

## DEPARTMENT OF THE INTERIOR

## Fish and Wildlife Service

50 CFR Part 17

RIN 1018-AC84

154-94

**Endangered and Threatened Wildlife and Plants; Proposed Rule To List the Laguna Mountains Skipper and Quino Checkerspot Butterflies as Endangered**

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

**ACTION:** Proposed rule and petition findings.

**SUMMARY:** The Fish and Wildlife Service (Service) proposes to list the Laguna Mountains skipper (*Pyrgus ruralis lagunae*) and quino checkerspot (*Euphydryas editha quino*) butterflies as endangered species throughout their respective ranges in southwestern California and northwestern Baja California, Mexico pursuant to the Endangered Species Act of 1973, as amended (Act). The Laguna Mountains skipper occupies two montane meadow habitats in a very restricted range within San Diego County, California. The quino checkerspot is locally distributed in sunny openings within chaparral and coastal sage shrublands in portions of Riverside County, California and northwestern Baja California, Mexico. These species are threatened by one or more of the following factors: Grazing, urban development, collection by lepidopterists and other human disturbance, stochastic events, and the inadequacy of existing regulatory mechanisms to provide for their conservation. This proposed rule, if made final, would extend protection under the Act to these species.

**DATES:** Comments from all interested parties must be received by October 3, 1994. Public hearing requests must be received by September 19, 1994.

**ADDRESSES:** Comments and materials concerning this proposal should be sent to the Field Supervisor, U.S. Fish and Wildlife Service, Carlsbad Field Office, 2730 Loker Avenue West, Carlsbad, California 92008. Comments and materials received will be available for public inspection, by appointment, during normal business hours at the above address.

**FOR FURTHER INFORMATION CONTACT:** Ms. Marjorie Nelson at the above address (telephone 619/431-9440).

**SUPPLEMENTARY INFORMATION:****Background**

The Laguna Mountains skipper (*Pyrgus ruralis lagunae*) is a small

butterfly within the skipper family (Hesperiidae). It is about 3 centimeters (cm) (1 inch) in length and is distinguished from the rural skipper (*P. ruralis ruralis*) by extensive white wing markings that give it an overall appearance of white rather than mostly black (Scott 1981). The Laguna Mountains skipper is found in wet montane meadow habitats.

*Pyrgus ruralis lagunae* is one of two recognized subspecies of the rural skipper, *Pyrgus ruralis* (Boisduval). Scott (1981) first described *Pyrgus ruralis lagunae* from a collection made in 1956 by F. Thorne in the Laguna Mountains of San Diego County California, based upon population isolation and color differentiation. The Laguna Mountains skipper is restricted to the Laguna Mountains and Mount Palomar in San Diego County.

The other subspecies of the rural skipper (*Pyrgus ruralis ruralis*) ranges from the mountains of British Columbia and Alberta south to central California, Nevada, Utah, and northern Colorado (J. Brown, Dudek and Associates, *in litt.*, 1992) and has darker wings than the Laguna Mountains skipper.

Three other species in the genus *Pyrgus* occur in San Diego County: the common checkered skipper (*P. communis*); the small checkered skipper (*P. scriptura*); and the western checkered skipper (*P. albescens*). The Laguna Mountains skipper can be distinguished from all three of these species by the whitish appearance of the adults and the use of a single larval host plant in the rose family (*Horkelia clevelandi*) (Garth and Tilden 1986, Scott 1986). In addition, the western checkered skipper and southern California populations of the small checkered skipper are restricted to desert areas (Garth and Tilden 1986).

The Laguna Mountains skipper is currently found at one site in the Laguna Mountains and one site on Mount Palomar in San Diego County, California (Dr. John Brown, *in litt.*, 1992). The total population of the Laguna Mountains skipper is estimated to be fewer than 100 individuals (Murphy 1990; Brown 1991; J. Brown, *in litt.*, 1992). The Laguna Mountains population is restricted to a relatively small fenced area where cattle cannot reach the larval host plant (G. Pratt, as cited in Murphy 1990; Dave Hogan, San Diego Biodiversity Project, pers. comm., 1993). The Laguna Mountains skipper was sighted and collected on Mount Palomar in 1991 by D. Lindsley (J. Brown, *in litt.*, 1992; Dr. John Brown, pers. comm., 1993). The Mount Palomar population is extremely small where

only five specimens have been reported in this century (J. Brown, *in litt.*, 1992).

*Horkelia clevelandi* (Cleveland's horkelia) is the larval host plant of the Laguna Mountains skipper. Cleveland's horkelia occurs along the margins of pine meadows in the Laguna, Cuyamaca, Palomar, and San Jacinto Mountains of southwestern California and northwestern Baja California, Mexico at 1200 to 2500 meters (m) (4000 to 8000 feet) in elevation. Although a butterfly's distribution is generally defined by the presence of its larval host plant, it may be further restricted by other physiological or ecological constraints. The Laguna Mountains skipper is currently found in a few open meadows of yellow pine forest between 1500 to 2000 m (5000 and 6000 feet) in elevation; historically, this species was found at elevations between 1200 and 2500 m (4000 to 6000 feet). It may have occurred throughout the higher elevations of San Diego County (Murphy 1990; Brown 1991; J. Brown, *in litt.*, 1992; and references cited therein). Murphy (1990) reported that there were at least six populations of this species in the Laguna Mountains in the 1950's and 1960's (at Big Laguna, Little Laguna, East Laguna, Laguna Lake, Boiling Springs, and Horse Heaven) (see also J. Brown, *in litt.*, 1992). Most specimens of the Laguna Mountains skipper were collected from Horse Heaven Springs near Mount Laguna (Murphy 1990). Until rediscovery in 1983 by J. Emmel, the last known sightings of the skipper in the Laguna Mountains were from 1972. Until specimens were collected in 1991, the last known sightings from Mount Palomar were from 1980 and, prior to that, from 1939 (Brown 1991; J. Brown, *in litt.*, 1992).

