

Fire-induced type conversion of Tecate cypress and surrounding chaparral to vegetation dominated by invasive alien plant species reduces Thorne's hairstreak habitat through loss of host and nectar resource plants. Zedler *et al.* (1983) documented type conversion in the San Ysidro Mountains within one mile of Thorne's hairstreak populations. Exotic grasses and forbes also appear to be increasing in former cypress and chaparral habitat following the 2003 Mine Fire (Klein, pers. comm.).

Prescribed fire

Prescribed fire does not appear to be planned for the San Ysidro Mountains, but could compound the threat of excessive fire to Thorne's hairstreak and Tecate cypress if implemented in the future. All five known remaining Thorne's hairstreak populations appear to be located on lands owned and administered by the U.S. Bureau of Land Management (also "BLM"), and the agency's South Coast Resource Management Plan ("South Coast RMP") states that "Prescribed

burning is generally allowed.” See South Coast RMP at 16. Thorne’s hairstreaks are vulnerable to fire throughout their life cycle, as discussed above. Controlled burning often differs from natural fires in frequency, intensity, timing, and patchiness (Schlicht and Orwig 1999), and these factors could reduce the likelihood of the species survival through prescribed fire.

Grazing

The Bureau of Land Management also authorizes grazing on the Otay Mountain grazing allotment in an area apparently occupied by Thorne’s hairstreak prior to the 2003 Mine Fire and near the last five known remaining populations. The allotment is currently vacant according to agency staff, but the BLM is actively considering renewal of this grazing lease, according to a Notice of Proposed Action dated May 26, 2004.

Renewal of the Otay Mountain grazing allotment lease will likely result in significant direct and indirect harm to Thorne’s hairstreak and Tecate cypress populations. Thorne’s hairstreak is likely to suffer many harmful effects from grazing similar to those identified by the Service for the Quino checkerspot butterfly. According to the Service, grazing may harm the Quino checkerspot through destruction of larval host plants, soil compaction, degradation of cryptogamic soil crusts, and trampling of eggs and larvae, according to the Quino checkerspot recovery plan. Cattle grazing also contributes to invasion of exotic plant species in Quino checkerspot habitat. Soil crusts are likely more effective in limiting spread of exotic species than targeted grazing, and crusts are extremely vulnerable to trampling by cattle. Cattle grazing should therefore be phased out in Quino habitat. See Quino checkerspot recovery plan at pages 59 – 60 (U.S. Fish and Wildlife Service 2003)

Grazing on the Otay Mountain allotment could still harm Thorne’s hairstreak and Tecate cypress even if grazing is excluded around existing populations of these species. The spread of highly flammable, exotic, invasive plant species through grazing may increase fire frequency, resulting in loss of sensitive species populations and habitat degradation. This, in turn, may result in subsequent further expansion of exotic invasives through disturbance from fire. Such landscape scale, harmful vegetation changes cannot be prevented through limited grazing exclusions around sensitive species populations.

Vehicle access and recreation

The Bureau of Land Management's emphasis of recreation in the San Ysidro Mountains and maintenance of vehicle access likely increases the risk of new fires through Thorne's hairstreak and Tecate cypress populations. BLM lands occupied by the species are located within the agency's designated Otay Mountain Wilderness. Roads grandfathered into the wilderness designation generally allow unrestricted public access in close proximity to Thorne's hairstreak populations except during special closures. The BLM's South Coast RMP authorizes "... stopping, parking, and camping ... within 25 feet of existing routes of travel." See RMP at page 16. The South Coast RMP also directs the agency to "Administer lands within the "Border Mountains" area as a special recreation management area. The [recreation area] provides opportunities for hiking, backpacking, equestrian use, camping, picnicking, nature study, hunting, and motorized vehicle use, including [off-highway vehicles] on existing routes." *Id.* at page 20.

Thorne's hairstreak may be endangered by predation

Experts suspect that birds, predatory insects, parasitic insects, and spiders prey upon Thorne's hairstreaks. Birds may prey on either larvae or adults. Surveyors have observed clipped hind wing tails on adult Thorne's hairstreak, consistent with the shape of a bird's beak (Klein, pers. comm.). The harmful effects of otherwise normal predation or parasitism might be exacerbated by population reduction from excessive fires.

Thorne's hairstreak is endangered due to the inadequacy of existing regulatory mechanisms

Very few regulatory mechanisms exist that might conserve the Thorne's hairstreak and Tecate cypress habitat. Three regulatory mechanisms provide some potential Thorne's hairstreak conservation – the Wilderness Act, Bureau of Land Management activities, and the San Diego Multiple Species Conservation Plan. None of these mechanisms have proven effective in reducing Thorne's hairstreak's primary threat from fire and related habitat degradation.

