U. S. DEPARTMENT OF THE INTERIOR
BUREAU OF LAND MANAGEMENT

Biological Assessment and Determination of Effects

FOR

The New Mexico Association of Counties Wildfire Risk Reduction Grant Program in New Mexico

BLM State Office
Santa Fe, New Mexico

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1. Project Description

The Wildfire Risk Reduction Program for Rural Communities was established in 2005 under the National Fire Plan to assist communities throughout New Mexico in reducing their risk from wildland fire. The New Mexico Association of Counties (NMAC), a nonprofit community foundation, has partnered with the Bureau of Land Management to administer the NMAC Wildfire Risk Reduction Grant Program (hereafter referred to as the Grant Program) and distribute awards. It is possible in the future that the US Forest Service (USFS) will contribute to the Grant Program as well.

The program targets at-risk communities by offering seed money to help defray the costs of community wildfire protection projects. For the first two years, the Wildfire Risk Reduction Grant Program has primarily funded projects for the development of Community Wildfire Protection Plans (CWPP), a prerequisite to all other activities. In 2007 and beyond, priority will be given to projects that request funding for hazardous fuel reduction, wildfire prevention, and community outreach activities that are identified in completed CWPPs. All projects are on non-federal lands in New Mexico. Funded projects must be completed within 12 months of award acceptance.

Fundable Projects

1. **Community Wildfire Protection Planning (CWPP)** - CWPPs are community-based fire planning efforts that are collaboratively developed to identify and prioritize areas for hazardous fuel reduction treatments and other mitigating activities to reduce fire risk to communities in the wildland urban interface. Funds are available to help develop CWPPs. A completed CWPP is required before other activities can be funded through this program.

2. **Hazardous Fuel Reduction** - Fuel reduction projects and vegetation treatments remove or modify fuels in the wildland urban interface (WUI) to reduce potential wildfires. The goal is to modify or break up the fuels in such a way that lessens catastrophic fires and their threats to public and firefighter safety and reduces damage to property. Examples include fuel breaks, thinning, pruning, and landscape modifications. Projects must be identified in a CWPP to be eligible for funding and must include a map showing exactly where the project will take place.

3. **Wildfire Education, Prevention, & Outreach Programs** - Homeowners and communities have a responsibility to create “fire safe” conditions in and around structures that will limit the transmission of fire from wildlands to property and property to wildlands. Examples include community outreach events, home evaluations, and the training of residents.

BLM New Mexico State Office provides between $250,000 and $500,000 annually to the NMAC through an assistance agreement as funding becomes available. Funding is not guaranteed each year. NMAC designed, and now

administers, the Grant Program by receiving applications annually by March 1, reviewing project proposals and making awards in early April. Awards are limited to $50,000 per project. BLM will provide technical assistance but does not participate in ranking or selecting projects other than meeting criteria that projects are in proximity to and will benefit BLM managed lands. The BLM State Office Wildlife Biologist will review each proposed project for compliance with the conservation measures listed in this Biological Assessment and with the determinations of effect. BLM will coordinate with FWS at this time concerning the projects under review. At such time as the U.S. Forest Service (USFS) provides funding for this program, the USFS Regional Office Biologist will review those projects that benefit the USFS in New Mexico.

The status of CWPPs statewide will vary from year to year as more communities and counties complete the planning process (Appendix A). New Mexico State Forestry maintains a web site where completed plans can be found (http://www.emnrd.state.nm.us/FD/FireMgt/cwpps.htm). Typical project descriptions recommend thinning, pruning, chipping and slash disposal in pinyon-juniper stands and other mixed conifer and deciduous stands near homes and structures to alter fire behavior and the ladder fuel structure. Mechanical methods using machines and hand tools may be used as well as prescribed fire in some areas and burning of slash piles. Mowing of fine fuels and maintaining grass lawns is also recommended.

2. Federally Listed Species

This Biological Assessment (BA) provides analyses, both detailed and incorporated by reference, of all federally listed (endangered or threatened), designated critical habitats, 10(j) populations and candidates that may be affected by activities funded through the New Mexico Association of Counties (NMAC) Wildfire Risk Reduction Grant Program in New Mexico. Development of this BA was guided by the Regulations on Interagency Cooperation (Section 7 of the ESA) in 50 CFR Part 402 and BLM Manual 6840. All anticipated environmental effects, conservation actions, mitigation, and monitoring are disclosed or incorporated by reference into this BA. This includes analysis of all direct and indirect effects of the potential projects funded by the Grant Program, including any interrelated and interdependent actions, on listed species and designated critical habitat, 10(j) species and candidate species from the analysis of the actions contained in Community Wildfire Protection Plans in New Mexico.

Based on discussions and analyses during early informal consultation, listed and candidate species that do not occur on non-federal lands in New Mexico or do not occur downstream or downwind of a fuel reduction action that may take place on non-federal land or are unlikely to be accomplished through this grant program have received No Effect determinations. No further analysis in included in this assessment for the 26 species listed here:

New Mexico ridge-nosed rattlesnake
Sand dune lizard
Boreal western toad
Lesser prairie chicken
Gila topminnow
Beautiful shiner
Black-footed ferret
Gypsum wild-buckwheat
Lee pincushion cactus
Knowlton's cactus
Mancos milk-vetch
Mesa Verde cactus
Holy Ghost ipomposis
Jaguar
Lesser long-nosed bat
Mexican long-nosed bats
Pecos assiminea
New Mexico hot spring pyrg
Koster's springsnail
Roswell pyrg (springsnail)
Noel's amphipod
Alamosa springsnail
Socorro isopod
Socorro pyrg (spingsnail)
Texas hornshell (mussel)
Chupadera pyrg (spingsnail)

For the Grant Program in New Mexico, 10 endangered species, 13 threatened species, 2 species with 10(j) designations, 2 candidate species and 9 Designated Critical Habitats could be affected by the proposed hazardous fuels reduction activities on non-federal lands. These 27 federally listed species and 2 candidate species can be grouped as follows: 1 amphibian, 7 birds, 12 fish, 6 flowering plants, and 1 mammal (see Table 1).

Table 1: Counties and Vegetation Types of Federally Listed, and Candidate Species in New Mexico Analyzed in this Biological Assessment for the New Mexico Association of Counties Risk Reduction Grant Program for Non-federal Lands in New Mexico.

Common Name and Federal Status[a]	**Scientific Name**	**County**	**Vegetation Type**
AMPHIBIANS			
1. Chiricahua leopard frog T	*Rana chiricahuensis*	Catron, Grant, Hidalgo, Luna, Sierra, Socorro	Wetland/Riparian/Aquatic, permanent water source
BIRDS			
2. Bald eagle T	*Haliaeetus leucocephalus*	All counties	Rivers, reservoirs, snags, trees
3. Interior least tern E	*Sterna antillarum*	Catron, Chaves, Curry, Dona Ana, Eddy, Otero, Quay, Rio Arriba, Socorro	River banks, sandbars
4. Northern aplomado falcon E, 10(j)[b]	*Falco femoralis septentrionalis*	Chaves, Dona Ana, Eddy, Grant, Hidalgo, Lea, Lincoln, Luna, Otero, Sierra, Socorro	Grasslands
5. Piping plover T	*Charadrius melodus*	Colfax, Socorro	River banks, sandbars

Common Name and Federal Status[a]	**Scientific Name**	**County**	**Vegetation Type**
6. Southwestern willow flycatcher E and Designated Critical Habitat	*Empidonax traillii extimus*	Bernalillo, Catron, Cibola, Colfax, Dona Ana, Grant, Guadalupe, Hidalgo, Los Alamos, Luna, McKinley, Mora, Otero, Rio Arriba, San Juan, San Miguel, Sandoval, Santa Fe, Sierra, Socorro, Taos, Valencia	Riparian areas
7. Mexican spotted owl T and Designated Critical Habitat	*Strix occidentalis lucida*	Bernalillo, Catron, Chaves, Cibola, Colfax, Dona Ana, Eddy, Grant, Hidalgo, Lincoln, Los Alamos, McKinley, Mora, Otero, Rio Arriba, San Juan, San Miguel, Sandoval, Santa Fe, Sierra, Socorro, Taos, Torrance, Valencia	Mixed conifer or ponderosa pine/gambel oak forests
8. Yellow-billed cuckoo C	*Coccyzus americanus*	Bernalillo, Catron, Cibola, Dona Ana, Grant, Hidalgo, Los Alamos, Luna, McKinley, Mora, Rio Arriba, San Juan, San Miguel, Sandoval, Santa Fe, Sierra, Socorro, Taos, Valencia	Broadleaf riparian forest

FISH			
9. Rio Grande silvery minnow E	*Hybognathus amarus*	Bernalillo, Dona Ana, Rio Arriba, Sandoval, Santa Fe, Sierra, Socorro, Valencia	Wetland/Riparian/Aquatic
10. Gila trout T	*Oncorhynchus gilae*	Catron, Grant, Sierra	Wetland/Riparian/Aquatic
11. Loach minnow T and Designated Critical Habitat	*Tiaroga cobitis*	Catron, Grant, Hidalgo	Wetland/Riparian/Aquatic
12. Spikedace T and Designated Critical Habitat	*Meda fulgida*	Catron, Grant, Hidalgo	Wetland/Riparian/Aquatic
13. Gila chub E and Designated Critical Habitat	*Gila intermedia*	Grant	Wetland/Riparian/Aquatic
14. Pecos gambusia E	*Gambusia nobilis*	Chaves, Eddy	Wetland/Riparian/Aquatic
15. Pecos bluntnose shiner T and Designated Critical Habitat	*Notropis simus pecosensis*	Chaves, De Baca, Eddy	Wetland/Riparian/Aquatic
16. Arkansas River shiner T	*Notropis girardi*	Colfax, Harding, Quay, San Miguel	Wetland/Riparian/Aquatic
17. Chihuahua chub T	*Gila nigrescens*	Grant	Wetland/Riparian/Aquatic
18. Colorado pikeminnow E	*Ptychocheilus lucius*	San Juan	Wetland/Riparian/Aquatic
19. Razorback sucker E	*Xyrauchen texanus*	San Juan	Wetland/Riparian/Aquatic
20. Zuni bluehead sucker C	*Catostomus discobolus yarrowi*	Cibola, McKinley	Wetland/Riparian/Aquatic
PLANTS			
21. Zuni fleabane T	*Erigeron rhizomatus*	Catron, Cibola, McKinley	Pinon/Juniper Woodland on Shale of the Chinle or Baca formations
22. Kuenzler hedgehog cactus E	*Echinocereus fendleri var. kuenzleri*	Chaves, Eddy, Lincoln, Otero	Grassy habitats on the lower fringes of the piñon - juniper woodland
23. Sneed pincushion cactus E	*Coryphantha sneedii var. sneedii*	Dona Ana, Eddy	Organ and Franklin Mountain range
24. Todsen's pennyroyal E and Designated Critical Habitat	*Hedeoma todsenii*	Otero, Sierra	Loose, steep gravelly north- and east-facing hillsides with gypseous limestone soils at about 2000 m elevation
25. Sacramento prickly poppy E	*Argemone pleiacantha ssp. Pinnatisecta*	Otero	Disturbed areas, wet soils
26. Sacramento Mountains thistle T	*Cirsium vinaceum*	Otero	Riparian meadows, springs, streams

MAMMALS			
27. Mexican gray wolf E, 10(J) [b]	*Canis lupus baileyi*	Catron, Grant, Hidalgo, Luna	Madrean evergreen forests and woodlands, including pine-oak woodlands, piñon-juniper forests, chaparral, grasslands and riparian areas above 4,500 feet

[a] Federal status designations are Endangered (E), Threatened (T), and Candidate (C).
[b] Species listed as "10(j)" are designated experimental/non-essential populations under Section 10(j) of the Endangered Species Act, as amended. This designation provides greater management flexibility. For BLM, 10(j) populations of federally listed species are equivalent to a "proposed" status.

3. Species Descriptions, Conservation Measures, and Effects Analyses

Descriptions of each species listed in Table 1 including life history, status, distribution, affected habitats and a determination of effect are provided here. When only basic or limited information is presented here, additional information and a literature citation is incorporated by reference from the 2004 Biological Assessment and Evaluation for the Fire and Fuels Management Plan Amendment and Environmental Assessment for BLM Lands in New Mexico and Texas (hereafter referred to as the BLM 2004 Fire and Fuels EA; http://www.nm.blm.gov/nmso/fire_plan_amendment/ffmpa_index.html; Consultation # 02-22-03-I-680).

Status designations for nine species and one Designated Critical Habitat that have changed since the BLM 2004 Fire and Fuels EA are:
1. Gila trout is now threatened;
2. Gila chub is endangered with critical habitat;
3. Northern aplomado falcon is now a 10(j) population;
4. Black-tailed prairie dog is no longer a candidate and is dropped from this analysis;
5. Koster's springsnail, Roswell springsnail, Pecos assiminea, and Noel's amphipod are all endangered without critical habitat in New Mexico and are not considered in this analysis; and
6. Sacramento Mountains checkerspot butterfly is no longer a proposed species and is not considered in this analysis.

CONSERVATION MEASURES THAT APPLY TO ALL PROJECTS

- All applicable Conservation Measures will be applied to areas with unsurveyed suitable habitat for federally protected species until a survey has been conducted by qualified personnel to clear the area for the treatment activity
- In addition to these measures and the species-specific measures, use Best Management Practices in all areas with known federally protected

species or habitat (Page 2-10 of the BLM 2004 Fire and Fuels EA at: http://www.nm.blm.gov/nmso/fire_plan_amendment/docs/final_docs_7604/Chapter2ea61404.pdf)

- Protection of known locations of habitat occupied by federally listed and candidate species will be achieved by development of fuel reduction projects to incorporate these conservation measures that apply to all projects, riparian and aquatic conservation measures, listed plant conservation measures, and species-specific conservation measures to minimize effects to federally protected species and their habitats within, adjacent to, and downstream from the proposed project sites
- All recipients of the NMAC grants will be briefed and educated about listed and candidate species and the importance of minimizing impacts to individuals and their habitats
- Equipment staging areas and fueling areas should be located outside of listed species habitats, and preferably in locations that are already disturbed. The potential for indirect effects to listed species or their habitat from the site location of staging areas (*e.g.,* if an area is within the water flow pattern, there may be indirect effects to aquatic habitat or species located off-site) must also be considered in project design and implementation
- Use of motorized vehicles during burning or other fuels reduction activities in suitable or occupied habitat of listed species will be restricted, to the extent feasible, to existing roads, trails, washes, and temporary fuel breaks or site-access routes. If off-road travel is deemed necessary, any cross-country travel paths will be surveyed for federally protected species prior to use and will be closed and rehabilitated after the burning or fuels reduction project is completed.
- All fire management protocols to protect federally protected species will be coordinated with local fire suppression agencies that conduct fire suppression on non-federal lands to ensure that the agency knows how to minimize impacts to federally protected species in the area.
- These and species-specific Conservation Measures would be implemented for projects occurring in riparian or upslope/upstream habitats, to minimize effects of these actions to federally protected fish species.
- Seedings, pole plantings and related projects to increase herbaceous or cover will use locally adapted native species. Use of exotic species is to be avoided.

Additional Conservation Measures for Riparian and Aquatic Habitats:

R.1. No permanent or temporary road construction would be allowed within the boundaries of Grant Program project areas.

R.2. No equipment use will be allowed in perennial channels, and intermittent channels with water, except at crossings that already exists. Vehicle and heavy equipment use in drainage bottoms, including in both riparian and non-riparian areas, that drain into listed fish habitat will be restricted.

R.3. Thinning and any other type of mechanical treatment of vegetation in drainage bottoms will follow Best Management Practices (BMPs) in all treatment areas (Page 2-10 of the BLM 2004 Fire and Fuels EA at: http://www.nm.blm.gov/nmso/fire_plan_amendment/docs/final_docs_7604/Chapter2ea61404.pdf)

R.4. No pile or jackpot burning in ephemeral, intermittent, or perennial channels. Pile and jackpot burning adjacent to channels (ephemeral, intermittent, or perennial) that flow into listed fish habitat will be positioned with adequate buffer distances from the channel.

R.5. Any plans for burning in listed fish habitats will be developed so as to minimize ash input into listed fish habitats. Activities to consider in the effort to minimize ash input: prescribe burn WUI areas in multiple year phases; prescribe burn WUI areas early enough (fall or early spring burning) to allow vegetation growth prior to summer rains; protect key riparian areas; minimize fire in riparian areas; etc.

R.6. Fire line and/or skid trail construction in drainages that flow into listed fish habitat will be designed so as to reduce erosion and sediment flow.

R.7. To minimize the cumulative effect of livestock grazing in areas that have been burned or treated, livestock will not be allowed in the treated area of the watershed that flows into the listed fish habitat until the area has recovered enough to control ash and sediment produced by the treatment.

R.8. No machinery used for vegetation removal or firebreak preparation would be allowed within 1/4 mile of standing or flowing water in the river channel. Vegetation removal needed for the construction of firebreaks within 1/4 mile of standing or flowing water would be removed using hand tools, but would require reinitiation of consultation with FWS in potential and/or occupied habitats. Any material removed during the construction of firebreaks would be pushed away from the river channel and never into the channel itself.

Additional Conservation Measures for Listed Plant Habitats:

The implementation of the following Conservation Measures minimizes or eliminates the impacts to listed plants. The determinations of effect are based on the implementation of some or all these measures needed to protect the species and their habitats.

These Conservation Measures for known locations and unsurveyed habitat of all federally protected plant species listed below, within the planning area, will be implemented during all fuel reduction projects funded by the Grant Program:

P 1. Surveys for federally protected and sensitive plant populations and habitats will be completed prior to implementation of the Grant Program projects.

P 2. No staging of equipment or personnel will be permitted within 100 meters of identified individuals or populations of federally protected and sensitive plant populations, nor will off-road vehicles be allowed within the 100-meter buffer area, unless necessary for firefighter or public safety or the protection of property, improvements, or other resources. One of the primary threats to

many of these plant species is trampling or crushing from personnel and vehicles.

P 3. No prescribed burning, slash pile burning or chemical treatments will be implemented within 100 meters of identified locations or unsurveyed suitable habitat for federally protected and sensitive plant populations unless specifically designed to maintain or improve the existing population.

P 4. Utilize minimum impact tactics to minimize disturbance of vegetation and soils.

P 5. Slash would not be piled on, drug across, or lopped and scattered onto either actively growing or dormant listed plants.

P 6. Persons working within the limited range of listed plants would be trained to identify the species and report occurrences to BLM or USFS personnel.

3.1 Amphibians

3.1.1 Chiricahua leopard frog (*Rana chiricahuensis*) Threatened

3.1.1. A) Species Life History, Status and Distribution

Chiricahua leopard frogs are highly aquatic habitat generalists and can be found in a variety of permanent aquatic habitats, such as montane springs, streams, ponds, lakes, marshes, stock ponds, and plunge pools of canyon streams, where adequate depth provides escape from predators. The Chiricahua leopard frog was listed as threatened on June 13, 2002. The historic range of the Chiricahua leopard frog in New Mexico included the Gila, San Francisco, Tularosa, and Blue Rivers. Once abundant within these areas, the Chiricahua leopard frog has experienced rapid declines in the population levels within recent years. Now it seems to only occur in Sierra, Grant and Hidalgo Counties (NMDGF 2004). Additional information can be found in the BLM 2004 Fire and Fuels EA.

3.1.1. B) Affected Habitat

The primary habitat type includes oak, mixed oak, and pine woodlands, although its habitat ranges into areas of chaparral, grassland, and desert, particularly for the southern populations. This species requires permanent water sources, including streams, rivers, backwaters, ponds, and stock tanks that are mostly free from introduced fish, crayfish, and bullfrogs. Natural aquatic systems include rocky streams with deep rock-bound pools, river overflow pools, oxbows, permanent springs, permanent pools in intermittent streams, and beaver dams. Human-influenced aquatic systems include earthen stock tanks, livestock drinkers, irrigation sloughs, mine adits, abandoned swimming pools, and ornamental backyard pools.

3.1.1. C) Species-specific Conservation Measures (in addition to those in Section 3)

Any mechanical treatments or burning within, immediately adjacent to, or within ¼ mile of habitats occupied by the Chiricahua leopard frog would require additional consultation with FWS prior to implementation.

Required conservation measures to lessen or eliminate potential effects to Chiricahua leopard frogs:

1. Water for fire engine use in support of prescribed burning, or for any mechanical treatment that might require water, would not be taken from sources supporting Chiricahua leopard frog to ensure no adverse impacts to these species. Unused water from fire or mechanical treatment activities will not be dumped into sites occupied by Chiricahua leopard frog to avoid introducing non-native species, diseases, or parasites.
2. Install sediment traps upstream of tanks and ponds occupied by Chiricahua leopard frogs in order to minimize the amount of ash and/or sediment entering the water. Consultation with a biologist during the planning phase will aid in determining sediment trap installation requirements. The consulting biologist must possess a Section 10a1a Recovery Permit for Chiricahua leopard frogs.
3. All personnel performing management activities at any creek crossing will be informed of the potential presence of Chiricahua leopard frogs, their status, and the need to perform their duties to avoid impacts to the frog and its habitat.

