PETITION TO LIST CLOUDCROFT CHECKERSPOT BUTTERFLY

Euphydryas chalcedona cloudcrofti
***(Occidryas anicia cloudcrofti* Ferris and R. W. Holland)**

AS A FEDERALLY ENDANGERED SPECIES

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November, 1998

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Endangered Species Report Number 41

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PETITION

The Southwest Center for Biological Diversity and Kieran Suckling formally petition to list the Cloudcroft Checkerspot Butterfly (*Euphydryas chalcedona cloudcrofti* Ferris and Holland) as an endangered species pursuant to the Endangered Species Act, 16 U.S.C. 1531 et seq. (ESA). This petition is filed under U.S.C. 553(e) and 50 CFR 424.14 (1997), which grants interested parties the right to petition for issuance of a rule from the Secretary of Interior.

Petitioners request that Critical Habitat be designated concurrent with the listing, pursuant to 50 CFR 424.12 and the Administrative Procedures Act (5 U.S.C. 553). For reasons made clear within the petition, we also request review of this petition for emergency listing described in 50 CFR 424.20.

PETITIONERS

The Southwest Center for Biological Diversity is a non-profit public interest organization dedicated to protecting the diverse life forms of the American Southwest and northern Mexico.

Kieran Suckling is a Doctoral Candidate and executive director of the Southwest Center for Biological Diversity. He is deeply involved in the conservation of biological diversity, including numerous butterfly species.

SUMMARY

The Cloudcroft Checkerspot Butterfly (*Euphydryas chalcedona cloudcrofti*) is a rare species known only from one small area in a single isolated mountain range of southern New Mexico. It is one of approximately 270 species of butterfly in New Mexico, which has the third-highest butterfly richness of any

state (Opler, 1995). It is a little known subspecies and biological and ecological information about the entity is much needed.

Habitat for *E. c. cloudrofti* on private and federal land in the Sacramento Mountains is steadily being developed primarily for residential use. Federal proposals in 1997 to relinquish public lands to the Village of Cloudcroft, pursuant to the Townsite Act of 1958, would affect critical components of the subspecies' habitat range. The effects of urbanization through Village expansion would contribute to cumulative effects of habitat loss and may foreclose options later determined to be important to butterfly persistence.

These impacts are in addition to those posed by habitat loss from rural development, highways, campgrounds, and administrative sites. They also add to the effects of less obvious ecosystem disruptions by historic farming practices, past insecticide use, the advent and expansion of non-native, aggressive weeds, global climate change, fire suppression and continued livestock grazing.

The majority of acres of the habitat type used by the Cloudcroft checkerspot butterfly is located within privately owned lands. This renders the available federal habitat to be of disproportionately high value for the ultimate conservation of the taxon and its habitat. Of the roughly 6,000 acres of meadow habitat in the known range, only 25 to 30% is within federal jurisdiction (Galeano-Popp, 1997).

The Cloudcroft checkerspot butterfly is vulnerable due to its limited range and distribution in a single small population within a single isolated mountain range. Furthermore, the majority of the subspecies' habitat is not subject to protections such as those available on federal land. Based on examination of past, present and potential habitat losses, disruptions, and vulnerabilities, the subspecies appears to be threatened with extinction throughout all or a significant portion of its range.

Emergency listing is prompted by the imminent potential for a significant portion of the species' limited range to be converted to a heavy equipment maintenance yard, ballfields, and sewage treatment plants. The Forest Service's Townsite Act decision would commit irretrievable resources that may preclude future options for avoiding jeopardy to the species. The timeframe required for precluding this possibility through normal listing procedures is approximately 1-2 years. By all indications, the Forest Service is ready to formally propose the overdue transfer through the NEPA process now. All efforts to have the Forest Service conserve the species prior to listing have failed.

TAXONOMY

Class:	Insecta
Order:	Lepidoptera
SubOrder:	Macrolepidoptera
Superfamily:	Ditrysia
Family:	Nymphalidae
Subfamily:	Nymphalinae
Genus:	*Euphydryas*
Species:	*chalcedona*
Subspecies:	*cloudcrofti*
Synonomy:	*Occidryas anicia cloudcrofti*
	Euphydryas anicia cloudcrofti

Since the original description of *E. c. cloudcrofti* in 1980 (Ferris and Holland), there have been numerous changes in the

nomenclature and classification of the genus and closely allied genera. The genus *Occidryas* is no longer acknowledged by most Lepidopterists and is instead recognized as being within the concept of *Euphydryas*.