The Laguna Mountains skipper is apparently bivoltine (two generations per year). The adult flight season occurs from April to May with a complete or partial second brood flight in late June to late July. A partial second brood indicates that this butterfly may have a flexible or variable diapause (state of suspended activity). The Laguna Mountains skipper may have evolved a unique mechanism for coping with the low diurnal temperatures it encounters during its spring flight, which is unusually early for butterflies in the Laguna Mountains (Brown 1991). It is assumed that the life history of the Laguna Mountains skipper is similar to that of the nominate subspecies (*Pyrgus ruralis ruralis*), which diapauses as a full grown larvae and adults live 10 to 20 days (J. Brown, *in litt.*, 1992).

The quino checkerspot, *Euphydryas* (= *Occidryas*) *editha quino* (Behr) is a small member of the brush-footed

butterfly family (Nymphalidae). It is about 3 cm (1 inch) in length and checkered with dark brown, reddish, and yellowish spots. It is one of 12 recognized subspecies of *Euphydryas editha* (editha checkerspot) (Garth and Tilden 1986). The quino checkerspot can be distinguished from other subspecies of *Euphydryas editha* by its wing coloration pattern and overall body size. The quino checkerspot tends to be larger with redder wings. The light spots on the wings tend to be fewer and more disjunct than in the other subspecies (Garth and Tilden 1986).

*Euphydryas editha quino* is geographically disjunct from them. This taxon is also phenotypically similar to two other species of butterfly that occur within its range. The Chalcedon checkerspot (*E. chalcedona*) is more yellow and is slightly larger than the quino checkerspot. Gabb's checkerspot (*Chlosyne gabbii*) is smaller than the quino checkerspot and has orange instead of red markings (Orsak 1977).

The quino checkerspot was first described in 1863 by Hans Herman Behr, an entomologist with the California Academy of Sciences in San Francisco, as *Melitaea quino* based on a specimen from coastal San Diego County, California. It was subsequently recognized by Comstock (1927) as a race of *Euphydryas editha* (Boisduval). For many years, *E. e. quino* was inappropriately recognized as *E. e. wrightii*. This error was rectified by J. Emmel based on a study of Behr's notes and available specimens (D. Murphy, Center for Conservation Biology, Stanford University, *in litt.*, 1988; Allen 1990). The genus *Euphydryas*, which is widely represented throughout North America, has been subdivided into closely related species groups (Scott 1986). The genus *Euphydryas* is also referred to as *Occidryas*, but many authors retain the former name (e.g., Scott 1986; Harrison *et al* 1988; Murphy 1990; Brown 1991).

The quino checkerspot is restricted to sunny openings on clay soils formed from gabbro parent materials within shrubland habitats of the interior foothills of southwestern California and northwestern Baja California, Mexico (G. Ballmer, *in litt.*, 1991). Similar to the Laguna Mountains skipper and butterflies in general, its distribution is defined primarily by that of its larval host plant but is further restricted by other factors. The primary larval food plant of the quino checkerspot is *Plantago erecta* (dwarf plantain, family Plantaginaceae). However, the larvae may also use *Plantago insularis* and *Orthocarpus purpurescens* (owl's clover, family Scrophulariaceae) (White

1974; Greg Ballmer, University of California at Riverside, pers. comm., 1993). These plants grow in or near meadows, vernal pools, and lake margins in upland shrub communities including sparse chaparral, and chaparral mixed with coastal sage scrub. This butterfly is generally found at sites where high densities of the host plant occur (J. Johnson, *in litt.*, 1989; D. Hawks, University of California at Riverside, *in litt.*, 1992) and was found at a variety of elevations from about sea level to about 1200 m (4000 feet). Within these areas, the quino checkerspot may be preferentially selecting sites where exposure to winter sun is greatest (Allen 1990). These habitats, like the quino checkerspot butterfly, were once commonly found along coastal bluffs, mesas, and inland foothills (Brown and Faulkner 1984).

