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August 12, 2008

Memorandum

To: Regional Director, Fish and Wildlife Service, Albuquerque, New Mexico (ARD-ES) (Attn: Susan Jacobsen)

State Conservationist, Natural Resource Conservation Service, Phoenix, Arizona

State Conservationist, Natural Resource Conservation Service, Albuquerque, New Mexico

From: Field Supervisor

Subject: Biological and Conference Opinion on the Malpai Borderlands Habitat Conservation Plan, Arizona and New Mexico

This biological and conference opinion (BCO) responds to the Fish and Wildlife Service (FWS) requirement for intra-Service consultation on the proposed issuance of a section 10(a)(1)(B) incidental take permit (TE-15587-0) to the Malpai Borderlands Group (MBG), pursuant to section 7 of the Endangered Species Act of 1973 (16 U.S.C. 1531-1544), as amended (Act), authorizing the incidental take of 19 covered species. Along with the permit application, MBG submitted a draft of the Malpai Borderlands Habitat Conservation Plan (MBHCP). On August 30, 2007, Natural Resources Conservation Service (NRCS) requested programmatic consultation for their funding and implementation of NRCS conservation practices: fire management – Prescribed fire (code 338), erosion control – Grade Stabilization (code 410), mechanical brush control-Brush Management (code 314), and construction and maintenance of linear facilities – Access Road (code 560), Fence (382), and Pipeline (code 516) that are covered activities in the MBHCP and would be implemented within the covered area of the MBHCP . This BCO covers those portions of the NRCS conservation practices that are consistent with the MBHCP covered activities. NRCS will implement all minimization measures that are associated with covered activities in the MBHCP to minimize incidental take of listed species and covered species, as applicable. The MBHCP permit

area covers non-Federal lands in the southeastern corner of Cochise County, Arizona and the southwestern corner of Hidalgo County, New Mexico (See Figure 1).

This BCO analyzes the potential effects that issuance of this permit may have on the threatened Chiricahua leopard frog (*Lithobates* [=*Rana*] *chiricahuensis*), threatened beautiful shiner (*Cyprinella formosa*) with critical habitat, threatened Yaqui catfish (*Ictalurus pricei*) with critical habitat, endangered Yaqui chub (*Gila purpurea*) with critical habitat, endangered Yaqui topminnow (*Poeciliopsis occidentalis sonoriensis*), endangered Huachuca water umbel (*Lilaeopsis schaffneriana* var. *recurva*) with critical habitat, threatened Mexican spotted owl (*Strix occidentalis lucida*) with critical habitat, and threatened New Mexico ridge-nosed rattlesnake (*Crotalus willardi obscurus*) with critical habitat. We analyze the potential effects that issuance of this permit may have on the nonessential experimental population of northern aplomado falcon (*Falco femoralis*), candidate western yellow-billed cuckoo (*Coccyzus americanus*), and the unlisted Yaqui sucker (*Catostomus bernardini*), Mexican longfin dace (*Agosia chrysogaster*), Mexican stoneroller (*Campostoma ornatum*), lowland leopard frog (*Lithobates yavapaiensis*), northern Mexican gartersnake (*Thamnophis eques megalops*), black-tailed prairie dog (*Cynomys ludovicianus*), western burrowing owl (*Athene cunicularia hypugaea*), white-sided jackrabbit (*Lepus callotis*), and western red bat (*Lasiurus blosseveillii*). Consistent with our policies concerning intra-service consultations, for the purposes of this opinion, we will treat these species herein as if they were proposed for listing as threatened or endangered.

We determined that this action may affect, but is not likely to adversely affect the threatened Cochise pincushion cactus (*Coryphantha robbinsorum*), endangered southwestern willow flycatcher (*Empidonax trailli extimus*) with critical habitat, endangered lesser long-nosed bat (*Leptonycteris curasoae yerbabuenae*), endangered Mexican long-nosed bat (*Leptonycteris nivalis*), and endangered jaguar (*Panthera onca*). Concurrences with the determinations on these species are in Appendix A. We further determined that this action will have no effect on the endangered Mexican gray wolf (*Canis lupis baileyi*) because they are not known or reasonably certain to occur within the action area during the term of the permit.

This BCO is based on information provided in the draft MBHCP dated June 27, 2007; the draft Environmental Assessment (EA) dated June 27, 2007; telephone conversations; field investigations; FWS files; and other sources of information. Literature cited in this BCO is not a complete bibliography of all literature available on the species of concern, the activities covered in the Agreement and their effects, or on other subjects considered in this opinion. A complete administrative record of this consultation is on file in the Arizona Ecological Services Office (AESO).

We appreciate the assistance of the NRCS Office in Douglas, Arizona, the San Bernardino/Leslie Canyon National Wildlife Refuge in Douglas, Arizona, and the New Mexico Ecological Services Field Office in Albuquerque, New Mexico for assistance in preparing this document. If there are any question concerning this BCO, please contact Marty Tuegel (520) 670-6150 x232, Sherry Barrett x223, or me.

