



United States Department of the Interior

FISH AND WILDLIFE SERVICE
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SUMMARY

FINAL BIOLOGICAL AND CONFERENCE OPINION ON THE EFFECTS TO THE MEXICAN SPOTTED OWL AND SACRAMENTO MOUNTAINS CHECKERSPOT BUTTERFLY FROM THE PROPOSAL TO IMPLEMENT THE PENASCO II VEGETATION MANAGEMENT PROJECT AND FOREST PLAN AMENDMENT, SACRAMENTO RANGER DISTRICT, OTERO COUNTY, NEW MEXICO

Cons. #2-22-02-F-397

Date of the final opinion: September 27, 2002

Action agency: Sacramento Ranger District, Lincoln National Forest

Project: The project concerns the proposal to implement Rio Peñasco II Non-Programmatic Vegetation Management Project and Forest Plan Amendment, on the Sacramento Ranger District, Lincoln National Forest. The primary purpose of this project is to reduce fuel loadings (both natural and activity-created), reduce overly dense forested stands resulting from years of fire suppression, and institute a monitoring program that will gather both pre-treatment and post-treatment data to evaluate which of three thinning treatments provides the best conditions for conserving Mexican spotted owls while reducing the risk of wildfire. Treatments include timber harvest (commercial thinning), stand thinning and fuels treatments (pre-commercial thinning), which will move landscape vegetation toward a more natural and sustainable condition. These treatments will enhance and protect the health of forest stands, especially in the wildland/urban interface, reduce the risk of insect and disease epidemics, reduce the danger of catastrophic wildfire in both human and threatened and endangered species habitats. The proposed action would treat 28,804 acres including 768 acres within Mexican spotted owl Protected Activity Centers (PACs).

Species affected: Mexican spotted owl (*Strix occidentalis lucida*) and the Sacramento Mountains checkerspot butterfly (*Euphydryas anicia cloudcrofti*) and its proposed critical habitat

Biological and Conference Opinion: The proposed action is not likely to jeopardize the Mexican spotted owl and the proposed Sacramento Mountains checkerspot butterfly and there will be no adverse modification of proposed critical habitat of the Sacramento Mountains checkerspot butterfly

Incidental take statement: There are 12 Mexican spotted owl PACs that are expected to be taken as a result of this project (harass to 12 PACs and harm to 1 Mexican spotted owl). We

also anticipate that approximately 36.4 acres of occupied checkerspot butterfly habitat will be taken within the footprint of the proposed project. We have provided reasonable and prudent measures and terms and conditions for both species.

Conservation Recommendations: Implementation of conservation recommendations is discretionary. **Four** conservation recommendations are provided.

recommended in the Mexican Spotted Owl Recovery Plan (Recovery Plan) (USDI Fish and Wildlife Service 1995a). The purpose of this amendment is to identify the effects that relate to this proposed action under consultation and to clarify certain details (e.g., the environmental baseline) from the Forest Plan biological opinion and the Southwestern Region of the Forest Service's Wildland Urban Interface Fuel Treatment program anticipated under the Service's programmatic biological opinion (USDA Forest Service 2001; USDI Fish and Wildlife Service 2001c) (WUI programmatic biological opinion).

We strongly support projects such as this that attempt to reduce the risk of stand-replacing fires, especially in areas of wildland-urban interface. Protecting human life and property is the highest priority. Threats of wide-scale habitat loss due to fire are real and immediate on many public lands. Reducing fuels in these areas also may help to protect habitat for threatened and endangered species.

This document represents both our biological opinion for the MSO and our conference opinion on the proposed checkerspot butterfly and its proposed critical habitat in accordance with section 7 of the Endangered Species Act of 1973, as amended (Act).

Sacramento Mountains thistle

Intensive surveys have been completed within suitable habitat throughout the range of the thistle on the Lincoln National Forest. Known occurrences are mapped on hard copy maps and in the forest Geographic Information System (GIS) system and are available at the Lincoln National Forest.

Eighty-six thistle sites occur on National Forest System lands within the project area. Twenty-four occurrences of the thistle fall within 200 feet (ft) of 21 forest stands selected for treatment. These 21 stands include 8 with commercial treatment prescriptions and 13 with pre-commercial prescriptions. The actual area treated within these stands will exclude the thistle and provide streamside buffers. The thistle will be excluded by incorporating buffers of sufficient width to absorb and prevent sediment flow around each of the species' occurrences. Streamside buffers will also protect additional riparian habitat near thistle sites. There are no new temporary roads, or roads or trails to be re-opened, within 200 ft of thistle occurrences. The following conservation measures for the thistle are part of the proposed action.

1. The Forest Service will survey areas to be treated or disturbed for threatened and endangered plant occurrences prior to treatment and protect all documented thistle with a site-appropriate buffer (see number 5 below).
2. Native species of seed will be used where re-seeding of grasses and herbaceous vegetation occurs after ground disturbing activities.



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September 27, 2002

Cons. #2-22-02-F-397

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

Dear Mr. Martinez:

This responds to your May 30, 2002, letter requesting review of the Biological Assessment (BA) for the Rio Peñasco II Non-Programmatic Vegetation Management Project and Forest Plan Amendment, on the Sacramento Ranger District, Lincoln National Forest, USDA Forest Service (USDA Forest Service 2002b). The BA evaluates the potential impacts of this project on the Mexican spotted owl (*Strix occidentalis lucida*) (MSO), Sacramento Mountains thistle (*Cirsium vinaceum*) (thistle), and the proposed endangered Sacramento Mountains checkerspot butterfly (*Euphydryas anicia cloudcrofti*) (checkerspot butterfly) and its proposed critical habitat. You have determined that the proposed action "may affect, is likely to adversely affect" the MSO, "may affect, is likely to adversely affect" the checkerspot butterfly and its proposed critical habitat, and "may affect, not likely to adversely affect" the thistle.

You also determined that the proposed action will have "no effect" on Lee's pincushion cactus (*Coryphantha sneedii* var. *leei*), Todsens's pennyroyal (*Hedeoma todsenii*), Sacramento prickly-poppy (*Argemone pleiacantha* ssp. *pinnatisecta*) and Kuenzler's hedgehog cactus (*Echinocereus fendleri* var. *kuenzleri*). Lee's pincushion cactus and Todsens's pennyroyal do not occur within the project area and will not be affected by the proposed action. The Sacramento prickly-poppy and Kuenzler's hedgehog cactus do occur within the project area; however, these species will not be affected by the proposed action. Consequently, we concur with your "no effect" determinations for these four plants.

This biological opinion represents an amendment to the November 25, 1996, formal consultation on the Southwestern Region of the Forest Service's Forest Plan Amendments (USDI Fish and Wildlife Service 1996b) (Forest Plan biological opinion). The current biological opinion analyzes the effect of take on the MSO from implementing the proposed action that includes conducting a monitoring program that will provide information useful for guiding future forest thinning projects and assessing potential impacts to habitat and prey, and will be useful information for recovery of the species. This experimental management approach has been

3. No identified habitat for threatened or endangered plant species will be seeded without additional site-specific coordination with the Service.
4. No broadcast burning will occur as a treatment under the Rio Penasco II project.
5. A buffer will be established around thistle occurrences falling within 200 feet of ground-disturbing activities. The buffer will be of sufficient width to absorb and prevent sediment flow that could plug or alter water flow through occupied travertine deposits. Buffer-widths were developed in coordination with the Forest Service (L. Barker, U.S. Forest Service, Lincoln National Forest, pers. comm., 2002). Additional relevant conservation measures include:
 - a) A buffer sufficient to prevent sediment flow, consisting of at least 200 ft above and 100 ft below and beside thistle occurrences will be established;
 - b) Within areas highly susceptible to erosion, qualified resource professionals will determine an appropriate buffer width required to control erosion to an insignificant or discountable level;
 - c) Trees within the buffer may be removed only if slash is lopped and scattered in amounts sufficient to retain the erosion-control integrity of the buffer;
 - d) No ground disturbing activities will be conducted within thistle habitat. For example, no trees will be cut within thistle habitat, as determined by the Forest Service. No vehicles are permitted within thistle habitat and cut materials cannot be pulled or carried through thistle sites.
6. All contracts for vegetation treatment, including thinning and piling of slash, sale of forest products including timber, and other project activities, will contain a clause that provides for the stoppage of work if new occurrences of threatened, endangered or sensitive plants, including thistle, are located. Once protective measures have been implemented, work may resume.
7. Public fuelwood gathering will not be allowed in sites supporting threatened, endangered or sensitive plant species, including thistle.

The thistle is an easily recognized plant that grows in a unique habitat. District employees responsible for laying out treatment units, supervising work crews, and administering contracts readily recognize the species. For these reasons, surveys for this species are considered to be 99.9 percent complete. Any additional sites discovered during field work associated with layout of this project will be documented and provided the protection of all conservation measures described above.

Buffers, as described above, will prevent sediment from reaching travertine formations and will exclude direct mechanical disturbance from falling trees, thinning and slash treatments and

mechanized equipment. Sites especially susceptible to erosion will have buffer widths developed with the assistance of qualified professionals. Buffer widths for the thistle follow Recovery Action Number 142 in the Recovery Plan for this species (USDI Fish and Wildlife Service 1993a). Additionally, slash piling and burning will not occur within thistle habitat. There are no new temporary roads and no trails or roads to be re-opened within 200 ft of thistle occurrences.

For these reasons, we believe that the effects to the thistle are discountable and insignificant. Consequently, we concur with your determination that the proposed action "may affect, is not likely to adversely affect" the thistle or its habitat.

Consultation History

This biological and conference opinion is based on information provided in the May 24, 2002, BA; the April 1, 2002, environmental assessment (EA) for the project, email and telephone conversations between our staffs; data presented in the proposed rule to list the checkerspot butterfly as endangered with critical habitat (USDI Fish and Wildlife Service 2001a; 66 FR 46575); data in our files; Forest Service checkerspot butterfly data from survey reports; data presented in the Recovery Plan for the MSO (USDI Fish and Wildlife Service 1995a); Forest Service regional MSO data; literature review; and other sources of information including the final rules to list the MSO as threatened (USDI Fish and Wildlife Service 1993; 58 FR 14248) and final rule to designate critical habitat (USDI Fish and Wildlife Service 2001; 66 FR 8530). References cited in this biological and conference opinion are not a complete bibliography of all literature available on the MSO or the checkerspot butterfly, the proposed action, or on other subjects considered in this opinion. A complete administrative record of this consultation is on file at this office. We received all the information necessary to begin formal consultation on May 29, 2002, when you submitted an amended BA and requested formal consultation and conferencing.

This proposed project was included in the WUI programmatic biological opinion, consultation was reinitiated because reinitiation is required where 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 the WUI programmatic biological opinion (50 FR 402.16). However, the proposed project includes additional actions that were not covered by the WUI programmatic biological opinion. In addition, the WUI programmatic biological opinion did not include the proposed Sacramento Mountain checkerspot butterfly or its proposed critical habitat, since they were not proposed when the WUI programmatic biological opinion was finalized (USDI Fish and Wildlife Service 2001a; FR 66 46575). Therefore, an individual consultation is required.

Tribal Trust Resources

On May 29, 2002, the Service informed the Forest Service of Secretarial Order No. 3206 regarding the Endangered Species Act and enhanced Native American participation. The Order requires that the Service provide timely notification to affected Tribes as soon as the Service is

aware that a proposed Federal agency action subject to formal consultation may affect Tribal rights or Tribal trust resources. The Order states that when the Service enters into formal consultation with agencies not in the Departments of Interior or Commerce on a proposed action that may affect Tribal rights or Tribal trust resources, the Service shall notify the affected Native American Tribes and encourage the action agency to invite the affected Tribes and the Bureau of Indian Affairs to participate in the formal consultation process. The environmental assessment indicated that the proposed project was discussed with the Mescalero Apache Nation and no specific concerns were identified. The Service is not aware of any action proposed by this proposed project that may affect Tribal rights or Tribal trust resources.

DESCRIPTION OF THE PROPOSED ACTION

Many southwestern forests have shown an increase in ladder fuels (i.e., smaller diameter trees and shrubs), so that crown fires, once rare, are now more common (Dahms and Geils 1997). The long-term effect of land management practices and climate on southwestern forests has been an increase in overall tree stand densities, lack of frequent low-intensity fires, and the unnatural buildup of fuels. Today's forested areas within the Lincoln National Forest are generally overgrown with dense stands of unhealthy trees and excessive amounts of standing and fallen dead tree material. These conditions, coupled with unfavorable weather conditions, present an extreme fire hazard to nearby communities and properties.

Mexican spotted owl

Extensive clearcut logging occurred in mixed conifer forests from 1903 through the 1930s (Kaufmann *et al.* 1998). Approximately 95 percent of the area's mixed conifer was harvested prior to the 1940s, resulting in an even-aged second growth condition. The average stand ages are between 80 and 120 years. Many areas of the Lincoln National Forest, where forest productivity is high, have returned to conditions that are suitable for the MSO. Relatively minor logging has occurred within this area in the last 20 years. Nevertheless, a well established suppressed class of conifers has developed in most of the mixed conifer understories (USDA Forest Service 2002c).

The Service is committed to fuels reduction projects and fully supports the proposed project. The Recovery Plan (USDI Fish and Wildlife Service 1995a) recognizes catastrophic wildfire as the greatest threat to the MSO and its habitat. Reduction in habitat and various habitat-based threats contributed to the listing of the MSO. Forest thinning, often in conjunction with prescribed fires, is extremely important as a management tool needed to enhance, and often to restore many of the ecosystem functions and processes. The long-term benefits to the MSO of many land management actions may contribute, in the short-term, to certain adverse affects to the MSO. Projects, such as the current one, fall into this category. Therefore, it is important to address adverse impacts by minimizing, to the greatest extent practical, those short-term adverse affects and move forward with proactive land management to restore ecosystem functions and community dynamics.

The Recovery Plan encourages fire management programs that have an active role in fuels management. The Recovery Plan also recognizes that catastrophic wildfire is one of the primary threats to the MSO in the Basin and Range East Recovery Unit, where the current proposed project is located. Therefore, fuels management programs play a dual role in being potentially beneficial and a significant threat to the MSO and its habitat. The Service stresses the need to apply adaptive management when conducting fuels management projects. Prescriptions should be structured to maintain key habitat features (e.g., large trees, snags, logs, overstory, and hardwoods) for the MSO and its prey, while reducing the risk of catastrophic wildfire. Treatments should produce or maintain such habitat components and must be assessed by a rigorous monitoring program to determine if treatment objectives for the MSO and fuels reduction were met in the short and long-term. Wholesale use of fuels management programs, without understanding or monitoring effects on habitat may render many of these areas unusable by the MSO and may miss opportunities to improve our knowledge of these programs on habitats.

