United States Department of the Interior

FISH AND WILDLIFE SERVICE
New Mexico Ecological Services Field Office
2105 Osuna NE
Albuquerque, New Mexico 87113
Phone: (505) 346-2525 Fax: (505) 346-2542

SUMMARY
FINAL CONFERENCE OPINION ON THE EFFECTS TO THE SACRAMENTO MOUNTAINS CHECKERSPOT BUTTERFLY FROM A PROPOSED GENETICS STUDY OF SACRAMENTO MOUNTAINS CHECKERSPOT BUTTERFLIES WITHIN THE SACRAMENTO RANGER DISTRICT, LINCOLN NATIONAL FOREST, NEW MEXICO

Cons. #2-22-02-F-667

Date of the final opinion: October 8, 2002

Action agency: Sacramento Ranger District, Lincoln National Forest

Project: This conference opinion evaluates a proposal from the Lincoln National Forest to issue a special use permit to investigate the genetics of the Sacramento Mountains checkerspot butterflies. The proposed action be conducted on the Sacramento Ranger District, Lincoln National Forest, New Mexico.

Proposed species affected: Sacramento Mountains checkerspot butterfly *(Euphydryas anicia cloudcrofti)*.

Conference opinion: Non-jeopardy; no proposed critical habitat will be affected, so there is no destruction or adverse modification of proposed critical habitat.

Incidental take statement: The U.S. Fish and Wildlife Service anticipates that no more than 100 prediapause checkerspot butterfly larvae will be taken by harm during the collection of genetic material. Implementation of reasonable and prudent measure and terms and conditions is discretionary unless the species becomes listed.

Conservation Recommendations: Implementation of the conservation recommendation is discretionary. One conservation recommendation is provided.

United States Department of the Interior

FISH AND WILDLIFE SERVICE
New Mexico Ecological Services Field Office
2105 Osuna NE
Albuquerque, New Mexico 87113
Phone: (505) 346-2525 Fax: (505) 346-2542

October 8, 2002

Cons. # 2-22-02-F-667

Jose M. Martinez, Forest Supervisor
Lincoln National Forest
Federal Building
1101 New York Avenue
Alamogordo, New Mexico 88310-6992

Dear Mr. Martinez:

This letter responds to your September 24, 2002, letter, which the U.S. Fish and Wildlife Service (Service) received on September 26, 2002, requesting initiation of formal conferencing under the Endangered Species Act of 1973, as amended (Act). The request concerns the proposal to conduct a genetics study that will benefit the management and recovery of the Sacramento Mountains checkerspot butterfly (*Euphydryas anicia cloudcrofti*) (checkerspot butterfly) within the Sacramento Ranger District, Lincoln National Forest, New Mexico. The Biological Assessment and evaluation for genetic study of the Sacramento Mountains checkerspot butterflies within the Sacramento Ranger District, Lincoln National Forest, Otero County New Mexico (BA) evaluates the potential impacts of this project on the proposed endangered checkerspot butterfly (USDA Forest Service 2002a). You have determined that the proposed action "may affect, is likely to adversely affect" the checkerspot butterfly and will have "no effect" on the checkerspot butterfly's proposed critical habitat.

The proposed activity will not affect or disturb any proposed critical habitat of the checkerspot butterfly. Because the proposed project will not affect any of the primary constituent elements of proposed critical habitat of the checkerspot butterfly, we concur with your determination that the proposed action will have "no effect" on the proposed critical habitat.

This document represents our conference opinion on the effects of the proposed project on the proposed checkerspot butterfly in accordance with section 7 of the Act. This conference opinion is based on information provided in the BA; email and telephone conversations between our staffs; data presented in the proposed rule to list the checkerspot butterfly as endangered with critical habitat (66 FR 46575); data in our files; USDA Forest Service (Forest Service) checkerspot butterfly data from survey reports; literature review; and other sources of information. References cited in this conference opinion are not a complete bibliography of all literature available on the checkerspot butterfly, the proposed action and its effects, or on other

subjects considered in this opinion. A complete administrative record of this conference is on file at this office.

Consultation History

Informal conferencing began for this project began on September 2, 2002, when we spoke to Ms. Rachael Ryan to provide comments on the proposed study and possible study methods. We also spoke with your staff concerning the BA and the study proposal. Your staff indicated that you would be requesting formal conferencing, and we discussed the project and any concerns with potential adverse impacts of the proposal on the proposed checkerspot butterfly. On September 24, 2002, the Lincoln National Forest submitted the BA with a request for formal conferencing (USDA Forest Service 2002a).

CONFERENCE OPINION

It is our conference opinion that the implementation of the proposal to investigate the genetics of the Sacramento Mountains checkerspot butterfly within the Sacramento Ranger District, Lincoln National Forest, New Mexico, as addressed in this document, is not likely to jeopardize the continued existence of the proposed checkerspot butterfly.

DESCRIPTION OF THE PROPOSED ACTION

The Lincoln National Forest is proposing to collect no more than 100 prediapause checkerspot butterfly larvae (e.g., 10 larvae from 10 different locations) from the following locations: Cox Canyon, Deerhead Campground, Silversprings Campground, Pines Campground, Horse Pasture, Yard Plot, Bailey Canyon, Spud Patch Canyon, Pumphouse Canyon, and Sleepygrass Canyon. The Forest Service proposed, as a conservation measure, to collect larvae across the range of the checkerspot butterfly to insure that the removal of prediapause larvae will have a minimal impact on each of the 10 populations.