Wilderness Act

BLM Lands occupied by the species are protected from urban development and mining by nature of their location within the designated Otay Mountain Wilderness. But wilderness designation alone cannot protect the species from the primary threat of fire, and the area is virtually unmanaged by BLM. A number of roads were grandfathered into the wilderness designation, generally allowing unrestricted public access in close proximity to Thorne's hairstreak populations except during special closures.

Bureau of Land Management activities

All five known remaining Thorne's hairstreak populations appear to be located on lands owned and administered by the Bureau of Land Management. The BLM does not appear to have directed any significant, pro-active conservation attention to either Thorne's hairstreak or the Tecate cypress, as suggested in part by the agency's failure to recognize these as "BLM sensitive species" in California. BLM ignorance of the importance of its San Ysidro Mountain lands to Thorne's hairstreak and Tecate cypress is also indicated by the agency's identification of both species as "Special status species considered but not addressed" and its inexplicable conclusion that the South Coast RMP "... will have little effect on these species." RMP at pages 74, 76, and 89.

BLM documents and agreements contain some conservation commitments that could conceivably benefit Thorne's hairstreak and Tecate cypress, but few of these have been implemented. For example, the BLM's South Coast Resource Management Plan promises to "...work to continue to improve the status of ... sensitive species (RMP at page 14), prohibits "... [t]he harvesting of any sensitive species ..." (*Id.* at page 16), calls for emphasis of "... protection and enhancement of sensitive species habitat and open space values" (*Id.* at page 19), calls for acquisition of "privately owned inholdings (1,300) acres within the Otay Mountains ... areas ..." (*Id.* at page 20). It is unclear whether these BLM promises for "sensitive" species apply only to those species formally recognized as "BLM sensitive species." Nevertheless, BLM does not appear to have taken any pro-active steps to directly improve the status of Thorne's hairstreak or Tecate cypress populations. The BLM's does appear to have acquired a number of private land inholdings in the Otay Mountains Wilderness, thereby reducing the threat

of development in close proximity to the species. But none of these areas have subsequently been pro-actively managed for the direct benefit of Thorne's hairstreak or Tecate cypress populations.

San Diego Multiple Species Conservation Plan

Thorne's hairstreak is recognized as a "covered species" under the San Diego Multiple Species Conservation Plan (or "San Diego MSCP"). See San Diego MSCP at page 3-61. The BLM's participation in the San Diego MSCP may have facilitated some conservation activities in the San Ysidro Mountains, but does not appear to have resulted in activities to reduce the primary threats to the species, especially from excessive wildfire.

The BLM has signed a Memorandum of Understanding addressing participation in the San Diego MSCP and 2 other San Diego County regional habitat conservation planning efforts (U.S. Bureau of Land Management *et al.* 1994). The range of Thorne's hairstreak is located entirely within the area covered by the San Diego MSCP.

The MOU contains several conservation commitments, but only 2 are directly relevant to conservation of Thorne's hairstreak and Tecate cypress. According to the MOU, the BLM promises to identify its lands "... for inclusion within the region's habitat conservation system," and to manage its lands "to conform with the habitat conservation plans of the other signatory parties." Also according to the MOU,

In addition to acquisition strategies, the signatory parties also agree to design strategies for effectively and efficiently managing the lands acquired through their respective acquisition efforts.

See MOU at page 3.

BLM involvement in the MOU may have contributed to establishment of the Otay Mountains Wilderness and associated reduced threats to Thorne's hairstreak and Tecate cypress from development and mining. But the BLM does not appear to have followed through with other

MOU commitments most important to the two species. The BLM does not appear to have designed "... strategies for effectively and efficiently managing ..." Thorne's hairstreak and Tecate cypress. The BLM also does not appear to have managed its lands "... to conform with the habitat conservation plans of the other [MOU] signatory parties."

For example, the BLM does not appear to have implemented conservation measures for Thorne's hairstreak and Tecate cypress consistent with the San Diego MSCP.

Table 3-5 of the San Diego MSCP contains the conditions under which the U.S. Fish and Wildlife Service considered the Thorne's hairstreak and Tecate cypress to be conserved by the program. According to table's description of measures to conserve Thorne's hairstreak,

Area-specific management directives must manage for the host species (Tecate cypress). Area-specific management directives for preserve areas will include specific guidelines for managing and monitoring covered species and their habitats ... Edge effects may include (but are not limited to) trampling, dumping, vehicular traffic, competition with invasive species, ... collecting, recreational activities, and other human intrusion.