The Recovery Plan provides for three levels of habitat management: protected areas, restricted areas, and other forest and woodland types. "Protected habitat" includes all known MSO sites, and all areas in mixed conifer or pine-oak forests with slopes greater than 40 percent where timber harvest has not occurred in the past 20 years, and all reserved lands. PACs are delineated around known MSO sites. A PAC includes a minimum of 600 ac designed to include the best nesting and roosting habitat in the area. The recommended size for a PAC includes, on average from available data, 75 percent of the foraging area of an MSO. The management guidelines recommended in the Recovery Plan for protected areas are to take precedence for activities within those areas. "Restricted habitat" includes mixed conifer forest, pine-oak forest, and riparian areas; the Recovery Plan provides less specific management guidelines for these areas. The Recovery Plan provides no MSO-specific guidelines for "other habitat."

The Rio Peñasco II Project area is located in the north-central portion of the Sacramento Ranger District of the Lincoln National Forest, Otero County, New Mexico. Adjacent communities include the villages of Cloudcroft, Mayhill and High Rolls. The proposed project area lies within the Upper Rio Peñasco and La Luz sub-watersheds. The entire area encompasses more than 161,000 acres. The Lincoln National Forest manages approximately 118,000 acres of this land. The vegetation of the area includes Chihuahuan desert scrub at lower elevations on the west side, with pinyon/juniper woodlands, ponderosa pine forest, and mixed conifer forest.

The proposed action also includes amending the Lincoln National Forest Land Management Plan dated June 5, 1996. The proposed changes are outlined in bold below:

Treat fuel accumulations to abate fire risk.

In general, select for treatment 10 percent of the [Mexican spotted owl] protected activity centers where nest sites are known or where a 100 acre "no treatment" area has been delineated (based on Ward and Salas, 2000) in each recovery unit having high fire risk

conditions. Also select another 10 percent of the PACs where nest sites are known as a paired sample to serve as control areas. **For the Rio Peñasco/La Luz Watershed, 38 PACs will have vegetative treatment and will be monitored as described in the Rio Peñasco II EA, August 2002.**

Designate a 100 acre "no treatment" area around the known nest site of each selected PAC or based on methods described by Ward and Salas, 2000. Habitat in the no treatment area should be as similar as possible in structure and composition as that found in the activity center.

Use combinations of thinning trees less than 9 inches [in] in diameter, mechanical fuel treatment and prescribed fire to abate fire risk in the remainder of the selected PAC outside the 100-acre "no treatment" area. **The nine-inch diameter limit is exempted in the Rio Peñasco/La Luz Watershed where scientific studies are designed to test fuel management prescriptions in MSO protected activity centers.**

Retain some woody debris larger than 12 in diameter, snags, clumps of broad-leaved woody vegetation, and hardwood trees larger than 10 in diameter at the root collar.

Select and treat additional protected activity centers in 10 percent increments if monitoring of the initial sample shows there were no negative impacts or there were negative impacts which can be mitigated by modifying treatment methods.

Use light prescribed burns in non-selected PACs on a case-by- case basis. Burning should avoid a 100-acre "no treatment" area within the PAC. Large woody debris, snags, clumps of broad-leaved woody vegetation should be retained and hardwood trees larger than 10 in diameter at the root collar.

Pre- and post-treatment monitoring should be conducted in some PACs treated for fire risk abatement. (See monitoring guidelines).

The Rio Peñasco II project incorporates ecosystem management principles to respond to goals and objectives of the National Fire Plan. The primary purpose of this proposed project is to reduce fuel loadings and dense forested stands resulting from years of fire suppression. Proposed treatments include timber harvest, stand thinning, and fuels management. These treatments will enhance and protect the health of forest stands, especially in the wildland/urban interface, reduce the risk of insect and disease epidemics, reduce the danger of catastrophic wildfire in both human and threatened and endangered species' habitats, and contribute to the maintenance of a sustainable, forest product-based economy. The proposed action treats approximately 28,800 acres, and includes approximately 42 miles of roads to be re-opened and 10 miles of new temporary roads. Reopening of decommissioned roads and constructing new temporary roads are planned only for removal of commercial products. Following project completion, temporary roads will be obliterated and reopened roads will be decommissioned. No new roads will be

added to the forest transportation system. The only proposed use for reopened or new temporary roads is for removal of forest products. Skid trails and decommissioned roads will be rehabilitated by loosening compaction, seeding with native seeds, and water bars.

Acres of vegetation and fuels treatments are specifically described in Table 2.2.3.8.1 and the Table for alternative E of the EA and are hereby incorporated by reference (USDA Forest Service 2002c). Generally, thinning prescriptions will include high, medium, and low intensity thinning as described below:

High Intensity Thin—High intensity thinning reduces tree density between 20 to 30 percent of maximum density or about 80 to 120 ft² basal area per acre in mixed conifer and 60 to 80 ft² basal area per acre in ponderosa pine. High intensity thinning requires a timber sale to implement (commercial target thinning).

Medium Intensity Thin—Medium intensity thinning reduces tree density between 30 to 40 percent of maximum density or about 150 to 160 ft² basal area per acre only in mixed conifer stands. The intent of this thinning is to maintain or enhance MSO threshold stands. This treatment also requires a timber sale to implement, but topography must be less than 40 percent slope (commercial threshold thinning).

Low Intensity Thin—Low intensity thinning leaves tree density above 40 percent of maximum density and does not target a specific basal area. This treatment only cuts trees less than 9 inch diameter at breast height (dbh). The intent of this thinning is to provide for a short-term reduction of ladder fuels. This treatment does not require a timber sale to implement (pre-commercial low intensity thinning).

The thinning prescriptions target stands that are at risk of catastrophic wildfire and are intended to reduce threats from stand replacement fires and epidemic levels of insects and disease, while maintaining a high degree of canopy closure. Most of these thinning prescriptions would employ “thinning from below” that removes trees from the lower crown classes.

Proposed commercial thinning (i.e., timber sales) would last about 5 years and remove between 50 and 70 percent of the 9 to 24 inch dbh trees in harvest units. No trees greater than 24 inch dbh would be cut unless necessary for safety considerations. Commercial thinning is planned to occur over a 5-year period and would include only ground-based logging methods (e.g., rubber-tire skidded or tracked vehicles that deliver commercial material to roads via dispersed skidding). Commercial thinning units are proposed to be interspersed across the project area on approximately 7,730 acres, of which 768 acres are within MSO PACs and 2,780 acres within restricted habitat. By-products of the proposed project will be commercial biomass and saw-timber. Mechanical treatment for commercial thinning would include removing whole-tree to designated landings with slash piles at landings. Public fuelwood-gathering areas will also be opened. Thus, all fuels generated from treatments (e.g., unused limbs, tree tops, small trees, etc.)

will not be a major source of fuel loading and will not represent a fire hazard (USDA Forest Service 2002c).

Fuels treatments are also proposed within commercial thinning units. These treatments would include pile burning, biomass removal, lopping and scattering, or chipping. Pile burning disposes of hand or machine-piled slash. Piles are normally ignited by hand using fusees or drip torches. Biomass removal could include post and pole or removal of other forest timber products. During the chipping process, slash is forced through a chipping machine, reducing large pieces of slash to small chips. These chips would be spread over an area or left to naturally decompose. Biomass harvest and post-timber sales treatments would continue up to 10 years after the commercial timber sale closes. No ground-based yarding (i.e., piling) of fuels would occur on slopes greater than 40 percent. Tree stands after commercial thinning treatments would range between 80 and 160 ft² basal area per acre, depending on the treatment (i.e., medium or high intensity).

Proposed pre-commercial thinning would remove understory trees less than 9 inch dbh. These treatments are proposed to be across the entire project area on approximately 21,000 acres, of which 5,384 acres are within PACs, 2,839 acres are within restricted habitat, and 1,324 acres are on steep slopes (i.e., slopes greater than 40 percent, as defined under protected habitat in the recovery plan (USDI Fish and Wildlife Service 1995a)). Pre-commercial thinning will reduce high conifer stocking levels, remove ladder fuels, and move treated forest stands toward historical conditions. Within these treated stands, handpiling of slash will occur on approximately 44 percent of the wildland urban interface. The biomass generated from pre-commercial treatments could be salvaged on approximately 11,000 of the 21,000 acres. Pre-commercial thinning may occur up to 10 years following commercial timber sales.

Streamside riparian buffers will be applied which exclude mechanized equipment entry, except for a small number of new temporary roads and some re-opening of old roads. Piling of slash for burning and skidding of logs on the ground, except when snow cover prevents ground disturbance from skidding, will be excluded from riparian buffers. Buffers will extend 50 ft slope distance each side of ephemeral and intermittent channels, 150 ft each side of perennial reaches, and 300 ft each side of fish-bearing reaches and in the candidate Wild and Scenic River corridor along the Rio Peñasco near Bluff Springs.

The proposed action also includes a MSO monitoring and research program (monitoring program). The monitoring program will gather both pre-treatment and post-treatment data to evaluate which of three thinning treatments provides the best conditions for conserving the MSO while reducing the risk of wildfire. The monitoring program proposes to treat forest stands within 17 PACs (only 12 PACs commercially). Each treatment zone will be shaped like a donut, 1 kilometer wide, centered on the 100-acre nest/roost protection area (i.e., no treatments will be conducted within this 100 acre area). Several MSO Recovery Team (Recovery Team) members are the principal investigators. The Recovery Team leader, along with other Recovery Team members, have reviewed and endorsed this proposed project (W. Block, USDA Forest Service,

MSO Recovery Team leader, pers. comm., 2002). The study was designed by following guidelines within the Recovery Plan for restricted habitat (e.g., reducing the 9 inch dbh trees outside of the 100-acre core area) and steep slopes. The treatments within PACs deviates from some specific guidelines, but were designed to follow the research recommendations outlined in the Recovery Plan. Because these treatments and monitoring plan have been endorsed and designed by MSO Recovery Team members, we conclude this information represents the best scientific and commercial data available (50 FR 402.14(d)).

Dense aggregations of smaller diameter trees have promoted closed forest stands with reduced shrubs, fewer forbs, fewer snags, and large diameter logs. It is believed that these conditions may reduce the abundance of Mexican woodrats (*Neotoma mexicana*), a preferred prey item of the MSO (Ward 2001). A greater use of prey smaller than woodrats such as Peromyscid mice (*Peromyscus* spp.) and voles (*Microtus* spp.) can contribute to increased variability in the MSO's reproductive output. Consequently, Ward (2001) recommended forest manipulations to reduce the risk of stand-replacing fires, while actively managing woodrats in an attempt to reduce the variability in MSO reproduction. The monitoring program is an experiment designed to test MSO responses to forest thinning operations. These responses include: plant composition, particularly food resources for woodrats, trends in the abundance of the MSO's preferred and alternative prey (i.e., woodrats v. mice and voles), foraging behavior (where it hunts, what it is eating) of the MSO, and the MSO's survival and reproduction.

The high, medium, and low intensity thinning treatments for the monitoring program are listed above but generally include: 1) reducing the number of pre-commercial trees that are smaller than 9 inch dbh (pre-commercial low intensity thinning); 2) reducing the number of threshold trees smaller than 24 inch dbh, to reduce forest stands to a basal area of 150 ft² or more per acre while retaining stand structure at or above conditions matching MSO roosting and nesting habitat (USDI Fish and Wildlife Service 1995a) (commercial threshold medium intensity thinning); and 3) reducing the number of target trees smaller than 24 inch dbh to maintain a basal area of 80-120 ft² per acre (i.e., thinning designed to open overstory canopy through greater reduction of tree biomass while retaining trees greater than 24 inch dbh) (commercial target high intensity thinning). For commercial target high intensity thinning, trees will be removed in small patches 0.5 to 2 acre in size to maximize protected foraging structures for the MSO and openings that will presumably attract Mexican woodrats. None of the prescriptions will be conducted within 100-acre roost-center or nest-area buffers within PACs.

There are a maximum of 17 treatment PACs that are proposed to be part of the monitoring program. The remaining 21 PACs will not be commercially thinned, but may have road construction or pre-commercial thinning (Table 1). Because the latter PACs were affected by the proposed action, they were included in the BA. Nevertheless, these PACs are not proposed to be part of the monitoring program. Of the 17 PACs proposed for the monitoring program, 12 are proposed to be commercially thinned with high or medium intensity treatments and the remaining 5 PACs are proposed to receive pre-commercial treatments (i.e., low intensity thinning), but no commercial treatments (e.g., high or medium intensity thinning). Control PACs

will be paired with each treatment PAC according to its similarity in physical and biotic attributes that influence MSO habitat use. The monitoring program is expected to last about 10 years. Additional details on methods recommended for estimating parameters associated with the effects of forest-thinning projects will be described in a formal study plan for the monitoring program. The study plan will be reviewed for appropriate scientific conduct, including reliability of proposed scientific design, data collection, and analysis procedures. The methods that will be used to collect these data have not been finalized. Consequently, for analysis we assumed that MSOs from the 17 treatment PACs listed in Table 1 will be monitored to estimate demographic parameters (e.g., reproduction, recruitment, and survival). MSOs from a maximum of 90 additional PACs beyond the proposed project area will be surveyed to provide additional data to analyze the effect of treatments on demography. For this analysis we assumed that MSOs would be captured and marked (leg bands) as part of the monitoring program and would follow common procedures (e.g., see Franklin *et al.* 1996).

The assigning of treatment and control PACs will be finalized after conducting MSO surveys during the 2002 field season. Nevertheless, this biological opinion analyzes the proposed treatments for the 38 PACs that are listed in Table 1. The Forest Service has indicated that the effects to the MSO will be no more than the treatments as they are proposed in Table 1 below (G. Garcia, Lincoln National Forest, pers. comm., 2002). It is important to note that the acres listed in Table 1 are based on stand acres calculated using a Geographic Information System. However, the maximum number of acres for commercial treatments associated within a PAC will be 60 acres and no more than 10 percent of each PAC proposed for commercial treatment (Jose Martinez, Forest Supervisor, Lincoln National Forest, August 22, 2002).

Table 1. Effects to MSO PACs from the Rio Peñasco II Project.