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CONSULTATION HISTORY

- October 12, 2006: We received the draft MBHCP and application for the section 10(a)(1)(B) incidental take permit.

- March 29, 2007: The MBG approved modifications made to the draft MBHCP and requested that FWS announce its availability for public comment in the Federal Register.

- July 2, 2007: The draft MBHCP and draft EA were available for public review.

- August 30, 2007: Request from NRCS for formal consultation under the FWS intra-service consultation for their Federal activities in association with the Malpai Borderlands Group and Malpai Borderlands area ranchers.

- August 31, 2007: The 60-day public review period ended.

- September 1, 2007: FWS initiated formal consultation on the issuance of the ITP associated with the MBHCP and its implementation.

- May 30, 2008: Draft Biological and Conference Opinion sent to NRCS for review.

- July 14, 2008: We received NRCS comments on the Draft Biological and Conference Opinion.

BIOLOGICAL OPINION

DESCRIPTION OF THE PROPOSED ACTION

The proposed action is our issuance of a section 10(a)(1)(B) permit to MBG for the incidental take of the 19 covered species in association with the implementation of the MBHCP within the Malpai Borderlands of Cochise County, Arizona and Hidalgo County, New Mexico (Figure 1). A complete description of the proposed action and associated conservation measures are included in the MBHCP and are incorporated herein by reference.

Generally, two types of activities are addressed by and will be implemented under the MBHCP. These are:

(A) Covered Activities. The covered activities consist of activities planned or proposed by MBG and/or Malpai-area ranchers which have the potential to result in incidental take of federally listed species and are therefore included in the MBHCP's regulatory coverage. Two categories of activities are covered by the plan: those planned or proposed to improve ecological conditions in the Malpai Borderlands, referred to as Grassland Improvement Activities (Section 3.5.1 of the MBHCP); and those planned or proposed in the course of managing and operating individual Malpai-area ranches, referred to as Ranch Management Activities (Section 3.5.2 of the MBHCP).

The Grassland Improvement Activities are defined as those expressly designed and carried out to correct, ameliorate, or improve a specific adverse grassland condition (e.g., lack of beneficial range fire, gully or stream channel erosion, etc.) and to meet the long-term interests of ecosystem health, watershed function, and grassland stability and productivity. They are not intended to address day-to-day ranch operation or management—except to the extent that, over the long term, they help maintain the landscape-level conditions that make ranching possible.

The Grassland Improvement Activities include:

- fire management (Section 3.5.1.1 of the MBHCP),
- erosion control (Section 3.5.1.2 of the MBHCP), and
- mechanical brush control (Section 3.5.1.3 of the MBHCP).

The MBHCP covers or addresses three types of Ranch Management Activities: livestock management, linear facilities construction, and stocktank maintenance and use. Among these activities are the placement and movement of livestock in and between pastures and locations in accordance with season, forage availability, water availability, etc.; construction of perimeter fencing, cross-fencing, and corrals; construction of livestock watering facilities (e.g., stocktanks, stockponds, troughs, water wells, and waterlines); and maintenance and use of stocktanks. These facilities and activities are routine on a ranch, and much of this infrastructure is already in place in the Malpai Borderlands. Nevertheless, new structures and facilities occasionally will be needed (primarily for the purpose of better managing livestock herds) and some existing facilities require periodic maintenance. MBG included these activities in the MBHCP to assist area ranchers should they which to seek coverage for these activities.

The Ranch Management Activities include:

- livestock management (Section 3.5.2.1 of the MBHCP),
- linear project construction (Section 3.5.2.2 of the MBHCP), and
- stocktank maintenance and use (Section 3.5.2.3 of the MBHCP).

Complete descriptions of these activities are found in Sections 3.5.1 and 3.5.2 of the MBHCP. The term of the Incidental Take Permit (ITP) is 30 years (Section 3.8 of the MBHCP) and may be renewed. The permit area consists of all private and state trust lands within the Malpai Borderlands (Section 3.4 of the MBHCP). NRCS may assist in these actions either with MBG or directly with Malpai area ranchers.

(B) Conservation Program Activities. The conservation activities, on the other hand, consist of activities and measures established by the MBHCP pursuant to the Act for the purpose of protecting federally listed species and other covered species in the course of carrying out the covered activities described above.

The MBHCP conservation program consists of: goals and objectives (Section 5.1 of the MBHCP); take minimization measures (Section 5.5 of the MBHCP); mitigation measures (Section 5.6 of the MBHCP); a monitoring program consisting of compliance monitoring measures and biological effectiveness monitoring measures (Section 5.7 of the MBHCP); an Adaptive Management program (Section 5.8 of the MBHCP); a Technical Advisory Committee to help implement the plan (Section 5.9 of the MBHCP); and an annual report (Section 5.10 of the MBHCP).

Conservation Measures

The following measures in the proposed MBHCP will be implemented by all participants to minimize take of listed, proposed, candidate, and covered species from implementation of the conservation activities included in the MBHCP and associated section 10(a)(1)(B) ITP. These are provided in sections of the MBHCP referenced below.