Furthermore, some lepidopterists have merged *E. chalcedona, E. colon* and *E. anicia* into a "superspecies" or species "complex" (Brussard et. al. 1989; NABA 1995; Scott, 1986; Opler, pers.comm.). Thus, based on the most recent publications in the literature, the subspecies *cloudcrofti* is referred to as *Euphydryas chalcedona cloudcrofti.* However, not all lepidopterists agree with this concept and prefer to view *E. chalcedona, E. colon* and *E. anicia* as separate species. These experts would classify the Cloudcroft entity as *E. anicia cloudcrofti*.

Regardless of nomenclature used, all experts concur that the Cloudcroft checkerspot is unique and taxonomically valid at the subspecies level (Opler, pers. comm. Pratt, pers. comm; Emmel, pers. comm.). Furthermore, experts believe that it's geographic isolation makes the subspecies "a species in the making".

The geographically closest known relatives to *E. c. cloudcrofti* are the subspecies *E. c. capella* in southern Colorado and *E. c. chuskae* in northwestern New Mexico (Ferris and Holland, 1980). The restricted distribution (within a small area above 8000' elevation) and genetic isolation of *E. c. cloudcrofti* from all other populations of the genus and species is notable. The smallest distance between *E. c. cloudcrofti* and the two neighboring subspecies may be as great as several hundred miles (Ferris and Holland, 1980). The evolutionary significance of its restricted distribution and isolation is high, relative to other members of the genus, because it represents the very building blocks of an allopatric speciation model, which could be perceived as the major mechanism of evolution within the genus (Pratt, pers. comm.).

DESCRIPTION

TECHNICAL:

Foreward wing costal margin length in males ranges 21 - 24 mm and 22 - 28 mm in females. Ferris and Holland (1980) described the subspecies *E. c. cloudcrofti* as generally similar to *E. c. chuskae* but differs from it in ground color and more extensive black maculation dorsally. The ventral forward wing (VFW) postmarginal pale spotband is heavily outlined in black as is the VHW basal anal margin region. The two quadrate VFW cells spots nearly touch while they are clearly separated in *E. c. chuskae*. The distal hindwing (DHW) postdiscal band is slightly darker than the ground color while in *E. c. chuskae* it is concolorous.

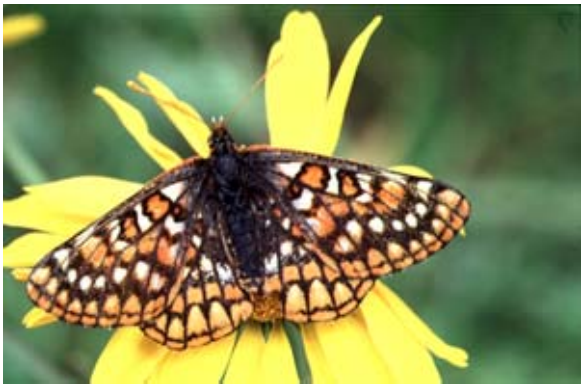

Figure 1. Adult Cloudcroft checkerspot butterfly. observed in late July, 1997. Photo by J. Popp.

Figure 2. Underwing of Cloudcroft checkerspot butterfly. Photo by J. Popp

The sexes are similar dorsally. However, the DHW pale markings are evident in the females of *E. c. cloudcrofti* but generally subdued in the males, which is the opposite of *E. c. chuskae.* Ventrally, both sexes of *E. c. cloudcrofti* are similar to *E. c. capella.* Ferris and Holland (1980) described it as boldly marked and the dorsal ground color is repeated. The principal VFW maculation consists of a repetition of the dorsal subapical white-spot rows and black outlines of the cell quadrate spots. On the VHW, the three (basal-discal, postdiscal, marginal) dark orange spot-bands are clearly defined and lack the cream-buff intrusion found in *E. c. carmentis* and *E. c. chuskae.* The veins and spot borders are strongly defined in black (Figures 1 and 2).

NON-TECHNICAL

The Cloudcroft checkerspot is classified in the Family Nymphalidae, the "brush-footed butterflies (Scott, 1986; Ferris and Brown 1981). This is one of the largest family of butterflies. In nymphalids, the front legs are greatly reduced in both sexes and are often hairy and brushlike, hence the common name. The antennae are scaled and clubbed. Most species' larvae lack branching spines on the head but have many on the body, including mid-dorsal spines (Figure 3). The pupae (chrysalis) have conspicuous projections and hang from the cremaster (abdominal appendage) alone (Figure 4).