PAC Name/Number	Road		Treatment		Percent of PAC affected
	Reopen (miles)	New (miles)	Pre-commercial (acres)	Commercial (acres)	
Rawlins/5	0.45	0	0	0	<1 ¹
Bail/6 ^T	0	0	89	83	10
Newman/7	0.45	0	0	0	<1
Peñasco/8 ^F	0	0	136	86	10
Lucas/16 ^T	0	0	81	0	0
Radio/20 ^T	0	0	45	42	7
Marcia/21 ^T	0	0	139	27	4
El Paso/26 ^T	0	0	113	33	5

Wilmeth/27 ^T	0	0	22	0	0
Bear Spring/30 ^T	0	0	118	0	0
Railroad/32	0	0	153	0	0
Greasy/33	0	0	160	0	0
Aspen/39	0.40	0	113	0	<1
Kerr/42	0	0	239	0	0
Goodsell/44 ^T	0.65	0	0	125	10
Sullivan/45	0	0	197	0	0
Pew/46	0.56	0	71	0	<1
Newman/47 ^T	0.39	0	72	17	3
Bluff/50	0	0	292	0	0
Coxpoint/52	0	0	25	0	0
Glenn/58 ^T	0	0	76	0	0
Pierce/68	0	0	197	0	0
Chippway/69 ^T	0.56	0	0	37	6
Wayne/74 ^T	0	0	0	73	10
Golf/75	0	0	326	0	0
Wills/78	0.48	0	0	0	<1
Dark/80 ^T	1.53	0	88	83	10
L Wills/85 ^T	0	0	140	51	8
Turkey/87	0	0	279	0	0
AFrame/90	0	0	259	0	0
LApache/91	0	0	225	0	0
Rio/94	0	0	338	0	0
Wyatt/95 ^T	0	0	239	0	0
Littlehay/96	0	0	283	0	0

Zoo/100	0	0	89	0	0
Peterson/102	0	0	271	0	0
Seville/103	0	0	102	0	0
Hubble/108 ^T	1.15	0.33	0	111	10
Russia/104 ^S	0	0	0	0	
Total	6.62	0.33	4,977	768 ²	

^TThis PAC is included as a treatment area within the monitoring program.

^F This PAC will have treatment inside the PAC boundary, but the treatment will serve to monitor effects to MSO in the Lower Newman PAC (#47). The MSOs in this PAC are not included in the monitoring study.

¹Percent of PAC acres affected by all adverse activities (i.e., reopening and new roads and commercial thinning). Note that no more than 60 acres within each PAC will be commercially thinned.

²This estimate is based on forest stand boundaries in GIS. Number of acres commercially treated within each PAC will be less than or equal to 60 acres (e.g., although Bail PAC lists 83 acres of commercial treatment, only 60 acres will be treated).

^SThis PAC is included in the monitoring study but will not have treatment within its boundary. Stands that will be treated for monitoring of the MSOs in the Russia PAC are located outside the PAC boundary.

The BA indicates that, as part of the proposed action, the following conservation measures for the MSO will be implemented:

1. All MSO restricted habitat will be managed according to Recovery Plan standards (i.e., retain trees greater than 61 cm (24 in) unless overriding management situations require their removal to protect human safety and/or property (e.g., the removal of hazard trees along roads, in campgrounds, and along power lines);
2. All treatments will retain trees greater than 61 centimeters (cm) (24 in), unless deemed a hazard tree;
3. All treatments will retain some trees greater than 18 in dbh to the extent that it does not impede the objective of reducing the risk of catastrophic wildfire in MSO habitat.
4. No treatments will occur in the 100-acre roost-nest buffer found within PACs;

5. Breeding season restrictions (March 1 to August 31) will be implemented in all PACs, which includes road use in new temporary or re-opened roads;
6. Presence surveys will occur for at least two years before treatment (i.e., commercial or pre-commercial thinning) occurs;
7. All new temporary or reopened roads will be closed following project completion, both within and outside of PACs;
8. Micro-habitat vegetation monitoring will occur within proposed project treatment areas using Forest Service Region 3 protocols;
9. No broadcast burning is allowed in protected or restricted habitat;
10. No snags over 14 in dbh will be cut unless it determined that they are hazard trees;
11. At least 3 snags, 18 in dbh or greater per acre will be left after treatment. To reduce losses of large snags or snags with obvious heavy use (cavities present and visible), cutting unit boundaries and/or prescriptions will be modified to save the snag, so that it is no longer a hazard; and
12. Retain 10-15 tons of downed woody material with an emphasis on not removing any logs greater than 12-in midpoint diameter and at least 8 ft long.

Sacramento Mountains checkerspot butterfly

There is an estimated 852 acres within the proposed critical habitat boundary that contain the proposed primary constituent elements for the checkerspot butterfly. Approximately 500 acres (59 percent) are meadow habitat found within the Rio Pefiasco project area and are occupied by the species. No treatments will occur within the meadows; however, treatment will occur on approximately 1,770 acres adjacent to unoccupied habitat and on 3,385 acres adjacent to occupied habitat.

A total of 12.9 miles of open system road, 5.4 miles of re-opened road and 0.4 miles of a proposed new temporary road are found within the proposed checkerspot butterfly critical habitat. Of this total, there are 3.3 miles of open system road, 0.6 miles of re-open road and 0.2 miles of a proposed new temporary road that are not occupied by the checkerspot butterfly, but are within the proposed critical habitat boundary. These roads will disturb approximately 1 acre or 0.2 percent of unoccupied proposed critical habitat. Additionally, there are 9.6 miles of open system road, 4.8 miles of re-open road and 0.2 miles of a proposed new temporary road within meadows that are occupied by the checkerspot butterfly. These roads will disturb approximately 9 acres or 1.8 percent of occupied habitat. For this conference opinion we have defined these disturbances to include the meadow habitat (direct impacts) within all reopened and proposed

new temporary roads including a surrounding 20-ft buffer (indirect impacts). Checkerspot butterflies in the adjacent non-graded areas may also be indirectly affected by soil erosion or dust covering and killing food plants (Farmer 1993).

The BA indicates that, as part of the proposed action, the following conservation measures for the checkerspot butterfly will be implemented:

1. Plants containing checkerspot butterfly larvae that cannot be avoided will be relocated prior to any road construction or reopening activities;
2. Road construction or reopening will be completed during the non-active season for the checkerspot butterfly (i.e., November 1 through February 28);
3. Surveys will be conducted prior to any activities being implemented within suitable checkerspot butterfly habitat. These surveys will focus on locating New Mexico penstemon (*Penstemon neomexicana*), valerian (*Valeriana edulis*), or orange sneezeweed (*Helenium hoopesii*) or any life stages of the checkerspot butterfly;
4. Road use will be kept to the existing roadbeds and pullouts;
5. Local New Mexico penstemon seed will be collected or purchased and seeded in the disturbed areas;
6. All road disturbance activities will be kept to the least amount possible (e.g., blading of roads will only be completed where safety hazards occur); and
7. All treatments and associated activities (including fuelwood gathering) will be confined to forested habitats.

STATUS OF THE SPECIES (range-wide)

Mexican spotted owl

The MSO was listed as threatened on March 16, 1993 (USDI Fish and Wildlife Service 1993; 58 FR 14248). Critical habitat for the MSO was designated on June 6, 1995 (USDI Fish and Wildlife Service 1995; 60 FR 29914), but was subsequently withdrawn on March 25, 1998 (USDI Fish and Wildlife Service 1998; 63 FR 14378). Critical habitat was proposed again on July 21, 2000 (USDI Fish and Wildlife Service 2000a; 65 FR 45336) and finalized on February 1, 2001 (USDI Fish and Wildlife Service; 66 FR 8530). Background and status information on the MSO is found in the Final Rule listing the MSO as a federally-threatened species (USDI Fish and Wildlife Service 1995; 58 FR 14248), previous biological opinions provided by us to the Forest Service, and the Recovery Plan (USDI Fish and Wildlife Service 1995a). The information

on species description, life history, population dynamics, status, distribution, and range-wide trends provided in those documents is included herein by reference and is summarized below.

The American Ornithologist's Union currently recognizes three spotted owl subspecies, including the California spotted owl (*Strix occidentalis occidentalis*); Mexican spotted owl (*S. o. lucida*); and northern spotted owl (*S. o. caurina*). The MSO is distinguished from the California and northern subspecies chiefly by geographic distribution and plumage. The MSO is mottled in appearance with irregular white and brown spots on its abdomen, back and head. The spots of the MSO are larger and more numerous than in the other two subspecies giving it a lighter appearance. Several thin white bands mark an otherwise brown tail. Unlike most owls, MSO have dark eyes.

The *lucida* subspecies is a distinguishable taxon based on allozyme electrophoresis (Barrowclough and Gutiérrez 1990). Analysis of mitochondrial DNA shows further evidence that the three designated subspecies are valid. Despite the demonstrated phylogenetic relatedness, there is evidence of reduced gene flow between the subspecies, indicating the three subspecies should be treated as separate conservation units (Barrowclough *et al.* 1999).

The MSO has the largest geographic range of the three subspecies. The range extends north from Aguascalientes, Mexico, through the mountains of Arizona, New Mexico, and western Texas, to the canyons of southern Utah, and southwestern Colorado, and the Front Range of central Colorado. Because this is a broad area of the southwestern United States and Mexico, much remains unknown about the species' distribution within this range. This is especially true in Mexico where much of the MSO's range has not been surveyed. The MSO occupies a fragmented distribution throughout its United States range corresponding to the availability of forested mountains and canyons, and in some cases, rocky canyon lands. Although there are no estimates of the MSO's historic population size, its historic range and present distribution are thought to be similar.

According to the Recovery Plan (1995), 91 percent of MSOs known to exist in the United States between 1990 and 1993 occurred on land administered by the Forest Service; therefore the primary administrator of lands supporting MSOs in the United States is the Forest Service. Most MSOs have been found within Region 3, which includes 11 National Forests in New Mexico and Arizona. Forest Service Regions 2 and 4, including 2 National Forests in Colorado and 3 in Utah, support fewer MSOs. The range of the MSO is divided into 11 Recovery Units, 5 in Mexico and 6 in the United States, as identified in the Recovery Plan (USDI Fish and Wildlife Service 1995a). The Recovery Plan also identifies recovery criteria and provides distribution, abundance, and density estimates by Recovery Unit. The Upper Gila Mountain Recovery Unit has the greatest known concentration of MSO sites (55.9 percent), followed by the Basin and Range-East (16.0 percent), Basin and Range-West, (13.6 percent), Colorado Plateau (8.2 percent), Southern Rocky Mountain-New Mexico (4.5 percent), and Southern Rocky Mountain-Colorado (1.8 percent) Recovery Units.

A reliable estimate of the number of MSOs throughout its entire range is not currently available due to limited information. Fletcher (1990) calculated that 2,074 MSOs existed in Arizona and New Mexico in 1990 using information gathered by Region 3 of the Forest Service. Fletcher's calculations were subsequently modified by us (USDI Fish and Wildlife Service 1991), who estimated a total of 2,160 MSOs throughout the United States. However, these numbers are not considered reliable estimates of current population size for a variety of statistical reasons, and a pilot study (Ganey *et al.* 1999) conducted in 1999, estimated the number of MSOs for the upper Gila Mountains Recovery Unit (exclusive of tribal lands) as 2,950 (95 percent confidence interval 717-5,183). While the number of MSOs throughout the range is currently not available, the Recovery Plan reports an estimate of MSO sites based on 1990-1993 data. An MSO "site" is defined as a visual sighting of at least one adult MSO or a minimum of two auditory detections in the same vicinity in the same year. Surveys from 1990 through 1993 indicate one or more MSOs have been observed at a minimum of 758 sites in the United States and 19 sites in Mexico. In addition, these surveys indicate that the species persists in most locations reported prior to 1989, with the exception of riparian habitats in the lowlands of Arizona and New Mexico, and all previously occupied areas in the southern States of Mexico.

In a summary of all territory and monitoring data for the 1995 field season, a total of 869 management territories (MT) were reported to us (U.S. Forest Service, *in litt.* January 22, 1996). Based on this number of MSO sites, total numbers in the United States may range from 869 individuals, assuming each known site was occupied by a single MSO, to 1,738 individuals, assuming each known site was occupied by a pair of MSOs. The 1996 data are the most current compiled information available to us; however, more recent surveys efforts have likely resulted in additional sites being located in all Recovery Units.

MSOs breed sporadically and do not nest every year. This MSO's reproductive chronology varies somewhat across its range. In Arizona, courtship apparently begins in March with pairs roosting together during the day and calling to each other at dusk (Ganey 1988). Eggs are laid in late March or typically early April. Incubation begins shortly after the first egg is laid, and is performed entirely by the female (Ganey 1988). The incubation period for the MSO is assumed to be 30 days (Ganey 1988). During incubation and the first half of the brooding period, the female leaves the nest only to defecate, regurgitate pellets, or receive prey from the male, who does all or most of the foraging (Forsman *et al.* 1984, Ganey 1988). Eggs usually hatch in early May, with nestling MSOs fledging four to five weeks later, and then dispersing in mid-September to early October (Ganey 1988).

Little is known about the reproductive output for the MSO. It varies both spatially and temporally (White *et al.* 1995), but the subspecies demonstrates an average annual rate of 1.001 young per pair. Current demographic research in Arizona and New Mexico has documented populations that are declining at "greater than" 10 percent a year (Seamans *et al.* 1999). Possible reasons for the population declines are declines in habitat quality and regional trends in climate (Seamans *et al.* 1999). Based on short-term population and radio-tracking studies, and longer-term monitoring studies, the probability of an adult MSO surviving from one year to the next is

0.8 to 0.9. Juvenile survival is considerably lower, at 0.06 to 0.29, although it is believed these estimates may be artificially low due to the high likelihood of permanent dispersal from the study area, and the lag of several years before marked juveniles reappear as territory holders and are detected as survivors through recapture efforts (White *et al.* 1995). Little research has been conducted on the causes of mortality, but predation by great horned owls, northern goshawks, red-tailed hawks, and golden eagles, as well as starvation, and accidents or collisions, may all be contributing factors.

MSOs nest, roost, forage, and disperse in a diverse array of biotic communities. Nesting habitat is typically in areas with complex forest structure or rocky canyons, and contain mature or old-growth stands that are uneven-aged, multi-storied, and have high canopy closure (Ganey and Balda 1989a, Service 1991). In the northern portion of the range (southern Utah and Colorado), most nests are in caves or on cliff ledges in steep-walled canyons. Elsewhere, the majority of nests appear to be in Douglas fir trees (Fletcher and Hollis 1994, Seamans and Gutierrez 1995). A wider variety of tree species is used for roosting; however, Douglas fir is the most commonly used species (Ganey 1988, Fletcher and Hollis 1994, Young *et al.* 1998). MSOs generally use a wider variety of forest conditions (mixed conifer, pine-oak, ponderosa pine, piñon-juniper) for foraging than they use for nesting/roosting.