3.1.1. D.1) Effects of the Proposed Action - Direct Effects:

Since larval and adult Chiricahua leopard frogs occur in stock tanks, ponds, and streams, and we could anticipate using prescribed fire, slash pile burning and mechanical treatments in habitats within or immediately adjacent to occupied sites, there could be direct impacts on leopard frog eggs, larvae, or adults. Fire suppression actions used during prescribed fire or pile burning on upland terrestrial habitats may affect frogs as described above, but the use of these fire management tools would only occur under conditions that meet predetermined prescriptions. Pre-planning that implements Best Management Practices and Minimum Impact Suppression Tactics (found in the BLM 2004 Fire and Fuels EA), combined with Conservation Measures, and additional consultation with FWS if required, would make the probability of this potential effect so low as to be discountable. In the event of a wildland fire, emergency consultation procedures would be followed as directed in the annual letter from the FWS (Appendix B).

While chemical herbicides can be toxic to aquatic organisms on an acute basis, implementing the Conservation Measures (i.e. no vegetative manipulation within ¼ mile of riparian/wetland areas with occupied or potential habitats of Chiricahua leopard frogs will be allowed without further consultation with FWS) would prevent these chemicals from entering the aquatic habitats used by the

Chiricahua leopard frog. Herbicide applications would be scheduled and designed to minimize potential direct effects and the use chemical treatments in habitats immediately adjacent to occupied sites is not anticipated. Aquatic habitats occupied by the frog would be buffered from aerial application of chemicals. Hand-application of herbicides may be used in riparian areas (*e.g.,* to control tamarisk regrowth) upstream of some sites, but would use drift-inhibiting agents to prevent herbicides from entering aquatic habitats occupied by frogs. This treatment would typically not be used around stagnant water sources (*e.g.,* stock tanks) occupied by the frogs, as these sites generally do not need fuels reduction. Pre-project planning, buffers, and other Conservation Measures would render the potential for direct impacts to this species from this activity so low as to be discountable.

3.1.1. D.2) Effects of the Proposed Action - Indirect, Interrelated and Interdependent Effects:

Any negative effects to the Chiricahua leopard frog from the proposed fuel reduction actions would be indirect, resulting from soil or ash inflow into occupied waters from project activities that occur upslope or upstream from occupied sites. An inflow of ash and/or sediment into a water body is capable of smothering eggs and tadpoles thus resulting in a change in numbers of individuals. Sediment and ash flow can also inhibit respiration in macroinvertebrates, resulting in reduced density and composition of macroinvertebrates, which are a primary food source for the frogs. A reduction in the amount of prey can ultimately affect leopard frog numbers and reproduction. These indirect effects that have the capability of affecting the numbers and reproduction of the species may result in a change in its distribution, if isolated populations are locally extirpated, and recolonization from adjacent sites is not feasible. In order to minimize these indirect effects on Chiricahua leopard frogs, several Conservation Measures (i.e. install sediment traps, upstream of tanks and ponds occupied by leopard frogs to minimize and/or avoid contamination to the ponds/tank) would be implemented for the proposed fuels reduction activities. These required Conservation Measures would reduce the scope and intensity of effects to the species numbers, reproduction, and distribution.

Conversely, Chiricahua leopard frogs may experience positive interdependent effects from aggressive fuel reduction activities within riparian or upland habitats, by minimizing the amount of vegetation lost from catastrophic wildfires, which could contribute to the soil and ash flow into occupied sites. Over time, implementing the proposed fuel reduction activities could reduce the risk of catastrophic fires in riparian or upland habitats that could result in large-scale losses of vegetation. Because small, disjunct populations, such as with the Chiricahua leopard frog, are at higher risk of local extirpation from catastrophic events, this long-term improvement could assist in protecting their aquatic habitats and potentially stabilizing frog populations, thereby providing a beneficial effect to the species.

3.1.1. D.3) Effects of the Proposed Action - Cumulative Effects:

Projects described in the CWPPs, as well as projects not included in a CWPP, will likely be accomplished on adjacent or adjoining non-federal lands without federal funding. Activities, such as grazing, human population expansion and associated infrastructure development, mining, and recreation (including off-highway vehicle use), are expected to continue on State and private lands within the range of the species. These activities could continue to introduce non-native species, such as bullfrogs, crayfish, and fish that prey on or compete with the Chiricahua leopard frog, and the chytrid fungus that could harm the species. These activities could also continue fragmentation, major conversions, and pollution of the frog's wetland habitats.

3.1.1. E) *Conclusion/Effects Determination*

The proposed fuel reduction activities could potentially result in adverse direct and indirect effects to leopard frog eggs, tadpoles, and invertebrates or their habitats, potentially causing a change in the numbers and reproduction of the species. Long-term positive effects to the species would occur from the reduced risk of catastrophic wildfires within its southern range, which would help stabilize populations, protect occupied habitat, and increase the resiliency of local populations to other types of disturbance. With the implementation of the Conservation Measures, the impacts would be minimized or eliminated. **It is BLM's determination that the proposed project may affect, but is not likely to adversely affect, the Chiricahua leopard frog.**

3.2 Birds

3.2.1 Bald Eagle *(Haliaeetus leucocephalus)* Threatened

3.2.1. A) Species Life History, Status and Distribution

The average lifespan of bald eagles is 15 to 20 years. Bald eagles become sexually mature at 4 to 5 years of age. Generally, clutch size is 2 to 3 eggs. Incubation lasts 35 days. The nestling stage lasts 77 days, first flight occurs around day 112. Eaglets generally leave the nest around 13 weeks, but usually return to the general region of their birth at ages 1 to 3 years. Bald eagles tend to remain at their nesting location throughout the year unless food and weather conditions are unfavorable. Bald eagles primarily feed on fish, although they also eat small mammals, carrion, birds, various turtles, and snakes. Wintering bald eagles frequent rivers, reservoirs, and lakes, and their distribution is dependent on prey availability, perch suitability, weather and human disturbance intensity. Changes in environmental conditions, such as fluctuating river flows, can affect foraging strategies and success of wintering bald eagles.

The bald eagle was federally listed as endangered on March 11, 1967. Although bald eagles face numerous threats throughout the 48 states, they have recovered from dramatic population declines over the past several decades

leading to downlisting on July 12, 1995 to threatened status. On July 6, 1999, the FWS proposed delisting of the species. That action is expected to be completed on June 29, 2007.

In New Mexico, only two pair of bald eagles have been documented to be nesting in 1996 (NMDGF, 1996), while an estimated 300-400 birds winter along rivers and reservoirs, covering all counties of New Mexico. Bald eagles occur on lands managed by numerous agencies, BIA/tribal lands, and county and private lands.

3.2.1. B) Affected Habitat

The species is primarily water-oriented, and the majority of the populations occurring in New Mexico are found near streams and lakes. Some non-riverine areas where these eagles occur regularly are in the region between the Pecos Valley and the Sandia, Manzano, Capitan, Sacramento Mountains, and the Mogollon Plateau.

3.2.1. C) Species-specific Conservation Measures (in addition to those in Section 3)

1) Conduct burning activities outside of nesting season in a manner to ensure nest and winter roost sites are more than ½ mile from downwind smoke effects.
2) No tree cutting within the area immediately around winter roost sites
3) Provide reasonable protective measures so fire prescription or fuels treatment will not consume dominant, large trees within ½ mile of known nests and roosts of bald eagles. Pre-treatment efforts should provide reasonable protection of identified nesting and roosting trees.

3.2.1. D.1) Effects of the Proposed Action - Direct Effects:

We anticipate implementing prescribed fire, slash pile burning, or mechanical or chemical treatments within habitats occupied by wintering bald eagles during the life of the NMAC Grant Program. If nesting occurs in the area of an NMAC grant-funded project, further consultation with FWS would be initiated. Because eagles can travel long distances for foraging, some treatments could be implemented in areas used for foraging, only if site-specific plans deem them suitable for the habitat type and effective for meeting fuel reduction objectives. Conservation Measures that include restrictions on timing and distance of the proposed fuel reduction activities could render the potential for any direct effects to wintering bald eagles from prescribed fires, slash pile burning and vegetation treatments so unlikely as to be discountable. Treatments proposed within historic breeding areas, or areas found to have breeding eagles will require further consultation with FWS. Because of the distance eagles can travel for foraging, bald eagles foraging outside of identified nesting or winter roost sites, but within proposed project areas during implementation, could be disturbed by project activities. Eagles could experience visual or auditory disturbance from human presence and activity, particularly during mechanical treatments, prescribed fires or slash pile burning. However, because of alternate available foraging areas, and the unlikely occurrence of an eagle where fuel reduction activities are occurring, the

potential for any residual effects could be so low as to be discountable. Some large trees or snags outside of identified winter roosting sites may be lost during these activities, although new snags could also be created from fire mortality. Because of the availability of alternate remaining or new snags, this effect could be so small as to be insignificant to the species. Bald eagles would not experience direct health effects from chemical treatments of fuels either within their winter roosting territories or in foraging areas outside identified territories, as eagles would not be in contact with the chemicals.

Overall, the proposed fuel reduction activities, including the Conservation Measures, would not affect the numbers, distribution, or reproduction of bald eagles on BLM-administered lands.

3.2.1. D. 2) Effects of the Proposed Action - Indirect, Interrelated and Interdependent Effects:

Indirect effects to the bald eagle include long-term changes in eagle habitat, as well as effects to eagle prey species, or prey species habitat. The long-term effects to winter roosting habitat from the proposed fuel reduction activities could primarily be positive for eagles by restoring habitats and reducing the risk of catastrophic wildfires. These catastrophic wildfires could destroy the large, old growth trees and snags that are important habitat components to bald eagles, as well as destroying large acreages of wintering habitat.
Nesting and wintering bald eagles forage mainly along rivers and at lakes for fish and waterfowl. Terrestrial, upland species, including road-killed animals, will also be taken by bald eagles. Conservation Measures would be implemented that minimize the effects to eagle foraging habitat and prey species habitat from fire management activities. Herbicides, such as Garlon and Roundup, used to prevent tamarisk regrowth, are moderately toxic to fish and other aquatic species. However, restrictions on the direct application of herbicides on vegetation, and the use of drift-inhibiting agents during herbicide application would minimize or eliminate effects to the bald eagle's prey species. In addition, thinning of dense vegetation to reduce fuel loads could increase site distances, which could facilitate hunting conditions for the bald eagle. For these reasons, the potential for negative indirect effects to the species from the proposed fire management activities would be so low as to be discountable.

3.2.1. D.3) Effects of the Proposed Action - Cumulative Effects:

Lands in New Mexico play an important role mainly for wintering eagles, but also breeding, even if minimal. Agricultural activities (*e.g.,* grazing), human population expansion and infrastructure development, and unregulated recreation on State and private lands within the action area (New Mexico) could potentially affect nesting, foraging, and roosting habitats, as well as eagles or their prey, through incidental predator control, human disturbance, loss of key habitat features such as nesting platforms or roost sites, and alteration or fragmentation of nesting, winter roost, or foraging habitat.

3.2.1. E) *Conclusion/Effects Determination*

Although the proposed fuel reduction activities would not directly or indirectly affect the numbers, distribution, or reproduction of the species, there is a potential for minor, short-term disturbances to eagles, and the loss of some key habitat features (*e.g.,* snags or large trees). The potential for negative effects to eagles from the proposed fuel reduction activities would be so unlikely as to be discountable or so minor as to be insignificant. Conversely, bald eagles would benefit from the long-term restoration of habitats and the reduction in catastrophic fires that exists from high accumulations of fuels within their habitat. **It is BLM's determination that the proposed action may affect, but is not likely to adversely affect, the bald eagle.**

3.2.2 Interior least tern (*Sterna antillarum*) Endangered

3.2.2. A) Species Life History, Status and Distribution

Least terns are piscivorous and are associated with shallow water areas of rivers, streams, and lakes. The food source for least terns consists of minnows or other small, non-spiny fish less than 3.9 inches in length. Generally, they feed close to their nesting areas and forage by hovering and diving for fish over standing or flowing water. Terns are colonial-nesting waterbirds that nest on ground that is sandy and relatively free of vegetation such as sandbars along rivers, beaches and spits in coastal areas. Sites that contain up to 15% vegetation cover are considered optimal, although other materials, such as water-deposited debris, can serve the same purpose. In New Mexico and other parts of the southern Great Plains, alkali flats are selected as nesting areas. The "nest" is a shallow scrape, in which the eggs are laid.

The Interior least tern was listed as Endangered in 1990. The historic distribution included the major river systems of the midwestern United States. These terns (presumably of the subspecies *S. a. athalassos*) breed in the vicinity of Roswell, including regularly at Bitter Lake N.W.R. – which is the key and essential habitat area in the state -- and perhaps rarely at Bottomless Lake State Park and Wade's Bog. The species occurs as a migrant in Eddy County and as a vagrant elsewhere, including Espanola, Sumner Lake (DeBaca Co.), Bosque del Apache N.W.R. (Socorro Co.), near Glenwood, Las Cruces, and Alamogordo.

3.2.2. B) Affected Habitat

Clear shallow water areas of rivers, streams, and lakes are needed for foraging while ground that is sandy and relatively free of vegetation (<15% cover) such as sandbars along rivers and alkali flats are used for nesting. Available nesting habitat is extremely limited and disturbance by humans is high.

3.2.2. C) Species-specific Conservation Measures (in addition to those in Section 3)

1) Implement the Conservation Measures that apply to all projects

2) Prescribed fire, slash pile burning, vegetative and herbicide treatment projects in occupied or suitable riparian/marsh habitat would only occur between September 1 and March 15 to avoid the breeding season. Herbicide application would not occur in Interior least tern habitat during the breeding season.
3) Drift-inhibiting agents would be used to assure that the herbicide does not enter river areas.

3.2.2. D.1) Effects of the Proposed Action - Direct Effects:

Implementation of the conservation measures for riparian and wetland habitats would help minimize or eliminate the direct impacts to the least tern and its habitat. Conservation Measures that include recommendations on how to manage the prescribed fires, slash pile burning or vegetation treatment activities would render the potential for any direct effects to least terns from prescribed fires and vegetation treatments so unlikely as to be discountable.

3.2.2. D.2) Effects of the Proposed Action - Indirect, Interrelated and Interdependent Effects:

Treatments proposed within breeding areas will require further consultation with FWS. Because least terns forage close to their breeding grounds, activities associated with project implementation could disturb their breeding, feeding and foraging behavior. Terns could experience visual or auditory disturbance from human presence and activity, particularly during mechanical treatments, and prescribed fires or slash pile burning. Some vegetation may be lost during fuel reduction activities, which could be beneficial to the tern by opening up more areas that could potentially be additional breeding habitat in the long term. The use of chemicals would not impact the terns because the main chemical to be used would be “Arsenal” to treat tamarisk in or near least tern habitat. The EPA label reads “acute toxicity is non-existent to terrestrial animals, and chronic toxicity levels are very low”. Least terns would not experience indirect health effects from chemical or mechanical treatments of fuels either within their breeding territories or in foraging areas with the implementation of the Conservation Measures to implement management activities during the time of year the least terns are not present in their breeding area. Additional planning and possible consultation with FWS would be required. Overall, the proposed fire management activities, including the Conservation Measures, would not affect the numbers, distribution, or reproduction of least terns on non-federal lands.

3.2.2. D.3) Effects of the Proposed Action - Cumulative Effects:

In southeastern New Mexico, where the interior least tern resides, land ownership is a checkerboard pattern of State, private, and Federal lands (BLM). Since these terns breed in the vicinity of Roswell, including regularly at Bitter Lake N.W.R. – which is the key and essential habitat area in the state -- and perhaps rarely at Bottomless Lake State Park and Wade's Bog, few cumulative impacts could occur other than human disturbance. If least terns start breeding on the Pecos river, agricultural activities (*e.g.,* grazing), human population

expansion and infrastructure development, and unregulated recreation on State and private lands within the action area (New Mexico), could potentially affect nesting, foraging, and roosting habitats, as well their food source, through incidental predator control, human disturbance, loss of key habitat features such as nesting sandbars, roost sites, or ground cover, and alteration or fragmentation of foraging and nesting habitat.

3.2.2. E) *Conclusion/Effects Determination*

Because least terns main breeding habitat occurs within Bitter Lake N.W.R., which is the key and essential habitat area in the state, and National Wildlife Refuges are set up for the protection of wildlife species, the probability of effects to the species from the proposed fuel reduction activities on non-federal lands would be so low as to be discountable, and would not affect reproduction. However, the proposed actions would potentially result in an overall improvement in habitat conditions for the least tern. This improvement in habitat conditions could promote re-occupancy of the tern's historical range, thus improving numbers and distribution in New Mexico. Additionally, Conservation Measures would be implemented to avoid negative effects to the species. **Therefore, it is BLM's determination that the proposed action may affect, but is not likely to adversely affect, the interior least tern.**

3.2.3 Northern Aplomado falcon (*Falco femoralis septentrionalis*) Endangered, 10(j) Experimental Nonessential Population

3.2.3. A) Species Life History, Status and Distribution

Northern Aplomado falcons are fast, powerful flyers, living from 15 to 30 years. Females typically lay 2 to 3 eggs between March and May. Both adults help to incubate the eggs. The young falcons begin to fly at approximately 30 days of age. The diet consists of insects and small birds, usually caught and consumed in the air.

Aplomado falcon were designated a nonessential experimental population on July 26, 2006, under section 10(j) of the Endangered Species Act. Species with this designation are considered a "proposed" species for purposes of compliance with Section 7 of the Act. In compliance with Section 7 of the Endangered Species Act we are providing the evaluation materials we used to make a determination of Not Likely to Adversely Affect the Aplomado falcon for this proposed action. Aplomado falcons were released in New Mexico starting in 2006 and releases will continue for another 10 years to increase the numbers of birds mainly in Hidalgo, Grant, Luna, Dona Ana, Sierra, and Otero Counties.

3.2.3. B) Affected Habitat

Northern Aplomado falcons primarily inhabit open grassland or savannah with scattered trees and shrubs, particularly sites with low ground cover and mesquite

or yucca for nesting platforms. They also use desert grasslands, at low elevations, adjacent to shrubby habitats
.
Other important habitat components include moderately low ground cover, an abundance of small to medium sized birds for forage, and a supply of nesting platforms, including large bromeliads and stick nests. In desert habitats, nest availability is influenced by the presence of birds that build large size nests, such as crows, kites, ravens, or hawks as falcons do not build their own nests.

3.2.3. C) Species-specific Conservation Measures (in addition to those in Section 3)

1) No treatment (prescribed burning, slash pile burning or vegetation treatments) will be allowed and human access restricted within ½ mile of nest sites during the breeding season. Prescribed burning and slash pile burning will be conducted in a manner to ensure nest sites are more than ½ mile from downwind smoke effects.
2) Fuel reduction actions would ensure that the yucca component is not damaged or lost by protecting these yuccas from fire, mechanical or chemical treatments.

3.2.3. D.1) Effects of the Proposed Action - Direct Effects:

Very few northern Aplomado falcons are known to nest in New Mexico so the probability of direct effects to the species from the proposed fuel reduction activities is low. Because Aplomado falcons could potentially increase in numbers in New Mexico, either through reintroduction or natural immigration, or nesting, Conservation Measures that apply to all projects would be implemented for the proposed fuel reduction activities to minimize or eliminate any direct effects to the birds and their breeding or nesting habitat. Any potential residual direct effects to the Aplomado falcon would include minor auditory and visual disturbance from machinery and personnel and associated fuel reduction activities. Habitat disturbance could potentially occur in the short-term, but would result in a positive benefit by reducing the risk of catastrophic wildfire. In the long-term, falcon habitat could benefit from prescribed fire, or mechanical or chemical treatment projects. Pre-project planning and the implementation of Conservation Measures would continue to make the probability of any direct effects to the species so low as to be discountable from prescribed fire, slash pile burning and mechanical treatments that could occur in or near occupied sites. No direct effects to Aplomado falcons are expected from mechanical or chemical treatments that may occur in occupied and suitable habitat.

3.2.3. D.2) Effects of the Proposed Action - Indirect, Interrelated and Interdependent Effects:

There could be indirect, interrelated, or interdependent effects to Aplomado falcons, or their prey or prey's habitat, from fuel reduction activities. The herbaceous/grassland component within suitable breeding or foraging habitat for

the falcon would quickly recover from treatments in these semi-desert grassland vegetation communities.