Figure 3. Cloudcroft checkerspot post-diapause larva observed late June, 1998. Photo by T. Narahashi.

Figure 4. Cloudcroft checkerspot pupa attached to the wood siding of a building in late June, 1998. Photo by T. Narahashi.

The *E. chalcedona-anicia* checkerspot is extremely variable. Adult butterflies are small

to medium sized (approximately 2 inches across). They are predominantly red to orange brown in color with black bands. Species are determined based on examination of male genitalia. Eggs are yellow when deposited, turning reddish-brown later.

HABITAT

The habitat used by the Cloudcroft checkerspot is moist, mountain meadows within the mixed-conifer forest (typical Lower Canadian Zone) at 8000-9000' feet elevation (Figure 5). Ferris and Holland (1980) reported that the butterflies frequent cleared areas and forest openings. Common species in these grass-dominated meadows are Kentucky bluegrass (*Poa pratensis*), yarrow *(Achillea* sp.), wormwood (*Artemisia ludoviciana*), skyrocket (*Ipomopsis* sp.), beardstongue, sneezeweed, and cutleaf coneflower (*Rudbeckia laciniata*) (Galeano-Popp, pers.comm.).

Mountain meadows containing the food plants of Cloudcroft checkerspot are key to the species' survival. Thus suitable habitat (as currently understood) is mountain meadow habitat types above 8,000 feet elevation within the Sacramentos that contain *Penstemon neomexicanus*, *Valeriana edulis*, and/or *Helenium hoopesii*. Pratt (pers. comm.) observed that there were more meadows and forest openings than contained these host plants, making the habitat relatively specific and limited in distribution.

The surrounding forest in the vicinity of the type locality for this subspecies (Pines Campground) is the best known old-growth or late seral Douglas-fir forest on the Lincoln National Forest. This has major implications for ecosystem-based management since it is not just the mountain meadow for the butterfly and the old growth forest for the Mexican spotted owl that are important. The entire forest-meadow-riparian matrix on the landscape is what is biologically significant.

Figure 5. General view of habitat at the type locality for Cloudcroft checkerspot butterfly. Photo by J. Popp.

According to Pratt (pers.comm.), most checkerspots prefer dry open habitats or are known to use wind-swept slopes. The association with the mesic meadows of the Sacramentos may also be relatively unique within the species complex and therefore of further biological significance.

GEOGRAPHIC DISTRIBUTION

Habitat Range

The *chalcedona-anicia* superspecies complex ranges from northern Baja California north to British Columbia and Alaska.