Seasonal movement patterns of MSOs are variable. Some individuals are year-round residents within an area, some remain in the same general area but show shifts in habitat use patterns, and some migrate considerable distances 12-31 miles during the winter, generally migrating to more open habitat at lower elevations (Ganey and Balda 1989b, Willey 1993, Ganey *et al.* 1998). Home-range size of MSOs appears to vary considerably among habitats and/or geographic areas (USDI Fish and Wildlife Service 1995), ranging in size from 647 - 3,688 ac for individuals birds, and 945 - 3,846 ac for pairs (Ganey and Balda 1989b, Ganey *et al.* 1999). Little is known about habitat use of juveniles during natal dispersal. Ganey *et al.* (1998) found dispersing juveniles in a variety of habitats ranging from high-elevation forests to piñon-juniper woodlands and riparian areas surrounded by desert grasslands.

MSOs consume a variety of prey throughout their range but commonly eat small and medium sized rodents such as woodrats, peromyscid mice, and microtine voles. MSO may also consume bats, birds, reptiles, and arthropods (Ward and Block 1995). Habitat correlates of the MSO's common prey emphasizes that each prey species uses a unique habitat. Deer mice (*P. maniculatus*) are ubiquitous in distribution in comparison to brush mice (*P. boyleyi*), which are restricted to drier, rockier substrates, with sparse tree cover. Mexican woodrats are typically found in areas with considerable shrub or understory tree cover and high log volumes or rocky outcrops. Mexican voles (*Microtus mexicanus*) are associated with high herbaceous cover, primarily grasses; whereas, long-tailed voles (*M. longicaudus*) are found in dense herbaceous cover, primarily forbs, with many shrubs, and limited tree cover. A diverse prey base is dependant on the availability and quality of diverse habitats.

Past, current, and future timber harvest practices in Region 3 of the Forest Service, in addition to catastrophic wildfire, were cited as primary factors leading to the listing of the MSO as a federally-threatened species. Other factors that have or may lead to the decline of this species include a lack of adequate regulatory mechanisms. In addition, the Recovery Plan notes that forest management has created ecotones favored by great horned owls, increasing the likelihood of predation on the MSO. Increases in scientific research, birding, educational field trips, and agency trips are also likely to increase. Finally, there is a potential for increasing malicious and accidental anthropogenic harm, and the potential for the barred owl to expand its range, resulting in competition and/or hybridization with the MSO.

A total of 536 projects have undergone formal consultation for the MSO. Of that aggregate, 261 projects resulted in a total anticipated incidental take of 477 MSOs plus an additional unknown number of MSOs. These consultations have primarily dealt with actions proposed by the Forest Service, Region 3, but have also addressed the impacts of actions proposed by the Bureau of Indian Affairs, Department of Defense (including Air Force, Army, and Navy), Department of Energy, National Park Service, and Federal Highway Administration. These proposals have included timber sales, road construction, fire/ecosystem management projects (including prescribed natural and management ignited fires), livestock grazing, recreation activities, utility corridors, military overflights, and other construction activities.

The WUI programmatic biological opinion was completed in April 2001 for the Southwestern Region of the Forest Service (USDI Fish and Wildlife Service 2001c). The WUI programmatic biological opinion reviewed the effects from a proposed action that would treat forest fuels within 283 wildland urban interface projects to reduce the risk of catastrophic wildfire in 11 National Forests in Arizona and New Mexico. Our determination of not likely to jeopardize the MSO for the effects of the project and the anticipated take from this proposed action are hereby incorporated by reference (USDI Fish and Wildlife Service 2001c), but pertinent information and conclusions are briefly described below.

The WUI programmatic biological opinion anticipated the take of 100 MSO PACs from harassment and 34 PACs from harm (USDI Fish and Wildlife Service 2001c). Additionally, an unquantified number of MSOs may be harassed within 229,859 acres of unsurveyed restricted habitat and an unquantified number of MSOs may be harmed within 42,572 acres of unsurveyed protected habitat.

The take from the WUI programmatic biological opinion "supplemented" (i.e., was in addition to) the take anticipated for the MSO under the Forest Plan biological opinion (USDI Fish and Wildlife Service 2001c). The Forest Plan biological opinion anticipated the take of MSOs described in Table 2.

The environmental baseline for the MSO has changed since the issuance of the Forest Plan biological opinion in 1996 (USDI Fish and Wildlife Service 1996b). There were an estimated 866 MSO territories rangewide in the United States in 1996, whereas currently we estimate there

are at least 935 PACs in this area. On Forest Service lands in the Southwestern Region, new PACs have been found at average of about 12 PACs per year since 1996. The WUI programmatic biological opinion estimated 6.6 million acres of MSO habitat on Forest Service lands in the Southwest, with about 588,000 acres in 935 PACs, 2.1 million acres in other protected habitat, and 3.9 million acres in restricted habitat. Large tracts of Forest Service lands have not been surveyed recently or have not followed MSO survey protocols. Consequently, it is reasonable to conclude that additional PACs will be discovered as surveys for the MSO continue.

We believe that Table 2 provides an up-to-date estimate of the number of MSO PACs that were anticipated to be taken under the Forest Plan biological opinion in 1996 (USDI Fish and Wildlife Service 1996b).

We conclude that the revised number of PACs anticipated for take in the Forest Plan biological opinion in 1996 is 24 for roads, 94 for fire abatement, and 47 for timber salvage projects (USDI Fish and Wildlife Service 1996b). Therefore, the total number of PACs anticipated for take in both the Forest Plan biological opinion in 1996 and the WUI programmatic biological opinion is 299. Moreover, as part of the WUI programmatic biological opinion, an additional and unquantified number of MSOs may be taken (i.e., harassed or harmed) within unsurveyed restricted or protected habitat.

Table 2. Estimated take of MSO from the Forest Plan biological opinion and the revised estimated take based on the number of PACs in the WUI programmatic biological opinion.

Recovery Unit	Territories/PACs	Take ¹ Associated With		
		Roads	Abate Fires	Salvage
Colorado Plateau	13/17 ²	1/1 ³	1/2	1/1
S. Rocky Mtn, NM	36/40	1/1	4/4	2/2
Upper Gila Mtn,	539/542	11/11	54/54	27/27
Basin and Range West	150/205	3/4	15/21	8/10
Basin and Range East	128/131	6/7	13/13	6/7
Total	866/935	22/24	87/94	44/47

¹Take was described in the Forest Plan biological opinion in 1996 as percent of PACs by each Recovery Unit (USDI Fish and Wildlife Service 1996b). The number of PACs anticipated to be taken were estimated by multiplying the percentage to be taken by number of PACs known in Recovery Unit in 1996 and in 2001.

²Number of known PACs from the Forest Plan biological opinion in 1996 (USDI Fish and Wildlife Service 1996b)/Number of known PACs from WUI programmatic biological opinion in 2001 (USDI Fish and Wildlife Service 2001c).

³Estimated number of PACs to be taken under the Forest Plan biological opinion in 1996 (USDI Fish and Wildlife Service 1996b)/Estimated number of PACs to be taken from the Forest Plan biological opinion in 1996, but revised using updated number of PACs from WUI programmatic biological opinion in 2001 (USDI Fish and Wildlife Service 2001c).

Sacramento Mountains checkerspot butterfly

The checkerspot butterfly is a member of the brush-footed butterfly family (Nymphalidae). The adults have a wingspan of approximately 2 in and 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 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 1999d).

Adult checkerspot butterflies apparently lay their eggs on New Mexico penstemon and perhaps valerian, the known larval host plants. 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).

The extent of the historical range of the checkerspot butterfly is not known due to limited information collected on this subspecies prior to its description (Ferris and Holland 1980). However, based upon the location of its meadow habitat, the general trend of commercial and private development in suitable habitat, and the encroachment of conifers into suitable habitat due to fire suppression on public and private lands, it is likely that the species once occupied a more extensive, but still limited area.

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, 2000b). The known range of the checkerspot butterfly is within an 33 mi² 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, 2000b). The potential range of the checkerspot butterfly to the east and west is likely restricted because the non-forested areas are below 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, 2000b).

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 5,198 ac of potential habitat, composed of 2,553 and 2,645 ac on private and Forest Service lands, respectively (USDA Forest Service 1999b).

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).

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 (USDI Fish and Wildlife Service 2001a; 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; Forest Service 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).

We are aware of Forest Service projects proposed within the known range of the checkerspot butterfly that have the potential to affect the checkerspot butterfly. Recent or future projects include: (1) a capital improvement project for three campgrounds; (2) a new power line, service road, and corridor; (3) livestock grazing activities in several allotments; and (4) a land transfer to the Village of Cloudcroft (USDA Forest Service 1999a, 1999b, 1999d, 2000a; Service 1999, 2001a).

The Forest Service has eliminated some proposed projects (e.g., the construction of new administrative building) in habitat used by the checkerspot butterfly. They have also taken some actions to protect and manage the checkerspot butterfly, including instituting a checkerspot butterfly closure order, fencing a portion of one checkerspot butterfly locality, and conducting checkerspot butterfly surveys to determine range and occupancy (USDA Forest Service 1999a, 1999b, 1999e, 2000a, 2000b). These actions have been beneficial, especially for increasing our knowledge of this species. However, other multiple use priorities on Forest Service lands, such as range management, road maintenance, or capital improvement projects, have the potential to impact this species.

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, 1999e). 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 (USDI Fish and Wildlife Service 2001a; 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; USDI Fish and Wildlife Service 2001a; 66 FR 46575).

The New Mexico State Highway and Transportation Department (NMSHTD) recently improved portions of an approximately 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, U.S. Fish and Wildlife Service pers. obs.). Some topsoil and larval food plants were stockpiled and used in the revegetation when the project was completed.

PROPOSED CRITICAL HABITAT

The primary constituent elements of critical habitat for the checkerspot butterfly include those habitat components providing for breeding, ovipositing (egg laying), diapausing, roosting or resting, or foraging areas and are described below. The proposed critical habitat designation includes the area found within an approximate 54 mi² polygon centered around the Village of Cloudcroft, Otero County, New Mexico. The primary constituent elements are: 1) elevation between 8,000 and 9,000 ft within the mixed-conifer forest (Lower Canadian Zone) and within an approximate 54 mi² polygon centered around the Village of Cloudcroft, Otero County, New Mexico, south of the Mescalero Apache Nation boundary; 2) drainages, meadows, or grasslands; 3) supporting the known food plants New Mexico penstemon, sneezeweed, or valerian; 4) less than 5 percent canopy cover; and 5) composed of plants such as arrowleaf groundsel, curly-cup gumplant, figworts, penstemon, skyrocket, milkweed, Arizona rose, or Wheeler's wallflower. Areas adjacent to or linking areas that have some or all of the above elements and are sufficient to provide for dispersal between areas of checkerspot butterfly habitat are necessary for the conservation of the species and thus are proposed as critical habitat. Habitat that provides for dispersal may not support all of the other primary constituent elements.

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 FR 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 defined the action area for the MSO to include the Basin and Range East Recovery Unit. For the checkerspot butterfly, the action area encompasses the 502 acres that are occupied, an additional 350 acres of unoccupied proposed critical habitat, and approximately 1,773 acres adjacent to unoccupied proposed habitat and 3,385 acres adjacent to occupied habitat. This action area for the checkerspot butterfly includes re-opened roads and new temporary roads, whereas the existing road system is part of the environmental baseline described below. For this conference, we also defined the action area to include the meadow habitat (direct impacts) within all reopened and proposed new temporary roads including a surrounding 20-ft buffer.

Mexican spotted owl

The jeopardy analysis for this current consultation will evaluate whether the activities of the current proposal may jeopardize the continued existence of the MSO. We are analyzing the effects of the action within this recovery unit and its relationship to the survival and recovery of the MSO range-wide (USDI Fish and Wildlife Service and National Marine Fisheries Service 1998). We have also included a discussion and update of the take of the MSO within this Recovery Unit that has been anticipated through the Forest Plan biological opinion in 1996 (USDI Fish and Wildlife Service 1996b) and the WUI programmatic biological opinion in 2001.

On the Lincoln National Forest, past and present Federal, State, private, and other human activities that may affect the MSO and its habitat include vegetation manipulations (various small sales, fuelwood gathering activities, salvage sales, and prescribed burns), livestock grazing, recreational activities, development of recreation sites (campgrounds) and scenic vistas, road construction and maintenance activities, land exchanges, issuance of rights-of way, off-road motorcycle events, and powerline construction. Forest management activities (timber sales, etc.) on adjacent Tribal and private lands, urban development in and around the Village of Cloudcroft, and fire suppression also affect the environmental baseline.

Other past and present Forest Service projects that may contribute to the environmental baseline are: the WUI programmatic biological opinion (2001), the Sacramento grazing Allotment, Scott Able, and North Bluewater Allotment grazing permits (2000), the Sacramento Allotment Management Plan and Environmental Impact Statement (2002), the Bridge fire fuelwood salvage (1995), and the Fresno Canyon water pipeline (1993), and programmatic biological opinions for the Forest Service's Land and Resource Management Plans and existing forest plans and the MSO (USDI Fish and Wildlife Service 1996b).

In addition, the risk of catastrophic habitat loss due to fire is extremely high. Past fires such as the Burgett, Bridge, and Scott Able fires, have modified thousands of acres of habitat and impacted multiple MSO territories. The Scott Able fire burned 16,034 acres, of which 14,551 were administered by the Lincoln National Forest and 1,483 acres were private land (USDA Forest Service 2000). Approximately 12,291 acres that burned were considered suitable MSO habitat. The fire affected all or portions of six PACs and two additional PACs are adjacent to the burned area. Additionally, the Peñasco Fire of 2002, burned 2,921 (4 percent) out of 71,825 acres of mixed conifer within the Peñasco proposed project area. The Peñasco Fire burned 516 acres within 5 PACs, 427 acres of mixed conifer at slopes greater than 40 percent and 2,144 acres of restricted habitat.

Within the Basin and Range East Recovery Unit, 27 PACs were anticipated for take under the Forest Plan biological opinion. Out of these 27 PACs, 13 PACs were related to abating fire risk (e.g., fuelwood harvest, removal of hazard trees, escaped prescribed burns, powerline maintenance, etc.) (Table 2). Take that has occurred in this Recovery Unit since the listing of the MSO is related to road or trail building. To date, there have been 3 PACs taken from Forest

Service road or trail building activities (USDI Fish and Wildlife Service 1995b, 1996c, 2000) and 4 PACs from other Federal agency's road or trail building activities (2001d). None of the anticipated take associated with fire abatement projects from the Forest Plan biological opinion has occurred within this Basin and Range East Recovery Unit. No take has occurred from fire abatement projects because all of these projects have been consistent with the terms and conditions of the Forest Plan biological opinion, and hence, the Recovery Plan. Consequently, we have not included the take of these 13 PACs within the environmental baseline, because impacts that we had anticipated from those Federal actions proposed under the Forest Plan biological opinion have not occurred and the current status of the species and its habitat within the action area were not affected by the previously proposed actions.