The objective of the proposed fuel reduction actions is to reduce dense vegetation that may be a threat to urban interface areas. This could involve removing shrubs in shrub-invaded grasslands, and possibly other non-native grass species (*e.g*., Lehmann lovegrass) within suitable habitat for falcons. Since tall, multi-branched yuccas are an important component for nesting Aplomado, protection of this component is essential. Fuel reduction actions would ensure that this component is not damaged or lost by protecting these yuccas from fire, mechanical or chemical treatments. Since the Aplomado falcon is a grassland-dependent species, fuels reduction treatments, such as prescribed fire or vegetation treatments (mechanical, chemical, or biological), could improve the habitat for the falcon. Mechanical treatments and prescribed burns may cause short-term impacts to falcon prey species, such as birds, insects, small mammals, and herpetofauna, however, these impacts would be insignificant to the falcon because of the variability of its prey and because these prey species could quickly recover from any fire-related effects. In the long-term, these treatments could result in improved habitat conditions for these grassland prey species. Ultimately, the proposed action could result in an overall improvement to the habitat for the Aplomado falcon. The distribution of the species would not be compromised; rather, the resulting anticipated shift from unsuitable to suitable conditions from the proposed treatments could benefit northern Aplomado falcons, improve distribution and increase the number of Aplomado falcons within New Mexico.

3.2.3. D.3) Effects of the Proposed Action - Cumulative Effects:

In southwestern New Mexico, where the falcons historically resided, land ownership is a checkerboard pattern of State, private, and Federal lands (USFS and BLM). As releases of falcons continue, activities on State and private lands within New Mexico would have cumulative effects to the species from agricultural activities (*e.g.,* grazing), human population expansion and infrastructure development, and unregulated recreation on State and private lands within the New Mexico. These could potentially affect nesting, foraging, and roosting habitats, as well as falcons or their prey, through incidental predator control, human disturbance, loss of key habitat features such as nesting platforms, roost sites, or ground cover, and alteration or fragmentation of foraging and nesting habitat.

3.2.3. E) *Conclusion/Effects Determination*

The probability of direct effects to the species from the proposed fuel reduction activities would be unlikely, and would not affect reproduction. However, the proposed action could result in an overall improvement in habitat conditions for the falcon which could improve numbers and distribution in New Mexico. Additionally, should the species continue to nest and increase in numbers on non-federal lands before the end of the Grant Program, implementation of the

Conservation Measures would avoid negative effects to the species. **Therefore, it is BLM's determination that the proposed action may affect, but is not likely to adversely affect, the northern Aplomado falcon.**

3.2.4 Piping Plover (*Charadrius melodus*) Threatened

3.2.4. A) Species Life History, Status and Distribution

Piping plover occur on sandflats or along bare shorelines of rivers, lakes, or coasts. Piping plover nest from late March to August on beaches in the Great Lakes and Atlantic Coast areas, bare areas on islands in the upper Missouri River system, and patches of sand, gravel, or pebbly-mud on the alkali lakes of the northern Great Plains. Most adults return to their previous nesting sites, where males set up and defend territories. The piping plover forages on a variety of invertebrates, including marine worms, fly larvae, beetles, crustaceans, mollusks, and other small animals and their eggs.

This species was listed Threatened in December 11, 1985. The piping plover breeds (or bred) from Alberta and Manitoba south to Nebraska, in the Great Lakes region, and along the Atlantic Coast from New Brunswick south to North Carolina. The species migrates mainly through the Mississippi Valley and along the Atlantic Coast, and it winters primarily along the Atlantic and Gulf coasts from South Carolina to Texas.

In New Mexico, this plover is known only as a rare spring (April) migrant, having been verified at Springer Lake (Colfax Co.) and reliably reported at Bosque del Apache National Wildlife Refuge (Socorro Co.).

3.2.4. B) Affected Habitat

Within Colfax County, NM, the piping plover has only been identified at Springer Lake and is considered only as an accidental migrant. Causes for the piping plover drastic decline are the loss and modifications of their nesting and wintering habitat due to commercial, residential and agricultural development; dune stabilization; damming and channelization of rivers which eliminates sandbars and allows vegetation encroachment; and wetland drainage. Other threats include human disturbance through recreational and vehicular traffic use and subsequent increases in predation by skunks, foxes, gulls, and domestic animals.

3.2.4. C) Species-specific Conservation Measures (in addition to those in Section 3)

1) Prescribed fires, slash pile burning, vegetative and herbicide treatment projects in occupied or suitable riparian/marsh habitat would only occur between September 1 and March 15 to avoid the breeding season in piping plover habitat.
2) Drift-inhibiting agents would be used to assure that the herbicide does not enter river areas.

3.2.4. D.1) Effects of the Proposed Action - Direct Effects:

Implementation of the Conservation Measures that apply to all projects would help lessen the direct impacts to the piping plover and its habitat. Piping plovers that are nesting, or foraging could experience direct effects from disturbance through noise and human activity. Mortality of young or adult birds could be expected if the actions occur within the nesting and feeding habitat of the piping plover. Piping plovers would not experience direct health effects from chemical or biological treatments of fuels either within their wintering territories or in foraging areas because implementation of fuel reduction activities will occur only during the time of year the piping plover are not present in the area. Overall, the direct impacts from fuel reduction actions are unlikely since there is no nesting or breeding occurring in New Mexico and the piping plover is only a migrant.

3.2.4. D.2) Effects of the Proposed Action - Indirect, Interrelated and Interdependent Effects:

Conservation Measures that include recommendations on how to manage the prescribed fires or vegetation treatment activities would render the potential for any indirect effects to piping plovers from prescribed fires, slash pile burning and vegetation treatments so unlikely as to be discountable. Treatments proposed within nesting territories would require further consultation with FWS. Because piping plovers forage close to their breeding grounds, activities associated with project implementation could disturb their feeding and foraging behavior, however, there are no breeding activities in New Mexico. Plovers could experience visual or auditory disturbance from human presence and activity, particularly during mechanical treatments, and prescribed fires. Because of the increased use of wildfire or prescribed fire as a resource management tool, some vegetation may be lost during these activities, which could be beneficial to the piping plover by opening up more areas that could potentially be additional breeding habitat in the long term. The use of chemical would not impact the piping plovers because the main chemical to be used would be “Arsenal” to treat tamarisk in or near piping plover habitat. The EPA label reads “acute toxicity is non-existent to terrestrial animals, and chronic toxicity levels are very low”. Overall, the proposed fuel reduction activities, including the Conservation Measures, would not affect the numbers, distribution, or reproduction of piping plovers on non-federal lands in NM.

3.2.4. D.3) Effects of the Proposed Action - Cumulative Effects:

In northern New Mexico, where piping plover resides, land ownership is a checkerboard pattern of State and private. Since the plovers are mainly migrants at Springer Lake and at Bosque del Apache, few cumulative impacts would incur other than human disturbance. There is no historical evidence that piping plovers nested in New Mexico. If piping plovers start breeding in New Mexico riparian/wetland areas, agricultural activities (*e.g.,* grazing), human population expansion and infrastructure development, and unregulated recreation on State and private lands within the action area, could potentially affect nesting and

foraging habitats, as well their food source, through incidental predator control, human disturbance, loss of key habitat features such as nesting sandbars, or ground cover, and alteration or fragmentation of foraging and nesting habitat.

3.2.4. E) *Conclusion/Effects Determination*

Because piping plovers are mainly migrants within New Mexico, the probability of effects to the species from the proposed fuel reduction activities would be so low as to be discountable, and would not affect reproduction or migration. However, the proposed action could result in an overall improvement in habitat conditions for the piping plover. This improvement in habitat conditions would promote re-occupancy of the plover's historical range, thus improving numbers and distribution in New Mexico. Additionally, should the species occur on non-federal lands during the Grant Program, Conservation Measures would avoid negative effects to the species. **Therefore, it is BLM's determination that the proposed action may affect, but is not likely to adversely affect, the piping plover.**

3.2.5 Southwestern willow flycatcher (*Empidonax traillii extimus*) Endangered, Critical Habitat in 7 counties

3.2.5. A) Species Life History, Status and Distribution

Willow flycatchers are neotropical migrants that breed in the southwest U.S. and migrate to Mexico and Central America during winter. The breeding season for southwestern willow flycatchers varies. At the earliest, flycatchers are found in breeding territories in late April to early May. Nesting begins in late May and early June. Nests are open cup structures, typically placed in the fork of a branch in a variety of tree species including Gooding's willow, box elder, Russian olive, and tamarisk. Nest heights vary with substrate but range from as low as 2.0 ft above the ground to over 46 ft above the ground. Young fledge from mid-June through mid-August, depending on re-nesting attempts. Nests are often parasitized by Brown-headed cowbirds. Southwestern willow flycatchers typically raise one brood per year but have been documented raising two broods during one season and may renest after nest failure. Most flycatchers survive to breed one or two seasons. The birds migrate southward in August and September. The diet of the southwestern willow flycatcher consists almost entirely of flying insects, although they may also eat berries and seeds.

The southwestern willow flycatcher was listed as endangered on February 27, 1995. Critical habitat was designated on October 19, 2005 and can be found in Grant, Hidalgo, Mora, Rio Arriba, Socorro, Taos and Valencia Counties. The distribution of this subspecies is restricted to riparian corridors within its range. Currently, the southwestern willow flycatcher occurs in six drainages in New Mexico, including the Rio Grande, Chama, Zuni, San Francisco, Gila River, and Bluewater Creek. The birds occur on lands owned or managed by all federal agencies, as well as tribal, state, county, and private lands. This species is

endangered because of riparian habitat loss and fragmentation, brood-parasitism by brown-headed cowbirds, diversion of water, draining of wetlands, channelization and levying of streambeds, construction of canals, drains and impoundments, livestock grazing, off-road vehicles, and the cutting of woodlands. Declining populations may also be due to predation and by invasion of riparian habitat by exotic species.

3.2.5. B) Affected Habitat

The species is riparian obligate, preferring dense canopy cover, a large volume of foliage, and surface water during midsummer. Breeding birds occupy habitat along rivers, streams, wetlands, and lakes, where dense growths of willow (*Salix* spp.), seepwillow (*Baccharis* sp.), buttonbush (*Cephalanthus* sp.), boxelder (*Acer negundo*), tamarisk (*Tamarix* spp.), or other plants are present, often with a scattered overstory of cottonwood and/or willow. Preferred habitat includes cottonwood-willow thickets, although with the significant loss of this native riparian vegetation, the species will also use tamarisk (*Tamarix* spp.) or Russian olive (*Eleagnus angustifolia*) thickets and riparian associates. Nests are generally constructed in mature forests of Gooding willow and Fremont cottonwood along still or slow moving waterways at lower elevations; at higher elevations, nests are constructed in pure willow stands.

Among the most important aspects of southwestern willow flycatcher habitat is the presence of a dense canopy and proximity to standing water. The size and shape of occupied riparian habitat patches vary considerably. Southwestern willow flycatchers have been found nesting in patches as small as 2 acres and as large as several hundred ha. Open water, cienegas, marshy seeps, or saturated soil are typically in the vicinity of flycatcher territories and nests. However, the total absence of water or visibly saturated soil has been documented at several willow flycatcher breeding sites in other areas where water was previously present in the river channel.

3.2.5. C) Species-specific Conservation Measures (in addition to those in Section 3)

1) Implementation activities (prescribed burning, slash pile burning or vegetation treatments) would not occur within occupied or unsurveyed suitable habitat (including tamarisk stands) without further consultation with U.S Fish and Wildlife Service.
2) Avoid developing access roads that would result in fragmentation or a reduction in habitat quality. Close and rehabilitate all roads that were necessary for project implementation.
3) Prescribed burning or slash pile burning will only be allowed within ½ mile of occupied or unsurveyed suitable habitat when weather conditions allow smoke to disperse away from the habitat when birds may be present (breeding season of April 1 – September 30).

4) Vegetation treatment projects adjacent to occupied or unsurveyed suitable habitat will not be conducted without further consultation with U.S. Fish and Wildlife Service.

3.2.5. D.1) Effects of the Proposed Action - Direct Effects:

Many riparian habitats in New Mexico are severely altered, leaving these non-fire-adapted habitats at risk from severe wildfires. In some instances, prescribed fire or mechanical treatments could be used to reduce hazardous fuels in severely altered riparian habitats to reduce the chance of catastrophic fire. Site-specific assessments could determine if and when any fuel reduction activity is appropriate in riparian habitats in or near occupied, suitable, or potential flycatcher habitat. Fuel reduction in occupied or unsurveyed suitable habitats would not be allowed without additional consultation with FWS. Implementing the Conservation Measures for these birds would minimize any direct effects to southwestern willow flycatchers from mechanical treatments, prescribed fire or slash pile burning. Thus breeding individuals, young, and eggs would not be directly affected by this activity. Smoke and/or human activity, associated with prescribed fires or slash pile burning may disturb migrating individuals if they are occupying or moving through an area during project implementation. Any effects could be short-term and temporary, as these migrating adult birds could likely survive these disturbances and could move to adjacent sites outside the project area. After consultation, if direct loss of suitable or potential habitat patches occurs from mechanical treatments or prescribed fires, impacts could be reduced by rehabilitation actions that would create potential habitat, such as planting native riparian vegetation (e.g., cottonwoods and willows) on burn sites, although it may be several years before the structure of the vegetation creates suitable habitat for flycatchers.

3.2.5. D.2) Effects of the Proposed Action - Indirect, Interrelated and Interdependent Effects:

Indirect effects to the willow flycatcher would be primarily due to changes in habitat quality and quantity from the proposed fuel reduction activities. Flycatchers may experience positive interdependent effects from aggressive fuel reduction actions within riparian habitats, by minimizing the amount of occupied, suitable, or potential habitat lost from catastrophic wildfires occurring in these habitats. The species may also experience positive interrelated effects from post-treatment rehabilitation and restoration activities in riparian areas, which could improve the quality and quantity of suitable and potential flycatcher habitat. Using the variety of proposed fuel reduction actions to restore riparian habitats could result in positive, long-term effects to willow flycatchers. Native riparian vegetation composition and structure could be improved over time. The risk of catastrophic wildfires could be reduced by reducing fuel loads, including *Tamarisk*, which is highly flammable and aggressively resprouts after fires. Because use of these techniques would be selective and be implemented in stages, a range of variability in occupied, suitable, and potential flycatcher habitat would be retained. The short-term direct loss of suitable habitat in one location

would be balanced with retention of current habitat conditions in nearby locations, allowing willow flycatchers to relocate among suitable habitat patches. Other indirect effects may occur to willow flycatcher food sources, which includes a variety of insects that could be affected by fuel reduction activities.

3.2.5. D.3) Effects of the Proposed Action - Cumulative Effects:

The southwestern willow flycatcher and its habitat have been severely impacted by activities on State and private lands within the state of New Mexico. These activities, such as urbanization, recreation, and grazing, are expected to continue in the future. Cumulative effects may be direct on individuals, or effects on habitat. Increases or changes in the types of potential cowbird foraging sites (e.g., bird feeders, corrals, and stockyards) could increase the potential for cowbird parasitism of local flycatchers. Construction within the 100-year floodplain could destroy or negatively alter suitable habitat, including occupied nesting sites. Increased recreational use of the river floodplains, particularly by off-highway vehicles or river floaters, may also disturb nesting birds or damage suitable habitat.

3.2.5. E) *Conclusion/Effects Determination*

Implementing the Conservation Measures would greatly minimize and/or eliminate negative impacts to nesting willow flycatchers, as well as occupied, suitable, and potential habitat. Overall, the proposed activities are not expected to affect the numbers, reproduction, or distribution of the subspecies. In addition, reducing the threat of catastrophic wildfires in some riparian habitats by using a variety of fuels reduction treatments and restoration activities is expected to benefit the species and its suitable and potential habitats. **It is BLM's determination that the proposed action may affect, but is not likely to adversely affect, the southwestern willow flycatcher. The proposed action is not likely to result in the destruction or adverse modification of critical habitat of the southwestern willow flycatcher.**

3.2.6 Mexican spotted owl (*Strix occidentalis lucida*) Threatened, Critical Habitat

3.2.6. A) Species Life History, Status and Distribution

Mexican spotted owls (MSO) roost during the day and forage during dusk and night hours. They are intolerant of moderately high temperatures, and may roost on north facing slopes with dense overhead canopies in summer daytime hours. Mexican spotted owls have a low survival rate of young to breeding age. The diet consists of woodrats, birds, lagomorphs, and insects. Prey is snatched from the ground after a gliding descent from a perch.

The Mexican spotted owl was listed as a threatened species on March 16, 1993. The species is threatened by logging of old growth forests. Additionally, the owls may compete with great horned owls in forests that have been thinned.

This species is patchily distributed in forested mountains statewide. It occurs at elevations from 3000-9000 ft in nearly all counties in New Mexico, except in 9; Curry, De Baca, Guadalupe, Harding, Lea, Quay, Roosevelt, and Union, which mainly make up the entire eastern part of New Mexico and Luna County which is located in the southern part of the state. Mexican spotted owls occur primarily on USFS lands, and may occur sparsely on tribal lands, private lands and in National Parks. Critical habitat is designated in the 24 counties where the owl occurs.

3.2.6. B) Affected Habitat

In New Mexico, the Mexican spotted owl is patchily distributed in forested mountains. These owls nest primarily in dense older forests of mixed conifer or ponderosa pine/gambel oak type, located on steep slopes, and deep, shady ravines or canyons. Optimum habitat includes sites with cool microclimate and high canopy closure, high basal area, many snags, and downed logs. The owl nests in cavities of coniferous trees, scrapes on cliff sites, and abandoned platform nests. A single owl's range averages 1,600 acres, while a mating pair's home range averages 2,000 acres. They use a variety of habitats for foraging, including multi-layered forests with many potential patches. Canyon habitats located in New Mexico are considered too hot and dry to provide suitable habitat for the species.

The majority of critical habitats in New Mexico occur on lands managed by the U.S Forest Service, Indian Reservation lands and State lands. Within New Mexico, these habitats are fire-adapted; however, many of these sites are overgrown with dense shrubs and young trees because they have been subjected to a regime of aggressive fire suppression and fire exclusion. Primary constituent elements of designated critical habitat for Mexican spotted owls within Protected Activity Centers (PACs) include all vegetation and other organic material within the 600 acre areas. Within restricted habitat, the primary constituent elements that occur in mixed conifer, pine-oak, and riparian forest types, which currently contain or may attain the habitat attributes believed capable of supporting nesting and roosting owls include:

1) High basal area of large diameter trees;
2) Moderate to high canopy closure;
3) Wide range of tree sizes suggestive of uneven-aged stands;
4) Multi-layered canopy with large overstory trees of various species;
5) High snag basal area;
6) High volumes of fallen trees and other woody materials (woody debris);
7) High plant species richness, including hardwoods; and
8) Adequate levels of residual plant cover to maintain fruit, seeds, and regeneration to provide for the needs of Mexican spotted owl prey species.

In canyon habitat, the primary constituent elements include one or more of the following attributes:

1) Cooler and often more humid conditions that the surrounding area;
2) Clumps or stringers of trees and/or canyon wall containing crevices, ledges, or caves;
3) High percent of ground litter and woody materials (woody debris); and
4) Riparian or woody vegetation (although not at all sites).

3.2.6. C) Species-specific Conservation Measures (in addition to those in Section 3)

1) The Recovery Plan for Mexican Spotted Owl (December 1995) will be followed for all proposed projects in Mexican Spotted owl habitats (http://www.fws.gov/southwest/es/mso/recovery_plan.htm).
2) No fuel reduction activities will occur within MSO designated critical habitat or protected or restricted habitat without further consultation with the FWS.
3) MSO protected or restricted habitat and designated critical habitat for MSO will be surveyed following the MSO protocol prior to implementing prescribed fire, slash pile burning or vegetation treatment activities on non-federal lands to determine MSO presence and breeding status. These activities will only be implemented within protected or restricted or critical habitat if birds are not present. If a spotted owl is discovered during these surveys, BLM will notify the FWS to reinitiate consultation and will determine any additional Conservation Measures necessary to minimize or eliminate impacts to the owl.
4) Mechanical cutting of trees is allowed as follows: within protected areas (PACs), trees with dbh less than 9 inches, and in restricted areas, trees with dbh of less than 18 inches. This tree cutting is only allowed during the non-breeding season which is September 1 to February 28.

3.2.6. D.1) Effects of the Proposed Action - Direct Effects:

Pre-project surveys would be conducted for prescribed fires, slash pile burning and mechanical treatments planned in protected, restricted or critical habitat for the species, and activities would only be implemented if owls are not present. Therefore, adult, young, and eggs of these owls would not experience direct effects from vegetation treatments or prescribed fires within protected, restricted or critical habitat. If an owl is located in the Grant Program project area during these pre-project surveys or during the fuel reduction activities, the BLM New Mexico State Office biologist would be notified and measures would be taken to minimize or eliminate effects to the owl. BLM would reinitiate consultation with the FWS to analyze effects of the fuel reduction activities on the owl and to determine the need for additional Conservation Measures.