The quino checkerspot may have been one of the most abundant butterflies in San Diego, Orange, and western Riverside Counties during the early part of the 20th century (Murphy 1990). The original range of the quino checkerspot extended as far south as Valle de la Trinidad in northwestern Baja California, Mexico, and as far north as Point Dume in Los Angeles County (Allen 1990). Currently, only six to seven small populations are known within the United States. Five to six populations occur near Vail Lake in southwestern Riverside and north-central San Diego Counties (G. Ballmer, *in litt.*, 1990 and 1991; David Hawks, entomologist, University of California at Riverside, pers. comm., 1993). One other population is known to occur (as of 1991) near Upper Otay Lake in San Diego County (Murphy, *in litt.*, 1991). Although the latter population has likely been extirpated (Murphy, pers. comm., 1994). At least one population exists in Mexico, in the Sierra Juarez near Tecate (Murphy, *in litt.*, 1991). Adult quino checkerspot butterflies were not seen at several historically occupied sites in Mexico during a survey in the spring of 1993 (unpubl. Service data). No estimates of population size for the quino checkerspot are currently available.

Adult quino checkerspot butterflies live from 4 to 8 weeks. The flight season occurs from mid-January to late April, and peaks between March and April. The eggs hatch in about 10 days, and the larvae begin to feed immediately. Fourth instar (development stage) larvae enter an obligatory diapause, as summer approaches and their larval food plant senesces. Extended periods of diapause may occur during times of drought (G. Ballmer, *in litt.*, 1990). Post-diapause larvae develop through four more

instars and then pupate to emerge as adults in the early spring (Murphy and White 1984).

#### Previous Federal Action

On June 3, 1991, the Service received a petition dated May 27, 1991, from Mr. David Hogan of the San Diego Biodiversity Project, to list four butterfly species as endangered under the Endangered Species Act of 1973, as amended (16 U.S.C. 1531 *et seq.*): the Laguna Mountains skipper (*Pyrgus ruralis lagunae*), Hermes copper (*Lycaena hermes*), Thorne's hairstreak (*Mitoura thornei*), and Harbison's dun skipper (*Euphyes vestris harbisoni*). The petition cited loss and degradation of habitat, through various causes, as the major threat to these butterflies. On July 12, 1993, the Service found that the petition contained substantial information indicating that the requested action may be warranted for the Laguna Mountains skipper, but not for the other three butterflies listed above. The latter finding was made because sufficient information was not available regarding the threats to and biological vulnerability of these taxa. An announcement of these findings were published in the **Federal Register** on July 19, 1993 (58 FR 38549). The Laguna Mountains skipper, Hermes copper, Thorne's hairstreak, and Harbison's dun skipper are currently classified as category 2 candidates for Federal listing (November 21, 1991; 56 FR 58804). Category 2 includes taxa for which information in the Service's possession indicates that listing is possibly appropriate but for which the Service lacks substantial information upon which to base a proposal to list as endangered or threatened.

On September 30, 1988, the Service received a petition dated September 26, 1988, from Dr. Dennis Murphy of the Stanford University Center for Conservation Biology, to list the quino checkerspot butterfly (*Euphydryas editha quino*) as endangered under the Act. At the time this petition was submitted, this taxon had not been seen for several years and was thought to be extinct. Extant populations of the quino checkerspot were reported by Dr. Murphy in a letter dated August 1, 1991, which again requested the Service to consider the petitioned action. The status of the quino checkerspot has been under review by the Service since 1984 when it was classified as a category 2 candidate for Federal Listing (May 22, 1984; 50 FR 37958). This taxon is currently classified as a category 1 candidate (November 21, 1991; 56 FR 58804), meaning that information in the Service's possession is sufficient to

support a proposal to list as endangered or threatened.

This proposed rule constitutes the final finding for the petitioned action to list the Laguna Mountains skipper as warranted. In addition, this proposed rule constitutes the 90-day finding that the petition for the quino checkerspot butterfly presented substantial information that the action may be warranted and the final 12-month finding for this petition that the action is warranted.

#### Summary of Factors Affecting the Species

Section 4 of the Endangered Species Act (16 U.S.C. 1533) and regulations (50 CFR part 424) promulgated to implement the Act set forth criteria and procedures for adding species to the Federal Lists. A species may be listed due to any one or a combination of the five factors listed in section 4(a)(1) of the Act. These factors and their application to the Laguna Mountains skipper (*Pyrgus ruralis lagunae*) and the quino checkerspot (*Euphydryas editha quino*) are as follows.

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

The habitats and the ranges of the two species considered herein have been substantially reduced by urban and agricultural development and recreational activities and are further threatened with destruction, modification, and curtailment. The Laguna Mountains skipper and the quino checkerspot currently occur within very restricted ranges and are extremely localized in their present distributions.

The habitat requirements for these two butterflies are primarily defined by their larval host plants. The removal or degradation of these plants, as well as that of nectar sources for adults, leads to the elimination of the affected population.

In the case of the Laguna Mountains skipper, habitat destruction and degradation from overgrazing and trampling of its larval host plant by domestic cattle is considered to be the primary factor responsible for its decline (Murphy 1990; D. Hogan, *in litt.*, 1991; J. Brown, *in litt.*, 1992). The larval host plant (Cleveland's horkelia) is itself a rare species and only found in the Laguna, Cuyamaca, and San Jacinto Mountains of southwestern California, and northwestern Baja California, Mexico. The only known extant skipper population in the Laguna Mountains is found in the El Prado campground area of the Cleveland National Forest

(Murphy 1990; D. Hogan, pers. comm., 1993). This area is protected from grazing cattle by a fence. Although the larval host plant is found throughout the campground, it is subject to trampling by people (D. Hogan, pers. comm., 1993).