Nevertheless, we believe that additional fire abatement projects may occur. Many of these projects will likely be covered under the WUI programmatic biological opinion. However, we also recognize that some projects may be proposed that were not analyzed under the WUI programmatic biological opinion or the effects are greater than those that were analyzed. During these consultations, we will determine if the proposed project jeopardizes the continued existence of the MSO or other proposed or listed species or critical habitat.

Similarly, the Forest Service has informed us that 49 of the 58 PACs anticipated for take by harassment under the WUI programmatic biological opinion were associated with the current proposed project. We have not included the take of these 49 PACs within the environmental baseline. Thus, the environmental baseline for the MSO has been revised because the take of 62 PACs that we had previously anticipated within the Basin and Range East Recovery Unit will not and have not occurred.

Sacramento Mountains checkerspot butterfly

Two projects have undergone formal conferencing for the proposed checkerspot butterfly, but only one of these conferences included proposed critical habitat. That project proposed development of a water well that will likely provide an additional source of water to supplement current and future needs for the Village of Cloudcroft and may support the growth of commercial or private development (USDI Fish and Wildlife Service 2002). Based upon the proposed project, we estimated that approximately 3.7 acres (3.6 acres - temporarily impacted and .1 acre permanently impacted) of occupied habitat would be taken within the footprint of the project. The other formal conference analyzed the effects of a mark recapture investigation on the checkerspot butterfly (USDI Fish and Wildlife Service 2002a). We have also 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 (e.g., Service 1999, 1999a, 2001e). 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)

Mexican spotted owl

The entire Lincoln National Forest is within the Basin and Range East Recovery Unit. The Basin and Range East Recovery Unit contains the second highest concentration of known MSO sites (16 percent) in the United States. Because of the high concentration of MSOs, the Basin and Range East Recovery Unit has been referred to as an important MSO distribution center in the Recovery Plan. MSOs occur in isolated mountain ranges scattered across the Basin and Range East Recovery Unit, but the largest portion of the MSO subpopulation occurs in the Sacramento Mountains. They are most common in mixed-conifer forest, but have been located in ponderosa pine forest and piñon/juniper woodland on a few occasions (Skaggs and Raitt 1988). MSO sites have been reported on National Forest lands in the Sandia, Manzano, Sacramento, and Guadalupe Mountains, as well as the Guadalupe National Park and on Mescalero Apache Tribal lands.

The range-wide population of the MSO is naturally fragmented into geographically distinct subpopulations. Because of its size and location, the Basin and Range East Recovery Unit likely plays a very important role in the metapopulation dynamics of the MSO in the southwest (Stacey 2000). However, other authors believe that the MSO population in the Sacramento Mountains likely contributes very little to other subpopulations (e.g., see Ward 2001). Nevertheless, dispersal is the mechanism that connects subpopulations and the larger metapopulation (e.g., see Gutierrez *et al.* 1996; Ganey *et al.* 1998). Adult and subadult MSOs are relatively sedentary; however, juveniles almost always disperse from their natal sites (USDI Fish and Wildlife Service 1995 and references therein). Consequently, the key to maintaining connectivity between distinct subpopulations appears to be reproduction (i.e., the production of juveniles that are likely to disperse). It is likely that weather, habitat condition, the MSO's population structure, and prey availability all interact to influence variation in the MSO's reproductive performance (Ward 2001).

Ward (2001) suggested that current conditions in the Sacramento Mountains are likely associated with elevated variation in the MSOs' reproductive rate. Hence, simply protecting existing areas from habitat fragmentation may not be the most prudent strategy (Ward 2001). Rather, a combination of protecting existing roosting and nesting core areas and restoration of late-seral conditions may be more appropriate for conserving the MSO in the Basin and Range East Recovery Unit (USDI Fish and Wildlife Service 1995a). This project and monitoring program are being proposed because limited amounts of timber harvesting and habitat fragmentation may improve the reproductive success or overall fitness of some spotted owl species (e.g., see Thome *et al.* 1999, Franklin *et al.* 2000).

Currently, there are a total of 134 MSO PACs on the Lincoln National Forest. Of these, 109 PACs are on the Sacramento Ranger District, where the proposed project is located. Of these PACs, many have a variety of uses occurring in them including: grazing, powerlines, winter recreation (e.g., snowmobile use), and other recreational uses (e.g., hunting, camping, hiking, etc.). On the Lincoln National Forest, mixed conifer habitat is considered either protected or restricted habitat as defined in the MSO Recovery Plan (USDI Fish and Wildlife Service 1995a). PACs and slopes greater than 40 percent (that have not experienced timber harvest in the last 20 years) are considered protected habitat.

MSOs occurring in the Sacramento Mountains have been exposed to various disturbances for more than a century. Disturbances include forest fires and human disturbances, including timber and fuelwood harvest, grazing, land development, and recreation. Coniferous forests, especially the mixed-conifer, were extensively logged during an era of railroad logging from 1890 to 1945 (Glover 1984). After the railroad logging era, trees grew rapidly and attained merchantable sizes in about 40-50 years on favorable sites. Consequently, much of the habitat currently used by MSOs in the Sacramento Mountains is regrowth forest that has attained a high density of moderately sized trees, poles, and saplings, together forming multiple layers. According to the Recovery Plan, the greatest threats in the Basin and Range East Recovery Unit, in order of potential effects, are catastrophic fire, timber harvest, fuelwood harvest, grazing, human developments, and forest insects and disease. Other activities that are considered potential threats to the MSO include certain military operations, other habitat alterations (such as powerlines and roads), mining, and recreation. Recovery in this unit will require management and maintenance of existing and future populations by managing and conserving habitats in areas not only inhabited by MSOs, but also in unoccupied suitable or potentially suitable habitats.

MSO density within the Basin and Range East Recovery Unit is relatively high, but little is known about the population trend (USDI Fish and Wildlife Service 1995a). Currently, there appears to be fewer PACs on the Sacramento Ranger District compared to the early 1990s (USDA Forest Service 2002a; Stacey 2000). However, the difference may be related to survey methods and corresponding survey efforts (e.g., informal monitoring results in substantially less survey effort than formal monitoring) (USDI Fish and Wildlife Service 1995a). As a complicating factor, PACs that are monitored are not a random sample of all existing PACs within the Basin and Range East Recovery Unit (USDI Fish and Wildlife Service 1995a). The Recovery Plan found that changes in occupancy rates of existing PACs does not provide for a valid inference about changes to the MSO population (USDI Fish and Wildlife Service 1995a). For example, on the Sacramento Ranger District in 2001, 53 of 109 PACs were not surveyed and 21 were informally monitored but no MSOs were detected, whereas formal monitoring found that 33 PACs were occupied and 1 was unoccupied (USDA Forest Service 2002a). It is important to note that where formal monitoring was conducted, 97 percent of the PACs were found to be occupied. Alternatively, many of the PACs were not surveyed or the survey procedures varied substantially among PACs. Thus, we came to a similar conclusion as the Recovery Plan, that changes in occupancy rates for PACs over the last decade may not reflect true changes in the MSO population and may only represent different levels of survey effort or

other administrative factors. As noted above, the monitoring program will use consistent survey methods to survey 90 PACs outside the proposed project area to provide additional data to analyze the effect of treatments on the MSOs. These and other data will be essential to understanding the population trends of MSOs within the Basin and Range East Recovery Unit.

Sacramento Mountains checkerspot butterfly

The proposed project area is occupied by the checkerspot butterfly and contains proposed critical habitat. The Forest Service has conducted surveys for the checkerspot butterfly within and adjacent to the proposed project area from 1997-2001. These surveys documented the presence and successful reproduction of the checkerspot butterfly within the proposed project area (USDA Forest Service 1999a 1999c, 2000a, 2000b, 2002a).

The Forest Service estimates that the area occupied by the checkerspot butterfly in the proposed project area is approximately 502 acres. There is also an additional approximately 350 acres within the project area that extend beyond the occupied habitat, and is considered proposed critical habitat because this area contains all of the primary constituent elements.

EFFECTS OF THE ACTION

Mexican spotted owl

The Forest Service estimates that the proposed action will treat approximately 25,100 acres of MSO habitat over an approximate 10-year period (5 years commercial concurrent with 10-year pre-commercial) (Table 3). This estimate includes approximately 6.5 miles of reopened roads and 0.3 miles of new temporary roads that will pass through PACs (Table 1), whereas the remaining miles pass through restricted habitat. Reopening of decommissioned roads and constructing new temporary roads are planned only for removal of commercial products. Following project completion, temporary roads will be obliterated and reopened roads will be decommissioned. This section will analyze the potential effects from the proposed action on the MSO and its habitat including: 1) commercial thinning operations on PACs and target/threshold restricted habitat; 2) pre-commercial thinning operations on PACs and target/threshold restricted habitat; 3) pre-commercial thinning operations on other restricted habitat; 4) road reopening and new construction activities within PACs; and 5) monitoring activities.

Table 3. Treatments within the Rio Peñasco II Analysis area affecting MSO

Mixed conifer acres treated	No. PACs	PAC acres treated		Steep slopes acres treated	Threshold acres treated		Restricted non-threshold acres treated
		4,977 ¹	768 ²		2,839 ¹	2,780 ²	
25,091	38			1,324 ¹			12,342

¹Pre-commercial thinning

²Commercial thinning

This proposed action will affect 38 PACs, with 12 PACs receiving treatments that are not consistent with the Recovery Plan (i.e., commercially thinning trees up to 24 inch dbh). Additionally, a new 0.33-mile temporary road will be constructed within one PAC. We estimate that the new road will impact less than 1 acre. The proposed commercial thinning treatments in the 12 PACs will impact from 3 to 20 percent of each PAC (Table 1).

The best scientific and commercial information available indicates that the proposed project may result in long-term benefits to the MSO. We believe the proposed treatments have the potential to improve reproduction and subsequent recruitment of the MSO within the Basin and Range East Recovery Unit and range-wide, and also to reduce the risk of catastrophic wildfire. Alternatively, the current proposal has the potential to reduce the variability of reproductive rates within the affected PACs, because the outcome of experiments such as this (i.e., the affect of commercial thinning treatments on the MSO) are unknown. Consequently, we have analyzed a worse-case scenario to determine if the adverse affects to these 12 PACs will jeopardize the continued existence of the MSO.

The Forest Service has incorporated 12 conservation measures into their proposed action. These include the following:

1. All MSO restricted habitat will be managed according to Recovery Plan standards (i.e., retain trees greater than 24 in unless overriding management situations require their removal to protect human safety and/or property (e.g., the removal of hazard trees along roads, in campgrounds, and along power lines);
2. All treatments will retain trees greater than 24 in, unless deemed a hazard tree;
3. All treatments will retain some trees greater than 18 in dbh to the extent that it does not impede the objective of reducing the risk of catastrophic wildfire in MSO habitat.
4. No treatments will occur in the 100-acre roost-nest buffer found within PACs;

5. Breeding season restrictions (March 1 to August 31) will be implemented in all PACs, which includes road use in new temporary or re-opened roads;
6. Presence surveys will occur for at least two years before treatment (i.e., commercial or pre-commercial thinning) occurs;
7. All new temporary or reopened roads will be closed, both within and outside of PACs;
8. Micro-habitat vegetation monitoring will occur within proposed project treatment areas using Forest Service Region 3 protocols;
9. No broadcast burning is allowed in protected or restricted habitat;
10. No snags over 14 in dbh will be cut unless it determined that they are hazard trees.
11. At least 3 snags, 18 in dbh or greater per acre will be left after treatment. To reduce losses of large snags (3 per acre greater than 18 in) or snags with obvious heavy use (cavities present and visible), cutting unit boundaries and/or prescriptions will be modified to save the snag; so that it is no longer a hazard; and
12. Retain 10-15 tons of downed woody material with an emphasis on not removing any logs greater than 12-in midpoint diameter and at least 8 ft long.

These conservation measures represent actions proposed by the Forest Service that were evaluated as part of the jeopardy and the incidental take analysis. They are intended to minimize or avoid adverse impacts to the MSO. Conservation measures 1, 2, 3, 9, 10, 11, and 12 promote management of forested habitat so that important and difficult to replace MSO habitat is conserved. These measures will assist in reducing habitat simplification (i.e., key habitat components will be retained without impeding the objective of reducing fire hazard). Conservation measures 4 and 5 are intended to protect the best available MSO habitat, while minimizing adverse impacts to the MSO and allowing some habitat to be managed to reduce the threat of catastrophic fires. Conservation measure 7 will reduce long-term road-related impacts to MSO's and their habitat, whereas measures 6 and 8 will be useful to assess the efficacies of the management prescriptions on the MSO and its habitat. All of these measures will directly lessen the impacts from habitat altering activities on prey species and disturbance related impacts on the MSO.

There have been limitations on past MSO research, mainly because these studies have been largely descriptive. The weakness of these previous studies is that there are a corresponding number of alternative hypotheses that could equally explain the same conclusions (Block *et al.* 2001). Consequently, manipulative experiments are critical for defining and understanding the impacts of current and proposed management activities on the MSO (USDI Fish and Wildlife Service 1995a).

We believe that the monitoring program will assist in guiding future restoration and recovery actions for the MSO. The monitoring program will also permit a more complete understanding of how the MSO and its prey respond to environmental variation related to forest management activities. The Recovery Plan recognizes the need to conduct experiments to assess cause-and-effect relationships between habitat conditions and MSO population dynamics. Careful consideration must be given to designing forest treatments that target enhancement of Mexican woodrat abundance so that responses by this prey species and by the MSO can be verified (Block *et al.* 2001). The final study plan for the monitoring program will include: 1) determining the types and extent of treatments to be implemented; 2) determining the response variables to monitor; 3) determining the sampling regime for monitoring response variables; 4) assigning project sites to treatments and controls; and 5) determining operational needs for conducting treatments and monitoring. The final study plan for the monitoring program will be consistent with the intent of the current Recovery Plan and will incorporate these tenets (W. Block, pers. comm., 2002).

Harassment of MSOs may occur from capture, banding, and release activities associated with the monitoring program. The monitoring program stems from recommendations in the Recovery Plan, but is likely to result in an unspecified level of harassment on individual MSOs. Nevertheless, these activities and study methods are essential to acquire information on the species demography, dispersal, and habitat and management requirements.