Use of prescribed fire, and mechanical vegetation treatments and slash pile burning to reduce fuel loads and improve overall forest condition could have the potential to initially reduce the quality of spotted owl habitat at a particular location by changing the owl's habitat structure. Effects could potentially include reducing dense canopy cover, reducing multi-storied canopies, or reduction of

the number of snags, downed logs, and woody materials (woody debris). However, clearing understory vegetation by the various fuel reduction actions would potentially improve foraging conditions for spotted owls in suitable or critical habitat. And reducing fuel accumulations in spotted owl roosting and nesting habitat through mechanical thinning could modify fire behavior to lower-intensity burning to benefit owl habitat.

3.2.6. D.2) Effects of the Proposed Action - Indirect, Interrelated and Interdependent Effects:

Indirect effects to the Mexican spotted owl include effects to prey species and prey species' habitat, as well as long-term changes in suitable or critical habitat. Changes in forest structure, including the removal of many downed logs or snags, by proposed fuel reduction activities could indirectly affect spotted owls by changing the structure of their prey species' habitat, affecting the abundance and composition of prey species. Although these fuel reduction actions could have negative effects to prey species and their habitat in the short-term, the proposed treatments could increase the diversity of vegetative conditions that in turn provide for a diverse prey base. Because dispersing wintering owls could forage in a variety of habitat types, any negative changes in the prey base in suitable or critical habitat could be insignificant to the species.

The long-term effects to habitat from the proposed fuel reduction activities would primarily be beneficial for spotted owls by restoring forest habitats and reducing the risk of catastrophic wildfires resulting from years of fire exclusion and aggressive fire suppression. These catastrophic wildfires could destroy the large, old growth trees and snags that are important habitat components to spotted owls, as well as destroying large acreages of suitable or critical habitat. Mexican spotted owls and their critical habitat would benefit from interdependent effects of fire management actions that prevent loss of critical habitat from catastrophic. Using a combination of carefully-timed adaptively managed wildfires, prescribed fires, and mechanical vegetation treatments to reduce fuel loads and fuel continuity are important tools in protecting and improving spotted owl habitat. These treatments could reduce the potential for stand-replacing fires, and could help to return forests to their natural fire regime. As the proposed fuel reduction activities are implemented over the long-term (15-20 years), Mexican spotted owls could potentially experience the positive effects of improved suitable and critical habitat and reduced risk of catastrophic wildfire in urban interface settings.

3.2.6. D.3) Effects of the Proposed Action - Cumulative Effects:

The Mexican Spotted Owl Recovery Plan recognizes catastrophic fire as a primary threat to Mexican spotted owls in all five Recovery Units in the United States. Within New Mexico, Mexican spotted owls and their suitable and critical habitat occur primarily on lands managed by several Federal agencies (69 CFR 53182). However, there is a potential for the cumulative loss of spotted owls and their habitat from catastrophic wildfires on State and private lands in New

Mexico, particularly if they spread onto Federal lands occupied by owls or their critical habitat. Wildfires frequently affect more acreage, have a higher level of impact, and the duration of the impact is much longer than under the natural fire regime for the owl's habitat. Ponderosa pine and mixed conifer communities that have experienced stand-replacing fires can take up to 100 years to recover, and, in some cases, as long as 240 to 300 years to attain the old-growth characteristics required by the Mexican spotted owls for nesting. Fire suppression tactics on State and private lands that continue to exclude fire from fire-adapted forest habitats used by or suitable for owls, and that continue to alter the natural forest structure and composition, would also continue to reduce the suitability of habitat for Mexican spotted owls. Conversely, as State and private landholders also recognize the need to reduce hazardous fuels and restore forest habitats, fire management activities on these lands may, in the long-term, restore the suitability of forested habitats for reoccupation by Mexican spotted owls.

In addition, timber harvesting, human population expansion and infrastructure development, and unregulated recreation on State and private lands within the action area could potentially affect nesting, foraging, and roosting habitats, as well as spotted owls and their prey, through human disturbance, loss of key habitat features such as nesting sites, and alteration or fragmentation of nesting and foraging habitat.

3.2.6. E) *Conclusion/Effects Determination*

Because pre-project surveys would be conducted to verify the species presence or absence, and the low probability of having an undetected owl in a location where fuel reduction activities would occur, any adverse effects to the subspecies would be unlikely. The proposed fuel reduction activities have the potential for minor, short-term adverse effects to critical or protected or restricted habitat for spotted owls, although these habitats in Grant Program areas typically do not sustain the primary constituent elements or old-growth characteristics preferred by owls. Implementation of the Conservation Measures would further minimize or eliminate the potential for negative effects to the subspecies or its critical habitat, as to make this potential so low as to be discountable. Conversely, the proposed action would have long-term, widespread beneficial effects on spotted owls and their critical habitat by reducing the threat of catastrophic wildfire and restoring their forest habitats, including the natural forest structure and fire regime. Overall, the proposed fuel reduction activities will not affect the numbers, reproduction, or distribution of the subspecies. If an owl is ever detected during implementation of the proposed action, the BLM would reinitiate consultation to analyze the effects of the activity and to determine the need for additional Conservation Measures. **Therefore, it is BLM's determination that the proposed action may affect, but is not likely to adversely affect, the Mexican spotted owl. The proposed action is not likely to result in the destruction or adverse modification of critical habitat of the Mexican spotted owl.**

3.2.7 Yellow-billed cuckoo (*Coccyzus americanus*) Candidate

3.2.7. A) Species Life History, Status and Distribution

The breeding season of the Yellow-billed cuckoo often coincides with outbreaks of cicadas and tent caterpillars. The diet consists of hairy caterpillars and various insects, bird eggs, frogs, lizards, and berries and fruit.

The yellow-billed cuckoo was listed as a candidate species on June 13, 2002. The FWS has found that the species warrants listing, but other, higher priority listing actions prevent the FWS from addressing the listing of the cuckoo at this time. Yellow-billed cuckoo decline is primarily due to habitat loss. In the West, cuckoos are closely associated with broadleaf riparian (i.e. streamside) forests. Logging, cattle, grazing, dams, water diversions, and water pumping have decimated the West's rivers and riparian forests, however, causing over a hundred birds, fish, amphibians, and mammals to be listed as federally endangered species.

In New Mexico, the Yellow-billed cuckoo is found in all the western counties of the state, especially along the Gila River. The Yellow-billed cuckoo occurs on land owned or managed by most Federal agencies, as well as tribal, state, and private lands.

3.2.7. B) Affected Habitat

The cuckoo requires large blocks of riparian woodlands such as cottonwood-willow galleries or tamarisk thickets. Habitat includes mature cottonwood-willow stands and large mesquite bosques. Nests are built in willow or mesquite thickets, 4 to 30 feet above ground. Most riparian habitats in New Mexico have been severely destroyed, damaged, or altered, putting these non-fire adapted habitats at severe risk for wildfires.

3.2.7. C) Species-specific Conservation Measures (in addition to those in Section 3)

1) Prescribed fires, slash pile burning, vegetative and herbicide treatment projects in occupied or suitable riparian/marsh habitat would only occur between September 1 and March 15 to avoid the breeding season. Herbicide application would not occur in yellow-billed cuckoo habitat during the breeding season.
2) Drift-inhibiting agents would be used to assure that the herbicide does not enter river areas.

3.2.7. D.1) Effects of the Proposed Action - Direct Effects:

Many riparian habitats in New Mexico are severely altered from a variety of causes, leaving these non-fire-adapted habitats at risk from severe wildfires. In some instances, prescribed fire and vegetation treatments and slash pile burning could be used to reduce hazardous fuels, to restore and maintain habitat in severely altered riparian habitats, and to reduce the chance of catastrophic fires.

Site-specific assessments could determine, if and when, these fire management activities are appropriate in riparian habitats that may be occupied by yellow-billed cuckoos. Because yellow-billed cuckoos are a riparian-obligate species, direct effects to the species and their habitat from these proposed fuel reduction activities would be similar to those described for southwestern willow flycatchers. Implementing Conservation Measures in riparian habitats would minimize or eliminate any direct effects to yellow-billed cuckoos from the proposed action.

3.2.7. D.2) Effects of the Proposed Action - Indirect, Interrelated and Interdependent Effects:

Because yellow-billed cuckoos are a riparian-obligate species, indirect effects to the species and their habitat from the proposed fuel reduction activities would be primarily due to changes in habitat quality and quantity from the proposed fuel reduction activities. Cuckoos may experience beneficial interdependent effects from fuel reduction actions within riparian habitats that minimize the amount of occupied or suitable habitat lost by catastrophic wildfires occurring in these habitats. This could include the positive, long-term effects of restoring riparian habitats used by yellow-billed cuckoos. Native riparian vegetation composition and structure could be improved over time. The risk of catastrophic wildfires could be reduced, by reducing fuel loads, including tamarisk, which is highly flammable and aggressively resprouts after fires. They may also experience beneficial interrelated effects from post-treatment rehabilitation and restoration activities that improve the quality of riparian habitats.

3.2.7. D.3) Effects of the Proposed Action - Cumulative Effects:

Because yellow-billed cuckoos are a riparian-obligate species, cumulative effects to the species and their habitat from activities on State and private lands would be similar to those described for southwestern willow flycatchers.

3.2.7. E) *Conclusion/Effects Determination*

Implementing Conservation Measures for the proposed fuel reduction activities within riparian habitats will greatly minimize adverse impacts to yellow-billed cuckoos. Overall, the proposed activities are not expected to affect the numbers, reproduction, or distribution of yellow-billed cuckoos. In addition, reducing the threat of catastrophic wildfires in riparian habitats by using a variety of fuels reduction treatments and restoration activities is expected to benefit the species. **It is BLM's determination that the proposed action may affect, but is not likely to adversely affect, the yellow-billed cuckoo.**

3.3 Fish

This Biological Evaluation will analyze 12 federally listed fish species and 7 designated critical habitats that have the potential to be affected by the implementation of the proposed fuel reduction activities. Potential effects and the level of effect to listed fish species that occur on or downstream from NMAC Grant Program projects depend upon the actual on-site activities that occur

within the range of each species, including the intensity, scope or size, and frequency of the activity. Activities on adjacent or upstream riparian and upland habitats potentially affect the quality of aquatic habitats located adjacently, down-slope, or downstream, directly and indirectly affecting federally protected fish species.

To protect, or at least minimize effects to, hydrologic processes and water quality variables, proposed fuels reduction projects using prescribed fire, vegetation treatments (mechanical, chemical, and biological) and slash pile burning would be implemented using general Conservation Measures that apply to all projects, species-specific Conservation Measures and Conservation Measures for Riparian and Aquatic Habitats. Further consultation with FWS may be required and would be determined on a case by case basis. Site-specific assessments would determine, if and when, these proposed activities are appropriate in riparian habitats or upstream/upslope habitats within the range of federally protected fish species.

Despite the particular habitat requirements of each fish species, some direct and indirect effects to fish species can be generalized, based on general ecological principles regarding fish habitat relationships. The following discussion will provide an overview of effects to federally protected fish species from implementing the proposed fuel reduction treatments on non-federal lands in New Mexico. Species-specific discussions will relate these general effects to the particular species life history or habitat requirements.

Mechanical (heavy equipment) vegetation treatments would be used where critical fuel conditions demand immediate, efficient action, and where natural resources can acceptably withstand the impacts associated with this method. This method would be used in a range of vegetation communities, primarily habitats with dense shrub or woody components. Manual vegetation treatments (use of hand-operated power tools or hand tools) would be used to reduce wildfire fuel loads on sites where methods can be extremely species selective and can be used in areas of sensitive fish populations and suitable or critical habitats. Chemical herbicides could be applied to reduce fuel loads and control regrowth of undesirable vegetation (e.g., tamarisk). Chemicals would be applied on the ground using vehicles or manual application devices.

Direct Effects Common to All Fish Species

The proposed fuel reduction vegetation treatments would result in the removal of riparian or upland vegetation located adjacent to, upstream, or upslope from federally protected fish species and suitable or critical habitats. Direct effects from mechanical removal would cause the greatest disturbance to vegetation, and the use of heavy machinery would also be more likely to disturb soils that would potentially erode or runoff into streams. Use of heavy equipment for mechanical removal of vegetation within or near streams could result in greater direct effects to federally protected fish from habitat destruction and mortality of

all life stages of some federally protected fish species compared to the other vegetation treatments. Site-specific assessments would determine, if and when, mechanical treatments are an appropriate management tool to reduce hazardous fuels that are adjacent to, upstream, or upslope from federally protected fish species. Implementing the Conservation Measures for riparian and aquatic habitats, as well as species-specific measures, would minimize direct effects to federally protected fish species from this activity.

Implementing manual vegetation removal (using hand tools), particularly in riparian habitats, would also minimize direct effects to fish species, since retention of more desirable vegetation would reduce the likelihood of decreased bank stability, increased sedimentation, and increased water temperatures. Mortality of fish would not occur with this treatment. While chemical herbicides can be toxic to fish on an acute basis, implementing the Conservation Measures would prevent these chemicals from entering the habitats of federally protected fish species. Herbicide applications would be scheduled and designed to minimize potential effects to non-target plants, as well as fish species. Hand-application of herbicides could be used in riparian areas (*e.g.,* to control tamarisk regrowth), but would use drift-inhibiting agents and application methods to prevent herbicides from entering aquatic habitats. Direct impacts to fish and wildlife species would be short-term, localized, and minimal, since direct mortality is unlikely, and sufficient vegetation would be retained to prevent adverse effects to fish habitats.

Indirect, Interrelated, and Interdependent Effects Common to All Fish Species

Indirect effects to federally protected fish species and their suitable and critical habitats from these fuel reduction treatments would most likely be from vegetation treatments that result in long-term changes to fish habitats. Indirect effects to federally protected fish would be unlikely from chemical treatments. Implementing vegetation treatments to reduce fuel loads would reduce the risk of catastrophic wildfires which could reduce the potential for large-scale losses of federally protected fish species and suitable and critical habitats.

Cumulative Effects Common to All Fish Species

Across the state of New Mexico, most federally protected fish species occur within drainages managed by many Federal, State, and private agencies and entities. These fish species and their suitable and critical habitats have been severely impacted by activities on all land ownerships in New Mexico. These activities, such as urbanization, recreation, and grazing, are expected to continue in the future on State and private lands within the basins containing these federally protected fish species. Human population expansion and associated infrastructure development along the major river drainages in New Mexico will continue to affect federally protected fish species. Construction, recreation, and grazing within the 100-year floodplain of river systems reduce habitat quality for federally protected fish species, and destroy or adversely modify critical habitat.

Urbanization often leads to some dewatering of river systems, through impoundments or water diversions, as well as removal of important wetland and riparian vegetation. Unregulated or State-regulated fishing and water recreation activities will continue to introduce alien species, such as bullfrogs, crayfish, and alien fish species that would prey on or compete with federally protected fish species, as well as diseases that could harm fish. Grazing practices that allow cows to enter occupied stream reaches decrease water quality and potentially trample near-shore spawning sites. These activities on State and private lands would also continue fragmentation, major manipulations, and pollution or degradation of wetland and river habitats. Conversely, improvements in riparian and terrestrial habitats on State or private lands adjacent to, upstream, or upslope from federally protected fish species through fuel reduction or other restoration activities could positively affect federally protected fish species, by reducing the potential for catastrophic wildfires, and, consequently, loss of vegetation and negative changes to water quality and habitat quality.

Cumulative effects to fish species from activities on State and private lands could include the following types of impacts:

- Changes in land use pattern around occupied reaches and designated critical habitat that further fragment, modify, or destroy upland or riparian vegetation, thereby negatively affecting water quality and quantity and the primary constituent elements of critical habitat.
- Encroachment of human development or recreational sites that remove upland or riparian vegetation, and potentially degrade water quality and habitat quality.
- Water withdrawals or diversions of aquatic habitats that reduce water quantity and quality.
- Competition with and predation by alien fish species introduced through fishing or recreational use of occupied reaches.
- Agricultural or grazing practices that degrade water quality or destroy potential spawning sites or critical habitat.
- Fire management actions by State, county, or city governments or private landholders on lands adjacent to or upstream from occupied sites or reaches that reduce the potential for catastrophic wildfires, as well as loss of vegetation and negative changes to water quality and habitat quality.

3.3.1 Rio Grande Silvery Minnow (*Hybognathus amarus*) Endangered, Critical Habitat

3.3.1. A) Species Life History, Status and Distribution

Rio Grande silvery minnow is a small, relatively heavy-bodied fish that rarely exceeds four inches total length. The Rio Grande silvery minnow has a herbivorous diet including epipsammatic algae are an important food source. Rio Grande silvery minnow spawns in late spring to early summer (May-June) when water temperatures are between 68 to 75ºF. Spawning coincides with spring

runoff. Following fertilization, eggs drift with the current for up to 50 hours. Hatching time is temperature dependent. Larvae drift for about a day after hatching and then move into low velocity habitats where food is abundant. Most Rio Grande silvery minnows live about 13 months, but a few long-lived individuals may survive up to about 25 months.

The Rio Grande silvery minnow was federally listed as endangered in 1994. Historically, this species was one of the most abundant and widespread fishes in the Rio Grande Basin, occurring from Espanola, New Mexico, to the Gulf of Mexico. It also occurred in the Pecos River, a major tributary of the Rio Grande, from Santa Rosa, New Mexico, to its confluence with the Rio Grande in South Texas. The Rio Grande silvery minnow has been extirpated from the Pecos River, and from most of its historical range in the Rio Grande River. The species now occurs in only a 163 mile reach of the Rio Grande from around Cochiti Dam downstream to Elephant Butte Reservoir in New Mexico. Within this reach it is rare north of Albuquerque, uncommon between Albuquerque and Isleta, seasonally common between Isleta and San Acacia, and, relatively common between San Acacia and the inlet of Elephant Butte Reservoir. Seventy percent of the remaining minnow population is reported to reside between San Acacia Diversion Dam and the headwaters of Elephant Butte.

The minnow's range has been so greatly restricted that the species is very vulnerable to a single naturally occurring event. In addition to its restricted distribution, Rio Grande silvery minnow numbers are highly variable both seasonally and annually. Its limited distribution and a poor reproductive year could be devastating to this species.

A final rule designating Rio Grande silvery minnow critical habitat was published on February 19, 2003 (68 FR 8088). The middle reach of the Rio Grande - from Cochiti Dam to the utility line crossing the Rio Grande in Socorro County, as well as the 300 foot riparian zone on each side of the river is included except when the river is bounded by levees; then the designation includes the levee as well. A portion of the tributary Jemez River that runs from Jemez Canyon Reservoir to its confluence with the Rio Grande is also designated as critical habitat. Primary constituent elements of critical habitat required to sustain the Rio Grande silvery minnow include:

- Stream morphology that supplies sufficient flowing water to provide food and cover needed to sustain all life stages of the species;
- Water of sufficient quality to prevent water stagnation (elevated temperatures, decreased oxygen, carbon dioxide build-up, etc.); and
- Water of sufficient quality to prevent formation of isolated pools that restrict fish movement, foster increased predation by birds and aquatic predators, and congregate pathogens.

3.3.1. B) Affected Habitat

The Rio Grande silvery minnow occupies a variety of habitats in low-gradient, large streams with shifting sand or silty bottoms. While it tolerates a wide variety of habitats, it prefers large streams with slow to moderate current over a mud, sand, or gravel bottom. Historically, Rio Grande silvery minnows occupied main channel run habitats over sand bottoms.

3.3.1. C) Species-specific Conservation Measures (in addition to those in Section 3)

See Conservation Measures for all listed fish.

3.3.1. D.1) Effects of the Proposed Action - Direct Effects:

In addition to the effects listed above for all listed fish, implementation of the conservation measures would result in insignificant and/or discountable direct effects to the Primary Constituent Elements.

3.3.1. D.2) Effects of the Proposed Action - Indirect, Interrelated and Interdependent Effects:

In addition to the effects listed above for all listed fish, implementation of the conservation measures would result in insignificant and/or discountable indirect, interrelated and interdependent effects to the Primary Constituent Elements.

3.3.1. D.3) Effects of the Proposed Action - Cumulative Effects:

Refer to general description above for all listed fish.

3.3.1. E) *Conclusion/Effects Determination*

NMAC Grant Program proposed projects within and upstream of the Rio Grande silvery minnow critical habitat will be reviewed by the BLM State Office Wildlife Biologist for compliance with applicable Conservation Measures. Therefore, with incorporation of the conservation measures, project implementation is unlikely to result in effects greater than insignificant and discountable effects to the Rio Grande silvery minnow or the Primary Constituent Elements. **It is BLM's determination that the proposed action may affect, but is not likely to adversely affect, the Rio Grande silvery minnow. The proposed action is not likely to result in the destruction or adverse modification of critical habitat of the Rio Grande silvery minnow.**

3.3.2 Gila Trout (*Oncorhynchus gilae*) Threatened

3.3.2. A) Species Life History, Status and Distribution

The Gila trout is a moderate sized salmonid that typically attains lengths of 7.8 to 9.8 inches total length; older individuals can exceed 13.7 inches.