Collections from each location will not exceed 10 individual prediapause larvae. We assume that the collection locations will be in the vicinity (i.e., less than 500 meters) of each of 10 approximately 50 by 50 foot monitoring plots (monitoring plots) where data have been collected from 1999 to 2002 (Forest Service 2002a). The genetic material will be extracted from the collected larvae and prepared and analyzed in the genetics laboratory at Moravian College in Bethlehem, Pennsylvania. The genetic material will be purified and isolated and run through gel electrophoresis and Southern blot tests. The genetic material collected from each of the 10 locations will be compared to one another to estimate the genetic variation of *Euphydryas anicia cloudcrofti*. This information will be compared to the parent species *Euphydryas anicia*. Based of the amount of polymorphism, a phylogenetic relationship can be estimated to infer how long *Euphydryas anicia cloudcrofti* have been isolated and to provide information on the genetic variability of *Euphydryas anicia cloudcrofti*. The goals of this study are to: 1) establish a set number of chromosomes for *Euphydryas anicia cloudcrofti*; 2) establish the normal amount of

genetic variation; and 3) compare highly polymorphic regions of DNA to the parent species *Euphydryas anicia*.

Larval checkerspot butterflies are proposed to be collected during October 2002. Forest Service personnel, including Ms. Ryan, will collect the prediapause larvae, whereas subsequent analysis will be conducted by Ms. Ryan and her advisors Dr. Frank Kuserk and Dr. Chris Jones. Drs. Kuserk and Jones have published peer-reviewed articles including papers on molecular genetics and animal behavior. This proposed project is comprised of four elements: 1) collecting larval checkerspot butterflies on the Sacramento Ranger District; 2) purifying and isolating the genetic material; 3) analysis using gel electrophoresis and Southern blot tests; and 4) submitting a final report of the results. The four elements will contribute to the development of biological data to provide scientific information for developing management strategies to benefit and/or recover the checkerspot butterfly.

STATUS OF THE SPECIES (range-wide)

The checkerspot butterfly is a member of the brush-footed butterfly family (Nymphalidae). The adults have a wingspan of approximately 5 centimeters (cm) (2 inches (in)) and they are checkered with dark brown, red, orange, white, and black spots and lines. The taxon was described in 1980 based on 162 adult specimens (Ferris and Holland 1980).

The checkerspot butterfly inhabits meadows within the mixed-conifer forest (Lower Canadian Zone) at an elevation between 2,450 and 2,750 m (8,000 and 9,000 ft) in the vicinity of the Village of Cloudcroft, Otero County, New Mexico. The adult checkerspot butterfly is often found in association with the larval food plants New Mexico penstemon and valerian, and adult nectar sources such as sneezeweed. New Mexico penstemon is a narrow endemic species (Sivinski and Knight 1996), restricted to the Sacramento Mountains of south-central New Mexico. Other plants that have been documented in checkerspot butterfly habitat include: arrowleaf groundsel (*Senecia riangularis*), curly-cup gumplant (*Grindelia squarrosa*), figworts (*Scrophularia* sp.), penstemon (*Penstemon* sp.), skyrocket (*Ipomopsis aggregata*), milkweed (*Asclepias* sp.), Arizona rose (*Rosa woodsii*), and Wheeler's wallflower (*Erysimum capitatum*) (USDA Forest Service 1999c).

Butterflies in the genus *Euphydryas* are known to undergo extreme variations in population size (Weiss 1999). Adult checkerspot butterflies apparently lay their eggs on New Mexico penstemon and perhaps valerian, the known larval host plants. An adult female may lay several hundred to one thousand eggs. A single larval cluster (i.e., an aggregation of first, second, or third instar larvae) may contain up to 100 individuals. After hatching, larvae feed on host plants and, during the 4th or 5th instar (the period between molts in the larval stage of the checkerspot butterfly), enter an obligatory and extended diapause (maintaining a state of extended inactivity), generally as the food plants die back in the fall from freezing. Some larvae may remain in diapause for more than one year, depending on environmental conditions. During diapause, larvae probably remain in leaf or grass litter near the base of shrubs, under the bark of conifers, or in the loose soils associated with pocket gopher (*Thomomys bottae*) mounds (Moore 1989; T.

Narahashi, Lincoln National Forest, pers. comm. 1999). Once larvae break diapause, they feed and grow through three or four more instars before pupating (entering the inactive stage within a chrysalis) and emerging as adults. Diapause is generally broken in late spring (March-April) and adults emerge in mid-summer (June-July).

Based on available information on topography, soils, and vegetation, it is likely that the distribution of the checkerspot butterfly was more extensive and continuous prior to the increase in commercial and private development, construction of roads, overgrazed range conditions, and the encroachment of conifers and subsequent decrease in the amount of non-forested lands. The isolated localities and limited geographic range of the checkerspot butterfly indicate that the species is particularly vulnerable to large-scale perturbations (disturbances that impact the habitat and host plants associated with the species), which could lead to extinction (Ehrlich *et al.* 1972; Thomas *et al.* 1996).