The Recovery Plan states that given existing forest conditions within the Basin and Range East Recovery Unit, threats of widespread habitat loss from catastrophic wildfire is real and immediate (USDI Fish and Wildlife Service 1995a). A fire hazard and risk analysis was conducted on the treatment areas (see, Forest Service 2002c). In general, the historic fire regime in the proposed project area is characterized as frequent, low-intensity surface fires. Natural fire cycles in the mixed-conifer stands ranged from 9 to 13 years. In ponderosa pine low-intensity fires occurred every 4 to 5 years and in pinon-juniper woodland, the cycles occurred every 28 years. Active management is therefore needed to reduce the threat of fire, while ensuring that adequate habitat will exist into the future (USDI Fish and Wildlife Service 1995a).

From 1921 to present, seven large fires (i.e., greater than 100 acres) have occurred within the proposed project area. These fires have been stand-replacing type fires, occurring on average about every 20 years. Currently, the Forest Service estimates that about 94 percent of the area under consideration is susceptible to stand-replacing fires (USDA Forest Service 2002c). Under current fuel loads, if a fire were to erupt within the proposed project area, the event would reduce basal area by at least 80 percent (USDA Forest Service 2002c). Failure to address the threat of fire by reducing fuel levels will inevitably lead to more and larger fires that result in the continual loss of the MSO and its habitat. The Forest Service believes that the current treatments will reduce the fire hazard in the proposed project to a moderate to low susceptibility for a stand-replacing fire (USDA Forest Service 2002c). This particular project and the experimental approaches being proposed were characterized as critical for understanding the effects from fuels management on the MSO and is knowledge needed for the development of long-term plans for

the conservation of the species (W. Block, pers. comm., 2002). The proposed study design is also considered "...consistent with the intent of current Recovery Plan guidelines for this species" (W. Block, pers. comm., 2002).

We believe that this proposed project will reduce the existing threat of catastrophic wildfire. Although the proposed project will result in the adverse effects to MSOs, we believe that this proposed project, in conjunction with the monitoring program, will assess the combined effects of thinning and fuels treatments on MSOs and their habitat. We believe that this proposed project meets the spirit and intent of fire abatement program described in the Recovery Plan (USDI Fish and Wildlife Service 1995a).

The implementation of the proposed action will likely produce an array of effects, possibly ranging from short- to long-term. Commercial thinning of trees up to 24 inch dbh within 12 PACs will adversely affect from 17 to 60 acres per PAC (Table 1, note footnote number 2). Although this action is proposed to reduce the risk of catastrophic wildfire and also to evaluate these types of fuel management prescriptions on the MSO, it will adversely affect the MSO by modifying the forest structure and understory plant diversity. The spatial configuration of PACs proposed for commercial thinning are interspersed across the project area. Within these units, the project proposes to commercially thin 768 acres within and surrounding 12 PACs and construct 0.33 miles of a new temporary road within 1 PAC.

Commercial thinning is proposed to remove between 50 and 70 percent of the 9 to 24 inch dbh trees in harvest units. No trees greater than 24 inch dbh would be cut unless necessary for safety considerations. Tree stands after treatment would range between 100 and 150 ft² basal area per acre. Each 600 acre PAC contains nesting/roosting and foraging habitat. The amount of nesting/roosting habitat for the 12 treatment PACs ranges from 396 to 575 acres. The proposed treatments will not lower the amount of nesting/roosting habitat below the natural range of variability among PACs within the Sacramento Ranger District. Moreover, half of the proposed treatments will keep nest/roost conditions (i.e., threshold conditions) as defined by the Recovery Plan.

A multitude of factors (e.g., weather patterns, fluctuating prey populations, etc.) influence the nesting success of the MSO and these factors change yearly, suggesting that the amount of foraging and protective cover an MSO may need on a given year may also change. It may be possible that MSO pairs that lose a small amount of habitat within the 600-acre PAC may be able to survive and successfully reproduce in good years or make up for this loss of habitat by foraging beyond the designated boundary of the PAC. This disruption of behavior patterns may affect the normal behavior patterns of resident MSOs, but the affect is not likely to result in mortality.

The proposed project is expected to change the overall stand structure within PACs because trees up to 24 inch dbh will be removed. Direct impacts to habitat would include removal of vegetation due to commercial thinning treatments and tree removal operations (e.g., skidding of

trees, piling slash, road construction and maintenance). Because mixed-conifer trees larger than 9 in dbh would be cut within PACs, we believe this proposed project will result in the loss of suitable nesting, roosting, foraging, and dispersal habitat as described by the Recovery Plan (USDI Fish and Wildlife Service 1995a). In fact, commercial treatments will be centered within mixed-conifer habitat that is considered nest/roost habitat by the Lincoln National Forest (e.g., see PAC histories in BA).

Prey availability may determine how large an area the MSO must use to meet their energetic needs (USDI Fish and Wildlife Service 1995a and references therein). Therefore, loss of suitable habitat within the boundaries of a PAC could increase the potential for predation of the MSO, as they venture further from the nest to find prey. The PAC represents a "reasonable amount of protected habitat and should provide for the nest site, several roost sites, and the most proximal and highly used foraging areas" (USDI Fish and Wildlife Service 1995a, p. 89). Our current policy for conducting section 7 consultation on the MSO states that likely incidental take can be supported if a habitat altering action compromises the integrity of the PAC (i.e., an action is proposed that does not fall under the specific recommendations of the Recovery Plan) (USDI Fish and Wildlife Service 1996a). We conclude that the commercial thinning operations proposed within the 12 PACs will result in effects that would compromise the integrity of PACs. We believe that these actions could result in a significant portion of the habitat lost or modified, and significantly disrupting normal behavior patterns such as breeding, sheltering, or feeding. Because each of the treatments will not affect greater than 10 percent within each PAC, we believe that each PAC will continue to provide suitable amounts of nest, roost, and foraging habitat. The biological integrity of each of the 12 PACs (i.e., Bail, Peñasco, Goodsell, Wayne, Dark, Hubble, Radio, Marcia, El Paso, Lower Newman, Chippway, and Lower Wills) will be temporarily compromised (i.e., the impacts are not expected to cause avoidance/abandonment or lead to future unoccupancy, but will lead to short-term adverse impacts). These PACs are interspersed across the proposed project area and will continue to function as important foraging and dispersal habitat within the local subpopulation and larger metapopulation.

We conclude that proposed commercial treatments will affect less than or equal to 10 percent of each of the 12 PACs. Following treatment, each of these PACs will still contain a substantial amount of habitat to provide for the nest site, several roost sites, and frequently used foraging sites. Prior to commercial treatments within each PAC, a 100-acre core activity center will be established (i.e., the nest/roost site is being buffered), indicating that impacts to the nest/roost habitat and the MSO from the proposed action will be minimized to the extent feasible (Ward and Salas 2000). For these reasons, we expect that the integrity of each these 12 PAC will not be permanently compromised.

Commercial thinning will likely result in a short-term disturbance and removal of vegetation and displace a variety of species, including small to medium-sized rodents such as woodrats, peromyscid mice, and microtine voles, which are prey for the MSO (USDI Fish and Wildlife Service 1995a; Ward and Block 1995). Additional impacts that are likely to occur include a

reduction in moderate to high canopy closure; a change in the forest stand structure from a wide range of uneven-age tree sizes to a more even-age structure (e.g., removal of "dog hair thickets"); and removal or disturbance of selected woody vegetation, fallen trees, and low growing limbs, which may temporarily affect the prey base of the MSO. This would result in the short-term loss of forest habitat, including mature trees, within forest stands. These effects to PACs are considered adverse, especially since these actions are not consistent with the Recovery Plan (USDI Fish and Wildlife Service 1995a). Nevertheless, it is believed that by thinning larger diameter trees, the canopy cover will be reduced, resulting in a long-term benefit to the MSO by increasing the abundance of woodrats within the treatment areas (Ward 2001). The three thinning prescriptions will vary in their capability to stimulate forbs and shrubs. In general, the production of forbs and shrubs should be greatest in high intensity commercial thinning and least in low intensity pre-commercial thinning (described above in proposed action).

Precommercial treatments within steep slopes are not expected to result in take of MSOs, because the activities in these areas are in compliance with the Recovery Plan (i.e., pre-commercial thinning would harvest trees less than 9 in dbh). These and other activities within restricted habitat will be in compliance with the Recovery Plan and the subsequent replacement language to the guidelines (USDI Fish and Wildlife Service 2001b). About 2,780 acres of restricted habitat will be commercially treated (i.e., up to 24 inch dbh trees will be thinned) to reduce the risk of catastrophic wildfire. These treatments will leave a basal area of 150 to 170 ft² per acre. Moreover, the Forest Service estimates that there are about 8,200 acres within the Rio Peñasco watershed that meet threshold stand conditions. Of these acres, 2,780 acres will be commercially thinned, but will not reduce the forest stand conditions lower than the threshold values given in Table III.B.1 in the Recovery Plan. We conclude that the alteration of this restricted habitat is insignificant and discountable because it is consistent with the Recovery Plan. Therefore, sufficient restricted habitat would remain for MSOs to nest, roost, forage, and disperse.

In previous consultations conducted for forest-management projects (USDI Fish and Wildlife Service 1998a), we have concluded that MSOs could be incidentally flushed if they are within the project area. When this proposed project is implemented, MSOs have the potential to be subjected to high levels of disturbance within protected and restricted habitat. Depending on topography and vegetation, these effects could be significant. This disturbance has the potential to result in incidental take in the form of harassment due to the disruption of breeding behavior, premature fledging, nest evacuation, or nest abandonment. Nevertheless, the potential effects of this take have been avoided or minimized because the Forest Service will implement, as part of their proposed action, the conservation measures identified above. These measures will ensure that: 1) harassment of MSOs during the sensitive breeding season will be avoided; and 2) other interrelated or interdependent actions (unauthorized use or creation of roads and trails) will be minimized. While timber harvesting results in a change in stand conditions that persists into the future, the potential for disruption or stress to MSOs from the noise and activity associated with commercial thinning activities does not occur throughout the year. Timber harvest will be less than 6 months and outside of the non-breeding season each year throughout the project. We

conclude that noise-related impacts from commercial thinning activities will likely be insignificant or discountable because these activities will only occur within PACs during the non-breeding season. We conclude that the short duration of disturbance along with seasonal restrictions (no harvest activities within the PAC from March 1 to August 31) will minimize or avoid the adverse effects to the MSO from noise disturbance.

Pre-commercial thinning proposes to remove understory trees less than 9 in dbh. These treatments are proposed to be across the entire project area on approximately 21,000 acres. Of these 21,000 acres, 4,977 acres occur within PACs (Table 1). It is expected that these pre-commercial thinning would remove fine fuels from below, but would only slightly reduce the basal area and canopy closure. This prescription would likely leave a relatively dense over-story, but reduce the risk of habitat loss by wildfire. This will provide for the high canopy cover component preferred and used by the MSO for nesting and roosting. Moreover, any canopy cover lost from pre-commercial thinning would be short-term, because crown densities on the remaining trees would increase from reduced competition. Snags are a key habitat component that could be affected by this proposed project. However, all snags that do not pose a threat to life or property will be retained. Consequently, we conclude that the pre-commercial thinning prescriptions and the retention of all snags that are not a safety hazard are consistent with the recommendations of the Recovery Plan and may affect the MSO, but will not result in take.

Consistent with the Forest Plan amendment Environmental Impact Statement that amended the Lincoln National Forest Plan (USDA Forest Service 1986, 1995), the proposed treatments will use uneven-age silvicultural methods as the primary timber harvest system. Because uneven-aged management will be used, we expect that continuous forest cover will be maintained simultaneously over the landscape, and multiple canopy layers will be present at the stand level. Additionally, no trees over 24 inch dbh will be harvested. This maintenance of and management for large trees should provide for important components of MSO nest and roost habitat. We expect the proposed action to open the tree canopy and attract and improve woodrat habitat. This will likely result in an increased abundance of a preferred prey item. We conclude that the current proposal will reduce fuels within the project area and create less dense forest stands (i.e., removal of small diameter "dog hair thickets" from pre-commercial thinning). All thinning prescriptions are likely to assist in the long-term protection of MSO habitat, and may result in more stable reproduction of the MSO (Ward 2001).

Road construction will likely have insignificant and discountable effects on the MSO. We reached this conclusion by estimating the amount of habitat that could potentially be affected by road construction. Reopening and new road construction will affect 10 PACs and 1 PAC, respectively. We estimate that the total acres impacted by road construction within the 10 PACs is approximately 17 acres. Road construction will result in less than 0.5 percent of each of these 10 PACs being affected. We also do not expect that the canopy cover or forest structure will be greatly affected by road construction activities because the majority of the roads will be reopened and not newly constructed. Additionally, when the proposed project is completed, all temporary

roads will be obliterated and reopened roads will be decommissioned. Therefore, we conclude that road construction activities may affect the MSO, but will not result in any take.

We also must consider indirect effects and the effects of interdependent and interrelated actions of this proposed project to the MSO. Indirect effects are those that are caused by, or result from, the proposed action, and are later in time, but are reasonably certain to occur. Interrelated actions are actions that are part of a larger action, and are dependent on the larger action for their justification. Interdependent actions are actions that have no independent utility apart from the action under consideration. The construction and reopening of access roads and fuelwood gathering are considered interrelated and interdependent with the implementation of the proposed project. The use of these roads during project implementation by field crews and vehicles, and any maintenance of the roads, or road repairs are considered interrelated and interdependent with the implementation of the current proposed project.

The most significant indirect effects are expected to result from increased disturbances from vehicular traffic or recreation in and around these PACs (e.g., from reopening forest roads). When these roads are reopened, the area that may be subjected to high levels of disturbance could extend beyond the PACs into adjacent lands. The potential for effects from these interdependent and interrelated actions from proposed project are expected to be limited and not likely to result in take (e.g., cause avoidance/abandonment or lead to future unoccupancy of any PACs). Moreover, adjacent unoccupied areas (e.g., restricted habitat), are not expected to be altered or indirectly disturbed to the extent that survival and recovery of the MSO will be affected.

Sacramento Mountains checkerspot butterfly

As part of the proposed action, seven conservation measures will be implemented for the checkerspot butterfly. For example, surveys will be conducted prior to any activities being implemented within suitable checkerspot butterfly habitat. Any larvae that are located during surveys and cannot be avoided will be relocated. We conclude that the implementation of all of the conservation measures will minimize or avoid take of the checkerspot butterfly.