The MBHCP's conservation measures were developed to meet the objectives of the MBHCP through a basic process for carrying out covered activities while minimizing and mitigating potential effects to covered species in and around the area of the activity. It does this in a manner that provides for flexibility in both cost and timing to the extent practicable. Generally speaking, these include the following:

- Identify the proposed covered activity (Section 3.5 of the MBHCP) and the area where the activity is to be implemented. Refer to species habitat and occurrence maps to determine what species associations may be present in the area of the proposed covered activity (Section 5.4 of the MBHCP).

- Incorporate all Take Minimization Measures for the species associations shown to be present in the covered activity area that are required for the particular covered activity into the covered activity (Section 5.5 of the MBHCP). This approach is based upon the assumption of species presence. This approach is taken to eliminate the need for costly pre-activity surveys.

- If during the planning process the assumption of species presence is too restrictive, pre-activity surveys may be performed for any species in an association where minimization measures may be in conflict with implementation of the covered activity. If presence is not demonstrated, minimization measures for that species are not required for implementation of that activity (Section 5.4.2 of the MBHCP).

- Mitigation Measures for the effects of incidental take under the MBHCP are largely based upon the long-term, ecological benefits of the covered activities on a landscape level (Section 5.6 of the MBHCP).

- Monitoring responsibilities of enrolled landowners, MBG, and other cooperators are to ensure compliance with the plan's minimization measures and the ecological or biological goals of the landscape level out-come of the MBHCP (Section 5.7 of the MBHCP).

- Monitoring results and new scientific information will be used to improve and modify the MBHCP's conservation strategy through Adaptive Management (Section 5.8 of the MBHCP).

- A Technical Advisory Committee will be formed to advise MBG in the implementation of the MBHCP and its effectiveness at achieving the stated goals of the MBHCP (Section 5.9 of the MBHCP).

- The reporting responsibilities and commitments for the MBHCP will include results of implemented activities, compliance monitoring, biological monitoring, and adaptive management decisions. These results will be reported on an annual basis along with any ITP reporting requirements (Section 5.10 of the MBHCP).

STATUS OF THE SPECIES

AQUATIC SPECIES

Chiricahua leopard frog

The Chiricahua leopard frog was federally listed as threatened without critical habitat on June 13, 2002 (67 FR 40790), at which time a special rule, under section 4(d) of the Act, was also promulgated exempting the prohibition against the take of Chiricahua leopard frogs for normal operations and maintenance of stocktanks on non-Federal lands. Primary factors cited as the basis for listing include significant population declines as a result of destruction, alteration, and fragmentation of the species' aquatic habitats; disease; and predation by introduced aquatic predators, especially bullfrogs and predatory fish (67 FR 40790). Chiricahua leopard frogs are considered a Wildlife Species of Concern (WSC) in Arizona and a Species of Concern (SOC) in New Mexico. Unless otherwise indicated, the following information for this species is adopted from the rule listing the species (67 FR 40790). The Chiricahua leopard frog was listed as threatened in Mexico by Secretaria de Desarrollo Social (SEDESOL) (1994).

Chiricahua leopard frogs are stout-bodied, medium-sized frogs that are green or brown with dark spots. The breeding season varies with elevation and water temperature, occurring from June to August above 5,900 feet (ft) (1799 meters [m]) and from about mid February to late October at sites below 5,900 ft (1799 m). Females deposit 300-1485 eggs in spherical masses attached to submerged vegetation, suspended within 5 cm of the surface (Sredl and Jennings 2005). Adult Chiricahua leopard frogs tend to be more nocturnal than juvenile frogs.

The Chiricahua leopard frog is an inhabitant of ciénegas, pools, livestock tanks, lakes, reservoirs, streams, and rivers at elevations of 3,281 to 8,890 ft (1,000 to 2,710 m) in central and southeastern Arizona; west-central and southwestern New Mexico; and in Mexico, northern Sonora, the Sierra Madre Occidental of northern and central Chihuahua, and possibly as far south as northern Durango (Platz and Mecham 1984, Degenhardt *et al.* 1996, Sredl *et al.* 1997, Sredl and Jennings 2005). Reports of the species from the State of Aguascalientes (Diaz and Diaz 1997) are questionable. The distribution of the species in Mexico is unclear due to limited survey work and the presence of closely related taxa (especially *Rana lemosespinali*) in the southern part of the range of the Chiricahua leopard frog. In New Mexico, of sites occupied by Chiricahua leopard frogs from 1994-1999, 67 percent were creeks or rivers, 17 percent were springs or spring runs, and 12 percent were stock tanks (Painter 2000). In Arizona, slightly more than half of all known historical localities are

natural lotic systems, a little less than half are stock tanks, and the remainder is comprised of lakes and reservoirs (Sredl *et al.* 1997). Sixty-three

percent of populations extant in Arizona from 1993-1996 were found in stock tanks (Sredl and Saylor 1998).