Checkerspot butterflies have a patchy distribution throughout the Sacramento Ranger District. Approximately 50 percent of all lands that might support the checkerspot butterfly are in non-Federal (i.e., private) ownership, subject to ongoing and future development activities. The Forest Service has estimated there are about 2,104 ha (5,198 ac) of potential habitat, composed of 1,034 and 1,070 ha (2,553 and 2,645 ac) on private and Forest Service lands, respectively (USDA Forest Service 1999b).

Based on data gathered by the Forest Service, the subspecies has been documented at 15 general localities (i.e., the geographic extent of occupied areas were not delimited and discrete populations were not identified) (USDA Forest Service 1999a, 1999b, 1999c, 2000a, 2000d). The known range of the checkerspot butterfly is within an 85 square km (33 square mi) area, within which the distribution of the checkerspot butterfly is patchy and disjunct. The known range of the checkerspot butterfly is delimited on the north by the Mescalero Apache Nation lands, on the west by Bailey Canyon at the mouth of Mexican Canyon, on the east by Spud Patch Canyon, and on the south by Cox Canyon (USDA Forest Service 2000a, 2000d). The potential range of the checkerspot butterfly to the east and west is likely restricted because the non-forested areas are below 2,450 m (8,000 ft) in elevation and the majority of checkerspot butterflies have been consistently documented at higher elevations (USDA Forest Service 1999a 1999b, 1999c, 2000a, 2000d).

The threats that have been identified for the checkerspot butterfly are commercial and private development, Forest Service activities, fire suppression and wildfire, highway and forest road reconstruction, recreational impacts, domestic livestock grazing, nonnative vegetation, and insect control (66 FR 46575).

Commercial and private development is a significant threat to the checkerspot butterfly. Habitat conversion activities from commercial and private development have likely reduced many historic checkerspot butterfly localities. Approximately 50 percent of all lands that might support the checkerspot butterfly are in private ownership, and may be subject to ongoing and future development activities. Much of these private lands are currently being developed for

residential or commercial uses (USDA Forest Service 1986, 1997; Holland 2001). Within the known range of the checkerspot butterfly, there are two golf courses, at least 12 private developments, the Village of Cloudcroft, schools, several recreational parks, a ski area, and a network of paved, gravel, or dirt roadways.

The construction of homes, businesses, and associated infrastructure in the habitat of the checkerspot butterfly could directly affect the species through mortality or result in indirect effects, such as the introduction of nonnative plants and animals or loss of movement corridors (Holland 2001). Ground disturbance and vegetation clearing for commercial or private development can disturb soils, remove or eliminate diapause sites (i.e., leaf litter and grasses) and larval or adult food plants, and kill or injure individuals (Wilcox and Murphy 1985; Murphy and Weiss 1988).

The results of 100 years of fire suppression in the Sacramento Ranger District currently threatens the checkerspot butterfly. Fire exclusion and suppression have reduced the size of grasslands and meadows by allowing the encroachment of conifers, and these trends are projected to continue (USDA Forest Service 1995, 1999d). The natural fire regime historically maintained non-forested openings and meadows. Prior to 1900, the mean natural fire interval for forests in the Sacramento Mountains was about 4 to 5 years (Kaufmann *et al.* 1998). These frequent, low-intensity, surface fires historically maintained a forest that was more open (i.e., more non-forested patches of different size, more large, older trees, and fewer dense thickets of evergreen saplings) than it is currently (Kaufmann *et al.* 1998). Such low-intensity fires are now a rare event. In the next few years, the Sacramento Ranger District may have a catastrophic burn that eliminates some or all of the remaining checkerspot butterfly habitat. This risk of catastrophic wildfire is one of the most significant threats facing this species and projects resulting from increased fire risk funding will need to be implemented before significant risk reduction for the checkerspot butterfly is achieved (66 FR 46575).

The reconstruction of forest roads is a threat to the checkerspot butterfly, causing elimination of larval food and adult host plants, crushing of butterflies, and increasing the amount of soil erosion or dust. Because roads are usually sited in open non-forested areas, larval food and adult nectar plants are frequently found in large concentrations along roadways. These areas can similarly contain aggregations of pre- and post-diapause larvae, because bare soils provide sites for thermoregulation (maintenance of a constant internal body temperature regardless of environmental temperature) (Porter 1982). Therefore, activities that disturb suitable habitat adjacent to roadways can impact very high quality sites, important for the development of various life history stages (e.g., pre-diapause instar development). Construction of roadways has historically eliminated or reduced the quality or quantity of checkerspot butterfly habitat (Pittenger 1999; 66 FR 46575)).

The New Mexico State Highway and Transportation Department (NMSHTD) recently improved portions of an approximately 3.2 km (2 mi) long stretch of State Highway 130 between the Village of Cloudcroft and the intersection of SH 130 and Sunspot Road (Metric Corporation 1996; Steve Reed, NMSHTD, pers. comm. 1999). The project cleared all vegetation by scraping

and widening the road and shoulders, constructing retaining walls, adding drainage ditches and culverts, and reconstructing a curve. In 1998 and 1999, checkerspot butterflies were located within the construction footprint (USDA Forest Service 1999a, 1999b; 1999c); however, none were observed during surveys in 2000 and 2001 (E. Hein, USFWS pers. obs., 2000, 2001). Some topsoil and larval food plants were stockpiled and used in the revegetation when the project was completed.