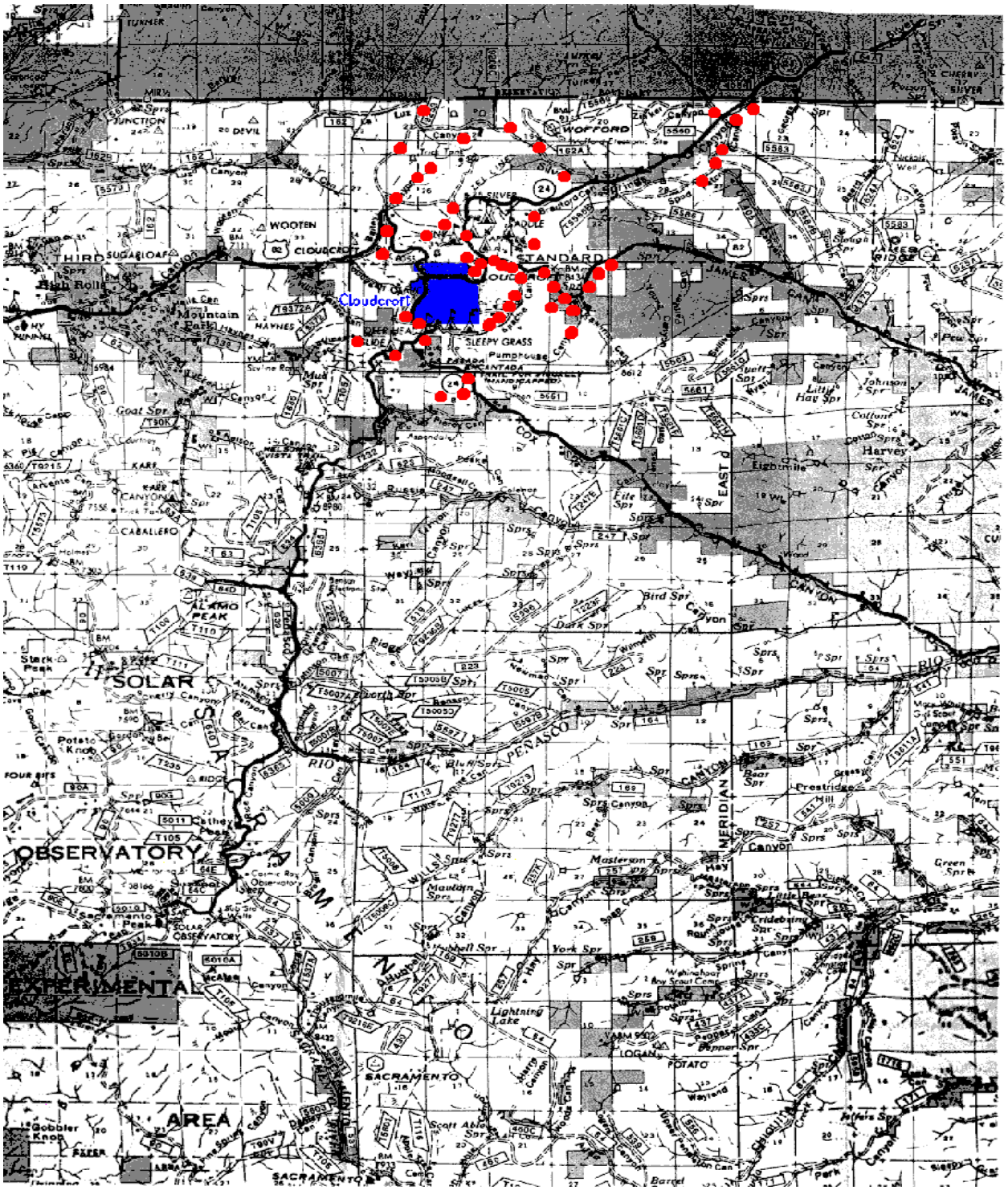

Figure 6. Known range of Cloudcroft checkerspot in the Sacramento Mountains of southern New Mexico. The Village of Cloudcroft is highlighted in blue. Approximate location records of adults or larvae are shown in red (courtesy U.S.Forest Service). Scale approximately 1 centimeter = 1 mile.

The Cloudcroft subspecies is known only from a single population around the Village of Cloudcroft, in the Sacramento Mountains of southeastern New Mexico. Extensive surveys elsewhere throughout the Sacramento Mountains failed to produce any additional *E. c. cloudcrofti* specimens (Ferris and Holland, 1980). In 1994 and 1995, S. Hager (pers. comm.) conducted an intensive butterfly inventory in Young Canyon, (a tributary of James Canyon) appproximately 4 miles east of Cloudcroft. He recorded several dozen species but found no *E. c. cloudcrofti,* despite the presence of apparently suitable habitat there.

Field surveys conducted by the Forest Service in 1997 confirmed species presence within a 2 mile radius of Cloudcroft, mainly to the east in James, Cox, and Pierce Canyons. In 1998, Forest Service biologists reported extending the known range by several miles to the north, northeast, and slightly west of previous records (Salas, pers. comm.). This was evidently due to improved survey techniques in 1998.

The distribution known in 1998 encompasses an area 6-7 miles long (north to south) and 7 - 8 miles wide (east to west), or approximately 45-55 square miles. The occupied range includes meadows within Silver Springs, Spud Patch, Zinker, James, Sleepygrass, Bailey, Pierce, Cox, and Russia Canyons (Figure 6).

The known range is contained within Forest Service Management Areas 2G (Silver prings), 2H (Upper James) and a portion of 2E (Upper Penasco) (USDA-FS, 1986).

Habitat Abundance

Because forested areas are expected to act as barriers to movement (Opler, pers. comm.) and are not used by butterflies, the actual suitable occupied habitat within this range is quite small. These 3 management areas contain a total of about 6,000 acres of non-forested lands, mainly grasslands and meadows. These non-forested acres constitute less than 1%, 5%, and 10% of the management areas respectively, or an average of 9% grassland (USDA-FS, 1986).