Sunny openings within chaparral and coastal sage scrub occupied by the quino checkerspot butterfly have been degraded by grazing and (to a small degree) destroyed by urban development. Fifty to seventy-five percent of the known range of the quino checkerspot has been lost since 1900 due to habitat degradation or destruction (Brown 1991). The primary larval food plant, *Plantago erecta*, can be displaced by exotic plants, which invade once the ground is disturbed by discing, grading, and/or grazing (J. Johnson, *in litt.*, 1989; G. Ballmer, *in litt.*, 1990). The food plant then recolonizes in sites where grass does not grow well, like cattle trails and road edges, where quino checkerspot larvae are subject to trampling (D. Hawks, pers. comm., 1993).

The encroachment of urban development in rural Riverside County potentially threatens one of the quino checkerspot populations near Vail Lake. This area is growing rapidly and is projected to be fully developed within the decade (Monroe et al. 1992). The Vail Lake area is included in a Community Plan that provides for subdivision of parcels into 20-acre (9 hectare (ha)) lots (M. Freitas, *in litt.*, 1993). Additional development in this area is expected to further reduce and degrade habitat of the quino checkerspot through construction of homes and roads, and increases in cattle and horse grazing, fire frequencies, and the distribution and abundance of exotic plants. An existing recreational vehicle park and marina at Vail Lake attracts unauthorized use of all terrain vehicles (ATV's) within natural habitat areas. ATV's increase the fire hazard and destroy habitat through creation of trails. Evidence of ATV use is apparent at one of the quino checkerspot localities near Vail Lake, where a recently created dirt road bisects the center of the habitat (G. Ballmer, *in litt.*, 1991). Quino checkerspot habitat at this locality has been disced in part; these disturbed areas no longer support this species, while the surrounding undisturbed areas do (G. Ballmer, *in litt.*, 1991).

Bureau of Land Management-administered lands and Forest Service Wilderness Areas are currently contiguous with privately-owned quino checkerspot habitat near Vail Lake. As Riverside County becomes more densely

populated, fragmentation and degradation of this contiguous habitat is expected.

Any residual individuals remaining near the last known population of the quino checkerspot in San Diego County would be threatened by a proposed urban development project on Otay Mesa. The preferred alternative for the Otay Ranch New Town Plan (the largest planned community in the southwestern United States) would result in the loss of 5,600 ha (14,000 acres) of upland shrub communities, or about 52 percent of their extent within the project area. The effects of this project on the quino checkerspot are not known at this time but may be significant. Habitat loss due to grazing and clay mining are the primary threats to the quino checkerspot butterfly in Mexico.

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

Overcollection is a potential threat to both the Laguna Mountains skipper and the quino checkerspot because they are rare butterflies. Johnson (*in litt.*, 1989) has noted that the number of quino checkerspot colonies has been reduced since lepidopterists, eager to include rare species in their collections and to obtain surplus specimens for exchange or sale to other lepidopterists, have visited the few remaining colonies steadily throughout the flight season. "Where the populations may already be small, this depredation by collectors may so weaken the colonies as to end their existence. I have witnessed examples of this with other species of Lepidoptera whose loss of habitat has restricted the species to isolated colonies. These have then been wiped out by intensive collection by lepidopterists." (J. Johnson, *in litt.*, 1989). The remaining populations of the quino checkerspot butterfly near Vail Lake are threatened by overcollection. In the spring of 1993, these populations were the subject of scientific collections for voucher specimens and captive-rearing (D. Hawks, pers. comm., 1993). In addition, at least two collections of about six specimens each have been made by private collectors for non-scientific purposes (unpubl. Service data).

A significant threat to the survival of both species considered herein is the potential for vandalism by landowners who may view the presence of sensitive species as an obstacle to development. The habitat of the largest and most dense quino checkerspot population in the Gavilan Hills of Riverside County was deliberately disced, in 1984 or

1985, to eliminate this population (J. Johnson, *in litt.*, 1989).

#### C. Disease or Predation

Disease is not known to be a factor affecting the species considered herein. There are no known predators of the Laguna Mountains skipper. However, there is evidence that predation is a threat to the quino checkerspot. Studies conducted by David Hawks (pers. comm., 1993) indicate that predation has contributed to the decline of the quino checkerspot at sites where habitat has been invaded by non-native plant species, which may also harbor predatory arthropods. Historical quino checkerspot habitat sites that have been heavily invaded by Mediterranean plant species also have high sowbug (*Oniscus* sp.) and earwig (*Forficula* sp.) densities. Sowbugs and earwigs prey upon butterfly eggs. These predators, as well as the non-native plant species that support them, are absent from natural sites currently occupied by the quino checkerspot butterfly (D. Hawks, pers. comm., 1993).

Although specific parasites are unknown for the Laguna Mountains skipper and the quino checkerspot, Johnson (*in litt.*, 1989) speculates that parasitism can eliminate a butterfly colony. " \* \* \* butterfly or moth populations will build up on the food plants for three or four years, then one will begin to find examples of larvae or pupae with parasites. The parasitism increases for two or three seasons, when nearly all of the larvae or pupae are affected, the moth or butterfly population disappears completely from the observed area, remains absent for some years, then the cycle is repeated" (J. Johnson, *in litt.*, 1989). This cycle can only continue if the affected area is recolonized, which is difficult when the host-butterfly population is small, fragmented, and isolated. In general, however, outbreaks of disease or parasitism are more likely to occur under conditions of high population densities. The Laguna Mountains skipper occurs in low population densities; most populations of the Quino checkerspot also occur at low densities.