ENVIRONMENTAL BASELINE

Under section 7(a)(2) of the Act, when considering the effects of the action on federally listed species, we are required to take into consideration the environmental baseline. Regulations implementing the Act (50 CFR 402.02) define the environmental baseline as the past and present impacts of all Federal, State, or private actions and other human activities in the action area, the anticipated impacts of all proposed Federal actions in the action area that have undergone section 7 consultation, and the impacts of State and private actions that are contemporaneous with the consultation in progress. The environmental baseline defines the current status of the species and its habitat in the action area to provide a platform to assess the effects of the action now under consultation.

We have recently completed a formal consultation that included a conservation recommendation for the checkerspot butterfly (Service 1999) and several formal conferences for incidental take associated with water well development (Service 2002), forest vegetation management (Service 2002b), and a mark and release study (Service 2002a). Additionally, we have worked with the Forest Service and NMSHTD to avoid or reduce adverse impacts to the checkerspot butterfly from proposed projects. Past and present Federal, State, private, and other human activities that may affect the checkerspot butterfly include: commercial and private development, recreational activities; development of recreation sites (campgrounds); issuance of rights-of-way; livestock grazing; vegetation manipulations (such as prescribed burns), and road construction and maintenance activities. In addition, forest management activities on other adjacent lands, several residential development projects throughout the area, and fire suppression affect the environmental baseline. Further, the risk of habitat loss due to catastrophic wildfire is extremely high within the Sacramento Ranger District.

STATUS OF THE SPECIES (within the Action Area)

The action area is defined as the entire known range of the checkerspot butterfly located on Forest Service lands within the Sacramento Ranger District. The Forest Service has conducted surveys for the checkerspot butterfly within and adjacent to the proposed study areas from 1997-2002. These surveys documented the presence and successful reproduction of the checkerspot butterfly within these meadows (USDA Forest Service 1999a 1999c, 2000a, 2000d, 2002; J. Pittenger, pers. comm., 2001).

Based upon 4 years of survey data collected within the monitoring plots, an average of 10 larval tents were observed at all the locations and the larval tents contained between 10 and 100 larvae (USDA Forest Service 2002a; Table 1).

Table 1. Number of checkerspot butterfly larval tents observed within monitoring plots on the Sacramento Ranger District from 1999 to 2002.

	Year				
Location	**1999**	**2000**	**2001**	**2002[a]**	**Average**
Bailey	30	4	1	0	8.75
Spud Patch	19	14	3	5	10.25
Pumphouse	8	6	1	24	9.75
Pines	14	34	9	4	15.25
Horse Pasture	14	13	6	0	8.25
Silver Springs	14	34	5	8	15.25
Yard	12	6	17	3	9.5
Sleepygrass	13	7	11	6	9.25
Cox	7	14	6	1	7.0
Deerhead	8	6	6	6	6.5

[a]Surveys are still on-going.

EFFECTS OF THE ACTION

Our primary tasks in developing a conference opinion are to determine whether the proposed action is likely to jeopardize the continued existence of any proposed species or result in the destruction or adverse modification of proposed critical habitat (50 CFR 402.10). The jeopardy/non-jeopardy determination is based on an evaluation of: 1) a species' status in the project area and range wide (see above sections); 2) the effects of the proposed action on the survival and recovery of a listed species (including effects of interdependent and interrelated actions); (3) the aggregate effects of other Federal actions on a listed species (e.g., amount of take occurring as a result of Federal actions subject to previous consultations); and (4) the cumulative effects on a listed species (i.e., future non-Federal actions that are reasonably certain to occur in the action area).

Activities to be conducted under authority of this conference opinion will be the collection of genetic material from prediapause checkerspot butterfly larvae. The impacts include harm to a limited number of wild checkerspot butterfly larvae. These activities are not anticipated to have

a long-term adverse effect on the butterfly population, because mortality from larval checkerspot butterflies is generally high during years of drought. For example, many authors have documented that prediapause larval mortality in the genus *Euphydryas* is normally 90 to 99 percent (e.g., Singer 1972; White 1974; Ehrlich *et al.* 1980; White and Levin 1981; Moore 1989). Collecting individuals from populations of butterflies that have limited geographic ranges may increase the risk of extinction if collecting is additive mortality (i.e., total mortality is increased and effective population size is reduced), rather than replacive mortality (i.e., compensatory mortality where collected individuals replace another from of natural mortality). The amount of these surplus individuals in a population will likely be dynamic, depending on fluctuations in weather, predation, starvation, and whether density dependent or density independent mortality processes are at work (e.g., see Errington 1946, Bailey 1984). Based on the best scientific and commercial information, we expect higher than normal mortality in prediapause checkerspot butterfly larvae this year because of drought conditions. Consequently, we believe that the collection of no more than 100 pre-diapause larvae might replace natural starvation mortality (e.g., see Ehrlich *et al.* 1980).