The known range of Cloudcroft checkerspot is contained in all of Management Area 2G and roughly half of Management Areas 2H and 2E. Using half of the non-forest acres for those 2 management areas, there could be as much as 3,000 acres of habitat in its verified range. Pratt (pers. comm.) reported that not all meadows in the area contain the host plants used by the Cloudcroft checkerspot and therefore total suitable habitat is estimated to be even less, e.g. 1,000 - 2,000 acres of federal land.

Habitat Quality

Of the federal habitat available, almost 1,000 acres are dedicated to campgrounds, highways, ski areas and miscellaneous uses, e.g. gravel pits and observatories (USDA-FS, 1986). In addition, meadow habitat in the Sacramentos is disproportionately contained within private ownership (Galeano-Popp, 1997) as are riparian habitats in the area. This non-federal habitat is valuable and yet unprotected. Privatized areas within the known checkerspot range include about 600 acres in Cloudcroft itself , two golf courses, a ski area and numerous homes and rural

subdivisions. Potentially, over half of the species habitat has already been developed for some type of anthropogenic utilization.

SYMPATRY WITH OTHER RARE AND ENDEMIC TAXA

The Cloudcroft checkerspot population in the Sacramentos is sympatric with the following federally listed species: *Strix occidentalis lucida* (Mexican spotted owl) and *Cirsium vinaceum* (Sacramento Mountain thistle). Sympatric local endemics include *Ashmunella rhyssa* (Sacramento Mountain land snail), *Automeris zephyria* (silkmoth), *Aneides hardyi* (Sacramento Mountain Salamander), *Penstemon neomexicanus* (New Mexico Beardstongue), and *Lesquerella aurea* (golden bladderpod). This has major implications regarding the need for ecosystem-based management.

NATURAL HISTORY/PHENOLOGY

As with other nymphalids, the Cloudcroft checkerspot butterfly has specific food preferences. The larval host is a species of *Penstemon* (beardstongue) most likely *P. neomexicanus,* a locally abundant endemic to the Sacramentos (New Mexico Native Plant Advisory Committee, 1984; Martin and Hutchins, 1980). Adult butterflies are attracted to *Helenium (Dugaldia) hoopesii* or sneezeweed, and probably other yellow composites for nectar. Secondary host plants for adults are likely but have not been identified by fieldworkers to date. Narahashi (pers.comm.) reported larval use of *Valeriana edulis.*

Ferris and Holland (1980) reported the first week of July is the putative peak of the annual flight of adult Cloudcroft checkerspots. However males have been recorded as early as June 16 and females as late as July 22. In general, butterflies can fly only in tolerable temperatures ranging from 20 to 42 degrees C. (68-107 deg. F), with an optimum of 32-38 degrees C. (89 - 100 deg. F.) (Ferris and Brown, 1981). Pratt (pers. comm.) reported sunlight levels may actually be more important than ambient temperature. On average, adult life span of related butterflies is 9 to 10 days (Scott, 1986).

The reproductive strategy of "hilltopping" has been identified within the *E. chalcedona* complex. This involves the aggregation of male butterflies on sunlit ridges and peaks and subsequent visitation by unmated females who orient to the peaks looking for males (Ehrlich and Wheye, 1986; Baughmann et. al. 1988a and 1988b.) Pratt (pers.comm.) saw no evidence of hilltopping while examining habitat of *E. c. cloudcrofti* in 1998.

The adult checkerspots lay eggs in masses and larvae emerge soon after. They are laid in large clusters mainly on the underside of leaves on sunlit host plants. Larval host plants are typically members of the Scrophulariaceae (Snapdragon Family), usually *Penstemon*, *Castilleja*, or *Besseya*. Young larvae live singly or in aggregations (Figure 7) in a silk nest or “tent” before winter. Cloudcroft checkerspot larvae were reportedly abundant in some areas visited by Pratt (pers. comm.) who suggested each female may lay as many as 1000 eggs in 20 or more egg masses on the host plants. High fecundity is important due to the number of factors that can cause mass mortality of larvae such as pathogens, severe weather events, predation, etc.

Figure 7. Aggregating larvae (pre-diapause) as seen in September 1998. Photo by T. Narahashi.

After hatching, larvae feed on host plants and undergo metamorphosis and diapause (inactive) stages prior to completing growth. Whether full development is reached in one year or requires more than one year in the subspecies *cloudcrofti* is not certain at this time. Butterflies associated with alpine habitats often undergo multiple year diapause prior to completion of growth due to the short growing season there. Although *E. c. cloudcrofti* is found in a subalpine environment rather than a true alpine zone, it may have multiple year diapause. Pratt (pers.comm.) observed larvae in multiple stages of development on his 1998 field visit to the type locality. He also reported observing large and very small larvae entering diapause, suggesting they require 2 years to complete their development.