Based on Painter (2000) and the latest information for Arizona, the species is still extant in most major drainages in Arizona and New Mexico where it occurred historically; with the exception of the Little Colorado River drainage in Arizona and possibly the Yaqui drainage in New Mexico. It has also not been found recently in many rivers, valleys, and mountains ranges, including the following in Arizona: White River, West Clear Creek, Tonto Creek, Verde River mainstem, San Francisco River, San Carlos River, upper San Pedro River mainstem, Santa Cruz River mainstem, Aravaipa Creek, Babocomari River mainstem, and Sonoita Creek mainstem. In southeastern Arizona, evidence suggests the species may be extirpated from the following mountain ranges or valleys: Baboquivari Mountains, Pinaleno Mountains, Chiricahua Mountains, Canelo Hills, Patagonia Mountains, and Sulphur Springs Valley. Moreover, the species is now absent from all but one of the southeastern Arizona valley bottom ciénega complexes. In many of these regions Chiricahua leopard frogs were not found for a decade or more despite repeated surveys. Recent surveys suggest the species may have recently disappeared from some major drainages in New Mexico (C. Painter and R. Jennings, pers. comm. 2004). Approximately 45 and 30-35 populations are likely extant in Arizona and New Mexico, respectively. The status of the species in Mexico is poorly known, but several populations have been documented in Chihuahua in the last two years.

Threats to this species include predation by nonnative organisms; disease; drought; floods; degradation and loss of habitat as a result of water diversions and groundwater pumping, poor livestock management, altered fire regimes due to fire suppression and livestock grazing, mining, development, and other human activities; disruption of metapopulation dynamics; increased chance of extirpation or extinction resulting from small numbers of populations and individuals; and environmental contamination. The Chiricahua Leopard Frog Recovery Plan (USFWS 2007) contains a complete discussion of these threats and is included herein by reference. The goal of the recovery plan is to improve the status of the species to the point that it no longer needs the protection of the Endangered Species Act. The recovery strategy calls for reducing threats to existing populations; maintaining, restoring, and creating habitat that will be managed in the long term; translocating frogs to establish, reestablish, or augment populations; building support for the recovery effort through outreach and education; monitoring; research needed to provide effective conservation and recovery; and application of research and monitoring through adaptive management. Recovery actions are recommended in each of eight recovery units throughout the range of the species. Management areas are also identified within recovery units where the potential for successful recovery actions is greatest.

Additional information about the Chiricahua leopard frog can be found in Platz and Mecham (1984, 1979), Sredl and Howland (1994), Jennings (1995), Degenhardt *et al.* (1996), Rosen *et al.* (1996, 1995), Sredl *et al.* (1997), Painter (2000), Sredl and Jennings (2005), and USFWS (2007).

Given the range of this species, several Federal actions affect this species every year. A complete list of consultations affecting this species in Arizona can be found on our website

(http://www.fws.gov/southwest/es/arizona/) by clicking on the "Document Library" tab and then on the "Section 7 Biological Opinions" tab. Survey work and recovery projects also occur periodically, and are summarized in our files.

Huachuca water umbel

On January 6, 1997, the FWS listed the Huachuca water umbel as an endangered species under the Act without critical habitat (62 FR 665). Critical habitat was designated on the upper San Pedro River, Garden Canyon on Fort Huachuca, and other areas of the Huachuca Mountains, San Rafael Valley, and Sonoita Creek on July 12, 1999 (64 FR 37441). The Arizona Department of Agriculture has designated Huachuca water umbel as a Highly Safe Guarded (HS) plant in Arizona, and it is not known to occur in New Mexico. Unless otherwise indicated, the following information for this species is adopted from the rule listing the species (62 FR 665). The Huachuca water umbel is not listed in Mexico.

The Huachuca water umbel is an herbaceous, semiaquatic perennial plant with slender, erect leaves that grow from creeping rhizomes. The species reproduces sexually through flowering and asexually from rhizomes, the latter probably being the primary reproductive mode. An additional dispersal opportunity occurs as a result of the dislodging of clumps of plants which then may reroot in a different site along aquatic systems.

The Huachuca water umbel has been documented from sites in Santa Cruz, Cochise, and Pima counties, Arizona, and in adjacent Sonora, Mexico, west of the continental divide (Haas and Frye 1997, Saucedo Monarque 1990, Warren *et al.* 1989, Warren *et al.* 1991, Warren and Reichenbacher 1991, FWS files). Overgrazing, mining, hay harvesting, timber harvest, fire suppression, and other activities in the nineteenth century led to widespread erosion and channel entrenchment in southeastern Arizona streams and ciénegas when above-average precipitation and flooding occurred in the late 1800s and early 1900s (Bryan 1925, Martin 1975, Hastings and Turner 1980, Dobyns 1981, Hendrickson and Minckley 1984, Sheridan 1986, Bahre 1991, Webb and Betancourt 1992, Hereford 1993). Wetland degradation and loss continue today. Human activities such as groundwater overdrafts, surface water diversions, impoundments, channelization, improper livestock grazing, chaining, agriculture, mining, sand and gravel operations, road building, nonnative species introductions, urbanization, wood cutting, and recreation all contribute to riparian and ciénega habitat loss and degradation in southern Arizona. The local and regional effects of these activities are expected to increase with the increasing human population.