Like many salmonids, Gila trout are opportunistic carnivores, consuming a large variety of aquatic and terrestrial insects entrained in the stream drift. Spawning

occurs in the spring, when water temperatures reach about 46°F and stream flows recede and utilizes substrates of fine gravel and course.

In 1966, the species was listed for the first time as endangered in the FWS Red Book. Protection was given to the endangered Gila trout under the Federal Endangered Species Preservation Act of 1966, and subsequently under the Endangered Species Act of 1973. Gila trout were reclassified to Threatened status on July 18, 2006.

Historically, the Gila trout was the only native trout in the headwaters of the Gila River, New Mexico possibly historically ranging from the headwaters down to its confluence with Mogollon Creek. The decline in Gila trout population and available habitat is due to a multitude of factors some of which are the introduction of non-native salmonids and land management practices that have caused habitat loss and modification.

3.3.2. B) Affected Habitat

The Gila trout inhabits small, cool, clear mountain streams that are typically narrow and shallow, along which riparian vegetation provides a complete canopy. Deep pools are important for the survival of the fish during droughts. Streams containing populations of Gila trout encompass two riparian vegetative communities. The arctic-boreal riparian community occurs within subalpine forest (2,500-3,500 m elevation) and extends to lower elevations in cool microclimates. The cold-temperate riparian community (1700-2300 m elevation) is the predominant type along streams currently occupied by Gila trout. Cobble is the predominate substrate, with low silt accumulations and prefer branches, logs, and undercut banks for cover.

3.3.2. C) Species-specific Conservation Measures (in addition to those in Section 3)

Refer to Conservation Measures for all listed fish.

3.3.2. D.1) Effects of the Proposed Action - Direct Effects:

Refer to the effects description above for all listed fish.

3.3.2. D.2) Effects of the Proposed Action - Indirect, Interrelated and Interdependent Effects:

Refer to the effects description above for all listed fish.

3.3.2. D.3) Effects of the Proposed Action - Cumulative Effects:

Refer to the effects description above for all listed fish.

3.3.2. E) *Conclusion/Effects Determination*

NMAC Grant Program proposed projects within and upstream of the Gila trout habitat will be reviewed by the BLM State Office Wildlife Biologist for compliance with applicable Conservation Measures. The potential for negative effects to

eagles from the proposed fuel reduction activities would be so unlikely as to be discountable or so minor as to be insignificant. **It is BLM's determination that the proposed action may affect, but is not likely to adversely affect, the Gila trout.**

3.3.3 Loach minnow (*Tiaroga cobitis*) Threatened, Critical Habitat

3.3.3. A) Species Life History, Status and Distribution

The loach minnow, a member of the minnow family Cyprinidae, is a small, slender, elongated fish rarely exceeding 2.6 inches in length with a life span of about two years. Loach minnow feed exclusively on aquatic insects largely deriving their food supplies from among riffle dwelling, larval mayflies, blackflies, and midges. Loach minnow appear to actively seek their food among bottom substrates rather than pursuing animals entrained in the stream drift. Loach minnow spawning typically occurs in the spring when water temperatures exceed 60°F.

The Loach minnow was listed as a threatened species on October 28, 1986. The loach minnow was once locally common throughout much of the Gila River basin, including the mainstem Gila River upstream of Phoenix, and the Verde, Salt, San Pedro, and San Francisco subbasins It occupies suitable habitat in both the mainstem reaches and moderate gradient tributaries, up to about 8,200 ft (2,500 m) in elevation. It is now restricted to portions of the upper Gila, the San Francisco, and Tularosa rivers in New Mexico; and is only common in limited portions of the upper San Francisco River, the upper Gila River, and Tularosa River in New Mexico.

Loach minnow critical habitat was designated on the upper Gila River and the West, East and Middle Forks of the Gila River in New Mexico on March 21, 2007 (72 FR 13355)**.** The designation includes portions of 21 streams for loach minnow; however, individual streams are not isolated, but are grouped with others to form areas or ‘‘complexes”. Critical habitat includes the area of bankfull width plus 300 ft (91.4 m) on either side of the banks. Designated critical habitat in these two basins runs from where each basin crosses the New Mexico/Arizona state line upstream to the headwaters of each of these drainages, including Pace Creek, Frieborn Creek, Dry Blue Creek, Negrito Creek, Tularosa River and the San Francisco River in Complex 4 and the Upper Gila River basin in Complex 5.

This species' range has been dramatically reduced and fragmented because of habitat destruction and competition and predation by introduced fish species. Activities that affect water quality, such as removal of riparian cover, sedimentation, or control of water levels, can affect loach minnow habitat quality. Dams and reservoirs appear to eliminate loach minnow populations for many miles both upstream and downstream by degrading habitat quality, disconnecting habitat, increasing sedimentation of substrate upstream and facilitating the

increase in abundance and spread of alien predators, especially flathead catfish and channel catfish.

3.3.3. B) Affected Habitat

Loach minnow are bottom-dwelling inhabitants of shallow, swift waters that flow over gravel, cobble, and rubble substrates with an open, low growing riparian community composed mostly of grasses and shrubs. Adult loach minnow are typically found in water flowing 2 to 2.5 feet per second and 6 to 7 inches deep, where they occupy the interstices of cobble-size substrate (these habitats occasionally have dense growths of filamentous algae). Loach minnow use the spaces between larger substrates for resting and spawning. The species is rare or absent from habitats where fine sediments fill the interstitial spaces.

The primary constituent elements essential to the conservation of the loach minnow are:

1. Permanent, flowing water with no or minimal pollutant levels, including:
   a. Living areas for adult loach minnow with moderate to swift flow velocities between 9.0 to 32.0 in/second (24 to 80 cm/second) in shallow water between approximately 1.0 to 30 inches in depth, with gravel, cobble, and rubble substrates;
   b. Living areas for juvenile loach minnow with moderate to swift flow velocities between 1.0 and 34 in/second (3.0 and 85.0 cm/second) in shallow water between approximately 1.0 to 30 inches (3 cm to 75 cm) in depth with sand, gravel, cobble, and rubble substrates;
   c. Living areas for larval loach minnow with slow to moderate velocities between 3.0 and 20.0 in/second (9.0 to 50.0 cm/second) in shallow water with sand, gravel, and cobble substrates;
   d. Spawning areas with slow to swift flow velocities in shallow water where cobble and rubble and the spaces between them are not filled in by fine dirt or sand; and
   e. Water with dissolved oxygen levels greater than 3.5 cc/l and no or minimal pollutant levels for pollutants such as copper, arsenic, mercury, and cadmium; human and animal waste products; pesticides; suspended sediments; and gasoline or diesel fuels.
2. Sand, gravel, and cobble substrates with low or moderate amounts of fine sediment and substrate embeddedness. Suitable levels of embeddedness are generally maintained by a natural, unregulated hydrograph that allows for periodic flooding or, if flows are modified or regulated, a hydrograph that allows for adequate river functions, such as flows capable of transporting sediments.
3. Streams that have:
   a. Low gradients of less than approximately 2.5 percent;
   b. Water temperatures in the approximate range of 35 to 82 degrees F (with additional natural daily and seasonal variation);
   c. Pool, riffle, run, and backwater components; and
   d. An abundant aquatic insect food base consisting of mayflies, true flies, black flies, caddisflies, stoneflies, and dragonflies.

4. Habitat devoid of nonnative aquatic species or habitat in which nonnative aquatic species are at levels that allow persistence of loach minnow.
5. Areas within perennial, interrupted stream courses that are periodically dewatered but that serve as connective corridors between occupied or seasonally occupied habitat and through which the species may move when the habitat is wetted.

3.3.3. C) Species-specific Conservation Measures (in addition to those in Section 3)

Refer to the Conservation Measures for all listed fish.

3.3.3. D.1) Effects of the Proposed Action - Direct Effects:

In addition to the effects listed above for all listed fish, implementation of the conservation measures would result in insignificant and/or discountable direct effects to the Primary Constituent Elements.

3.3.3. D.2) Effects of the Proposed Action - Indirect, Interrelated and Interdependent Effects:

In addition to the effects listed above for all listed fish, implementation of the conservation measures would result in insignificant and/or discountable indirect, interrelated and interdependent effects to the Primary Constituent Elements.

3.3.3. D.3) Effects of the Proposed Action - Cumulative Effects:

Refer to the effects description above for all listed fish.

3.3.3. E) *Conclusion/Effects Determination*

NMAC Grant Program proposed projects within and upstream of the loach minnow or its designated critical habitat will be reviewed by the BLM State Office Wildlife Biologist basis for compliance with applicable Conservation Measures. Therefore, there would be no direct or indirect effects to the species from these activities. **It is BLM's determination that the proposed action may affect, but is not likely to adversely affect, the loach minnow. The proposed action is not likely to result in the destruction or adverse modification of critical habitat of the loach minnow.**

3.3.4 Spikedace (*Meda fulgida*) Threatened, Critical Habitat

3.3.4. A) Species Life History, Status and Distribution

The spikedace is a sleek, stream-dwelling member of the minnow family (Cyprinidae) that seldom exceeds 3 inches in maximum length and spawns in spring and summer, typically from March through May. Spikedace are found in moderate to large perennial streams, where they inhabit shallow riffles with sand, gravel, and rubble substrates. Breeding of spikedace is apparently initiated in response to a combination of declining stream discharge and increasing water temperatures. Breeding males have bright brassy yellow heads and fin bases,

yellow bellies and fins. Spikedace live about two years, with reproduction occurring primarily in one-year old fish. Spikedace are opportunistic insectivore/piscivores, generally feeding on aquatic and terrestrial insects, fry or other fish during certain seasons. Production of aquatic insects consumed by spikedace occurs mainly in riffle habitats, where the insects are dependent upon clean and relatively stable conditions. Diet composition is largely determined by type of habitat and time of year.

The spikedace was listed as threatened on July 1, 1986. Historically, this species was common and locally abundant throughout the Upper Gila River basin of Arizona and New Mexico. Its distribution was widespread in large and moderate-sized rivers and streams in New Mexico, including the Agua Fria, San Pedro, and San Francisco River systems, and the Gila, Salt and Verde Rivers and major tributaries upstream of present-day Phoenix. It is now restricted to portions of the upper Gila River and the East, West, and Middle Forks of the Gila River in New Mexico and the middle Gila River, lower San Pedro River, Aravaipa Creek, Eagle Creek, and the Verde River in Arizona and is only commonly found in surveys of Aravaipa Creek and some parts of the upper Gila River in New Mexico.

Designated spikedace critical habitat includes portions of 8 streams in NM and AZ; however, individual streams are not isolated, but are connected with others to form areas or complexes. Critical habitat was designated on March 21, 2007 (72 FR 13356) and includes the stream channels within the identified stream reaches and the area of bankfull width plus 300 lateral feet on either side of bankfull width, except when the floodplain is narrow and bounded by canyon walls. In New Mexico, critical habitat is designated in Complex 5 containing the Gila River, and the East, West and Middle Forks of the Gila River.

Threats to this species include stream flow depletion and disruption or diversion; riparian and stream habitat alteration, simplification or destruction including loss of instream cover; and competition and predation from nonnative aquatic species.

3.3.4. B) Affected Habitat

Spikedace occupy mid-water habitats, usually less than 39 inches in depth; adults often aggregate in shear zones along gravel-sand bars, quiet eddies on the downstream edges of riffles, and broad shallow areas above gravel-sand bars. In larger streams, the species may be found only at the mouth of tributaries. Smaller, younger fish are found in quiet water along pool margins over silt or fine-grained sand. In winter, spikedace appear to seek out protected areas, either cobble stream banks or slow-velocity areas in the lee of gravel bars. Spawning occurs in shallow sand and gravel-bottomed riffles. Physical cover in the form of instream or overhead objects does not appear a factor in the habitat requirements of the species.

The primary constituent elements essential to the conservation of the spikedace are:

1. Permanent, flowing water with no or low levels of pollutants, including:

a. Living areas for adult spikedace with slow to swift flow velocities between 20 and 60 cm/second (8 and 24 in/second) in shallow water between approximately 10 cm (4 in) and 1 meter (40 in) in depth, with shear zones where rapid flow borders slower flow, areas of sheet flow (or smoother, less turbulent flow) at the upper ends of mid- channel sand/gravel bars, and eddies at downstream riffle edges;

b. Living areas for juvenile spikedace with slow to moderate water velocities of approximately 18 cm/second (8 in/second) or higher in shallow water between approximately 3 cm (1.2 in) and 1 meter (40 in) in depth;

c. Living areas for larval spikedace with slow to moderate flow velocities of approximately 10 cm/second (4 in/second) or higher in shallow water approximately 3 cm (1.2 in) to 1 meter (40 in) in depth; and

d. Water with dissolved oxygen levels greater than 3.5 cc/l and no or minimal pollutant levels for pollutants such as copper, arsenic, mercury, and cadmium; human and animal waste products; pesticides; suspended sediments; and gasoline or diesel fuels.

2. Sand, gravel, and cobble substrates with low or moderate amounts of fine sediment and substrate embeddedness. Suitable levels of embeddedness are generally maintained by a natural, unregulated hydrograph that allows for periodic flooding or, if flows are modified or regulated, a hydrograph that allows for adequate river functions, such as flows capable of transporting sediments.

3. Streams that have:

a. Low gradients of less than approximately 1.0 percent;

b. Water temperatures in the approximate range of 35 to 86 degrees F (with additional natural daily and seasonal variation);

c. Pool, riffle, run, and backwater components; and

d. An abundant aquatic insect food base consisting of mayflies, true flies, caddisflies, stoneflies, and dragonflies.

4. Habitat devoid of nonnative aquatic species or habitat in which nonnative aquatic species are at levels that allow persistence of spikedace.

5. Areas within perennial, interrupted stream courses that are periodically dewatered but that serve as connective corridors between occupied or seasonally occupied habitat and through which the species may move when the habitat is wetted.

3.3.4. C) Species-specific Conservation Measures (in addition to those in Section 3)

See Conservation Measures for all listed fish.

3.3.4. D.1) Effects of the Proposed Action - Direct Effects:

In addition to the effects listed above for all listed fish, implementation of the conservation measures would result in insignificant and/or discountable direct effects to the Primary Constituent Elements.

3.3.4. D.2) Effects of the Proposed Action - Indirect, Interrelated and Interdependent Effects:

In addition to the effects listed above for all listed fish, implementation of the conservation measures would result in insignificant and/or discountable indirect, interrelated and interdependent effects to the Primary Constituent Elements.

3.3.4. D.3) Effects of the Proposed Action - Cumulative Effects:

Refer to the effects description above for all listed fish.

3.3.4. E) *Conclusion/Effects Determination*

NMAC Grant Program proposed projects within and upstream of the spikedace habitat will be reviewed by the BLM State Office Wildlife Biologist for compliance with applicable Conservation Measures. Therefore, there would be no direct or indirect effects to the species from these activities. **It is BLM's determination that the proposed action may affect, but is not likely to adversely affect, the spikedace. The proposed action is not likely to result in the destruction or adverse modification of critical habitat of the spikedace.**

3.3.5 Gila chub (*Gila intermedia*) Endangered, Critical Habitat

3.3.5. A) Species Life History, Status and Distribution

A secretive fish, the Gila chub spends most daylight hours under cover such as cutbanks and thick overhanging or aquatic vegetation. Gila chubs reach sexual maturity anywhere from the end of their first year through their third. Most populations breed primarily from late spring to summer, depending on conditions, but this species has been known to breed from late winter through autumn. Gila chubs are opportunistic omnivores, consuming terrestrial and aquatic insects, as well as smaller fish and filamentous algae.

This species' listing as endangered with Critical Habitat by the FWS became effective on December 2, 2005. Gila chub were historically found throughout the Gila River basin in southern Arizona, southwestern New Mexico, and northeastern Sonora, Mexico. The Gila chub has been reduced in numbers and distribution in the majority of its historical range and where it is still present, populations are often small, fragmented, and at risk from known and potential threats and from random events such as drought, flood events, and wildfire. The primary threats to Gila chub include predation by and competition with nonnative organisms, including fish in the family Centrarchidae, other fish species, bullfrogs (Rana catesbeiana), and crayfish (Orconectes virilis), and habitat degradation from surface water diversions and ground water withdrawals. Secondary threats include habitat alteration, destruction, and fragmentation resulting from numerous factors that are discussed in the November 2, 2005 Federal Register final rule. The status of the Gila chub at that time was much degraded from historical levels. The species existed as a few, small isolated, populations. The small size

of these populations, and their degree of fragmentation and isolation, cause them to be highly susceptible to threats. Due to reduced status of the Gila chub and the severity of threats, including nonnative species predation and habitat destruction, the Gila chub was likely to become extinct throughout all or a significant portion of its range. Approximately 160.3 river miles (mi) of critical habitat located in Grant County, New Mexico, and Yavapai, Gila, Greenlee, Graham, Cochise, Santa Cruz, Pima, and Pinal Counties in Arizona were designated in the Final rule.

3.3.5. B) Affected Habitat

Adults often associated with cienegas and deep pools in smaller headwater streams (elevations 2700-4000 ft amsl) where cover is abundant. Juveniles occur among plants and large woody materials in shallows and currents, becoming more restricted to pools as they reach maturity.

The seven areas designated as critical habitat are: (1) Upper Gila River Area; (2) Middle Gila River Area; (3) Babocomari River Area; (4) Lower San Pedro River Area; (5) Lower Santa Cruz River Area Area; (6) Upper Verde River Area; and (7) Aqua Fria River Area.

The geographic extent of critical habitat includes Cochise, Gila, Graham, Greenlee, Pima, Pinal, Santa Cruz, and Yavapai Counties, Arizona; and Grant County, New Mexico. The primary constituent elements are the following:
(i) Perennial pools, areas of higher velocity between pool areas, and areas of shallow water among plants or eddies all found in small segments of headwaters, springs, or cienegas of smaller tributaries;
(ii) Water temperatures for spawning ranging from 17 to 24°C (62.6 to 75.2° F), and seasonally appropriate temperatures for all life stages (e.g. varying from approximately 10°C to 30°C);
(iii) Water quality with reduced levels of contaminants, including excessive levels of sediments adverse to Gila chub health, and adequate levels of pH (e.g. ranging from 6.5 to 9.5), dissolved oxygen (e.g. ranging from 3.0 to 10.0) and conductivity (e.g. 100 to 1000 mmhos);
(iv) Food base consisting of invertebrates (e.g., aquatic and terrestrial insects) and aquatic plants (e.g., diatoms and filamentous green algae);
(v) Sufficient cover consisting of downed logs in the water channel, submerged aquatic vegetation, submerged large tree root wads, undercut banks with sufficient overhanging vegetation, large rocks and boulders with overhangs, and a high degree of streambank stability and healthy, intact riparian vegetative community;
(vi) Habitat devoid of nonnative aquatic species detrimental to Gila chub or habitat in which detrimental nonnatives are kept at a level that allows Gila chub to continue to survive and reproduce; and
(vii) Streams that maintain a natural flow pattern including periodic flooding.
(3) Each stream segment includes a lateral component that consists of 300 feet on either side of the stream channel measured from the stream edge at bank full

discharge. This lateral component of critical habitat is intended as a surrogate for the 100-year floodplain.
(4) Lands located within the boundaries of the critical habitat designation, but are excluded by definition include: Existing paved roads; bridges; parking lots; dikes; levees; diversion structures; railroad tracks; railroad trestles; water diversion canals outside of natural stream channels; active gravel pits; cultivated agricultural land; and residential, commercial, and industrial developments. These developed areas do not contain any of the primary constituent elements, do not provide habitat or biological features essential to the conservation of the Gila chub, and generally will not contribute to the species' recovery.

3.3.5. C) Species-specific Conservation Measures (in addition to those in Section 3)

See Conservation Measures for all listed fish.

3.3.5. D.1) Effects of the Proposed Action - Direct Effects:

In addition to the effects listed above for all listed fish, implementation of the conservation measures would result in insignificant and/or discountable direct effects to the Primary Constituent Elements.

3.3.5. D.2) Effects of the Proposed Action - Indirect, Interrelated and Interdependent Effects:

In addition to the effects listed above for all listed fish, implementation of the conservation measures would result in insignificant and/or discountable indirect, interrelated and interdependent effects to the Primary Constituent Elements.

3.3.5. D.3) Effects of the Proposed Action - Cumulative Effects:

Refer to the effects description above for all listed fish.

3.3.5. E) *Conclusion/Effects Determination*

NMAC Grant Program proposed projects within and upstream of the Gila chub habitat will be reviewed by the BLM State Office Wildlife Biologist compliance with applicable Conservation Measures. Therefore, there would be no direct or indirect effects to the species from these activities. **It is BLM's determination that the proposed action may affect, but is not likely to adversely affect, the Gila chub. The proposed action is not likely to result in the destruction or adverse modification of critical habitat of the Gila chub.**

3.3.6 Pecos gambusia (*Gambusia nobilis*) Endangered

3.3.6. A) Species Life History, Status and Distribution

Pecos gambusia produce live young in an average brood size of 38. Pecos gambusia females may spawn several times each year. Pecos gambusia is a "carnivorous surface feeder," consuming any insect that alighted on the water surface. The Pecos gambusia is endemic to springs and spring systems of the Pecos River basin of southeastern New Mexico and western Texas. It

apparently did not regularly inhabit the Pecos River. Generally, Pecos gambusia was common to abundant in spring habitats.