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

Existing regulatory mechanisms that could provide some protection for both the Laguna Mountains skipper and the quino checkerspot include: (1) Listing under the California Endangered Species Act; (2) adequate consideration under the California Environmental Quality Act (CEQA) and the National Environmental Policy Act (NEPA); (3)

local laws and regulations; (4) occurrence with other species protected by the Federal Endangered Species Act; and (5) land acquisition and management by Federal, State, or local agencies, or by private groups and organizations for the conservation of these species.

Neither of the species discussed herein is under consideration for listing under the California Endangered Species Act.

The status of and threats to the Laguna Mountains skipper and the quino checkerspot, as discussed under Factor A above, reflect the failure of CEQA, NEPA, and local laws and regulations to protect and provide for the conservation of these species. Although there are several regional conservation planning efforts underway within the range of the Laguna Mountains skipper and the quino checkerspot, none have been completed, approved, funded, or implemented.

The Service is not aware of any overlap in distribution between the Laguna Mountains skipper and any State or Federally listed species. At some localities, the quino checkerspot co-occurs with the coastal California gnatcatcher (*Poliophtila californica californica*), a Federally listed threatened species. However, the habitat requirements for the quino checkerspot are different than for the gnatcatcher.

Some protection is afforded to the Laguna Mountains skipper on Forest Service land. However, this protection is limited to a campground area that is subject to human disturbance. Considering the small population size and extremely limited distribution of the Laguna Mountains skipper, this protection is insufficient to conserve the species. In the case of the quino checkerspot, some protection may be provided to one population by its occurrence, in part, on Bureau of Land Management land near Vail Lake in Riverside County. However, this Federal land is currently subject to off-road vehicle activity (G. Ballmer, *in litt.*, 1991).

The Service is not aware of any regulatory mechanisms that protect the quino checkerspot in Mexico.

#### E. Other Natural or Man-Made Factors Affecting Its Continued Existence

The extremely restricted range and localized distribution, and small population size of the Laguna Mountains skipper and the quino checkerspot makes them vulnerable to the effects of fragmentation, especially with regard to stochastic events (e.g., see Gilpin and Soule 1986). For example, the Mount Palomar population of the

Laguna Mountains skipper is known from one site, where five specimens were taken. A chance event could easily extirpate this population of the skipper.

Although both butterflies occur in fire adapted ecosystems, a single fire event could eliminate affected populations. Orsak (1977) reported that a quino checkerspot population near Hidden Ranch, Black Star Canyon, in the Santa Ana Mountains of Orange County was apparently destroyed by a fire in 1967. (As discussed in the Background section above, the quino checkerspot is now extirpated from Orange County.) The only site known to be occupied by the Laguna Mountains skipper in the Laguna Mountains is subject to cattle grazing and trampling by both cattle and people.

Interconnected populations can act as reservoirs to maintain populations that may be subject to periodic extirpation (Murphy and White 1984, Harrison et al. 1988). If a stochastic event eliminates a population of either species (due to factors discussed in this rule), few (if any) neighboring populations are available to recolonize the area. No information is available regarding the vagility of the Laguna Mountains skipper. The sedentary behavior of the quino checkerspot diminishes the probability that natural, long distance dispersal could reestablish most extirpated local populations.

Periodic droughts (like those recently occurring in southwestern California) can adversely affect both of the species considered herein. Drought is known to decrease numbers of butterflies (Thorne 1963). Drought conditions may cause loss or early senescence of the larval host plant prior to completion of larval development, or lower the nutritional quality of the host plant (e.g., water content). Drought can also reduce the quantity and quality of adult nectar sources. Larval starvation and extirpation of local populations during periods of drought have been documented for *Euphydryas editha* (White 1974, Ehrlich et al. 1980).

Habitat fragmentation can affect the genetic heterogeneity of small isolated populations like those of the Laguna Mountains skipper and the quino checkerspot. Small, fragmented populations are subject to a higher frequency of genetic drift and inbreeding. As a consequence, genetic variation of the population and individual heterozygosity is decreased. That can lead to inbreeding depression and lowered fitness of individuals. Low genetic diversity may decrease the ability of a species to adapt to changing environmental conditions. Genetically homogenous populations may be at a

greater risk of extinction from environmental or demographic stochasticity (e.g., from fire or drought events) than are large, diverse populations that can more readily recover from such events. For example, variation in the length of diapause among butterfly offspring requires genetic heterogeneity (see Seger and Brockman 1987). If a population is variable in diapause length, it has a lower risk of losing an entire cohort to adverse environmental conditions during any given season. Individuals with prolonged diapause may survive if drought causes high mortality during the next season. A large population or metapopulation can maintain the genetic heterogeneity needed to maintain the population during these kinds of events.