Our June 10, 2005, Programmatic Biological and Conference Opinion for the Continued Implementation of the Land and Resource Management Plans for the Eleven National Forests and National Grasslands of the Southwestern Region (USFWS 2005b) included a detailed Status of the Species for the Huachuca water umbel. This biological opinion (BO) is available on our website at http://www.fws.gov/arizonaes, under Document Library; Section 7 Biological Opinions. Herein, we incorporate that status discussion by reference.

Critical habitat for Huachuca water umbel includes seven critical habitat units in Sonoita Creek, Santa Cruz River, Scotia Canyon, Sunnyside Canyon, Garden Canyon, the Verde River in Yavapai County, Lower Gila River, the San Pedro River, and Aravaipa Creek in Pinal and Graham counties,

portions of Eagle Creek in Graham and Greenlee counties, and Upper Gila River in Catron, Grant, and Hidalgo counties New Mexico (70 FR 75546 and 71 FR 32496).

The critical habitat primary constituent elements are:

- Sufficient perennial base flows to provide a permanently or nearly permanently wetted substrate for growth and reproduction of Huachuca water umbel;

- A stream channel that is relatively stable, but subject to periodic flooding that provides for rejuvenation of the riparian plant community and produces open microsites for Huachuca water umbel expansion;

- A riparian plant community that is relatively stable over time and in which nonnative species do not exist or are at a density that has little or no adverse effect on resources available for Huachuca water umbel growth and reproduction; and

- In streams and rivers, refugial sites in each watershed and in each reach, including, but not limited to, springs or backwaters of mainstem rivers, that allow each population to survive catastrophic floods and recolonize larger areas.

Activities that may result in the destruction or adverse modification of critical habitat include those that alter the ability of the primary constituent elements to function properly and serve the intended conservation role for the species. These types of activities are discussed in the final rule designating critical habitat (70 FR 75546 and 71 FR 32496) and because no designated critical habitat exists within the action area, these activities are only mentioned herein by reference.

The Huachuca water umbel occurs in ciénegas (mid-elevation wetland communities usually surrounded by relatively arid environments) and along streams and rivers at mid elevations from 3,500 to 6,500 ft (1,067 to 1,982 m). These aquatic environments are extremely rare in the desert southwest and much reduced from their historical abundance (about 10 percent remaining), and the Huachuca water umbel is correspondingly rare.

A complete list of all consultations affecting this species can be found on our website (http://www.fws.gov/southwest/es/arizona/) by clicking on the "Document Library" tab and then on the "Section 7 Biological Opinions" tab. Survey work and recovery projects also occur periodically, and are summarized in the appropriate land-management agency documents.

Lowland leopard frog

The lowland leopard frog is not currently listed under the Act nor is it a candidate species. The species is listed as endangered by the State of New Mexico and is considered a WSC in Arizona. The Mexican government considers it a rare species (SEDESOL 1994).

A description of lowland leopard frogs is found in Degenhardt *et al.* (1996) and Stebbins (2003). The only frog with which the lowland leopard frog is likely to be confused in the Malpai Borderlands is the Chiricahua leopard frog, which is often a greener colored frog, with rougher

skin, eyes that are turned more upward, and there is a salt and pepper color pattern on the rear of the thigh of adults.

The species breeds primarily from January through April and again in late summer or early fall. Tadpoles take three to nine months to metamorphose and some overwinter (Sartorius and Rosen 2000, Sredl 2005). Dispersal abilities of the lowland leopard frog are not well known. At a site in central Arizona, 154 frogs moved about 820 ft (250 meters [m]) upstream and four frogs moved 2,953 ft (900 m) downstream after their breeding pond dried out (Sredl 1996). This species is considered to be more terrestrial than the Chiricahua leopard frog (Scott 1992).

Lowland leopard frogs are found primarily in small to medium-sized streams, but also occur in small springs, ciénegas, stock tanks, and occasionally larger rivers. They have also been propagated in backyard pools and school ground projects. Lowland leopard frogs, on average, are found at lower elevations than Chiricahua leopard frogs, generally occurring below 5,500 ft (1,677 m). Reproduction has been documented year-round in low elevation and geothermal sites, but most breeding activity occurs in the spring (Sredl 2005). Egg masses have been observed from January through late April and in October (Ruibal 1959; Collins and Lewis 1979; Frost and Platz 1983). Spherical masses are attached to submerged vegetation, bedrock, or gravel (Sartorius and Rosen, 2000). The clutch size of lowland leopard frogs has not been quantified, but it seems to exhibit the typical high reproductive potential as other North American Ranid species. (Stebbins and Cohen 1995, Lannoo 2005, AGFD 2006).