The Pecos gambusia, was federally listed as endangered on Oct. 13, 1970 and listed in 1975 as endangered by New Mexico (19 NMAC 33.1).

Springs and gypsum sinkholes on Bitter Lake National Wildlife Refuge (near Roswell) and Blue Spring and its outflow (near Whites City) apparently are the only areas of regular occurrence of Pecos gambusia in New Mexico. Natural populations of the species are reported in sinkholes 7, 20, and 27, Sago Spring, and Dragonfly Spring and its associated spring run (Lost River) on Bitter Lake National Wildlife Refuge. Where present on Bitter Lake National Wildlife Refuge, Pecos gambusia were usually common to abundant. In Blue Spring, Pecos gambusia were common in headwaters and diminished in abundance in the spring run as it flowed to its confluence with Black River. Within ponded habitats and gypsum sink holes on Bitter Lake NWR and Blue Spring, New Mexico, the Pecos gambusia appears stable

3.3.6. B) Affected Habitat

The Pecos gambusia is most common in heads and runs of springs, where it uses such cover as aquatic vegetation for refuge. This is the habitat type of New Mexico's largest population, that being at Blue Spring, where many thousands of these fish occur. The state's other, much smaller population occupies a rather different habitat that being the limestone sinks and associated areas on Bitter Lake National Wildlife Refuge. The Pecos gambusia associates in loose schools that spend much of the time near the surface, typically near the edges of any body of water. The Pecos gambusia inhabits shallow areas of alkaline waters with aquatic vegetation for cover. They are found in spring pools and their outflows, as well as the sink holes.

3.3.6. C) Species-specific Conservation Measures (in addition to those in Section 3)

See Conservation Measures for all listed fish.

3.3.6. D.1) Effects of the Proposed Action - Direct Effects:

Refer to the effects description above for all listed fish.

3.3.6. D.2) Effects of the Proposed Action - Indirect, Interrelated and Interdependent Effects:

Refer to the effects description above for all listed fish.

3.3.6. D.3) Effects of the Proposed Action - Cumulative Effects:

Refer to the effects description above for all listed fish.

3.3.6. E) *Conclusion/Effects Determination*

NMAC Grant Program proposed projects within and upstream of the Pecos gambusia habitat will be reviewed by the BLM State Office Wildlife Biologist for compliance with applicable Conservation Measures. Therefore, there would be no direct or indirect effects to the species from these activities. **It is BLM's determination that the proposed action may affect, but is not likely to adversely affect, the Pecos gambusia.**

3.3.7 Pecos bluntnose shiner (*Notropis simus pecosensis*) Threatened, Critical Habitat

3.3.7. A) Species Life History, Status and Distribution

The bluntnose shiner is a relatively small, moderately deep-bodied minnow, rarely exceeding 80 mm that use a pelagic broadcast spawning method. Females release their non-adhesive, semi-buoyant eggs in the water column and males immediately fertilize them after which the eggs drift with the current. Development of eggs is rapid and larvae hatch in 24 to 48 hrs. Pecos bluntnose shiner may live three years, but most individuals probably survive less than two years. Pecos bluntnose shiners are often found in aggregations with other minnows, most commonly the native red shiner, Rio Grande shiner, sand shiner, Arkansas River shiner, and plains minnow. Pecos bluntnose shiners are prey to several piscivores in the Pecos River including native flathead catfish and nonnative white bass.

The Pecos bluntnose shiner was listed by New Mexico as threatened (19 NMAC 33.1) in 1976, and as threatened with designated critical habitat by the FWS in 1987. Critical habitat for the Pecos bluntnose shiner occurs in the Pecos River in Chaves, De Baca and Eddy Counties.

The bluntnose shiner is endemic to the Pecos River in New Mexico and the Rio Grande in New Mexico and the El Paso/Cuidad Juarez area of Texas and Chihuahua. Pecos bluntnose shiner historically occupied the Pecos River from near Santa Rosa downstream to the vicinity of Major Johnson Springs (now inundated by Brantley Reservoir).

3.3.7. B) Affected Habitat

Habitat consists mainly of shallow runs; pools are uncommon and substrates are largely shifting sand and small gravel. In these stream reaches, Pecos bluntnose shiners are generally found in all available habitats. Larger individuals tend to be more common in more rapidly flowing water (> 40 cm/sec), but preferences for particular depths were not found.

Shiner critical habitat is divided into 2 separate reaches designated as upper and lower critical habitat. Upper critical habitat is a 64 mi (103 km) reach extending from 0.6 mi (1 km) upstream from the confluence of Taiban Creek (river mi

668.9) downstream to the Crockett Draw confluence (river mi 610.4). Upper critical habitat is encompassed within the Rangelands reach (shiner stronghold), but approximately 36 mi (58 km) are contiguous with, but downstream of, upper designated critical habitat. This area is referred to as "quality habitat," even though it is not designated as critical habitat. Lower critical habitat is a 37 mi (60 km) reach extending from Hagerman to Artesia. This portion of the critical habitat is located in the Farmlands reach.

Primary constituent elements of the critical habitat are clean, permanent water; a main river channel with sandy substrate; and low water velocity. At the time of listing, sporadic water flow in the river was identified as the greatest threat to the shiner and its habitat. Water diversions, ground and river water pumping, and water storage had reduced the amount of water in the channel and altered the hydrograph with which the shiner evolved. Although block releases maintain the current channel morphology (Tetra Tech 2003), since the construction of Sumner Dam, the peak flow that can be released is much less than the historical peak flows (U.S. Geological Survey historical surface flow data). The altered hydrograph encourages the proliferation of non-native vegetation, such as salt cedar, which armors the banks and causes channel narrowing. Channel narrowing increases water velocity, reduces backwater areas, and leads to the removal of fine sediments such as sand. Consequently, in areas dominated by salt cedar, the habitat becomes less suitable or unsuitable for shiners. Lack of permanent flow and an altered hydrograph continue to be the greatest threats to the shiner and its habitat.

3.3.7. C) Species-specific Conservation Measures (in addition to those in Section 3)

See Conservation Measures for all listed fish.

3.3.7. D.1) Effects of the Proposed Action - Direct Effects:

In addition to the effects listed above for all listed fish, implementation of the conservation measures would result in insignificant and/or discountable direct effects to the Primary Constituent Elements.

3.3.7. D.2) Effects of the Proposed Action - Indirect, Interrelated and Interdependent Effects:

In addition to the effects listed above for all listed fish, implementation of the conservation measures would result in insignificant and/or discountable indirect, interrelated and interdependent effects to the Primary Constituent Elements.

3.3.7. D.3) Effects of the Proposed Action - Cumulative Effects:

Refer to the effects description above for all listed fish.

3.3.7. E) *Conclusion/Effects Determination*

NMAC Grant Program proposed projects within and upstream of the Pecos bluntnose shiner habitat will be reviewed by the BLM State Office Wildlife Biologist for compliance with applicable Conservation Measures. Therefore, there would be no direct or indirect effects to the species from these activities. **It is BLM's determination that the proposed action may affect, but is not likely to adversely affect, the Pecos bluntnose shiner. The proposed action is not likely to result in the destruction or adverse modification of critical habitat of the Pecos bluntnose shiner.**

3.3.8 Arkansas River shiner (*Notropis girardi*) Threatened

3.3.8. A) Species Life History, Status and Distribution

Spawning by Arkansas River shiners occurs from late spring through early autumn but most spawning occurrs in June and July and is closely linked to increases in flow. Spawning occurs in the water column when water temperatures are about 25°C and the fertilized, semi-buoyant eggs drift with the current. Arkansas River shiners grow rapidly their first summer, attaining an average standard length of 25 mm. Most Arkansas River shiners do not live more than 18 months. Arkansas River shiners presumably feed on drifting aquatic invertebrates.

The Arkansas River shiner was listed as endangered by New Mexico (19 NMAC 33.1) in 1976 and was federally listed as threatened by the FWS in 1998. The introduced population of Arkansas River shiner in the Pecos River, New Mexico is excluded from protection by New Mexico (19 NMAC 33.1) and the U.S. Fish and Wildlife Service.

In New Mexico, the shiner occurred in the South Canadian River drainage from near Sabinoso on the South Canadian River downstream to the Texas/New Mexico border, in Ute Creek in the vicinity of Bueyeros, Conchos Creek, and the lowermost reaches of Revuelto Creek. The species has never been reported from the New Mexico portion of the Dry Cimarron River, although its type locality is in the Cimarron River just downstream from the New Mexico/Oklahoma border.

The current distribution of the Arkansas River shiner is much reduced from its historic extent. The native New Mexico range of Arkansas River shiner currently is limited to the South Canadian River downstream of Ute Dam and the lowermost reaches of Revuelto Creek. It is seasonally common in these stream reaches. Arkansas River shiner was introduced to the Pecos River about 1978 and has since become established in the river between Sumner Dam and Red Bluff Reservoir on the Texas/New Mexico border.

3.3.8. B) Affected Habitat

Arkansas River shiners inhabit the main channels of sand-bottomed streams and rivers where they most often are found on the downstream side of transverse

sand ridges. These streams are generally broad and meandering with little shading, highly variable flows and water temperature, and high concentrations of dissolved solids.

In New Mexico, habitat occurs on private or state lands in the Canadian River in Harding, Quay, and San Miguel Counties and is considered extirpated in Colfax, Mora and Union Counties.

3.3.8. C) Species-specific Conservation Measures (in addition to those in Section 3)

See Conservation Measures for all listed fish.

3.3.8. D.1) Effects of the Proposed Action - Direct Effects:

Refer to the effects description above for all listed fish.

3.3.8. D.2) Effects of the Proposed Action - Indirect, Interrelated and Interdependent Effects:

Refer to the effects description above for all listed fish.

3.3.8. D.3) Effects of the Proposed Action - Cumulative Effects:

Refer to the effects description above for all listed fish.

3.3.8. E) *Conclusion/Effects Determination*

NMAC Grant Program proposed projects within and upstream of the Arkansas River shiner habitat will be reviewed by the BLM State Office Wildlife Biologist for compliance with applicable Conservation Measures. Therefore, there would be no direct or indirect effects to the species from these activities. **It is BLM's determination that the proposed action may affect, but is not likely to adversely affect, the Arkansas River shiner.**

3.3.9 Chihuahua chub (*Gila nigrescens*) Threatened

3.3.9. A) Species Life History, Status and Distribution

The Chihuahua chub has been reported to be trout-like (opportunistic carnivore) in its feeding behavior, taking terrestrial insects, aquatic invertebrates, and some fish. Chihuahua chub spawning season could extend from early spring through autumn. Eggs are probably scattered randomly over sandy or silty substrate, and young most likely occupy quiet backwater. Chubs probably do not live more than 4 or 5 years.

The Chihuahua chub was listed as threatened on October 1, 1983. This species has declined substantially in abundance and range, and until 1975, was believed to be extirpated from New Mexico. The Chihuahua chub is restricted to the closed Guzman Basin of southwestern New Mexico and northwestern Chihuahua, Mexico, and the Laguna Bustillos basin in Chihuahua, Mexico. In the

United States the Chihuahua chub only occurs in the Mimbres drainage in Southwestern New Mexico. This drainage starts on the Gila National Forest, and then flows through private lands with a series of different owners. Historically, the Chihuahua chub probably occurred in all the warmwater reaches of the Mimbres drainage. Today the species is only found in McKnight Creek on the Gila, and along a 9.3-mile section of the Mimbres River just south of the Gila National Forest boundary.

3.3.9. B) Affected Habitat

In the Mimbres River, Chihuahua chub are found in areas where there are deep pools bordered by undercut banks, or in pools that are formed around a channel obstruction such as boulders and root wads. Substrate in pools occupied by Chihuahua chub is typically pea-gravel and sand. Cobble-bottomed riffles are typically just upstream of pools occupied by Chihuahua chub. This type of reach provides both escape cover and foraging habitat.

3.3.9. C) Species-specific Conservation Measures (in addition to those in Section 3)

See Conservation Measures for all listed fish.

3.3.9. D.1) Effects of the Proposed Action - Direct Effects:

Refer to the effects description above for all listed fish.

3.3.9. D.2) Effects of the Proposed Action - Indirect, Interrelated and Interdependent Effects:

Refer to the effects description above for all listed fish.

3.3.9. D.3) Effects of the Proposed Action - Cumulative Effects:

Refer to the effects description above for all listed fish.

3.3.9. E) *Conclusion/Effects Determination*

NMAC Grant Program proposed projects within and upstream of the Chihuahua chub habitat will be reviewed by the BLM State Office Wildlife Biologist for compliance with applicable Conservation Measures. Therefore, there would be no direct or indirect effects to the species from these activities. **It is BLM's determination that the proposed action may affect, but is not likely to adversely affect, the Chihuahua chub.**

3.3.10 Colorado pikeminnow (*Ptychocheilus lucius*) Endangered, Critical Habitat

3.3.10. A) Species Life History, Status and Distribution

The Colorado pikeminnow is the largest member of the minnow family (Cyprinidae) native to North America. It has been reported that this species may live in excess of 50 years and that it can grow to lengths in excess of 5.9 feet and

weights of 99.2 pounds or greater. Juveniles feed primarily on insects and crustaceans, while individuals over 1.2 inches start feeding on fish. As adults, pikeminnows are almost exclusively piscivores.

Spawning occurs usually between late June and about mid-August, depending on local hydrology and temperature regimes. Spawning coincides with rising water temperature and decreasing flow. Eggs are broadcast over gravel and cobble substrates in riffles and rapids. After hatching, the larvae drift downstream to nursery areas. Migration is an important component in the reproductive cycle as found in some research where migrations exceeded 186 miles.

The Colorado pikeminnow, formerly the Colorado squawfish, was listed as endangered by the U.S. Fish and Wildlife Service in 1967. In March 1994, the FWS designated 1,148 miles, or 29 percent of its historical range, of the Colorado River basin as "critical habitat" for Colorado pikeminnow. One of the six reaches of the upper Colorado basin included as critical habitat is located on the San Juan River in New Mexico between Farmington (NM) and the New Mexico/Colorado border.

3.3.10. B) Affected Habitat

A small population of reproducing pikeminnows occurs in the San Juan River of New Mexico. Colorado pikeminnow have been extirpated from the Gila River. The Colorado pikeminnow is adapted to life in big river systems that are highly variable, with extremes in flow and turbidity. Adult pikeminnows are found in a variety of water velocities, depths, and substrates. Seasonal habitat use by adults varies. In the spring, when flows are high, adults are often found in backwater areas and flooded bottomlands. When spring flows recede, adults return to the main channel, and some mature individuals congregate near the mouths of tributaries. These confluences may serve as staging areas prior to spawning migrations. Small individuals occupy shallow backwater areas with little or no current and silt/sand substrates.

Critical habitat is defined as all areas within the 100-year flood plain that provide the following three characteristics:

- A sufficient quality and quantity of water needed by the fish at each life stage.
- Physical characteristics such as side channels, backwaters, flood plains and bottom lands, which are used by the fish as spawning, nursery, feeding and rearing sites.
- An adequate food supply and other biological characteristics.

3.3.10. C) Species-specific Conservation Measures (in addition to those in Section 3)

See Conservation Measures for all listed fish.

3.3.10. D.1) Effects of the Proposed Action - Direct Effects:
In addition to the effects listed above for all listed fish, implementation of the conservation measures would result in insignificant and/or discountable direct effects to the Primary Constituent Elements.

3.3.10. D.2) Effects of the Proposed Action - Indirect, Interrelated and Interdependent Effects:
In addition to the effects listed above for all listed fish, implementation of the conservation measures would result in insignificant and/or discountable indirect, interrelated and interdependent effects to the Primary Constituent Elements.

3.3.10. D.3) Effects of the Proposed Action - Cumulative Effects:
Refer to the effects description above for all listed fish.

3.3.10. E) *Conclusion/Effects Determination*
NMAC Grant Program proposed projects within and upstream of the Colorado pikeminnow habitat will be reviewed by the BLM State Office Wildlife Biologist for compliance with applicable Conservation Measures. Therefore, there would be no direct or indirect effects to the species from these activities. **It is BLM's determination that the proposed action may affect, but is not likely to adversely affect, the Colorado pikeminnow. The proposed action is not likely to result in the destruction or adverse modification of critical habitat of the Colorado pikeminnow.**

3.3.11. Razorback sucker (*Xyrauchen texanus*) Endangered, Critical Habitat

3.3.11. A) Species Life History, Status and Distribution
Razorback sucker is one of the larger members of the sucker family (Catostomidae). The razorback may reach lengths of three feet and weigh 11 to 13.2 pounds and are a long-lived species, reaching ages of at least the mid-40's. Spawning takes place in the late winter to early summer when water temperatures are between 50 and 68ºF. Larvae and juveniles suffer very high mortality from predation, particularly from non-native species. Razorback sucker feed mostly from the bottom on midge larvae, planktonic crustaceans, diatoms, filamentous algae, and detritus.

The razorback sucker was listed as endangered on October 23, 1991, with critical habitat (U.S. Fish and Wildlife Service, 1994). Fifteen river reaches covering about 49 percent of the historic habitat of the razorback sucker (1,724 miles) are designated critical habitat within the Colorado River Basin and its 100-year floodplain.

In New Mexico, critical habitat includes: the San Juan River from the Hogback Diversion to the Utah-New Mexico border (San Juan County).

3.3.11. B) Affected Habitat

Razorback sucker tend to use low velocity main channel habitats such as pools, eddies, nearshore runs, and channels associated with sand or gravel bars Backwaters, oxbows, and sloughs are well-used habitat areas adjacent to the main channel. Flooded bottomlands are important to the species in the spring and early summer.

As with the Colorado pikeminnow, critical habitat for the razorback sucker is defined as all areas within the 100-year flood plain that provide the following three characteristics:

- A sufficient quality and quantity of water needed by the fish at each life stage.
- Physical characteristics such as side channels, backwaters, flood plains and bottom lands, which are used by the fish as spawning, nursery, feeding and rearing sites.
- An adequate food supply and other biological characteristics.

3.3.11. C) Species-specific Conservation Measures (in addition to those in Section 3)

See Conservation Measures for all listed fish.

3.3.11. D.1) Effects of the Proposed Action - Direct Effects:

In addition to the effects listed above for all listed fish, implementation of the conservation measures would result in insignificant and/or discountable direct effects to the Primary Constituent Elements.

3.3.11. D.2) Effects of the Proposed Action - Indirect, Interrelated and Interdependent Effects:

In addition to the effects listed above for all listed fish, implementation of the conservation measures would result in insignificant and/or discountable indirect, interrelated and interdependent effects to the Primary Constituent Elements.

3.3.11. D.3) Effects of the Proposed Action - Cumulative Effects:

Refer to the effects description above for all listed fish.

3.3.11. E) *Conclusion/Effects Determination*

NMAC Grant Program proposed projects within and upstream of the Razorback sucker habitat will be reviewed by the BLM State Office Wildlife Biologist for compliance with applicable Conservation Measures. Therefore, there would be no direct or indirect effects to the species from these activities. **It is BLM's determination that the proposed action may affect, but is not likely to adversely affect, the Razorback sucker. The proposed action is not likely to result in the destruction or adverse modification of critical habitat of the Razorback sucker.**

3.3.12 Zuni bluehead sucker (*Catostomus discobolus yarrowi*) Candidate

3.3.12. A) Species Life History, Status and Distribution

Zuni bluehead suckers spawn from early April through late May or early June when water temperatures are 10 to 15°C. Most females produce 200 to 300 eggs. The spawning habitat is not known; presumably it spawns among the interstices of the cobble substrate of its preferred pool and pool-run habitat. Zuni bluehead suckers feed by scrapping diatoms and algae from bedrock, boulders, and cobble in its pool and pool-run habitats.

The Zuni bluehead sucker, was listed by New Mexico as endangered (19 NMAC 33.1) in 1975. In 2001, Catostomus discobolus yarrowi was listed as a Federal Candidate for listing.

The Zuni bluehead sucker currently is limited in New Mexico mainly to the Rio Nutria upstream of the mouth of the Nutria Box Canyon near the eastern boundary of the Zuni Indian Reservation and the Agua Remora although its distribution is discontinuous within the Rio Nutria. It is moderately common only near the mouth of the Nutria Box Canyon, at the confluence of Tampico Draw and Rio Nutria, uppermost Agua Remora, and uppermost Rio Nutria.