The quino checkerspot is somewhat adapted to unpredictable weather patterns but requires sufficient patches of suitable habitat to respond to this environmental stochasticity. The quino checkerspot's dispersal capabilities vary considerably depending upon rainfall patterns and the resulting availability of adult nectar sources and larval food plants. For example, a San Diego County population of the quino checkerspot exhibited an increase in numbers as a result of favorable weather (Murphy and White 1984). The greater number of larvae defoliated the larval food plants. This central core area was left without sufficient egg-laying sites for females, and adults went for greater dispersal distances in search of additional suitable habitat. Ideally these dispersing adults would have found marginally suitable areas, and in subsequent generations would have returned to a central core area. In this case, the mass dispersal failed to restore populations in previously occupied habitat, and the butterflies have not re-colonized the original site (Murphy and White 1984; Murphy, pers. comm. 1994).

The Service has carefully assessed the best scientific and commercial information available regarding the past, present, and future threats faced by these two taxa in determining to propose this rule. Based on this evaluation, the Service finds that the preferred action is to list the Laguna Mountains skipper and the quino checkerspot as endangered. The range and habitat of these species has been substantially reduced by historical activities associated with urban and agricultural development and recreational activities. These two taxa are threatened by one or more of the following factors: Habitat alteration and destruction resulting from urban and agricultural development, grazing,

overcollection, recreational activities, inadequate regulatory mechanisms, and displacement of the larval host plant by exotic species. The extremely restricted range, localized distribution, and small population size of both butterflies makes them very vulnerable to extinction by the factors listed above as well as by stochastic events such as fire and drought. For these reasons, the Service finds that the Laguna Mountains skipper and the quino checkerspot are in imminent danger of extinction throughout all or a significant portion of their ranges. Threatened status would not accurately reflect the diminished status and threats to these species. Other alternatives to this action were considered but not preferred because not listing these species would not provide adequate protection and would be inconsistent with the purposes of the Act. Critical habitat is not being proposed for these taxa for the reasons discussed below.

#### Critical Habitat

Critical habitat, as defined by section 3(5)(A) of the Act, means: (i) The specific areas within the geographical area occupied by a species, at the time it is listed in accordance with the Act, on which are found those physical or biological features (I) essential to the conservation of the species and (II) that may require special management considerations or protection; and (ii) specific areas outside the geographical area occupied by a species at the time it is listed, upon a determination that such areas are essential for the conservation of the species.

Section 4(a)(3) of the Act requires that critical habitat be designated to the maximum extent prudent and determinable concurrently with the determination that a species is endangered or threatened. The Service's regulations (50 CFR 424.12(a)(1)) state that designation of critical habitat is not prudent when one or both of the following situations exist: (1) The species is threatened by taking or other human activity, and identification of critical habitat can be expected to increase the degree of such threat to the species; or (2) such designation of critical habitat would not be beneficial to the species.

The Service finds that designation of critical habitat is not prudent at this time for the Laguna Mountains skipper and the quino checkerspot. The quino checkerspot, mostly occurs on privately owned lands with little or no Federal involvement, although the Bureau of Land Management owns a portion of one site. The additional protection provided by the designation of critical

habitat to a species is only achieved through section 7. Therefore, the designation of critical habitat would not appreciably benefit the quino checkerspot. Publication of precise maps and descriptions of critical habitat for the quino checkerspot and the Laguna Mountains skipper could result in additional habitat destruction through trampling, discing, and grading as well as collection. As discussed under Factor B in the "Summary of Factors Affecting the Species" section of this proposal, habitat for the one of the largest quino checkerspot colonies was graded in Riverside County to deliberately eliminate that population, and a number of quino checkerspot colonies have been subject to collection by lepidopterists for trading and similar purposes.

#### Available Conservation Measures

Conservation measures provided to species listed as endangered or threatened under the Endangered Species Act include recognition, recovery actions, requirements for Federal protection, and prohibitions against certain practices. Recognition through listing encourages and results in conservation actions by Federal, State, and private agencies, groups, and individuals. The Endangered Species Act provides for possible land acquisition and cooperation with the States and requires that recovery actions be carried out for all listed species. The protection required of Federal agencies and the prohibitions against taking and harm are discussed, in part, below.

Section 7(a) of the Act, as amended, requires Federal agencies to evaluate their actions with respect to any species that is proposed or listed as endangered or threatened and with respect to its critical habitat, if any is being designated. Regulations implementing this interagency cooperation provision of the Act are codified at 50 CFR part 402. Section 7(a)(4) requires Federal agencies to confer with the Service on any action that is likely to jeopardize the continued existence of a proposed species or result in destruction or adverse modification of proposed critical habitat. If a species is subsequently listed, section 7(a)(2) requires Federal agencies to insure that activities they authorize, fund, or carry out are not likely to jeopardize the continued existence of such a species or destroy or adversely modify its critical habitat. If a Federal action may affect a listed species or its critical habitat, the responsible Federal agency must enter into formal consultation with the Service.

Federal agencies expected to have involvement with the Laguna Mountains skipper and the quino checkerspot include the Forest Service and Bureau of Land Management due to the presence of habitat and populations within their jurisdiction. The Immigration and Naturalization Service may need to evaluate the effects of its activities on the quino checkerspot, which is known to occur near the international border in San Diego County.