The lowland leopard frog occurred historically from the Imperial Valley of southeastern California and the lower Colorado River east through central Arizona below the Mogollon Rim and southeastern Arizona to New Mexico (Platz and Frost 1984, Platz 1988, Stebbins 2003). In Mexico, the species occurs from the Río Magdalena drainage east to the Sierra San Luis and south to Highway 16. It likely occurred in the Río Colorado, as well (Rorabaugh *in press*). The species is now absent from the lower Colorado River and adjacent portions of southeastern California (Clarkson and Rorabaugh 1989). They are about gone from their limited historical range in New Mexico (Sredl 2005; C. Painter, pers. comm.) and have declined significantly in southeastern Arizona. Although no records exist for the lower Gila River downstream of the Phoenix area, they almost certainly occurred there historically, but are now replaced by the Río Grande leopard frog and American bullfrog (Rorabaugh *et al.* 2002). The species is still relatively secure in central Arizona; however, declines and extirpations have occurred in that region as well.

Causes of decline and extirpations are complex; some are operating on a local or regional level, while others appear to be global problems. Worldwide, habitat loss and pollution are the leading threats to amphibians (Stuart *et al.* 2004). In the Southwest, although habitat loss and perhaps pollution locally are problems, currently one of the most pervasive threats to ranid frogs is predation by introduced predators, including American bullfrogs, fishes (e.g. sunfishes, bass, carp, catfishes, mosquitofish), crayfish, barred tiger salamanders, spiny softshell (*Apalone spinifera*), pond slider (*Trachemys scripta*), and other turtles introduced west of the Continental Divide (Ernst *et al.* 1994, Moyle 1973, Fernandez and Rosen 1996; Rosen *et al.* 1996, 1995; Hayes and Jennings 1986). Non-native predators are especially diverse and often abundant in big rivers, lakes, reservoirs, and valley bottom ciénegas. These same places likely supported large populations of ranid frogs historically, but native frogs are now often relegated to stock tanks and headwater

springs and streams where non-native predators have yet to invade or fare poorly (Rosen *et al.* 1995, Sredl and Saylor 1998). In some cases, native frogs can coexist with a variety of non-native predators if the habitat is complex (e.g., lowland leopard frogs on the lower San Pedro River, AZ, Rosen and Schwalbe 2002). Of the native ranid frogs in Arizona, the lowland leopard frog may be the most tolerant of non-native predators because it can live and breed in relatively shallow, flowing water that is marginal or unsuitable for bullfrogs and introduced fishes.

Another important cause of decline appears to be an introduced fungal skin disease, chytridiomycosis or "Bd" (Berger *et al.* 1998, Sredl 2000, Sredl and Caldwell 2000, Bradley *et al.* 2002, Christman *et al.* 2003, Weldon *et al.* 2004). A lowland leopard frog collected from Sycamore Canyon in 1972 was also found positive for the disease and is the earliest record of a chytrid positive anuran in the United States (U.S.). Populations of lowland leopard frogs have persisted with the disease at some locations (e.g. lower San Pedro River, Arizona), but have disappeared from other sites where the disease has occurred (e.g. Sycamore Canyon and Las Ciénegas National Conservation Area, Arizona). A discussion of this disease, its potential interactions with contaminants and pollution, and its impacts on amphibians is included in the Chiricahua Leopard Frog Recovery Plan, which is included herein by reference (USFWS 2007). Additional information can be found in Lips (1999), Carey *et al.* (1999, 2001), Parris and Baud (2004), Hale *et al.* (2005), and Hale and Jarchow (1988).

In the arid Southwest, riparian and wetland communities have been extensively used and altered for human purposes (Minckley and Brown 1982, Hendrickson and Minckley 1984, Brown 1985, Arizona Department of Water Resources 1994). Dams, diversions, groundwater pumping, introduction of non-native organisms, woodcutting, mining, contaminants, urban and agricultural development, road construction, overgrazing, and altered fire regimes have all contributed to reduced quality and quantity of riparian and wetland habitat (Gifford and Hawkins 1978, Arizona State University 1979, Hendrickson and Minckley 1984, Brown 1985, Bahre 1991, Hadley and Sheridan 1995, Hale *et al.* 1995, Ohmart 1995, Stebbins and Cohen 1995, Belsky and Blumenthal 1997; DeBano and Neary 1996, Wang *et al.* 1997, Wallace 2003).

Where aquatic habitats have been eliminated, ranid frogs have disappeared. For instance, lowland leopard frogs once occupied the now dry reaches of the Santa Cruz River through Tucson (Arnold 1940). Wildfires and subsequent post-fire floods and ash flow have eliminated lowland leopard frogs in the Santa Catalina Mountains, Arizona (Wallace 2003). In many cases, aquatic habitats remain (albeit altered) or have been replaced by stock tanks or agricultural developments that include canals, ditches, and drains. Lowland leopard frogs often can use these altered habitats, so long as non-native predators are absent. Historically, lowland leopard frogs occupied agricultural areas in southeastern California, but are now absent (Clarkson and Rorabaugh 1989, Jennings and Hayes 1994), likely due to introduced predators.