Collecting genetic material from 10 larvae across 10 different locations will permit a large pool of individual DNA, which will allow the comparison of genetic variation between individuals and between various populations. The monitoring plots are located within occupied habitat, but are only about 2,400 ft^2. Based upon the average of 10 larval tents observed per year within all of the monitoring plots (Table 1), we have extrapolated that the average relative number of larval tents per acre would be about 180 (i.e., 10 tents within 2,400 ft^2 equates to approximately 180 tents per acre). It is important to note that this is a relative estimate that assumes the suitability of habitat and the number larval tents across a location is constant, which may not be true for some locations. Using these estimates, we believe that about 0.5 to 0.05 percent (i.e., 10 larvae collected from 180 tents each containing 10 to 100 larvae) of the prediapause larvae population on 1 acre will be impacted by the proposed project. Nevertheless, if the minimum relative density of larval tents across a location is only 90 per acre (i.e., 50 percent of our relative estimate of 180 larval tents per acre), then this study will still only affect a fraction of the total population within each location. Additionally, some larvae may remain in diapause for more than one year, depending on environmental conditions (66 FR 46575). Therefore, the number of prediapause larvae collected would only be a small fraction of the total checkerspot butterfly population at each location. Moreover, to ensure that the impacts to the checkerspot butterfly are minimal, the Forest Service included conservation measure that would spread the collections across the range of the checkerspot butterfly. We conclude that the collection of checkerspot butterfly from across the range of the species will minimize take and lessen the subsequent impacts to each of the 10 populations.

Within some localities, the checkerspot butterfly can often be found in relatively large numbers (J. Pittenger, Blue Earth Ecological Consultants, pers. comm., 2001). The Service believes that loss of a limited number of individuals as a result of the proposed investigation anticipated under this conference opinion, will not constitute a threat to the overall survival and recovery of this species. Moreover, the persistence of related checkerspot butterflies (e.g., *Euphydryas editha; Euphydryas anicia*) in areas where individuals have been collected for various scientific studies

support assertions that these activities will not adversely affect these populations (e.g., Cullenward *et al.* 1979; Moore 1989, Ehrlich and Murphy 1987 and reference therein). We also do not anticipate any long-term impacts from the proposed action, but expect that the information will benefit the management and recovery of the checkerspot butterfly by acquiring scientific information on the genetic composition of this species. We are not aware of any indirect effects or effects from interdependent and interrelated actions of this proposed project that would affect the checkerspot butterfly.

CUMULATIVE EFFECTS

Cumulative effects include the effects of future State, tribal, local, or private actions on endangered or threatened species or critical habitat that are reasonably certain to occur in the foreseeable future in the action area considered in this conference opinion. Future Federal actions that are unrelated to the proposed action are not considered in this section because they require separate consultation pursuant to section 7 of the Act. Cumulative effects analysis as stated here applies to section 7 of the Act and should not be confused with the broader use of this term in the National Environmental Policy Act or other environmental laws.

The proposed project study area is located near the Village of Cloudcroft, New Mexico. It is surrounded by mostly National Forest land and private inholdings (e.g., subdivisions), existing infrastructure (e.g., powerlines), private campgrounds, subdivisions, and small communities and surrounding areas, where activities occur either seasonally or year-round. Many roads and public highways that are adjacent to and located within the proposed project and are used throughout the year, but especially during the checkerspot butterfly's active season. Consequently, the checkerspot butterfly population in this area is subjected to a variety of other impacts including trampling, road maintenance, and vegetation management (e.g., mowing). These activities have the potential to reduce the quality and quantity of occupied, unoccupied, and proposed critical habitat of the checkerspot butterfly, cause disturbance to checkerspot butterflies, and contribute as cumulative effects to the proposed action.

There has been a recent increase in commercial or private development projects on non-Federal lands. In addition, future actions on non-Federal lands adjacent to the Forest Service lands that are reasonably expected to occur include grazing, road construction, vegetation management (e.g., mowing or herbicide treatments), fuels management, fire suppression activities, and other associated actions. The major concern in assessing cumulative impacts is the further loss of currently occupied and unoccupied habitat or proposed critical habitat that contributes to a functioning metapopulation, including those areas necessary to provide connectivity between populations. We believe that if permanent habitat loss on private lands continues at the current rate, the metapopulation dynamics of this species could potentially be disrupted in the future.

CONCLUSION

After reviewing the current status of the checkerspot butterfly, the environmental baseline for the action area, the effects of the proposed action, and the cumulative effects, it is the Service's

conference opinion that the action, as proposed, is not likely to jeopardize the continued existence of the proposed Sacramento Mountains checkerspot butterfly.

We reached this conclusion for the following reasons: 1) the effect to each of the 10 local populations will be minimal because of the low number of prediapause larvae to be collected (i.e., no more than 100 larvae); 2) the proposed project is not expected to result in the disruption of the metapopulation dynamics of the species; 3) the collection of genetic material does not involve habitat altering activities; and 4) the expected collection of larvae during October 2002 will likely be replacive mortality (i.e., compensatory mortality where collected individuals replace another from of natural mortality) rather than additive mortality (i.e., total mortality is increased and effective population size is reduced).