See San Diego MSCP at page 3-61. Also according to the San Diego MSCP,

Area-specific management directives will be prepared by federal, state, and local agencies responsible for managing lands conserved as part of the reserve. ... [A]rea-specific management directives ... will address the following management actions ... : Fire management, Public access control, Fencing and gates, Ranger patrol, Trail maintenance, Visitor/interpretive services, Volunteer services, Hydrological management, Signage and lighting, Trash and litter removal, Access road maintenance, ... Removal of invasive species, ... Species monitoring, Habitat restoration, ... Biological surveys, Species management conditions (See Table 3-5).

Id. at page 6-7.

... the federal and state agencies will manage and monitor their present land holdings, as well as those they acquire on behalf of the MSCP, consistent with the MSCP plan.

Id. at page 6-8.

The MSCP also specifically calls for “fire management for biological resources,” and states that “Detailed fire management plans should be prepared by preserve managers ...” *Id.* at page 6-9.

The BLM appears to have failed to implement nearly all San Diego MSCP conservation activities for Thorne’s hairstreak and Tecate cypress. Almost no management is provided for the Otay Mountains Wilderness, with the possible exception of maintenance of vehicle gates on access roads and cooperation with species surveys and research by others. The agency has never prepared any management plan for lands, species, or vegetation found within the Otay Mountains Wilderness, in contrast to its MOU commitments. Lacking any management plan, the agency has never implemented pro-active conservation measures directly benefiting Thorne’s hairstreak and Tecate cypress.

Other natural or manmade factors affecting the continued existence of Thorne’s hairstreak

Habitat fragmentation

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

Habitat fragmentation is the process where a continuous area of habitat is both reduced in area and divided into two or more fragments (Wilcove et al. 1986; Schonewald-Cox and Buechner 1992; Reed et al. 1996). Habitat specialists like Thorne’s hairstreak are more vulnerable to extinction than habitat generalists when habitat has been degraded and fragmented

(Sarre *et al.* 1995, Fischer and Stocklin 1997, Henein *et al.* 1998). The likelihood of habitat specialists locating suitable habitat are much less than those of habitat generalists that are capable of inhabiting a variety of habitat types.

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

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

Vulnerability of small and isolated populations

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

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

Similarly, as individual plants in a population become more rare, and become distributed further apart from one another, pollination becomes less likely (Santos and Telleria 1994).

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

A small population and isolation suggest that Thorne's hairstreak populations are subject to genetic drift and restricted gene flow that may decrease genetic variability over time and could adversely affect the species' viability. Thorne's hairstreak could be exposed to a number of harmful genetic effects, including inbreeding depression and loss of evolutionary flexibility. Inbreeding is characterized by higher mortality of offspring, fewer offspring, or offspring that are weak, sterile, or have low mating success (Ralls et al. 1988). Loss of genetic variability in a small population may limit its ability to respond to new conditions and long-term changes in the environment – pollution, new diseases, global climate change (Allendorf and Leary 1986; Falk and Holsinger 1991). The tendency of small populations to decline toward extinction as a result of these factors has been likened to a vortex. Once caught in the vortex, it is difficult for a species to resist the pull toward extinction (Gilpin and Soule 1986).

Global climate change

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

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

Delayed protection

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

Thorne's hairstreak was designated as a category 2 candidate for listing by the U.S. Fish and Wildlife Service in 1984 and maintained on subsequent candidate lists (U.S. Fish and Wildlife Service 1984; 1989; 1991; 1994). The Service took no action to list the species as endangered despite repeated occurrence of harmful wildfires through occupied Tecate cypress habitat. Worse, the species' candidacy was removed when the agency unilaterally abolished the category 2 candidates list in 1996 (U.S. Fish and Wildlife Service). Candidate 2 status was also removed for Tecate cypress in 1996.

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

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

VI. CRITICAL HABITAT

The Service should designate critical habitat for Thorne's hairstreak concurrent with an emergency ESA listing as an endangered species for a number of reasons.

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

Critical habitat also provides very significant conservation benefits for listed species like Thorne's hairstreak. Critical habitat is an essential tool for species recovery because it mandates a higher habitat conservation standard during section 7 consultations, and because it provides detailed, practical guidance on the location of areas essential to the conservation of listed species. Critical habitat will assist the Bureau Land Management, Department of Homeland Security, and other agencies in identifying and adjusting necessary management activities in and around Thorne's hairstreak Tecate cypress habitat in the San Ysidro Mountains, including fire suppression, border security, public access and recreation, grazing, and others.