The impacts to the species from this proposed project will be related to roads. The majority of roads within the meadows occupied by the checkerspot butterfly are already constructed and will only be reopened. Some of the adverse affects related to road construction activities will be avoided or minimized. For example, the blading of roads will only be completed where safety hazards occur. Although, the re-opened roads and the newly constructed road will be obliterated following the completion of the forest thinning activities, we consider these impacts to be long-term because the proposed project will be conducted over a 15-year period.

Table 4. Existing and new proposed road impacts within the project area.

Status	Open roads ¹	Reopened roads	New temporary roads ²	Total impacts from reopened and temporary roads
Occupied and proposed critical habitat	9.6/70.0 ³	4.8/34.9	0.2/1.5	5.0/36.4
Unoccupied and proposed critical habitat	3.3/24.0	0.6/4.4	0.2/1.5	0.8/5.9
Total proposed critical habitat	12.9/94.0	5.4/39.3	0.8/3.0	6.2/42.3

¹ Part of existing baseline in the project area

² Impacts from the proposed action

³ Estimated miles of road/estimated acres

The proposed action will result in the long-term loss of approximately 36.4 acres of occupied habitat and 42.3 acres of proposed critical habitat (Table 4). Checkerspot butterflies have been repeatedly observed in this area during surveys conducted from 1997 to 2002. Hostplants are also known throughout the meadows within the proposed project area. We expect that the road-related impacts will result in the elimination of some larval food and adult host plants, the crushing of various life history stages of the checkerspot butterfly, and increase the amount of soil erosion or dust. Many of the proposed roads are situated within open meadows where larval food and adult nectar plants are found in large concentrations. These areas may also contain pre- and post-diapause larvae, because checkerspot butterfly larvae thermoregulate (maintenance of a constant internal body temperature regardless of environmental temperature) on patches of open soils (e.g., roads and trails) (Porter 1982). We anticipate that the reopening and construction of forest road will further reduce the quality or quantity of checkerspot butterfly habitat in the proposed project area (Pittenger 1999; USDI Fish and Wildlife Service 2001a; 66 FR 46575) and will result in adverse impacts to checkerspot butterflies utilizing this habitat.

Implementation of the proposed project will result in direct temporary impacts to the habitat within these reopened and newly constructed roads. These impacts will result in a temporary loss of the larval food plants New Mexico penstemon and valerian, and the adult nectar source orange sneezeweed. We estimate this temporary direct loss of habitat to be approximately 10 acres. The proposed project will also result in the temporary loss of these same food plants in areas where the roads will be reopened or newly constructed resulting from the indirect effects within a 20-ft buffer on either side of these roads. We estimate this temporary loss of habitat to be approximately 28 acres.

The Forest Service used a GIS to model the extent of all existing checkerspot butterfly habitat (USDA Forest Service 1999b). The model was built using non-forested openings visible on 1:24,000 scale orthophoto quadrangles, elevation, and known occupied locales. Based on the model, the Forest Service estimated there were 5,198 acres of potential habitat, composed of 2,553 and 2,645 acres on private and Forest Service lands, respectively (USDA Forest Service 1999b). Based upon survey data, it appears that 15 to 35 percent of all suitable habitat is currently used by the checkerspot butterfly (USDI Fish and Wildlife Service 2001a; 66 FR 46575). Using these estimates, we believe that about 2 to 4.5 percent of the habitat currently used by the checkerspot butterfly will be impacted by the proposed project.

Because the checkerspot butterfly has a life history pattern similar to other butterflies in the genus *Euphydryas* that exist as metapopulations, it is likely that this checkerspot butterfly has a metapopulation structure (Murphy and Weiss 1988; Harrison 1989; Hanski and Gilpin 1991). A metapopulation is a set of local populations within an area, where typically migration from one local population to other areas containing suitable habitat is possible, but not routine. Movement between areas containing suitable habitat (i.e., dispersal) is restricted due to inhospitable conditions around and between areas of suitable habitat. A metapopulation's persistence depends on the combined dynamics of these local extinctions and the subsequent recolonization of these areas by dispersal (Hanski 1999, Hanski and Gilpin 1991).

Habitat altering activities have likely eliminated or interrupted dispersal of butterflies between suitable habitat patches and thus affected the metapopulation dynamics of the checkerspot butterfly. For example, recent habitat-altering projects have likely fragmented the distribution of the checkerspot butterfly and eliminated checkerspot butterfly localities or prevented the checkerspot butterfly from moving between areas of suitable habitat (Murphy and Weiss 1988). Although impacts of habitat-altering projects may have the potential to fragment the population between occupied areas, we do not believe that the reopening or construction of roads proposed by this proposed project will result in the disruption of the metapopulation dynamics. We believe this is a reasonable conclusion given that the surrounding occupied habitat will remain intact, and the areas being impacted are between 2 and 4.5 percent of the suitable habitat believed to be occupied by the species.

With the exception of road-related impacts described above, there are no direct losses of the checkerspot butterfly expected from the forest thinning treatments. For example, all treatments (including fuelwood gathering) are within forested habitat and all slash piling, staging of equipment and parking is restricted to forested habitats or existing road pullouts. We anticipate some direct losses of this species as a result of new temporary road construction and re-opening of roads, but these losses are expected to be minimal because of the seven proposed conservation measures including: 1) any plants containing larvae that cannot be avoided will be relocated before the any road activity can occur, and 2) road reopening or construction will be completed from November 1st through February 28th. Although the proposed action will likely result in the take of an unknown number of checkerspot butterflies, this loss should not affect the population of butterflies in adjacent occupied habitat.

We also must consider indirect effects and the effects of interdependent and interrelated actions of this proposed project to the checkerspot butterfly. An indirect effect would be public recreational use within the proposed project area of reopened or newly constructed roads after the proposed project is terminated (e.g., mountain biking, ATV use, etc.). The use of these roads during proposed project implementation by field crews and vehicles, and any maintenance of the roads, or road repairs are considered interrelated and interdependent with the implementation of the current proposed project. Effects of the proposed project from indirect impacts and interdependent and interrelated actions should not be any greater than those described above, since the Forest Service will ensure that road use from field crews and vehicles will be kept to the existing roadbeds and pullouts. Additionally, following completion of the project, all re-opened roads and newly constructed road will be obliterated. Moreover, the majority of the proposed action (i.e., forest thinning) involves activities habitat altering activities in forested areas and not within the checkerspot butterfly habitat. Consequently, these effects are not expected to be significant.

All of the primary constituent elements of proposed critical habitat for the checkerspot butterfly are found within 852 acres of the proposed project area. The proposed project will temporarily destroy those checkerspot butterfly habitat components that provide for breeding, ovipositing (egg laying), diapausing, roosting or resting, and foraging. For example, one of the primary constituent elements that is composed of food plants for the checkerspot butterfly (i.e., New Mexico penstemon, sneezeweed, and valerian) occurs within the action area and will be adversely affected by the reopening and construction of roads. Additionally, other plants that compose a primary constituent element occur or likely occur within the action area and will also be affected include arrowleaf groundsel, curly-cup gumplant, figworts, penstemon, skyrocket, milkweed, Arizona rose, or Wheeler's wallflower.

The proposed reopening and construction of roads will result in the impact of approximately 43 acres (36.4 acres occupied and 5.9 acres unoccupied) of proposed critical habitat (Table 4). These impacts are considered long-term even though the roads will be closed, obliterated, and reseeded following project completion. However, we do not expect any permanent impacts to the areas proposed as critical habitat. To ensure that the majority of impacts to proposed critical habitat are not permanent, the Forest Service has included several conservation measures to restore the habitat to pre-construction conditions.

Based on the GIS model and related information described above, we estimate that less than 1 percent (i.e., $42.3 \div 5,198$ acres) of the proposed critical habitat will be impacted from the proposed project. Because the surrounding proposed critical habitat will remain intact, we do not anticipate that the impacts from this proposed project will appreciably alter the value of proposed critical habitat for both the survival and recovery of the checkerspot butterfly. Thus, we conclude that these impacts, when added to the environmental baseline, will not appreciably diminish the capability of the proposed critical habitat to satisfy the essential requirements of the checkerspot butterfly.

We have also considered the indirect effects and the effects of interdependent and interrelated actions of this proposed project on the proposed critical habitat of the checkerspot butterfly. The use of these roads during project implementation by field crews and vehicles, and any maintenance of the roads, or road repairs are considered interrelated and interdependent with the implementation of the current proposed project. Affects of the proposed project from indirect impacts and interdependent and interrelated actions should not be any greater than those described above, since the Forest Service will ensure that road use from field crews and vehicles will be kept to the existing roadbeds and pullouts. Moreover, the majority of the proposed action (i.e., forest thinning) involves activities habitat altering activities in forested areas and not within the checkerspot butterfly habitat. Consequently, these affects are not expected to be significant. Therefore, we conclude that the affects of interdependent and interrelated actions and indirect impacts will not result in permanent impacts to the proposed critical habitat.

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 biological and 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.

Mexican spotted owl

In past Biological Opinions, it has been stated that, "Because of the predominant occurrence of the MSOs on Federal lands, and because of the role of the respective Federal agencies in administering the habitat of the MSO, actions to be implemented in the future by non-Federal entities on non-Federal lands are considered of minor impact." However, there has been a recent increase of harvest activities on non-Federal lands (e.g., timber harvest on neighboring Mescalero Apache Nation, private land timber sales on inholdings in and around the Lincoln National Forest). In addition, future actions on non-Federal lands adjacent to the Forest Service lands that are reasonably expected to occur include urban development, road construction, land clearing, logging, fuelwood gathering, and other associated actions.

The proposed project area is located in the proximity of the Village of Cloudcroft, New Mexico. The area is interspersed by National Forest and non-Federal lands including Highways 82 and 130, existing infrastructure (e.g., powerlines), developed private campgrounds, and the Village of Cloudcroft and surrounding residential areas, where activities occur either seasonally or year-round. These activities reduce the quality and quantity of MSO nesting, roosting and foraging habitat, and cause disturbance to breeding MSOs and contribute as cumulative effects to the proposed action.

Sacramento Mountains checkerspot butterfly

The proposed project 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 the continuing rate of habitat loss has the potential in the future, to disrupt the metapopulation dynamics of this species.

CONCLUSIONMexican spotted owl

After reviewing the current status of the MSO, the environmental baseline for the action area, the effects of the proposed action, and the cumulative effects, it is the Service's biological opinion that the action, as proposed, is not likely to jeopardize the continued existence of the MSO within the Basin and Range East Recovery Unit or range-wide. No critical habitat is currently designated for this species on Forest Service lands within the action area; therefore, none will be affected. This conclusion was reached because the proposed project is expected to assist the Forest Service in restoring and protecting forest stands in the action area. Intensive, destructive fires will occur less frequently and the treatments will minimize the potential risk of wildland fire damaging life, property, and natural resources. This will assist in lessening the threat of wildfire to the MSO and its habitat.

This conclusion is based on the following: 1) MSOs occurring within the Sacramento Ranger District have demonstrated occupancy and reproduction under some level of disturbance from past fuels management activities occurring within PACs; 2) a 100-ac core area will be maintained within the PAC; 3) the 12 conservation measures included above will be

implemented; 4) the proposed study design is considered "...consistent with the intent of current Recovery Plan guidelines for this species" (W. Block, pers. comm., 2002); 5) the implementation of the proposed action is not expected to impede the ability of the survival or recovery of the MSO within the Basin Range East Recovery Unit or range-wide; and 6) the proposed commercial treatments will be less than or equal to 10 percent of each of the 12 PACs.

Sacramento Mountains checkerspot butterfly

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 checkerspot butterfly and is not likely to destroy or adversely modify proposed critical habitat.

We reached this conclusion for the following reasons: 1) the proposed project is not expected to result in the disruption of the metapopulation dynamics of the species; 2) the majority of the proposed action (i.e., forest thinning) involves habitat altering activities in forested areas and not within the checkerspot butterfly habitat; 3) the road-related impacts only disturb 2 to 4.5 percent of the occupied habitat, but should not result in any permanent impacts to the species or its habitat; and 4) the implementation of the conservation measures will further minimize impacts or avoid take.

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 measures described below for the MSO are non-discretionary and must be implemented by the Forest Service so that they become binding conditions of any grant or permit issued, as appropriate, in order for the exemption in section 7(o)(2) to apply.

Our policy states that incidental take can only be supported if an activity compromises the integrity of an MSO PAC. Actions outside PACs will not be considered incidental take, except

in cases when areas that may support MSOs have not been adequately surveyed. The Service anticipates that the proposed action will result in incidental take of MSOs in the form of harm and harassment due to the monitoring study and habitat alterations in PACs, respectively. This determination is based on the knowledge that survey data indicate that MSOs currently occupy the proposed project area and the project will alter habitat within PACs (USDI Fish and Wildlife Service 1995a).

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 any permittee or contractor 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 checkerspot butterfly to the Service as specified in the incidental take statement.

Amount or extent of take

For this proposed project, take of MSOs may be in the form of harassment within each of the affected 12 PACs and harm from capture and marking MSOs. Based on the best available information concerning the MSO, habitat needs of this species, the proposed project description, and information furnished by the Forest Service, take is considered likely for the MSO as a result of the following actions that do not fall within the specific recommendations of the Recovery Plan:

1. Harassment of 12 PACs including 12 pairs of MSOs (and associated eggs/young) from commercial thinning operations in the following PACs: Bail, Peñasco, Goodsell, Wayne, Dark, Hubble, Radio, Marcia, El Paso, Newman, Chippway, and Lower Wills.
2. The harassment of an unspecified number of MSOs and the harm of 1 MSO associated with handling and capturing birds for the monitoring program and the possibility of an individual being accidentally injured while being handled or captured.

Sacramento Mountains checkerspot butterfly

Based on the best available information concerning the checkerspot butterfly, the habitat needs of this species, the proposed project description, and information furnished by the Forest Service, take for the checkerspot butterfly is anticipated. Nevertheless, because of the cryptic nature of the various life history stages of the checkerspot butterfly (e.g., eggs, larvae, chrysalis) and the variation in population sizes from year to year, it is difficult to estimate the number of individuals that will be taken with implementation of this proposed project. Based upon the proposed project, it is estimated that approximately 36.4 acres of occupied habitat will be taken within the footprint of the proposed project. Using the information provided in the BA and our knowledge

of the checkerspot butterfly and this site, we anticipate that some individual checkerspot butterflies within the 36.4 acres will be taken in the form of harm and harassment.

Effect of the take

In the accompanying biological opinion, the Service determined that this level of anticipated take is not likely to jeopardize the continued existence of the MSO or the proposed checkerspot butterfly or result in the destruction or adverse modification of proposed critical habitat of the checkerspot butterfly.

Reasonable and Prudent Measures for the MSO

The Service believes the following reasonable and prudent measures are necessary and appropriate to minimize take.