INCIDENTAL TAKE

Section 9 of the Act and Federal regulation pursuant to section 4(d) of the Act prohibit the take of endangered and threatened species, respectively, without special exemption. Take is defined as harassing, harming, pursuing, hunting, shooting, wounding, killing, trapping, capturing, or collecting, or attempting to engage in any such conduct. Harass is further defined by us as intentional or negligent actions that creates the likelihood of injury to listed species to such an extent as to significantly disrupt normal behavior patterns which include, but are not limited to, breeding, feeding, and sheltering. Harm is further defined by us to include significant habitat modification or degradation that results in death or injury to listed species by significantly impairing behavioral patterns such as breeding, feeding, or sheltering. Incidental take is defined as take that is incidental to, and not the purpose of, the carrying out of an otherwise lawful activity. Under the terms of section 7(b)(4) and section 7(o)(2), taking that is incidental to, and not intended as part of the agency action is not considered a prohibited taking under the Act provided that such taking is in compliance with the terms and conditions of this incidental take statement.

The prohibitions against taking the species found in section 9 of the Act do not apply until the species is listed. However, the Service advises the Forest Service to consider implementing the following reasonable and prudent measures. If this conference opinion is adopted as a biological opinion following a listing or designation of critical habitat, these measures, with their implementing terms and conditions, will be non-discretionary.

Amount or extent of take

Based on the best available information concerning the checkerspot butterfly, the habitat needs of this species, the project description, and information furnished by the Forest Service, take from this project is considered likely. Because the number of larvae collected will be dependent upon the number of larvae observed, it is difficult to estimate the exact number of individuals that will be taken with implementation of this project. Nevertheless, no more than 100 prediapause checkerspot butterfly larvae will be taken in the form of harm as a result of collecting genetic material.

The Forest Service has a discretion to regulate the activity that is covered by this incidental take statement. If the species is listed and the Forest Service: 1) fails to require that permittee adheres to the terms and conditions of the incidental take statement through enforceable terms that are added to the permit, grant, or contract document, and/or 2) fails to retain oversight to ensure compliance with these terms and conditions, the protective coverage of section 7(o)(2) may lapse. In order to monitor the impact of incidental take, we recommend that the Forest Service report the progress of the action and its impact on the species to the Service as specified in the incidental take statement.

Effect of the take

In the accompanying conference opinion, the Service determined that this level of anticipated take will not jeopardize the continued existence of the proposed Sacramento Mountains checkerspot butterfly.

Reasonable and Prudent Measures

The Service believes the following reasonable and prudent measure is necessary and appropriate to minimize take.

1) Conduct all activities in a manner that will minimize the number of Sacramento Mountains checkerspot butterfly larvae that are collected in an area.

Terms and Conditions

In order to be exempt from the prohibitions of section 9 of the Act, the Forest Service and their employees, contractors, or subcontractors must comply with the following terms and conditions, which implement the reasonable and prudent measure described above. These terms and conditions are nondiscretionary.

The following Terms and Conditions are established to implement the Reasonable and Prudent Measure:

1.1 Collection of prediapause larvae shall be spread across each location (i.e., collection of larvae shall not be concentrated in any one area).

1.2 To the extent possible, collection of prediapause larvae shall be focused on those areas that are currently subject to trampling or damage (i.e., within roads, trails, or campgrounds).

1.3 Prudence shall be exercised when selecting individual prediapause larvae to collect (i.e., collections shall not focus on a single tent, but should be spread among tents).

1.4. No life history stages of the checkerspot butterfly will be moved from one location to another.

1.5 The Forest Service shall provide a report documenting how the project is in compliance with the reasonable and prudent measures and the terms and conditions of this conference opinion. This report and the final project report containing the study results shall be submitted to the New Mexico Ecological Services Field Office by April 15, 2003.

CONSERVATION RECOMMENDATIONS

Section 7(a)(1) of the Act directs Federal agencies to utilize their authorities to further the purposes of the Act by carrying out conservation programs for the benefit of endangered and threatened species. Conservation recommendations are discretionary agency activities to minimize or avoid adverse effects of a proposed action on listed species or critical habitat, to help implement recovery plans, or to develop information. The recommendations provided here relate only to the proposed action and do not necessarily represent complete fulfillment of the agency's section 7(a)(1) responsibility for these species. In order for us to be kept informed of actions that either minimize or avoid adverse effects or that benefit listed species and their habitats, we request notification of the implementation of the conservation recommendations. We recommend the following conservation recommendations be implemented:

1. The Forest Service should work cooperatively with the Service and other entities to develop and implement a regional conservation strategy for the Sacramento Mountains checkerspot butterfly.

2. The investigators should contact other researchers working on the genus *Euphydryas* (e.g., Dr. Michael Singer, Dr. Camille Parmesan, Dr. Erica Fleischman, Dr. Peter Brussard) for possible collaboration with existing genetic work.

In order for the Service to be kept informed of actions minimizing or avoiding adverse effects or benefitting listed species or their habitats, the Service requests notification of the implementation of any conservation recommendations.

DISPOSITION OF DEAD OR INJURED LISTED ANIMALS

Upon finding a dead, injured, or sick individual of an endangered or threatened species, initial notification must be made to the nearest Service Law Enforcement Office. In New Mexico, contact (505/346-7828) or the New Mexico Ecological Services Field Office (505/346-2525). Written notification must be made within five calender days and include the date, time, and location of the animal, a photograph, and any other pertinent information. Care must be taken in handling sick or injured animals to ensure effective treatment and care, and in handling dead specimens to preserve biological material in the best possible condition. If feasible, the remains of intact specimens of listed animals shall be submitted to educational or research institutions

holding appropriate State and Federal permits. If such institutions are not available, the information noted above shall be obtained and the carcass left in place.