Many facets of this species' ecology are speculative and require confirmation or are simply unknown and require species-specific research. Marking studies to track movements of individuals might provide useful information about habitat utilization. Floristic assessment of the occupied and unoccupied meadows would help identify potential factors limiting distribution.

STATUS THREATS

Biological Setting

Butterflies are highly visible insects and serious population declines have been recognized in many regions of the world. Losses in diversity and numbers are generally attributed to loss of habitat through major changes in land use (Gaskin 1995). British scientists have tracked rapid declines in butterfly distribution and abundance which have been linked to widespread habitat destruction (Pullin, 1996). In Japan, all butterfly species there are reportedly in decline and threatened by recent urbanization (Ishii, 1996). In the Netherlands, scientists report 24% of the native butterflies have been extirpated and 43% are threatened (Veling, 1996). Clearly, butterflies are vulnerable to environmental changes and are of concern world-wide.

As an insect, the Cloudcroft Checkerspot has many adaptive features that have helped it survive and evolve through time. For example, with large populations, frequent generations and high fecundity of females, insect populations can rebound quickly if their numbers are decreased. However, decreases in habitat quantity or quality could be disastrous for a local endemic. Habitat protection is thus critical to conservation of the Cloudcroft checkerspot and its protection is needed now before critical thresholds are reached.

There is only one known population of Cloudcroft Checkerspot butterfly, and it is

relatively small in area, which renders the entire subspecies to be highly vulnerable to localized threats. The Cloudcroft subspecies has evolutionary significance due to its extreme genetic isolation from any close relatives.

The Cloudcroft checkerspot is presently threatened by development for residential use on private land and for administrative and community development on federal land. Potential threats include pesticides, noxious weeds and herbicide use, highway and campground development and reconstruction, land exchanges, global warming and livestock grazing. Lack of knowledge about this subspecies renders the population especially vulnerable to imminent and ongoing habitat modifications because of the potential to foreclose future options.

HISTORICAL DECLINES AND CURRENT INSTABILITY

Historic Habitat Losses and Conversions

There is no known information regarding the status or trend of Cloudcroft checkerspot populations. Habitat conversions have taken place to develop the Cloudcroft area including roads, houses, schools, ballfields, golf courses, ski areas, etc. In recent history, at least 80 acres have been transferred from the Lincoln National Forest to the Village of Cloudcroft and the Board of Education pursuant to the Sisk Act (USDA-FS, 1996). The recently transferred lands have been converted to a ballfield in one instance and a new High School is planned on the other.

These conversions along with expansive golf courses, mowed areas, and road systems remove native flora depended on by the species and, thus, are decimating. Most roadsides in the range of Cloudcroft checkerspot butterfly are dominated by non-native grasses seeded in for erosion control, e.g. *Bromus inermis* (smooth brome) and *Dactylis glomerata* (orchard grass) which are unlikely to serve as butterfly habitat due to their abundance and persistence.

Historic Population Declines

Past history includes the possible adverse effects of insecticide use to control western spruce budworm in the 1950's through the 1980's. In 1984, the entire Douglas-fir forest in the Sacramento's, including private and Mescalero Apache Indian lands, was treated. Spraying was conducted over 240,000 acres wirh carbaryl (SEVIN) over most acres, however *Baccillus thuringensis* (BT) was used in sensitive areas. These sensitive areas were Cloudcroft, La Luz watershed, and the Rio Penasco drainage. The entire known range of *E. c. cloudcrofti* today lies within the BT treated areas. This may mean that the more general and damaging insecticide SEVIN could have reduced the Cloudcroft checkerspots range and distribution. Opler and Pratt (pers. comm.) both agree that the widespread use of insecticide in 1984 probably had an adverse effect on the Cloudcroft checkerspot and other invertebrates. However, the extent to which the population declined and has potentially rebounded in the past 15 years is unknown.

As a multiple year diapauser, *E. c. cloudcrofti* could have had larvae in a variety of stages when the spraying occurred. Those in diapause might not have been affected thus leaving individuals to perpetuate the

population. Even if local colonies were extirpated as a result of the treatments, both Opler and Pratt (pers. comm.) believe that dispersing females should have repopulated such habitats in the past 15 years.