- 1) Conduct all proposed activities in a manner that will minimize disturbance to the MSO and minimize modification and loss of MSO habitat.
- 2) Coordinate monitoring program activities with the New Mexico Ecological Services Field Office and with the Mexican Spotted Owl Recovery Team.

Terms and Conditions for the MSO

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 measures described above. These terms and conditions are nondiscretionary.

The following Terms and Conditions are established to implement Reasonable and Prudent Measure 1.

- 1.1 The Forest Service shall ensure that their employees, contractors, or subcontractors shall designate a field contact representative (FCR) who shall be responsible for overseeing compliance with the protective measures outlined in these Terms and Conditions. The FCR shall have the authority to halt all associated project activities that may be in violation of the Terms and Conditions of the Biological Opinion.
- 1.2 The Forest Service and their employees, contractors, or subcontractors shall strictly limit their activities, vehicles, equipment, and construction materials to the proposed project area(s), staging areas, and routes of travel. The construction area(s) shall be the minimal area necessary to complete the project. To this end, all fuels management and areas to be thinned shall be clearly delineated (e.g., stakes, flags, paint, etc.). All personnel onsite during project activities shall be instructed by the FCR that their activities are restricted to

these areas. These actions could also be facilitated by flagging/painting trees that are scheduled for removal or conversely to be retained.

- 1.3 All unauthorized impacts (i.e., impacts outside of the proposed project description) shall be immediately reported to the Service by the Forest Service, or their employees, contractors, subcontractors, or the FCR.
- 1.4 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 Biological Opinion. This report shall be submitted to the Service annually at the beginning of each calendar year (i.e., January 1) for the duration of the project.

The following Terms and Conditions are established to implement Reasonable and Prudent Measure 2.

- 2.1 Procedures used in the monitoring program to capture, band, and survey MSOs shall only use professional, scientifically approved methods (e.g., American Ornithological Union or peer-reviewed methods) and shall be performed by persons skilled in the techniques of handling MSOs, performing MSO surveys, and banding MSOs.
- 2.2 The final monitoring program study design will be submitted to the New Mexico Ecological Services Field Office and coordinated with the Mexican Spotted Owl Recovery Team.
- 2.3 The monitoring program principal investigators will submit an annual project report as part of their section 10(a)(1)(A) reporting requirement. This report shall be submitted at the beginning of each calendar year (i.e., January 1) for the duration of the project to the New Mexico Ecological Services Field Office and to the Mexican Spotted Owl Recovery Team. This report will detail accomplishments for the previous year.

Reasonable and Prudent Measures for the Checkerspot Butterfly

The Service believes the following reasonable and prudent measures are necessary and appropriate to minimize take. The prohibitions against taking the checkerspot butterfly found in section 9 of the Act do not apply until the species is Federally-listed. However, the Service advises the Forest Service to consider implementing the following reasonable and prudent measures for the checkerspot butterfly. 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.

- 1) Minimize disturbance to the checkerspot butterfly during road reopening and construction and operations and maintenance.

- 2) Conduct all construction activities, operations and maintenance in a manner that will minimize modification and loss of checkerspot butterfly habitat.

Terms and Conditions for the Checkerspot Butterfly

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 measures described above. These terms and conditions are nondiscretionary.

The following Terms and Conditions are established to implement Reasonable and Prudent Measure 1:

- 1.1 Any staging areas (i.e., areas where vehicles or equipment will be located during the construction of the project) should be situated within areas that do not contain any life stages of the checkerspot butterfly. Efforts should also be made to avoid New Mexico penstemon, valerian, or orange sneezeweed to the greatest extent possible. The staging areas should be clearly delineated (e.g., with surveys stakes or flagging) and the contractors should be informed of and adhere to these requirements;
- 1.2 The Forest Service shall ensure that their employees, contractors, or subcontractors shall designate an FCR who shall be responsible for overseeing compliance with the protective measures outlined in these Terms and Conditions. The FCR shall have the authority to halt all associated project activities that may be in violation of the terms and conditions of the conference opinion;
- 1.3 The Forest Service shall monitor the project to ensure compliance with any applicable requirements for contractors and shall otherwise ensure that proposed project is implemented in a manner consistent with the term and condition and the conservation measures described above;
- 1.4 The Forest Service shall monitor the project area for noxious weed infestations (e.g., Russian knapweed (*Acroptilon repens*), musk thistle (*Carduus nutans*), and teasel (*Dipsacus sylvestris*)). If noxious weed infestations are located, control and eradication treatments shall be implemented following the Lincoln National Forest's approved weed treatment prescriptions; and
- 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 shall be submitted to the New Mexico Ecological Services Field Office annually at the beginning of the calendar year (i.e., January 1) for the duration of the project.

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 emphasize and implement restoration of lowland riparian habitats for the MSO (USDI Fish and Wildlife Service 1996b).
2. The Forest Service should review the 1996 Biological Opinion (USDI Fish and Wildlife Service 1996b) and work with the Service to update the environmental baseline for the MSO range-wide.
3. The Forest Service should work cooperatively with the Service and other entities to develop and implement a regional conservation strategy for the checkerspot butterfly.
4. The Forest Service should update and review the MSO monitoring data annually and meet with the Service to share the updated information. Using these data, the Service will reassess the amount of take and provide any additional guidance or clarifications to this biological opinion as necessary to facilitate project implementation and protect listed and proposed species.

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 (e.g., MSO), 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 calendar 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.

Arrangements regarding proper disposition of potential museum specimens shall be made with the institution before implementation of the action. A qualified biologist should transport injured animals to a qualified veterinarian. Should any treated listed animal survive, we should be contacted regarding the final disposition of the animal.

REINITIATION - CLOSING STATEMENT

This concludes formal consultation on the Rio Peñasco II Non-Programmatic Vegetation Management Project and Forest Plan Amendment, on the Sacramento Ranger District, Lincoln National Forest. As required by 50 FR 402.16, reinitiation of formal consultation is required where discretionary Federal agency involvement or control over the action has been retained (or is authorized by law) and 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 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 opinion; or (4) a new species is listed or critical habitat designated that may be affected by the action.

This concludes formal conference on the Rio Peñasco II Non-Programmatic Vegetation Management Project and Forest Plan Amendment, on the Sacramento Ranger District, Lincoln National Forest. You may ask the Service to confirm the conference opinion as a biological opinion issued through formal consultation if the checkerspot butterfly is listed or critical habitat is designated. 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.

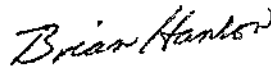
After listing of the checkerspot butterfly as endangered/threatened and/or designation of critical habitat for the checkerspot butterfly and any subsequent adoption of this conference opinion, the Federal agency shall request reinitiation of consultation if: (1) the amount or extent of incidental take 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 checkerspot butterfly or its habitat has occurred. Modification of the opinion and

incidental take statement may be appropriate to reflect that take. No take of the checkerspot butterfly or its habitat may occur between the listing of the 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-397. If you have any questions or would like to discuss any part of this biological opinion, please contact Eric Hein of my staff at (505) 346-2525, extension 135.

Sincerely,



for Joy E. Nicholopoulos
Field Supervisor

cc:

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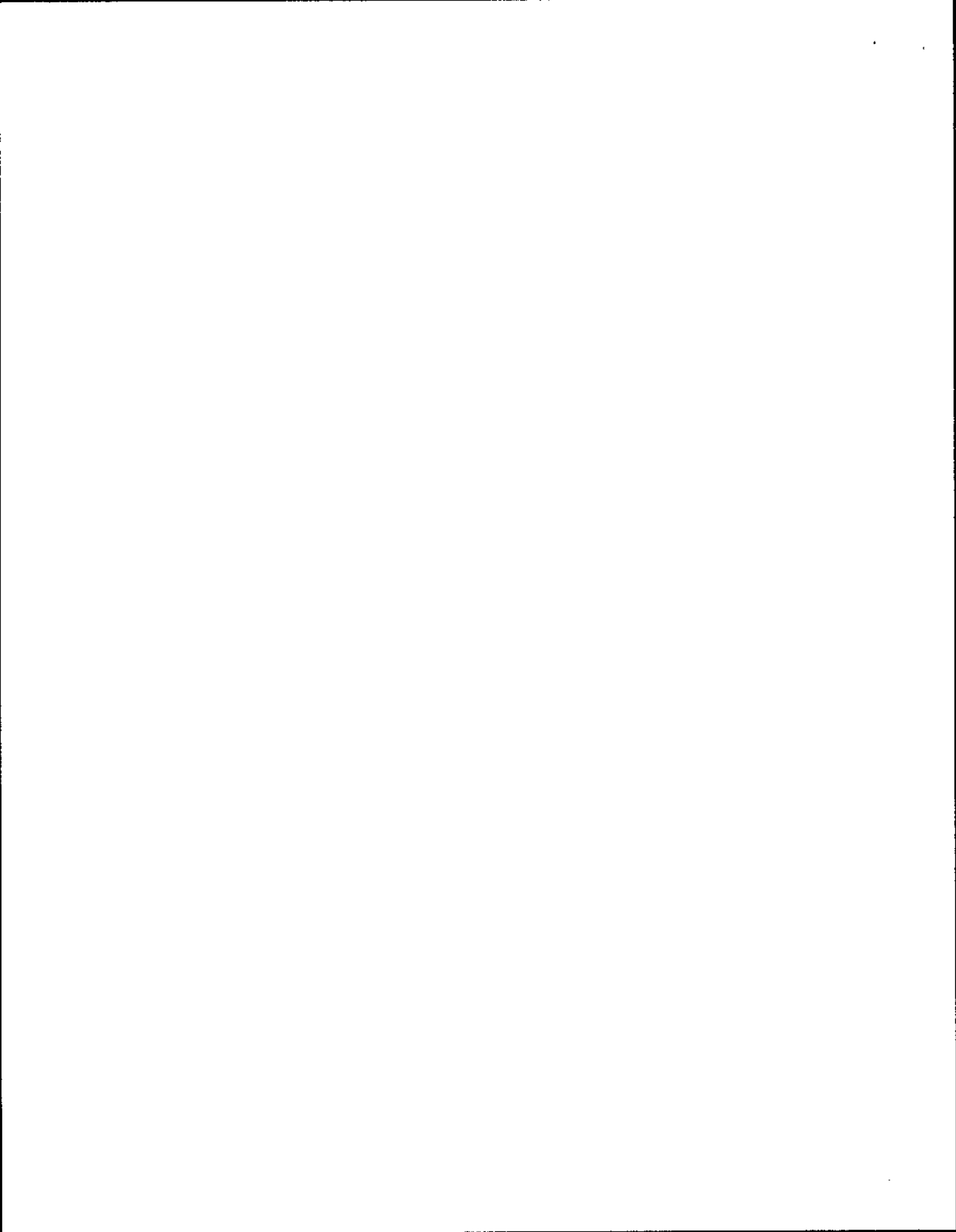
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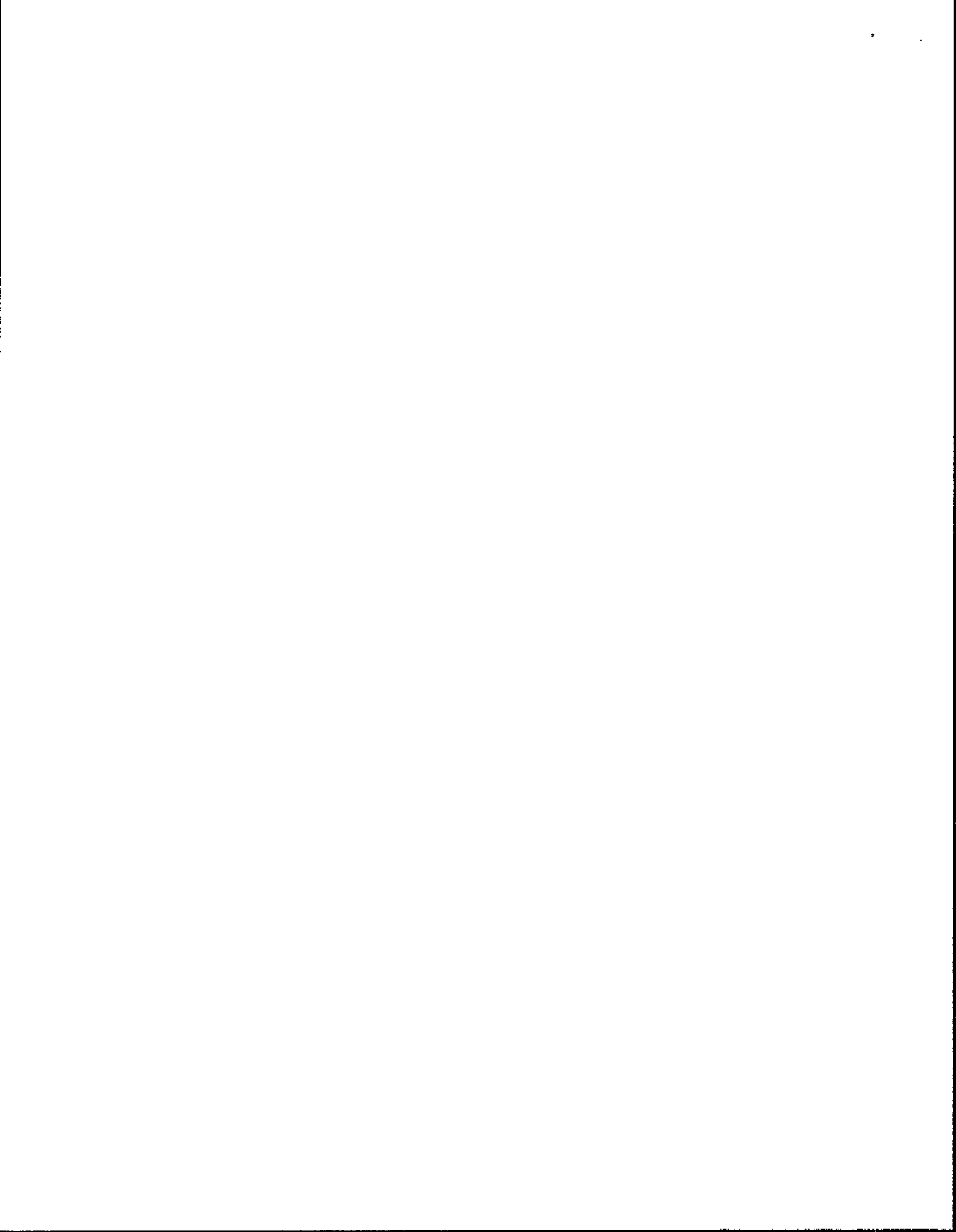
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