See Platz and Frost (1984), Platz (1988), Degenhardt *et al.* (1996), Sredl (1997, 2005), and Sartorius and Rosen (2000) for further information about this species.

Northern Mexican gartersnake

The northern Mexican gartersnake is one of ten subspecies of the Mexican gartersnake and is not currently listed under the Act, but is considered by the FWS to be a species of concern. It is listed as endangered by the State of New Mexico and is considered a WSC in Arizona. This species is listed as threatened in Mexico. The northern Mexican gartersnake has the largest and northernmost distribution of any of the subspecies of Mexican gartersnakes and is the only subspecies to occur in the U.S. In Mexico, the Mexican gartersnake (*Thamnophis eques*) is listed as threatened by SEDESOL (1994).

A description of the northern Mexican gartersnake is included in our Notice of 12-month Petition Finding (71 FR 56228) and in Rosen and Schwalbe (1988) and Rossman *et al.* (1996), which are included herein by reference. Throughout its rangewide distribution, the northern Mexican gartersnake occurs at elevations from 130 to 8,497 ft (40 to 2,590 m) (Rossman *et al.* 1996). The northern Mexican gartersnake is considered a riparian obligate (restricted to riparian areas when not engaged in dispersal behavior) and occurs chiefly in the following general habitat types: (1) source-area wetlands (e.g., ciénegas [mid-elevation wetlands with highly organic, reducing (basic, or alkaline) soils], stock tanks [small earthen impoundments], etc.); (2) large river riparian woodlands and forests; and (3) streamside gallery forests (as defined by well-developed broadleaf deciduous riparian forests with limited, if any, herbaceous ground cover or dense grass) (Hendrickson and Minckley 1984, Rosen and Schwalbe 1988, Arizona Game and Fish Department 2001a).

The northern Mexican gartersnake is surface active at ambient temperatures ranging from 71 to 91˚ Fahrenheit (F) (22 to 33˚ Celsius [C]) and forages along the banks of waterbodies. The northern Mexican gartersnake is an active predator and is believed to heavily depend upon a native prey base (Rosen and Schwalbe 1988). Generally, its diet consists predominantly of amphibians and fishes, but may also include annelids, small rodents, and lizards of the genera *Aspidoscelis* and *Sceloporus* (Rosen and Schwalbe 1988; Holm and Lowe 1995; Degenhardt *et al.* 1996; Rossman *et al.* 1996; Manjarrez 1998). To a much lesser extent, this snake's diet may include nonnative species, including juvenile fish, larval and juvenile bullfrogs, and mosquitofish (*Gambusia affinis*) (Holycross *et al.* 2006).

Threats to the species include loss and degradation of its aquatic habitats as a result of dams, diversions, groundwater pumping, introduction of nonnative species (vertebrates, plants, and crayfish), woodcutting, mining, contaminants, urban and agricultural development, road construction, poorly managed livestock grazing, wildfires, and illegal border activity (71 FR 56228). Of all these threats, the literature, as well as field observations, suggest that the effects of nonnative species (bullfrogs, spiny-rayed fish, and crayfish) are the most influential on the status of the northern Mexican gartersnake and the prey base that it requires for survival (71 FR 56228).

Its historical range once extended from central Arizona and southwestern New Mexico, south along western Mexico to Oaxaca in southern Mexico. The northern Mexican gartersnake historically occurred in several drainage systems in Arizona including the Gila, Salt, Verde, San Pedro, Colorado, and Santa Cruz. In New Mexico, the species was historically found in scattered locations throughout the Gila and San Francisco headwater drainages in western Hidalgo and Grant counties. In recent decades, northern Mexican gartersnakes have declined precipitously in the U.S. and are

considered extirpated from the State of New Mexico. Current estimates indicate that the species has been extirpated from 90 percent of its historical distribution in the U.S. and only remains extant in a handful of geographically disjunct locations (71 FR 56228).

See Rosen and Schwalbe (1988); Holm and Lowe (1995); Degenhardt *et al.* (1996); Rossman *et al.* (1996); Manjarrez (1998), and Holycross *et al.* (2006) for further information about this species.

Yaqui Fish - listed

The Yaqui fish listed under the Act include the beautiful shiner, Yaqui catfish, Yaqui chub, and Yaqui topminnow. On August 31, 1984, the beautiful shiner was listed as a threatened species, and the Yaqui catfish and Yaqui chub were listed as endangered species (49 FR 34490). Critical habitat was designated for these three species at the time of their listing (49 FR 34490).

Critical habitat for the beautiful shiner, Yaqui catfish, and Yaqui chub includes all aquatic habitats of San Bernardino National Wildlife Refuge (San Bernardino NWR), Cochise County, Arizona. These areas provide habitat for one of the two existing populations of beautiful shiner. Additionally, the aquatic habitats on San Bernardino NWR may provide expansion habitat for these three species.