PRESENT OR THREATENED DESTRUCTION, MODIFICATION, OR CURTAILMENT OF HABITAT OR RANGE

Community Development

The area thought to be critical to the species (the type locality) is located within a National Forest campground scheduled for reconstruction in the imminent future (FY99). This campground is within a recreational complex adjacent to the Village of Cloudcroft and a State Highway. Picnic and campgrounds in the complex include Pine, Fir, Silver, Saddle, Slide, Sleepygrass, Deerhead, and Trestle Depot. The Cloudcroft (Snow Canyon) Ski Area also operates within the known range of the Cloudcroft checkspot on federal land. All of these facilities have removed habitat and with continued maintenance will continue to remove habitat for the species.

The Village of Cloudcroft, New Mexico is roughly 600 acres in size and has proposed to acquire up to 550 acres of National Forest pursuant to the Townsite Act of 1958. In their application (Venable, 1996), the Village proposed to use the meadow and forest matrix in occupied butterfly habitat for the purpose of constructing a 40 acre maintenance yard, additional ballfields, and sewage plants. Adjacent forests in the proposed land acquisition are planned for development of recreational trails as part of a Village greenbelt project.

The Village proposal originally included all of Pines Campground and most of the best known butterfly habitat but later was reduced to approximately 215 acres. At present, approximately 5 to 10% of the federal meadow habitat in the checkerspot's known range would be directly affected if the proposal is approved. The central location of these acres within the species range make them critical to the future population dynamics of this local population. This would affect the Village boundaries in 3 of 4 directions (north, west and east). Further, there is enough evidence to be concerned about any further habitat conversions or reductions in federal habitat in the area, due to the threat of adverse cumulative effects from past, present, and future foreseeable actions combined.

The Forest Service has also proposed the same area for use as a new administrative (Ranger Station) site. This need could be hastened by Village acquisition of lands with existing FS facilities in Cloudcroft. The land acquisition by the Village would also force the Forest Service to look for alternative locations in the same general area for the administrative site. This would further the trend for habitat modification to proceed eastward where the only contiguous Federal land in James Canyon would be diminished. This narrow corridor of public land (approx. 1 mile wide) begins immediately adjacent (east) to the present Cloudcroft Village Boundaries.

The Village Townsite proposal has been under consideration for approximately 10 years. The most recent NEPA schedule from

the Lincoln National Forest (Forest Supervisor, November 25, 1998) specifies a decision will be announced April of 1999 with estimated date of implementation May of 1999.

Forest Service lack of concern about this species during the process is evident, despite knowledge of the butterfly and concerns about its continued viability and the need for federal listing if development were to proceed east of Cloudcroft (Galeano-Popp, 1997), the Lincoln National Forest has prepared an EA rather than acknowledge the significance of the proposed action by preparing an EIS. Furthermore, the Lincoln National Forest has never required Cloudcroft to exhaust private options first and has not proposed alternative sites for the Village's proposed uses. Instead, it has relied solely on the Village's judgement of what land is best suited for their use. With so little meadow habitat in federal jurisdiction and a predominance of private lands within James Canyon to the east of the Village, this type of continued and unjustified trend in habitat conversions constitutes the most serious and imminent threat to the species.

On private lands, residential development is expected to continue in the Sacramento's. This contributes to the potential for cumulative habitat reductions that could eventually add up to a significant threshold.

Noxious Weeds

Aggressive non-native plants are prevalent within the mountain meadows and alluvial bottoms of the Sacramento mountains (USDA-Forest Service, 1993). The Forest Service inventoried an estimated 3,000 acres of noxious weeds in the Sacramento's alone. At least 30% of these were in grasslands and meadows not including road corridors though forested habitats.

Noxious weeds are exotic species that are aggressive pioneers that often form monocultures which displace native plants and alter the community composition and functioning of the local ecosystem. Examples include musk thistle (*Carduus nutans)*, teasel (*Dipsacus sylvestris*), and sleepygrass (*Stipa sp*.) in James Canyon. Combined with past disturbances, such as farming in the meadows, these non-native plants may have adversely affected habitat quality for the Cloudcroft checkerspot butterfly. Their introduction and expansion are likely important factors limiting the species distribution within the Sacramento's. Forest Service actions since 1993 to control these plants have not been shown to be effective to date.