The Act and its implementing regulations found at 50 CFR 17.21 set forth a series of general prohibitions and exceptions that apply to all endangered wildlife. These prohibitions, in part, make it illegal for any person subject to the jurisdiction of the United States to take (including harass, harm, pursue, hunt, shoot, wound, kill, trap, capture, collect, or to attempt any of these), import or export, transport in interstate or foreign commerce in the course of commercial activity, or sell or offer for sale in interstate or foreign commerce any listed species. It is also illegal to possess, sell, deliver, carry, transport, or ship any such wildlife that has been taken illegally. Certain exceptions apply to agents of the Service and State conservation agencies.

Permits may be issued to carry out otherwise prohibited activities involving endangered wildlife species under certain circumstances. Regulations governing such permits are at 50 CFR 17.22 and 17.23. Such permits are available for scientific purposes, to enhance the propagation or survival of the species, and/or for incidental take in connection with otherwise lawful activities. In some instances involving trade, permits may be issued for a specified time to relieve undue economic hardship that would be suffered if such relief were not available. The Laguna Mountains skipper and quino checkerspot are not involved in trade, and such permit requests are not expected.

Requests for copies of the regulations on listed wildlife and plants and inquiries regarding them should be addressed to the U.S. Fish and Wildlife Service, Ecological Services—Endangered Species Permits, 911 Northeast 11th Ave, Portland, Oregon 97232-4181 (telephone 503/231-6241).

**Public Comments Solicited**

The Service intends that any final action resulting from this proposal will be as accurate and as effective as possible. Therefore, comments or suggestions from the public, other concerned governmental agencies, the scientific community, industry, or any other interested party concerning this proposed rule are hereby solicited. Comments particularly are sought concerning:

- (1) Biological, commercial trade, or other relevant data concerning any threat (or lack thereof) to these taxa;
- (2) The location of any additional populations of these species and the reasons why any habitat should or should not be determined to be critical habitat as provided by section 4 of the Act;
- (3) Additional information concerning the range, distribution, and population size of these taxa; and
- (4) Current or planned activities in the subject area and their possible impacts on these species.

The final decision on this proposal will take into consideration the comments and any additional information received by the Service, and such communications may lead to a final regulation that differs from this proposal.

The Endangered Species Act provides for a public hearing on this proposal, if requested. Requests must be received within 45 days of the date of publication of the proposal. Such requests must be made in writing and addressed to the Field Supervisor of the Carlsbad Field Office (see ADDRESSES section).

**National Environmental Policy Act**

The Fish and Wildlife Service has determined that an Environmental Assessment or Environmental Impact Statement, as defined under the authority of the National Environmental Policy Act of 1969, need not be prepared in connection with regulations adopted pursuant to section 4(a) of the Endangered Species Act of 1973, as amended. A notice outlining the Service's reasons for this determination was published in the Federal Register on October 25, 1983 (48 FR 49244).

**References Cited**

A complete list of all references cited herein are available upon request from the Carlsbad Field Office (see ADDRESSES section).

**Author**

The primary author of this proposed rule is Marjorie Nelson of the Carlsbad Field Office (see ADDRESSES section).

**List of Subjects in 50 CFR Part 17**

Endangered and threatened species, Exports, Imports, Reporting and recordkeeping requirements, and Transportation.

**Proposed Regulations Promulgation**

**PART 17—[AMENDED]**

Accordingly, it is hereby proposed to amend part 17, subchapter B of chapter I, title 50 of the Code of Federal Regulations, as set forth below:

- 1. The authority citation for part 17 continues to read as follows:

Authority: 16 U.S.C. 1361-1407; 16 U.S.C. 1531-1544; 16 U.S.C. 4201-4245; Pub. L. 99-625, 100 Stat. 3500, unless otherwise noted.

- 2. It is proposed to amend § 17.11(h) by adding the following, in alphabetical order under INSECTS, to the List of Endangered and Threatened Wildlife:

**§ 17.11 Endangered and threatened wildlife.**

\* \* \* \* \*  
(h) \* \* \*

Species		Historic range	Vertebrate population where endangered or threatened	Status	When listed	Critical habitat	Special rules
Common name	Scientific name						
INSECTS							
Butterfly, Laguna Mountains skipper.	<i>Pyrgus ruralis lagunae</i> .	U.S.A. (CA)	NA	E		NA	NA
Butterfly, quino checkerspot.	<i>Euphydryas (=Occidryas) editha quino</i> .	U.S.A. (CA), Mexico	NA	E		NA	NA

Species		Historic range	Vertebrate population where endangered or threatened	Status	When listed	Critical habitat	Special rules
Common name	Scientific name						

Dated: July 24, 1994.

Mollie H. Beattie,

Director, Fish and Wildlife Service.

[FR Doc. 94-18932 Filed 8-1-94; 8:45 am]

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#### 50 CFR Part 17

RIN 1018-AC83

### Endangered and Threatened Wildlife and Plants; Proposed Rule to List the San Diego Fairy Shrimp as Endangered

AGENCY: Fish and Wildlife Service, Interior.

ACTION: Proposed rule.