3.3.12. B) Affected Habitat

Habitat of the Zuni bluehead sucker is stream reaches with abundant shade and primarily pool and riffle habitats with coarse substrates. Pools are often 1.0 to 2.0 m deep and pool-runs (0.5 to 1.0 m deep) have water velocity <10.0 cm/sec. Zuni bluehead sucker are rare or absent where the substrate was predominantly sand and silt. Periphytic and perilithic algae and diatoms were seasonally common in occupied habitats, and pools were often edged with cattails (*Typha* sp.).

3.3.12. C) Species-specific Conservation Measures (in addition to those in Section 3)

See Conservation Measures for all listed fish.

3.3.13. D.1) Effects of the Proposed Action - Direct Effects:

Refer to the effects description above for all listed fish.

3.3.12. D.2) Effects of the Proposed Action - Indirect, Interrelated and Interdependent Effects:

Refer to the effects description above for all listed fish.

3.3.12. D.3) Effects of the Proposed Action - Cumulative Effects:

Refer to the effects description above for all listed fish.

3.3.12. E) *Conclusion/Effects Determination*

NMAC Grant Program proposed projects within and upstream of the Zuni bluehead sucker habitat will be reviewed by the BLM State Office Wildlife Biologist for compliance with applicable Conservation Measures. Therefore, there would be no direct or indirect effects to the species from these activities. **It is BLM's determination that the proposed action may affect, but is not likely to adversely affect, the Zuni bluehead sucker.**

3.4 Plants

The Indirect, interrelated, and interdependent Effects as well as the Cumulative Effects are similar for all listed plants so they are listed here in lieu of with each listed plant:

Indirect, Interrelated, and Interdependent Effects for Listed Plants

Indirect, interrelated, and interdependent effects to this species and its habitat may include the following list of effects:

- soil erosion following implementation of fire management activities
- soil compaction from vehicle use during implementation of fire management activities
- alteration of vegetative structure and/or composition from implementation of fire management activities
- an increase in invasive species in the habitat which may out compete this species. This may occur when native vegetation is removed by implementation of fire management activities. The weedy species then quickly occupy newly vacated habitat
- increased recreational or incidental traffic through this species habitat as an indirect result of new permanent or temporary roads for implementation of fire management activities

Cumulative Effects for Listed Plants

Cumulative effects include the effects of future State, tribal, local, or private actions that are reasonably certain to occur in the action area. Cumulative effects to this species under this proposed action may include, but are not necessarily limited to, the following broad types of impacts:

- changes in land use pattern, such as shifts in grazing, commercial or industrial development, mining activity, and recreational activity that negatively affect this species habitat or potential habitat
- construction and/or maintenance of roads and water pipelines, and water diversions.
- encroachment of human development into this species habitat or potential habitat leading to a potential reduction in gene flow, habitat fragmentation, and accidental or purposeful loss of plants due to use of machinery or foot travel through the habitat

- fire management actions designed to reduce the threat of catastrophic wildfires by some, or all, of the following groups, on lands adjoining or near BLM-administered lands
  - Tribal Governments
  - State of New Mexico
  - County Governments in New Mexico
  - Municipal Governments in New Mexico

3.4.1 Zuni fleabane (*Erigeron rhizomatus*) Threatened

3.4.1 A) Species Life History, Status and Distribution

The Zuni fleabane is an herbaceous perennial with creeping rhizomes with stems 2.5-4.5 dm tall, sparsely branching from near the base and growing in clumps to about 3 dm in diameter. The leaves alternate and are oblong, about 1.0 cm long; glabrous except for occasional ciliate hairs on the margins. The flower heads are solitary, terminating at the branches, 13-16 mm wide with involucral bracts in several series. Ray flowers of 25-45 with white or tinged with blue-violet, are 6-7 mm long and 1.3-1.5 mm wide. The disk flowers are yellow with achenes 5-6 nerved, nearly glabrous; pappus 25-35 fragile bristles with a few short outer setae. It flowers in May and June.

The Zuni fleabane was listed as threatened on May 28, 1984.

There are 37 known sites in New Mexico in Catron and McKinley counties. Populations are known on the Cibola National Forest in areas south of Fort Wingate in the Zuni Mountains, McKinley County, and on the Cibola National Forest and adjacent areas administered by the Bureau of Land Management (BLM) northwest of Datil in Catron County (28 locations (probably more) in the Sawtooth and northwest Datil mountains). The plants are restricted to specific substrates that are potentially minable.

3.4.1. B) Affected Habitat

This species occurs in nearly barren detrital clay hillsides with soils derived from shales of the Chinle or Baca formations (often seleniferous). It is most often on north or east-facing slopes in open piñon-juniper woodlands at 7,300-8,000 ft.

The Zuni Mountain population is found on loose, decaying slopes of the Chinle shale formation. However, the majority of the Datil plants occur in the Baca formation. Most of the populations are close to inactive uranium claims. If exploration or mining is reactivated, there may be adverse impacts to the plants. The plants in the Sawtooth and Datil mountains are protected under an Area of Critical Environmental Concern Management Plan, administered by the BLM.

Potential impacts to the Zuni fleabane is the reactivation of uranium mining claims, road construction, recreational use, livestock grazing, and fire. It is

doubtful that the Zuni fleabane is adapted to fire and a hot fire in adjacent areas may destroy or damage plants.

3.4.1. C) Species-specific Conservation Measures (in addition to those in Section 3)

See Conservation Measures for all listed plants.

3.4.1. D.1) Effects of the Proposed Action - Direct Effects:

Mechanical treatments would be augmented to safeguard against any adverse effects of thinning activities in or near suitable habitat or near areas of prior human disturbance occupied by the Zuni fleabane. Slash would not be piled on, drug across, or lopped and scattered onto either actively growing or dormant Zuni fleabane plants, and persons working within the limited range of Zuni fleabane would be trained to identify the Zuni fleabane and report occurrences to BLM State Office Botanist. At present, there would be no effects to the Zuni fleabane due to mechanical treatments. If in the future, mechanical treatments are deemed necessary, further consultation with the FWS would be initiated.

Chemical treatments typically refer to the use of herbicides to control densities of undesirable plant species in a given habitat. Due to the difficulty of protecting the species of concern during the application process, this treatment alternative is not appropriate for this species and its habitat. No effects are predicted based on this determination.

3.4.1. D.2) Effects of the Proposed Action - Indirect, Interrelated and Interdependent Effects:

Refer to the effects description above for all listed plants.

3.4.1. D.3) Effects of the Proposed Action - Cumulative Effects:

Refer to the effects description above for all listed plants.

3.4.1. E) *Conclusion/Effects Determination*

Implementation of the Additional Conservation Measures for Listed Plant Habitats for fuel reduction activities on non-federal lands that contain this species' occupied habitats would result in no adverse effects to individuals or its habitat. This determination is based on the potential for incidental damage or loss of Zuni fleabane plants during fuel reduction activities that would be so remote as to make it unlikely due to the scarcity of the species. The species would experience positive effects from fuel reduction activities that minimize the amount of vegetation lost from a wildfire, helping to ensure the continued existence of the species. **It is BLM's determination that the proposed action may affect, but is not likely to adversely affect, the Zuni fleabane.**

3.4.2 Kuenzler's hedgehog cactus (*Echinocereus fendleri var. kuenzleri Escobario*) Endangered

3.4.2 A) Species Life History, Status and Distribution

Kuenzler's hedgehog cactus is a long-lived perennial. This species generally has solitary stems or a few stems in a cluster. The body of the plant is more or less conical, can grow up to 30 cm tall with 7 to12 ribs. There are usually 3 to 7 spines per areole. The spines are thick, over 0.1 cm in diameter and are near a swollen base. The spines are often angular in cross section, usually white to pale gray, sometimes brownish, and often with a brown to purplish or black longitudinal line extending down their length. The plants usually flower in late May to early June, but flowering varies depending upon the weather. The flowers are bright magenta in color and 6.0–12.0 cm in diameter. Seed dispersal is primarily by rodents who eat the fruit and by wind and water. It takes about 4 to 5 years for a plant to reach reproductive capability following germination.

Kuenzler's hedgehog cactus was first listed as a federal endangered species on October 26, 1979 and the recovery plan was drafted in 1985. At the time of the plant's listing, there were less than 250 known plants.

The cactus was first discovered in the Sacramento and Capitan Mountains in Otero, Chaves and Lincoln counties. Populations of Kuenzler's hedgehog cactus have been known to occur around Fort Stanton and near Mayhill since the mid-1980's. Additional populations of this species have been found on the east side of the Sacramento Mountains near Weed and Tinnie. The species has also been found near Elk and east of Elk on the plains. The plant was found on the northern end of the Guadalupe Mountains in Eddy County in 1992. The plant ranges south from the northern end of the Guadalupe Mountains to near the Queen subdivision. All of these locations are along the eastern slopes of the drainages of the Sacramento Mountains and related mountain ranges.

Within the Guadalupe Mountains, Kuenzler's hedgehog cactus has been found to range from 5,200 feet to 6,600 feet on gentle, gravelly to rocky slopes (typically less than 5 percent) and benches. The larger Ft. Stanton Kuenzler's hedgehog cactus populations are found between 6,600 feet and 6,900 feet on open southeast aspects. They are typically found on the upper one-third of 20 percent slopes. Plants are found on soils with an igneous substrate. Plants have not been found on the east side of the Ft. Stanton area where the soils are of limestone origin.

3.4.2 B) Affected Habitat

Habitat for the species occurs on the lower fringes of the piñon - juniper woodland on skeletal soils of limestone outcrop. The soil type the plants are most frequently found on is the Deama soils (0 to 5 percent slope). The Deama soil is described as very dark grayish brown of limestone origin, with a weak granular structure, non-plastic, and strongly calcareous.

Kuenzler's hedgehog cactus is typically found growing wedged against rocks, within grass clumps or beneath shrub canopies. Clipping the surrounding grass and other vegetation causes a significant decrease in cactus condition. Removal of the herbaceous cover has been cited as being a major contributing factor to the decline of the species.

3.4.2 C) Species-specific Conservation Measures (in addition to those in Section 3)

See Conservation Measures for all listed plants.

3.4.2 D1) Effects of the Proposed Action - Direct Effects

Kuenzler's hedgehog cactus is found on relatively barren, open areas where competition from other species is light. However, the Kuenzler's hedgehog cactus is frequently found in disturbed areas, requiring only good moisture conditions to establish in such areas. The location of Kuenzler's hedgehog cactus in its natural habitat does not normally include sites or locations where thinning activities, either mechanical or fire, would have an impact on the species. The Kuenzler's hedgehog cactus would benefit from any slight increases in base flows afforded by reductions in tree canopies provided treatments are within the programmatic prescriptions. The opening of P/J and shrub canopies together with the thinning disturbance could promote the spread of the Kuenzler's hedgehog cactus from seed dispersed by birds.

In addition to the effects listed above for all listed plants, implementation of the conservation measures would result in insignificant and/or discountable direct effects to the Primary Constituent Elements.

3.4.2. D.2) Effects of the Proposed Action - Indirect, Interrelated and Interdependent Effects:

In addition to the effects listed above for all listed plants, implementation of the conservation measures would result in insignificant and/or discountable indirect, interrelated and interdependent effects to the Primary Constituent Elements.

3.4.2. D.3) Effects of the Proposed Action - Cumulative Effects:

See discussion above for all listed plants.

3.4.2. E) *Conclusion/Effects Determination*

Implementation of the Additional Conservation Measures for Listed Plant Habitats for fuel reduction activities on non-federal lands that contain this species' occupied habitats would result in no adverse effects to individuals or its habitat. This determination is based on the potential for incidental damage or loss of Kuenzler's hedgehog cactus plants during fuel reduction activities that would be so remote as to make it unlikely due to the scarcity of the species. The species would experience positive effects from fuel reduction activities that minimize the amount of vegetation lost from a wildfire, helping to ensure the continued existence of the species. **It is BLM's determination that the**

proposed action may affect, but is not likely to adversely affect, the Kuenzler's hedgehog cactus.

3.4.3 Pecos sunflower (*Helianthus paradoxus*) Threatened, Proposed Critical Habitat

3.4.3. A) Species Life History, Status and Distribution

Pecos sunflower is the only sunflower in the southwestern United States that requires permanent wetlands for its survival. Pecos sunflowers grow in saline soils that are permanently saturated. Areas that maintain these conditions are commonly called cienegas (desert wetlands) associated with springs. However the required conditions may be also be found at stream margins and at the margins of impoundments. Where plants are associated with the latter the impoundments have replaced the natural cienegas. Pecos sunflower occupies a distinct zone within the cienega. It rarely occurs on drier sites with alkali sacaton, or in the wettest soils near the water's edge with Olney bulrush. Rather Pecos sunflower grows in sites dominated by saltgrass and other less frequent herbaceous species. The reproductive biology is likely to be very similar to that of the common sunflower, H. annuus.

Pecos sunflower differs from the common sunflower (H. annuus) in having narrower, lanceolate leaves (vs. deltoid leaves), fewer hairs on the leaves, nearly glabrous stems, lanceolate phyllaries (vs. deltoid phyllaries), slightly smaller flower heads with fewer ray flowers, and flowering confined to autumn (September, October) as compared to the spring through fall flowering of the common sunflower. The habitat of Pecos sunflower is also different from that of the common sunflower. Pecos sunflower grows in saturated, saline soils of marshes while the common sunflower usually occurs in disturbed soils that are dry during mid-summer.

This plant was listed by the FWS as threatened in October 20, 1999.

This species is found at widely separated locations in central and southern New Mexico and into Texas. It may once have been more common but suitable habitat within the range is declining. A couple of the New Mexico populations are large, but others are very small and non-viable. Species is very vulnerable to changes in natural hydrologic regimes.

At present Pecos sunflower occurs in four general areas in New Mexico. In New Mexico the population at the Bitter Lake National Wildlife Refuge is the most secure. The impoundments and springs at the wildlife refuge are relatively stable and it is not anticipated that they will be grazed or seriously altered. The other significant New Mexico population is near the town of Santa Rosa in the upper Pecos River basin. There are several small sites on land owned and administered by the City of Santa Rosa and the City of Roswell.

Ground water depletion, competition with exotic plants, hybridization with the common sunflower, grazing, wildfire, and development all threaten this species. Suitable habitat within the range is declining.

Proposed critical habitat is located in Chaves, Cibola, Guadalupe, Socorro, and Valencia Counties in New Mexico. FWS is proposing five (5) units as critical habitat for *H. paradoxus* (72 FR 14328 March 27, 2007).

Unit 1: West-Central New Mexico

Subunit 1a is located at Rancho del Padre Spring Cienega. This subunit is 25.5 ac (10.3 ha) in Cibola County, New Mexico. The subunit consists of an area of Rancho del Padre Spring Cienega from the spring on the south side of I– 40 then northeast approximately 0.5 mi (0.8 km) to the Rio San Jose.

Subunit 1b is located at Grants Salt Flat Wetland. This subunit is 62.5 ac (25.3 ha) in Cibola County, New Mexico. The subunit consists of an area of wet alkaline playa between railroad tracks and I–40 and west of Hwy 122 (Road from Interstate to downtown Grants). Playas are nearly level areas at the bottom of undrained desert basins that are sometimes covered in water. This population consists of large patches of several thousand plants mostly on private property.

Subunit 1c is located at the Pueblo of Laguna. This subunit's acreage is undefined in Valencia County, New Mexico. The subunit consists of an area along the Rio San Jose, South Garcia, and New Mexico.

Unit 2: La Joya

Unit 2 is located in the La Joya State Wildlife Management Area. This unit is 854.3 ac (345.7 ha) in Socorro County, New Mexico. This population is located about 7 mi (11 km) south of Bernardo within Socorro County near the confluence of the Rio Grande and the Rio Puerco. The La Joya population is bounded to the west by I–25 and to the east by the Unit 7 Drain. The north boundary is adjacent to River Mile 126 of the Rio Grande and the south boundary is adjacent to River Mile 123. One of the largest populations of *H. paradoxus* occurs on the Rio Grande at La Joya. This Rio Grande population consists of 100,000 to 1,000,000 plants and occurs on the La Joya State Waterfowl Management Area (Service 2005, p. 4). It is within the La Joya Unit of the Ladd S. Gordon Waterfowl Complex. This property is owned by the New Mexico State Game Commission.

Unit 3: Santa Rosa

Subunit 3a is located at Blue Hole Cienega/Blue Hole Fish Hatchery Ponds. This subunit is 127.6 ac (51.6 ha) in Guadalupe County, New Mexico. The Blue Hole Fish Hatchery Ponds population of *H. paradoxus* is part of the same population as and nearly contiguous with the Blue Hole Cienega in Santa Rosa, New Mexico. The Blue Hole Fish Hatchery Ponds is immediately north of Blue Hole Road and the Blue Hole Cienega is immediately south.

Unit 4: Roswell/Dexter

Subunit 4a is located at Bitter Lake National Wildlife Refuge/ City of Roswell Land. The subunit is 3,572.2 ac (1,445.6 ha) in Chaves County, New Mexico. This subunit is approximately 92.2 ac (37.3 ha) of land adjacent to the southwest boundary of Bitter Lake National Wildlife Refuge is owned by the City of Roswell.

There are a few thousand *H. paradoxus* on this land. It is located on a large alkaline cienega adjoining the Bitter Lake National Wildlife Refuge population. This site was known to be occupied at *H. paradoxus* is a plant that grows on permanently wet, alkaline soils at spring seeps, wet meadows, stream courses, and pond margins. It is currently known from 12 populations in 5 widely spaced geographical areas in west-central and eastern New Mexico and adjacent Trans-Pecos Texas. These populations are all dependent upon wetlands that result from an elevated water table. The number of *H. paradoxus* per site varies from fewer than 100 to over one million. Because *H. paradoxus* is an annual, the number of plants per site can fluctuate greatly from year to year with changes in precipitation and depth to groundwater or in response to other physical and biological changes. Stands of *H. paradoxus* can change location within the habitat as well (Sivinski 1992, p. 125). If a wetland habitat dries out permanently, even a large population of *H. paradoxus* will disappear.

Little is known about the historic distribution of *H. paradoxus.* The plant is associated with spring seeps and desert cienegas, and there is evidence these habitats were historically reduced or eliminated by aquifer depletion, or severely impacted by agricultural activities and encroachment by nonnative plants. *H. paradoxus* was known only from a single population near Fort Stockton, Pecos County, Texas, when it was proposed as a candidate species under the Act on December 15, 1980 (45 FR 82480). This is a large population of several hundred thousand to one million plants at The Nature Conservancy's Diamond Y Spring Preserve and a smaller group of plants downstream at a nearby highway right-of-way. Between 1980 and 1994, field surveys for this plant found additional populations in New Mexico and Texas. During this period, *H. paradoxus* was discovered in a second Texas site at The Nature Conservancy's Sandia Spring Preserve in the Balmorhea area of Reeves County, Texas. In addition, *H. paradoxus* was found at 11 spring seeps and cienegas in the Roswell/Dexter region of the Pecos River valley in Chaves County, New Mexico. Three of these wetlands support many thousands of *H. paradoxus,* but the remainder are smaller, isolated occurrences. Springs and cienegas within and near the town of Santa Rosa in Guadalupe County, New Mexico, were found to have eight wetlands with *H. paradoxus*, one of which consisted of a few hundred thousand plants. Also discovered were two widely separated areas of spring seeps and cienegas in the Rio San Jose valley of western New Mexico, each supporting a medium-sized population of *H. paradoxus.* One occurs on the lower Rio San Jose in Valencia County and the other is in Cibola County in the vicinity of Grants. After the species was listed, two more populations were added to the total number of known populations: (1) A very large population near La Joya, in Socorro County, at the confluence of the Rio Grande and the Rio Puerco; and (2) a population on State lands in Chaves County in a marshy sink.

3.4.3. B) Affected Habitat

Pecos sunflower occurs in wetlands with relatively high levels of salinity, both in the water and the soil. However, Pecos sunflower is reliant on a delicate balance

of temporally varying salinity. In the late fall to early spring, Pecos sunflower is dependent on a high water table to leach the salt from the soil surface which allows a narrow window for germination and establishment of roots in the lower soil levels where salinity is less. Changes in the water table level will affect leaching, and thus the extent of the Pecos sunflower population.

The majority of the populations of the Pecos sunflower are located on private, Indian, State, and National Wildlife Refuges.

Based on current knowledge of the life history, biology, and ecology of the species and the requirements of the habitat to sustain the essential life history functions of the species, we have determined that H. paradoxus's Primary Constituent Elements (PCEs) are the desert wetland or riparian habitat components that provide:

(1) Silty clay or fine sand soils that contain high organic content, are saline or alkaline, are permanently saturated within the root zone (top 50 cm of the soil profile), and have salinity levels ranging from 10 to 40 parts per thousand; and

(2) Low proportion (less than 10 percent) of woody shrub or canopy cover directly around the plant.

Critical habitat does not include manmade structures, such as buildings, aqueducts, runways, airports, roads, and other paved areas, and the land on which such structures are located within the boundaries of a final critical habitat designation that exist on the effective date of a final rule.