REINITIATION - CLOSING STATEMENT

This concludes formal conference on the proposal from the Lincoln National Forest to conduct a genetics study of the Sacramento Mountains checkerspot butterfly that will benefit the management and recovery of the species. You may ask the Service to confirm the conference opinion as a biological opinion issued through formal consultation if the Sacramento Mountains checkerspot butterfly is listed. The request must be in writing. If the Service reviews the proposed action and finds that there have been no significant changes in the action as planned or in the information used during the conference, the Service will confirm the conference opinion as the biological opinion on the project and no further section 7 consultation will be necessary.

After listing of the Sacramento Mountains checkerspot butterfly as endangered/threatened and any subsequent adoption of this conference opinion, the Federal agency shall request reinitiation of consultation if: (1) the amount or extent of incidental take is exceeded; (2) new information reveals effects of the agency action that may impact listed species or critical habitat in a manner or to an extent not considered in this conference opinion; (3) the agency action is subsequently modified in a manner that causes an effect to the listed species or critical habitat that was not considered in this conference opinion; or (4) a new species is listed or critical habitat designated that may be affected by the action.

The incidental take statement provided in this conference opinion does not become effective until the species is listed and the conference opinion is adopted as the biological opinion issued through formal consultation. At that time, the project will be reviewed to determine whether any take of the Sacramento Mountains checkerspot butterfly has occurred. Modification of the opinion and incidental take statement may be appropriate to reflect that take. No take of the Sacramento Mountains checkerspot butterfly or its habitat may occur between the listing of the Sacramento Mountains checkerspot butterfly and the adoption of the conference opinion through formal consultation, or the completion of a subsequent formal consultation.

In future communications regarding this project, please refer to consultation #2-22-02-F-667 If you have any questions or would like to discuss any part of this conference opinion, please contact Eric Hein of my staff at (505) 346-2525, extension 135.

Sincerely,

Joy E. Nicholopoulos

Joy E. Nicholopoulos
Field Supervisor

LITERATURE CITED

Bailey, J. A. 1984. Principles of wildlife management. John Wiley and Sons, Inc., New York.

Cullenward, M. J., P. R. Ehrlich, R. R. White, and C. E. Holdren. 1979. The ecology and population genetics of an alpine checkerspot butterfly, *Euphydryas anicia*. Oecologia 38:1-12.

Ehrlich, P. R., D. E. Breedlove, P. F. Brussard, and M. A. Sharp. 1972. Weather and "regulation" of subalpine populations. Ecology 53:243-247.

Ehrlich, P. R., D. D. Murphy, M. C. Singer, C. B. Sherwood, R. R. White, and L. L. Brown. 1980. Extinction, reduction, stability and increase: the responses of checkerspot butterfly (*Euphydryas*) populations to the California drought. Oecologia 46:101-105.

Ehrlich, P. R., and D. D. Murphy. 1987. Conservation lessons from long-term studies of checkesrpot butterflies. Conservation Biology 1:122-131.

Errington, P. L. 1946. Predation and vertebrate populations. Quarterly Review of Biology 21:144-177.

Ferris, C. D., and R. W. Holland. 1980. Two new subspecies of *Occidryas anicia* (Doubleday) from New Mexico. Bulletin of the Allyn Museum 57:1-9.

Holland, R. May 5, 2001. Email to Eric Hein concerning the Sacramento Mountains checkerspot butterfly.

Kaufmann, M. R., L. S. Huckaby, C. M. Regan, and J. Popp. 1998. Forest reference conditions for ecosystem management in the Sacramento Mountains, New Mexico. General Technical Report, RMRS-GTR-19, U.S. Forest Service, Rocky Mountain Forest and Range Experimental Station, Fort Collins, Colorado.

Metric Corporation, Inc., 1996. Environmental assessment NMSHTD project No. TPM-0130(1)00 [ST-SM-0130(200)], CN 3169, NM 130 3.22 km from US 82 East, Cloudcroft, New Mexico. Prepared for New Mexico State Highway and Transportation Department and Federal Highway Administration, New Mexico Division, Albuquerque.

Moore, S. D. 1989. Patterns of juvenile mortality within an oligophagous insect population. Ecology 70:1726-1737.

Murphy, D. D., and S. B. Weiss. 1988. Ecological studies and the conservation of the bay checkerspot butterfly, *Euphydryas editha bayensis*. Biological Conservation 46:183-200.

Pittenger, J. 1999. Mitigation alternatives for impacts to the Sacramento Mountains checkerspot butterfly from the N.M. Highway 130 rehabilitation project. Blue Earth Ecological Consultants, Sante Fe.

Porter, K. 1982. Basking behaviour in larvae of the butterfly *Euphydryas aurinia*. Oikos 38:308-312.

Sivinski, R. C., and P. J. Knight. August 1996. Narrow endemism in the New Mexico flora. pp. 286-296 in Southwestern rare and endangered plants: proceedings of the second conference. General Technical Report, GTR-283, U.S. Forest Service, Rocky Mountain Forest and Range Experimental Station, Fort Collins, Colorado.

Thomas, C. D., M. C. Singer, and D. A. Boughton. 1996. Catastrophic extinction of population sources in a butterfly metapopulation. The American Naturalist 148:957-975.