Herbicide Use

Herbicides have been used to manage noxious weeds in the Sacramento's over the last few years. Both Lincoln and Otero Counties routinely apply herbicides along state and county roads for this purpose. The Lincoln National Forest and the Mescalero Indian Tribe have active spraying programs as well (USDA-FS 1996). These chemicals could potentially affect larval or nectar producing plants of value to this subspecies. It could also affect adult butterflies within the spraying zones, especially where Clopyralid, Dicamba, or other toxic compounds are employed. The Forest Service evaluated the effects of their noxious weed program to some species, however it did not address the Cloudcroft

checkerspot butterfly and no re-analysis has been initiated.

Livestock Grazing

The floristic composition and functioning of the meadow ecosystems in the Sacramento's have been subjected to alterations mainly through historic and on-going livestock grazing (Kaufmann et. al. 1998). Livestock grazing negatively affects butterfly habitat quality by reducing plant community diversity, richness, and structure. Heavy grazing has reduced some meadows in the Sacramentos to erosive conditions dominated by Kentucky bluegrass (Kaufmann et.al. 1998) which degrades checkerspot habitat quality and quantity in the long term. In fact, most grazing allotments on the Sacramento District are in poor vegetative condition relative to their ecological potential (Kaufmann et. al. 1998). Portions of the Checkerspot butterfly's range, particularly at the southern end in Pierce and Russia Canyons are heavily grazed, and in very poor condition (e.g. Russia, Pumphouse, and Sacramento Allotments).

Global Climate Change

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

The Uncompahgre fritillary butterfly (*Boloria acronema*) in Colorado is restricted to the coolest, moistest habitat available in the southern latitudes it inhabits. The hot dry summers of the 1980's were reportedly devastating for this federally threatened species (Mlot, 1991). These examples imply that other specialized butterfly species at the southern edge of a given habitat may meet a similar fate if the weather patterns continue. Cloudcroft checkerspot is restricted to the highest elevation, coolest, moistest habitats of the southern Sacramento Escarpment. At the northern end of the mountain range, Sierra Blanca could offer refuge if Cloudcroft became inhospitable due to global climate change, however the species' ability to traverse the significant distances to Sierra Blanca would appear to be formidable.

OVERUTILIZATION FOR COMMERCIAL, RECREATIONAL, SCIENTIFIC, OR EDUCATIONAL PURPOSES

Collection of rare species, especially butterflies, is a threat and the Cloudcroft checkerspot has potential to attract interested parties. To date, all indications are that the population is locally abundant and can withstand its current level of collecting activity.

DISEASE OR PREDATION

Many endemic diseases e.g. viruses, bacteria and fungi, attack butterflies especially in the larval stage. Natural predators such as ants, spiders, birds, rodents lizards and toads take advantage of both larval and adult butterflies. None of these appear to constitute a threat to the Cloudcroft checkerspot.

INADEQUACY OF EXISTING REGULATORY MECHANISMS

The Cloudcroft checkerspot butterfly is not protected under any federal, state or local laws. It is on the New Mexico state list as sensitive (BISON-M, 1998), which means that New Mexico Department of Game and Fish biologists have identified a need for special consideration during habitat management and planning. This status affords no protection but can serve to bring early attention to little known taxa before they are extirpated. *E. c. cloudcrofti* is not contained on the most recent candidate list for federal protection (USDI-FWS, 1996). Similarly, the subspecies is not included on the Forest Service list of Sensitive species (USDA-FS, 1988) for which policy in Forest Service Manual Chapter 2670 would apply.

These mechanisms could collectively serve as a good basis for conservation of the Cloudcroft checkerspot butterfly and its habitat, however they have not been put into operation. This is true despite the knowledge of the species' plight by all affected parties and agencies with the capabilities to implement these mechanisms. The longstanding proposal by the Village of Cloudcroft for Village expansion (and the Forest Services's tacit acceptance) signifies the urgency of the need for protections to be implemented through the Endangered Species Act.

EMERGENCY LISTING STATEMENT

The time to act is now. The existing mechanisms have not been effective in protecting this species. The Forest Service's imminent decision under the Townsite Act would compromise future options to avoid jeopardy to this extremely rare, unique and valuable butterfly. Petitioners request emergency listing consideration in order to preclude this devastating action and subsequent trend from proceeding.

CRITICAL HABITAT STATEMENT

Due to the predominance of privately-owned habitat within the species range, it is essential that critical habitat be designated. This is the only feasible option for the world's only population of this subspecies to be conserved in a holistic, coordinated and effective way.

Respectfully submitted,

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