This proposed designation is designed for the conservation of PCEs necessary to support the life history functions that are the basis for the proposal and the areas containing those PCEs. Because all of the species' life history functions require all of the PCEs, all proposed critical habitat units contain all PCEs.

3.4.3. C) Species-specific Conservation Measures (in addition to those in Section 3)

See Conservation Measures for all listed plants.

3.4.3. D1) Effects of the Proposed Action - Direct Effects

Implementing the Additional Conservation Measures for Riparian and Aquatic Habitats would further protect populations and habitats for the Pecos sunflower.

In addition to the effects listed above for all listed plants, implementation of the conservation measures would result in insignificant and/or discountable direct effects to the Primary Constituent Elements.

3.4.3. D.2) Effects of the Proposed Action - Indirect, Interrelated and Interdependent Effects:

In addition to the effects listed above for all listed plants, implementation of the conservation measures would result in insignificant and/or discountable indirect, interrelated and interdependent effects to the Primary Constituent Elements.

3.4.3. D.3) Effects of the Proposed Action - Cumulative Effects:

Refer to the effects description above for all listed plants.

3.4.3. E) *Conclusion/Effects Determination*

Implementation of the Additional Conservation Measures for Listed Plant Habitats for fuel reduction activities on non-federal lands that contain this species' occupied habitats would result in no adverse effects to individuals or its habitat. This determination is based on the potential for incidental damage or loss of Pecos sunflower plants during fuel reduction activities that would be so remote as to make it unlikely due to the scarcity of the species. The species would experience positive effects from fuel reduction activities that minimize the amount of vegetation lost from a wildfire, helping to ensure the continued existence of the species. **It is BLM's determination that the proposed action may affect, but is not likely to adversely affect, the Pecos sunflower. The proposed action is not likely to result in the destruction or adverse modification of proposed critical habitat of the Pecos sunflower.**

3.4.4 Sacramento prickly poppy (*Argemone pleiacantha ssp. Pinnatisecta*) Endangered

3.4.4. A) Species Life History, Status and Distribution

The Sacramento prickly poppy is similar in general appearance to other members of this normally weedy genus found in New Mexico. It is a robust perennial herbaceous plant with 3 to 12 branching stems averaging about three feet tall. The deeply lobed leaves are about six inches long with the spaces between the lobes rectangular. Both the stem and leaves are armed with stout, yellow spines. The showy white flowers have six petals with the consistency of tissue paper. The numerous yellow stamens and purple stigma set off the center of what most people consider a striking flower. This plant is separated from its closest relatives in the squareness of its leaf lobes, simple spines on the capsule, and most definitively by having white sap instead of yellow.

This plant was listed as endangered in August 24, 1989. Although not weedy, the Sacramento prickly poppy does favor disturbed areas and is particularly adapted to the periodic flooding of the normally dry to intermittently perennial canyons on the west face of the Sacramento Mountains (although not adapted to the extreme events of the larger degraded canyons like Alamo Canyon). Seven canyon systems are known to contain the plant. From north to south these are Fresnal, Dry, Alamo, Mule, San Andres, Dog, and Escondido Canyons. The habitat within the first six drainages is mostly within the Cloudcroft District of the Lincoln National Forest. The Escondido Canyon population is on private land. Approximately 80 percent of the total species' range is on National Forest system lands, with 18 percent on private and the remainder on lands administered by the Bureau of Land Management. Numbers of the plant vary somewhat from year to year depending on the timing and abundance of rainfall.

3.4.4. B) Affected Habitat

The habitat of Sacramento prickly poppy has been described as being disturbed and either semi-riparian or with a reliable seasonal provision of water. The plant is often found at springs and appears to withstand permanently wet sites so long as the soils are well drained. Mature plants are often found in drier sites such as terraces above the normal level of flood flows. The plant is adapted to withstand some scouring of summer floods and such scouring may encourage seed germination.

3.4.4. C) Species-specific Conservation Measures (in addition to those in Section 3)

See Conservation Measures for all listed plants.

3.4.4. D1) Effects of the Proposed Action - Direct Effects

Mechanical treatments are unlikely within the occupied habitats of the Sneed pincushion cactus.

3.4.4. D.2) Effects of the Proposed Action - Indirect, Interrelated and Interdependent Effects:

Refer to the effects description above for all listed plants.

3.4.4. D.3) Effects of the Proposed Action - Cumulative Effects:

Sacramento prickly poppy is found on relatively open areas where competition from other species is light. The type of treatments and treatment objectives proposed are pointed toward denser plant communities and conditions not conducive to finding or impacting the prickly poppy. However, the prickly poppy is frequently found in recently disturbed areas, requiring only good moisture conditions to establish in such areas. The location of prickly poppy in its natural habitat does not normally include sites or locations where mechanical thinning activities should have an impact on the species.

3.4.4. E) *Conclusion/Effects Determination*

Implementation of the Additional Conservation Measures for Listed Plant Habitats for fuel reduction activities on non-federal lands that contain this species' occupied habitats would result in no adverse effects to individuals or its habitat. This determination is based on the potential for incidental damage or loss of Sacramento prickly poppy plants during fuel reduction activities that would be so remote as to make it unlikely due to the scarcity of the species. The species would experience positive effects from fuel reduction activities that minimize the amount of vegetation lost from a wildfire, helping to ensure the continued existence of the species. **It is BLM's determination that the proposed action may affect, but is not likely to adversely affect, the Sacramento prickly poppy.**

3.4.5 Todsen's pennyroyal (*Hedeoma todsenii*) Endangered, Critical Habitat

3.4.5. A) Species Life History, Status and Distribution

Todsen's pennyroyal is an endemic species, originally known from several small populations or colonies in the San Andres Mountains approximately 30 miles west of the Sacramento Mountains. In 1988 the species was found in the Sacramento Mountains with a total of 15 colonies being found on BLM and USFS lands. The pennyroyal is a perennial herb approximately 4 to 8 in tall having orange/red tube shaped flowers unlike other species in the vicinity. The plant reproduces almost entirely from rhizomes. The species is considered a Pleistocene relict and because of its small population size and low reproductive potential, the species is highly susceptible to extirpation of individual colonies and potentially total extinction. The species appears to be restricted (in habitat – but not in the laboratory) to specific soils and directional exposures.
Habitat consists of steep to gentle slopes within the piñon/juniper community on east to north aspects from 6200 to 7400ft. in elevation. Substrates are somewhat gypseous and related to the Permian Yeso formation. The plant appears to have indicator and contra indicator plants in some areas and not in other areas (author's personal observation). Specifically, threadleaf horsebush (Tetradymia filifolia), Drummond onion (Allium drummondii), and spoonleaf rabbitbrush (Chrysothamnus spathulatus) are associated with many occupied micro-sites at Domingo Peak area south of the analysis/action area. Wavyleaf oak (Quercus undulata) does not occur in these sites. However, wavyleaf oak (along with ponderosa pine) does occur in association with the pennyroyal in a large drainage system on USFS surface south of Mountain Lion Peak.

3.4.5. B) Affected Habitat

Todsen's pennyroyal has designated Critical Habitat which is at the original San Andres Mountains colonies. No Critical Habitat is designated in the Sacramento Mountains. Todsen's pennyroyal in the San Andres and Sacramento Mountains is found in loose, steep gravelly north- and east-facing hillsides with gypseous limestone soils at about 2000 m elevation, usually with or positioned immediately below the Permian Yeso Formation. The surrounding plant community is open pinyon-juniper woodland.

3.4.5. C) Species-specific Conservation Measures (in addition to those in Section 3)

See Conservation Measures for all listed plants.

3.4.5. D1) Effects of the Proposed Action - Direct Effects

Activities of ground crews could cause trampling of plants. Such disturbance would be limited to the single season during which fuel reduction operations were in progress. Due to the rhizomatous nature of the plants, they potentially could re-sprout with little effect to individual plant health. The effects of fire on the species are unknown. However, due to the presence of rhizomes, it could be

expected that plants would resprout following a fire should a relatively cool fire is used. The effect of habitat opening on the plant could be beneficial by allowing additional light, precipitation, and nutrients to become available and thereby improving plant vigor. A potential additional benefit could be an increase in flowering plants attractive to hummingbirds and insects that could improve pollination and seed set in Todsen's. Or, habitat opening could lead to dessication and loss of plants due to increased solar insolation and evaporation rates. Note that the plant occurs in relatively mesic east and north facing microsites. Additionally, increased herbaceous and shrub components of the habitat could either ameliorate habitat drying reducing the effect, or, conversely, increase competition for water and nutrients as understory plants increase in the site causing elimination of Todsen's. Finally, failure of understory vegetation to re-establish would likely cause an increase in erosion and potential loss of plants. The likelihood of failure is reduced by subsequent seeding of treatment areas. Drought could be a large factor in the success of the treatments, causing little or no re-establisment of herbaceous understory.

3.4.5. D.2) Effects of the Proposed Action - Indirect, Interrelated and Interdependent Effects:

Refer to the effects description above for all listed plants.

3.4.5. D.3) Effects of the Proposed Action - Cumulative Effects:

Refer to the effects description above for all listed plants.

3.4.5. E) *Conclusion/Effects Determination*

Implementation of the Additional Conservation Measures for Listed Plant Habitats for fuel reduction activities on non-federal lands that contain this species' occupied habitats would result in no adverse effects to individuals or its habitat. This determination is based on the potential for incidental damage or loss of Todsen's pennyroyal plants during fuel reduction activities that would be so remote as to make it unlikely due to the scarcity of the species. The species would experience positive effects from fuel reduction activities that minimize the amount of vegetation lost from a wildfire, helping to ensure the continued existence of the species. **It is BLM's determination that the proposed action may affect, but is not likely to adversely affect, the Todsen's pennyroyal or its critical habitat.**

3.4.6 Sacramento Mountains thistle (*Cirsium vinaceum*) Threatened

3.4.6. A) Species Life History, Status and Distribution

The Sacramento Mountain thistle is known only from the Sacramento Mountains of south-central New Mexico where it is dependent on surface water found in travertine springs, streams and riparian meadows. Unlike most thistles, the Sacramento Mountain thistle is not weedy. This plant is considered to be biennial because it first forms rosettes that accumulate sufficient energy to produce a

flowering stalk which dies after flowering. The distinctive stems and flower heads make identification of this species easy. The five to seven foot tall stems are purplish-green and terminate in nodding, two inch, flower heads bordered with spiny purplish bracts, reflexed at the middle. Flowers in this typical composite head are rose-purple.

This plant was listed by the US FWS as threatened in June 16, 1987.

The plants were historically known to occur along the moist banks of streams and in wet meadows throughout the Sacramento Mountains. The only population now know to grow in this type of habitat is located at the Lincoln National Forest-Mescalero Indian Reservation boundary. All other known populations are, restricted to the areas around springs flowing from limestone rock. Fourteen populations are known, with a combined total of 2,000-3,000 plants: most of these populations consist of approximately 100 plants each. Most of the populations are in the Lincoln National Forest, several are on private lands, and one is on the Mescalero Indian Reservation. This plant is dependent on springs or streams; reduction or removal of the water supply would reduce or eliminate the populations. Several populations of the Sacramento Mountains thistle occur at Bluff Springs, an area heavily used by recreationists. Over-use for recreation or any human-caused deterioration of the area around the springs could harm the Sacramento Mountains thistle. Ground disturbance is detrimental to the Sacramento Mountains thistle because it is slow to reestablish itself in disturbed areas. While more than ninety percent of the Sacramento Mountain thistle habitat lies within National Forest System lands, a few localities occur on the Mescalero Apache Reservation and private lands where impacts are unknown.

3.4.6. B) Affected Habitat

This riparian thistle requires saturated soils at springs, seeps, and streams. Occupied wetlands are unique in their calcium carbonate content. Travertine deposits, often built up as steep hills or bluffs, are the most common habitats for the Sacramento Mountain thistle. Occupied sites occur between 7,500 and 9,000 feet in the mixed-conifer community. The range of the species includes approximately 150 square miles within which the plant is known to occur in 20 canyons.

3.4.6. C) Species-specific Conservation Measures (in addition to those in Section 3)

See Conservation Measures for all listed plants.

3.4.6. D1) Effects of the Proposed Action - Direct Effects

Mechanical treatments proposed for heavy stands of tamarisk and Russian olive would have an impact on the species habitat. The Sacramento Mountains thistle should benefit from any slight increases in water flows afforded by the reductions in tree canopies provided treatments which are within the programmatic prescriptions. The opening of exotic invaded forest and shrub canopies together

with the thinning could promote the spread of the Sacramento Mountains thistle into potential habitats.

3.4.6. D.2) Effects of the Proposed Action - Indirect, Interrelated and Interdependent Effects:

Refer to the effects description above for all listed plants.

3.4.6. D.3) Effects of the Proposed Action - Cumulative Effects:

Refer to the effects description above for all listed plants.

3.4.6. E) *Conclusion/Effects Determination*

Implementation of the Additional Conservation Measures for Listed Plant Habitats for fuel reduction activities on non-federal lands that contain this species' occupied habitats would result in no adverse effects to individuals or its habitat. This determination is based on the potential for incidental damage or loss of Sacramento Mountains thistle during fuel reduction activities that would be so remote as to make it unlikely due to the scarcity of the species. The species would experience positive effects from fuel reduction activities that minimize the amount of vegetation lost from a wildfire, helping to ensure the continued existence of the species. **It is BLM's determination that the proposed action may affect, but is not likely to adversely affect, the Sacramento Mountains thistle.**

3.5 Mammals

3.5.1 Mexican gray wolf (*Canis lupus baileyi*) Endangered, 10(j) Experimental Nonessential Population

3.5.1 A) Species Life History, Status and Distribution

Mexican gray wolves breed between late winter and early spring. Dens are located in enlarged badger holes or high up on a slope or bluff. Gestation lasts 63 days, after which a litter of up to 6 pups is born. Young are born in March and early April. The entire pack helps to care for and feed the pups. The wolf preys on a variety of items, including white-tailed deer, mule deer, pronghorn, javelina, bighorn sheep, rabbits, rodents, and some fruit and berries. The wolf is an opportunistic hunter and once livestock were introduced into its range, livestock were included as a major food item.

Effective as of January 24, 1998, the Fish and Wildlife Service classified wolves to be reestablished in these areas as a nonessential experimental population under section 10(j) of the Endangered Species Act (Act) of 1973, as amended. This final rule set forth management directions and provided for limited allowable legal take of wolves within a defined Mexican Wolf Experimental Population Area.

In March 1998, 11 captive-reared Mexican wolves were released into the Blue Range Wolf Recovery Area (BRWRA) in eastern Arizona. In subsequent years, additional releases have occurred. With birth of the first wild-born litter from a wild-born parent, in 2002, the Reintroduction Project has evolved into a new phase, whereby natural reproduction is beginning to replace reintroduction from captive populations.

The 5-Year Review, authorized by section 10(j) of the Endangered Species Act of 1973 (Act), as amended, was conducted by the Mexican Wolf Blue Range Adaptive Management Oversight Committee (AMOC) and completed on December 31, 2005. It included are a set of 37 recommendations for improving management of the Blue Range wolf reintroduction project.

3.5.1 B) Affected Habitat

The Blue Range Wolf Recovery Area comprises 6.854 square miles of which about 95% is National Forest. Habitat types are primarily Madrean evergreen forests and woodlands, including pine-oak woodlands, piñon-juniper forests, chaparral, grasslands and riparian areas above 4,500 feet. In New Mexico, habitat also includes high, mountainous areas, usually in coniferous forests. Individuals may also cross desert areas.

The wolf's primary association with oak woodland and oak pine vegetation types may be significant because of their ability to support prey species such as white-tailed deer, mule deer, pronghorn, javelina, bighorn sheep, rabbits, and rodents.

3.5.1 C) Species-specific Conservation Measures (in addition to those in Section 3)

No human disturbance associated with fuel reduction activities will occur within one mile of a Mexican gray wolf den or rendezvous site from April1 to June 30.

3.5.1 D1) Effects of the Proposed Action - Direct Effects

Mexican wolves may be disturbed when proposed fuel reduction activities occur in occupied areas. This disturbance is anticipated to be of short duration. Due to the mobility of the species, introduced wolves will likely be able to avoid these areas.

3.5.1. D.2) Effects of the Proposed Action - Indirect, Interrelated and Interdependent Effects:

Fuel reduction actions would not indirectly affect Mexican wolves, since these actions would not cause long-term changes in key habitat components or prey species for wolves dispersing across non-federal lands. The proposed activities will likely result in the modification of historic wolf habitat and habitat of its prey species that may occur on non-federal lands within the species range. Wolves prey on various species, some of which prefer open habitat and others prefer dense habitat. Implementing the proposed action would positively affect some prey species while negatively affecting others. Because these proposed

activities would be selective and project areas would be relatively small in size compared to the overall available habitat for wolves and their prey, any effects to wolf prey species, combined with the mobility of wolves and their opportunistic foraging capabilities, would not indirectly affect the species, including its distribution, reproduction, or numbers.

3.5.1. D.3) Effects of the Proposed Action - Cumulative Effects:

Because the current 10(j) recovery area for the species is restricted to USFS lands, cumulative effects to the species would be limited to wolves that roam off of USFS lands and onto adjacent State or private lands. The primary effect to these wolves on State or private lands would be human disturbance and mortality from predator control activities. Other incidental cumulative effects would be fragmentation of habitat and home range territories from human population expansion and infrastructure development, as well as agricultural or grazing operations, if wolves expand out of the current recovery area.

3.5.1. E) *Conclusion/Effects Determination*

Implementation of the Conservation Measures that apply to all projects for fuel reduction activities on non-federal lands that contain this species' occupied habitats would result in no adverse effects to individuals or its habitat. This determination is based on the potential for incidental damage or loss of Mexican gray wolves during fuel reduction activities that would be so remote as to make it unlikely due to the scarcity of the species. **It is BLM's determination that the proposed action may affect, but is not likely to adversely affect, the Mexican gray wolf.**

Table 2: Effect Determinations for Federally Listed, and Candidate Species in New Mexico Analyzed in this Biological Assessment for the New Mexico Association of Counties Risk Reduction Grant Program for Non-federal Lands in New Mexico.

Common Name	Scientific Name	Federal Status[a]	Critical Habitat[a]	Effect Determination
AMPHIBIANS				
1. Chiricahua leopard frog	*Rana chiricahuensis*	T	No	NLAA
BIRDS				
2. Bald eagle	*Haliaeetus leucocephalus*	T	No	NLAA
3. Interior least tern	*Sterna antillarum*	E	No	NLAA
4. Northern aplomado falcon	*Falco femoralis septentrionalis*	E, 10(j)	No	NLAA
5. Piping plover	*Charadrius melodus*	T	No	NLAA
6. Southwestern willow flycatcher	*Empidonax traillii extimus*	E	Yes	NLAA
7. Mexican spotted owl	*Strix occidentalis lucida*	T	Yes	NLAA
8. Yellow-billed cuckoo	*Coccyzus americanus*	C	No	NLAA
FISH				

Common Name	Scientific Name	Federal Status[a]	Critical Habitat[a]	Effect Determination
9. Rio Grande silvery minnow	*Hybognathus amarus*	E	Yes	NLAA
10. Gila trout	*Oncorhynchus gilae*	T	No	NLAA
11. Loach minnow	*Tiaroga cobitis*	T	Yes	NLAA
12. Spikedace	*Meda fulgida*	T	Yes	NLAA
13. Gila chub	*Gila intermedia*	E	Yes	NLAA
14. Pecos gambusia	*Gambusia nobilis*	E	No	NLAA
15. Pecos bluntnose shiner	*Notropis simus pecosensis*	T	Yes	NLAA
16. Arkansas River shiner	*Notropis girardi*	T	No	NLAA
17. Chihuahua chub	*Gila nigrescens*	T	No	NLAA
18. Colorado pikeminnow	*Ptychocheilus lucius*	E	Yes	NLAA
19. Razorback sucker	*Xyrauchen texanus*	E	Yes	NLAA
20. Zuni bluehead sucker	*Catostomus discobolus yarrowi*	C	No	NLAA
PLANTS				
21. Zuni fleabane	*Erigeron rhizomatus*	T	No	NLAA
22. Kuenzler hedgehog cactus	*Echinocereus fendleri var. kuenzleri*	E	No	NLAA
23. Pecos sunflower	*Helianthus paradoxus*	T	No	NLAA
24. Sacramento prickly poppy	*Argemone pleiacantha ssp. Pinnatisecta*	E	No	NLAA
25. Todsen's pennyroyal	*Hedeoma todsenii*	E	No	NLAA
26. Sacramento Mountains thistle	*Cirsium vinaceum*	T	Yes	NLAA
MAMMALS				
27. Mexican gray wolf	*Canis lupus baileyi*	E, 10(j)	No	NLAA

Attachments:
Appendix A: CWPP status map
Appendix B: Emergency Consultation letter