**SUMMARY:** The Fish and Wildlife Service (Service) proposes to list the San Diego fairy shrimp (*Branchinecta sandiegoensis*) as endangered throughout its range in southwestern California and northwestern Baja California, Mexico, pursuant to the Endangered Species Act of 1973, as amended (Act). This species occurs in vernal pools and is threatened by a variety of factors including: Habitat destruction and fragmentation from agricultural and urban development, alterations of wetland hydrology by draining, off-road vehicle activity, and cattle and sheep grazing. This proposed rule, if made final, would extend the Act's protection to the San Diego fairy shrimp.

**DATES:** Comments from all interested parties must be received by October 3, 1994. Public hearing requests must be received by September 19, 1994.

**ADDRESSES:** Comments and materials concerning this proposal should be sent to the Field Supervisor, U.S. Fish and Wildlife Service, Carlsbad Field Office, 2730 Loker Avenue West, Carlsbad, California 92008. Comments and materials received will be available for public inspection, by appointment, during normal business hours at the above address.

**FOR FURTHER INFORMATION CONTACT:** Fred M. Roberts, at the above address (telephone 619/431-9440).

#### SUPPLEMENTARY INFORMATION:

##### Background

The San Diego fairy shrimp (*Branchinecta sandiegoensis*) is a

member of Branchinectidae, a freshwater crustacean family in the Order Anostraca (fairy shrimp). The species was first described by Michael Fugate (1993) based on collections made at Del Mar Mesa in San Diego County in 1990 by himself and M. Simovich. The San Diego fairy shrimp is closely allied with, and has historically been misidentified as, *B. lindahli*, a species widely distributed in western North America. The San Diego fairy shrimp was first collected (but then identified as *B. lindahli*) in Poway and Ramona, San Diego County, in 1962; additional collections were made on Kearny Mesa in 1979 (Simovich and Fugate, 1992).

The San Diego fairy shrimp is restricted to vernal pools, which occur in areas with shallow depressions that have a clay hardpan soil layer that inhibits water percolation. This results in a perched water table during the winter rainy season and the following spring. Vernal pools retain water only long enough to support relatively few species of aquatic emergent plants and invertebrates. As the pools dry and the surface water recedes toward the center of the pool, a unique and dynamic flora develops in its place. Vernal pools typically occur on mesa tops or valley floors and are surrounded by very low hills, usually referred to as mima mounds (Zedler 1987).

The San Diego fairy shrimp is a small and delicate animal with large stalked compound eyes, no carapace, and 11 pairs of swimming legs. Mature males are from 9 to 16 mm (0.4 to 0.6 in) in length and females are 8 to 14 mm (0.4 to 0.5 in) in length. They swim or glide upside down by means of complex beating movements of the legs that pass in a wave-like anterior to posterior direction. The second pair of antennae on the adult female are cylindrical and elongate, but in the male are greatly enlarged and specialized for clasping the female during copulation. The female carries the eggs in an oval or elongate ventral brood sac. The eggs are either released or remain attached to the female until she dies and sinks. The thick-shelled eggs are capable of withstanding high heat, cold, and prolonged desiccation.

The San Diego fairy shrimp occurs in San Diego County from San Marcos and Ramona south to Otay Mesa and at Valle de Palmas in northwestern Baja

California, Mexico. All known localities are below 700 meters (2,300 feet) and within 50 kilometers (30 miles) of the Pacific coast. Five other branchinectid fairy shrimp occur in southern California. Only one of these species, *Branchinecta lindahli*, is known from San Diego County (Simovich and Fugate 1992). *B. lindahli* is a habitat generalist and may occur in ponds or ditches. The only other branchinectid fairy shrimp in southern California that is similar in appearance to the San Diego fairy shrimp is the vernal pool fairy shrimp (*B. lynchi*), which occurs in adjacent Riverside County. Male San Diego fairy shrimp may be separated from males of other species within the genus by the shape of the second antenna. Female San Diego fairy shrimp are distinguishable by the shape and length of the ovisac and egg and by the presence of paired dorsolateral spines (Fugate 1993).

The San Diego fairy shrimp is a habitat specialist and is restricted to vernal pools. This species occasionally occurs in ditches and road ruts, but only if these depressions are in degraded vernal pool habitat (D. Hogan, San Diego Biodiversity Project, *in litt.*, 1992; Marie Simovich, University of San Diego, pers. comm., 1993). This species appears to prefer cool water temperatures ranging from 10 to 23 degrees centigrade (Fugate and Simovich 1992).

The prehistorical distribution of this species is uncertain. The majority of the vernal pools in this region were lost prior to 1990. However, based on historical collections (some originally identified as *B. lindahli*) the San Diego fairy shrimp was known from at least 15 locales within San Diego County (Balko and Ebert 1987, Fugate 1993). The fairy shrimp presently occurs in fewer than 70 vernal pools within 11 vernal pool complexes in coastal San Diego County (Hogan 1992). Three of the San Diego County populations of this species are on Federal land (all on Miramar Naval Air Station). Two others are, in part, on public land (Del Mar Mesa Vernal Pool Preserve and Mission Trails Regional Park).

The San Diego fairy shrimp has also been reported from Isla Vista in Santa Barbara County, California, but the identification of the single female individual is unconfirmed (Michael Fugate, University of Oregon, pers.