USDA Forest Service. 1986. Environmental impact statement for the Lincoln National Forest Plan. Alamagordo, New Mexico, 406pp.

USDA Forest Service. 1995. Wildlife and fish report for the Lincoln National Forest, noxious weeds management environmental assessment. Sacramento Ranger District, Lincoln National Forest, New Mexico.

USDA Forest Service. 1997. Fish and wildlife rare plants report addressing the Townsite Act application by the Village of Cloudcroft (9/10/96). Sacramento Ranger District, Lincoln National Forest, New Mexico.

USDA Forest Service. 1999a. Cloudcroft checkerspot butterfly (handouts given at February 24, 1999). Sacramento Ranger District Office, Lincoln National Forest, New Mexico.

USDA Forest Service. 1999b. Additional information on topics discussed on February 24, 1999, meeting regarding the Cloudcroft checkerspot butterfly. Sacramento Ranger District, Lincoln National Forest, New Mexico.

USDA Forest Service. 1999c. Cloudcroft checkerspot butterfly 1998 survey summary. Sacramento Ranger District, Lincoln National Forest New Mexico.

USDA Forest Service. 1999d. Decision notice and finding of no significant impact for Rio Penasco Wildland/Urban interface project, Otero County, New Mexico. Lincoln National Forest, Otero County, New Mexico. Sacramento Ranger District, New Mexico.

USDA. Forest Service 2000a. Survey summary from 1999, information, and comments regarding the status review for the Sacramento Mountains checkerspot butterfly. Lincoln National Forest.

USDA Forest Service. 2000d. Cloudcroft checkerspot butterfly 2000 survey summary. Sacramento Ranger District, Lincoln National Forest, New Mexico.

USDA Forest Service. 2002. Sacramento Mountains checkerspot butterfly 2001 survey summary. Sacramento Ranger District, Lincoln National Forest, New Mexico.

USDA Forest Service. 2002a. Biological Assessment and evaluation for genetic study of the Sacramento Mountains checkerspot butterflies within the Sacramento Ranger District, Lincoln National Forest, Otero County New Mexico (BA) evaluates the potential impacts of this project on the proposed endangered checkerspot butterfly. Lincoln National Forest, Alamogordo, New Mexico.

USDI Fish and Wildlife Service. May 28, 2002 (2002). Final biological opinion: issuance of a special use permit for the Village of Cloudcroft water well and pipeline at Sleepy Grass, Sacramento Ranger District, Lincoln National Forest, New Mexico,2-22-02-F-012. New Mexico Ecological Services Field Office, Albuquerque, New Mexico.

USDI Fish and Wildlife Service. June 20, 2002 (2002a). Final biological opinion: amendment of an existing contract with Blue Earth Ecological Consultants, Inc., to conduct biological studies that will benefit the management and recovery of the Sacramento Mountains checkerspot butterfly (*Euphydryas anicia cloudcrofti*) within the Sacramento Ranger District, Lincoln National Forest, New Mexico, 2-22-02-F-470. New Mexico Ecological Services Field Office, Albuquerque, New Mexico.

USDI Fish and Wildlife Service. September 26, 2002 (2002b). Final biological and conference opinion: the effects to the Mexican spotted owl and the Sacramento Mountains checkerspot butterfly from the proposal to implement the Rio Penasco II vegetation management project and Forest Plan Amendment, Sacramento Ranger District, Lincoln National Forest, New Mexico, 2-22-02-F-397. New Mexico Ecological Services Field Office, Albuquerque, New Mexico.

USDI Fish and Wildlife Service. 2001. Endangered and Threatened Wildlife and Plants; Proposed Endangered Status for the Sacramento Mountains Checkerspot Butterfly and Proposed Designation of Critical Habitat. Federal Register 66:46575-46595.

USDI Fish and Wildlife Service. 2001a. The influence of range management on the abundance of the Sacramento Mountains checkerspot butterfly (*Euphydryas anicia cloudcrofti*) and its host plants. Draft experimental design for the Sacramento Ranger District, Lincoln National Forest, New Mexico.

USDI Fish and Wildlife Service. 2001b. Response to an environmental assessment concerning the proposed Cloudcroft Townsite Land Application on the Sacramento Ranger District, Lincoln National Forest; Consultation number 2-22-01-I-379.

USDI Fish and Wildlife Service. 1999. Final biological opinion: issuance of a 10-year special use permit to Otero County Electric Cooperative to construct a new powerline from a substation south of Cloudcroft to James Canyon at highway 82, 2-22-96-F-456. New Mexico Ecological Services Field Office, Albuquerque, New Mexico.

Weiss, S. B. 1999. Cars, cows, and checkerspot butterflies: nitrogen deposition and management of nutrient-poor grasslands for a threatened species. Conservation Biology 13:1476-1486.

White, R. R. 1974. Food plant defoliation and larval starvation of *Euphydryas editha*. Oecologia 14:307-315.

White, R. R., and M. P. Levin. 1981. Temporal variation in vagility: implications for evolutionary studies. The American Midland Naturalist 105:348-357.

Wilcox, B. A., and D. D. Murphy. 1985. Conservation strategy: the effects of fragmentation on extinction. The American Naturalist 125:879-887.