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

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

It is the Committee's view that classifying a species as endangered or threatened is only the first step in insuring its survival. Of equal or more importance is the determination of the habitat necessary for that species' continued existence If the protection of endangered and threatened species depends in large measure on the preservation of the

species' habitat, then the ultimate effectiveness of the Endangered Species Act will depend on the designation of critical habitat.

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

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

See Center for Biological Diversity et. al. v. Norton, 240 F. Supp. 2d 1090, 1101 (D. Ariz. 2003) (citation omitted). The court further noted that 14 courts have rejected the Service's argument that other provisions of the ESA provide equivalent protection to critical habitat. *Id.* at 14. According to the Tenth Circuit,

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

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

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

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

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

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

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

VII. ECOSYSTEM PROTECTION UNDER THE ESA

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

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

In the major subsequent amendments – in 1978, 1982, and 1988 – Congress and the Supreme Court have affirmed this ecosystem protection purpose. In 1978, when the Tellico Dam controversy erupted, pitting a three-inch species of perch against a \$100-million dam, the Supreme Court ruled that a species’ value is incalculable, in part, because of the “unforeseeable place such creatures may have in the chain of life on this planet” (Tennessee Valley Authority v. Hiram Hill (437 US 153 (1978)), pp. 178-179). In short, given the possibility of species extinction causing ecosystem collapse and the likelihood that humans may not know about such

consequences before they occur, the value of a species is incalculable and no costs should be spared in preventing its extinction (Rosmarino 2002).

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

In 1982, Congress chastised the U.S. Fish and Wildlife Service for discrimination against so-called “lower life forms,” in listing decisions and was influenced, in part, by the argument that such discrimination was indefensible on ecological grounds. Scientists in the hearings leading up to the 1982 amendments vociferously criticized taxonomic discrimination, arguing that it violated Aldo Leopold’s view that “To keep every cog and wheel is the first precaution of intelligent tinkering” (Leopold 1966). The cogs and wheels of which Leopold spoke were species, and the implicit machine of which they were a part (i.e., the subject of one’s tinkering) was the ecosystem. Leopold was metaphorically rebuking the view that any species is insignificant, and his rebuke was made on eco-systemic grounds. Heeding Leopold’s metaphor, House Subcommittee Chairman John Breaux (D-LA) explicitly lamented the loss of “‘cogs and wheels’ of the biological mechanism that sustains life on Earth” on the House Floor (1982 Floor: 12957).

In the most recent set of amendments to the ESA, in 1988, House Subcommittee chairman Gerry Studds (D-MA) endorsed the ecosystem protection purpose of the ESA by quoting John Muir, “[w]hen we try to pick up anything by itself, we find it attached to everything in the

universe.’” Sen. John Chafee (R-RI) invoked the same sentiment in the Senate (1988 Floor: 18570-71).

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

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

VIII. BENEFITS OF ENDANGERED SPECIES ACT PROTECTION

Formal, emergency recognition of Thorne’s hairstreak as an endangered species and designation of critical habitat should substantially increase available conservation resources and education on the status of the species.

Formal listing protection should also result in preparation of a recovery plan for Thorne’s hairstreak by the U.S. Fish and Wildlife Service and increase the availability of funding for recovery activities - improved fire suppression in and around San Ysidro Mountains Tecate cypress stands, restoration of Tecate cypress habitat, resident wilderness managers, patrols for unauthorized campfires and arsonists, efforts to increase the number of Thorne’s hairstreak populations and individuals, and other specific recovery measures.

Increased conservation and education should include improved recognition by responsible agencies - the U.S. Bureau of Land Management, California Department of Forestry, U.S.

Immigration and Naturalization Service, and others - of the species' perilous status and of the significant threat posed by fire.

Formal listing protection should compel the BLM to initiate pro-active conservation activities to benefit Thorne's hairstreak and Tecate cypress, and to insure that activities authorized under its South Coast Resource Management Plan – grazing, prescribed fire, vehicle access, recreation, and others – will not jeopardize the continued existence of the species or adversely modify critical habitat, as required by Section 7 of the Endangered Species Act.

Listing protection should also compel the Immigration and Naturalization Service to carry out pro-active conservation activities, and to insure that border law enforcement activities will not jeopardize the continued existence of Thorne's hairstreak or adversely modify critical habitat.

IX. 90-DAY FINDING

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

X. REFERENCES CITED

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

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APPENDIX 1

Fire perimeters and the Thorne's hairstreak butterfly metapopulation