The critical habitat primary constituent elements for the beautiful shiner, Yaqui catfish, and Yaqui chub are:

- clean, small, permanent streams with riffles, or intermittent creeks with pools and riffles in the Río Yaqui drainage (beautiful shiner),
- permanent streams of medium current with clear pools (Yaqui catfish),
- permanent water with deep pool and intermediate areas with riffles (Yaqui chub),
- areas of detritus or heavy overgrown cut banks (Yaqui chub),
- clean and unpolluted water, and
- water free of introduced nonnative fish.

Yaqui topminnow, originally listed as Sonoran topminnow (*Poeciliopsis occidentalis*), was listed as endangered only in the U.S. portion of its range on March 11, 1967 (32 FR 4001). Descriptions of these species and life history accounts are included in the Fishes of the Río Yaqui Recovery Plan (USFWS 1995a), and are included herein by reference.

Our June 10, 2005, Programmatic Biological and Conference Opinion for the Continued Implementation of the Land and Resource Management Plans for the Eleven National Forests and National Grasslands of the Southwestern Region (USFWS 2005b) included a detailed Status of the Species for the Yaqui catfish and Yaqui Chub. A detailed Status of the Species for Yaqui topminnow is included in the September 3, 2004 Biological and Conference Opinion for the Bureau

of Land Management (BLM) Arizona Statewide Land Use Plan Amendment for Fire, Fuels, and Air Quality Management (USFWS 2004). The status of the beautiful shiner was documented in the January 23, 2006, Biological Opinion for the Implementation of the Fire Management Plan at the San Bernardino and Leslie Canyon National Wildlife Refuges (USFWS 2006a). These BOs are available on our website at http://www.fws.gov/southwest/es/arizona/, under Document Library; Section 7 Biological Opinions. Herein, we incorporate those status discussions by reference. A brief update to the status of these four species referenced here is included below.

A complete list of all consultations affecting these species can be found on our website (http://www.fws.gov/southwest/es/arizona/) by clicking on the "Document Library" tab and then on the "Section 7 Biological Opinions" tab. Survey work and recovery projects also occur periodically, and are summarized in the appropriate land-management agency or AGFD documents.

Beautiful shiner

The beautiful shiner is found in a variety of habitats, but the largest populations appear to occur in the riffles of small streams (49 FR 34490). In Mexico, the beautiful shiner has been reported in both riffles and pools within moderate-sized, clear streams, creeks, spring-fed pools, and artesian-fed ditches, and exceptionally, in ephemeral lakes; occurring in habitats subject to environmental extremes (Miller *et al.* 2005). It is a mid-water-column species, remaining near, but rarely within aquatic vegetation or other cover along pond margins. This shiner likely spawns from February to June and perhaps over a longer period in warm springs (Miller *et al.* 2005). Little else is known about the life history and ecology of this fish, although it is thought to be similar to that of the red shiner (49 FR 34490).

The beautiful shiner historically occurred in the U.S. only in San Bernardino Valley in Arizona (now designated as the Yaqui form) and the Mimbres River in New Mexico (now designated as the Guzman form). In Mexico, its range includes the Río Yaqui system, Guzman basin, and Bavicora and Sauz basins. The Guzman form was extirpated in the U.S. by about 1951 and the Yaqui form by 1970. The species is continuing to suffer reductions in Mexico as a result of changes in land and water use along with impacts of non-indigenous species such as the red shiner. Few individuals were found in Sonora's Cajon Bonito during 2005 fish surveys, and none were documented during 2006 surveys in the same stream (W. Radke, pers. comm.).

The species was federally listed as threatened, with critical habitat including all aquatic habitats of San Bernardino NWR, on August 31, 1984. The constituent elements of its critical habitat include isolated ponds and small permanent streams with riffles or intermittent creeks with pools and riffles in the Río Yaqui drainage with clean unpolluted water that is free of introduced exotic fishes (49 FR 34490). About 900 beautiful shiner were collected under permit in Chihuahua from Arroyo Moctezuma on the Bavispe drainage during October 1989. These fish were held and propagated at Dexter National Fish Hatchery (Dexter NFH), and 300 fish were ultimately reestablished into Twin Pond on San Bernardino NWR on May15, 1990. The species is currently reproducing and thriving in the two adjacent Twin Ponds, and has adapted well to these off-channel ponds established as refugia for this and other fish species. Beautiful shiner from the Twin Ponds are able to pioneer into lotic habitats within Black Draw, but the species is not typically found in Black Draw during annual fish surveys (W. Radke, pers. comm.). In addition to being federally listed as threatened in

the U.S., beautiful shiner are considered WSC in Arizona and are not currently known from New Mexico. The species was listed as threatened in Mexico (SEDESOL) (1994).

Yaqui catfish

The Yaqui catfish is a medium to large fish of the family Ictaluridae (Minckley 1973), with lengths of 15 inches (in) (40 centimeter [cm]) and weights of two pounds (lbs) (one kilogram [kg]) or more common in wild-caught specimens. A captive specimen at Dexter NFH weighs about 17 lbs (eight kg). The species is most commonly caught in larger rivers in areas of medium to slow current over gravel and sand substrates. These catfish are found in deeper pools in the canyon-bound reaches of the Río Yaqui among Mexican roundtail chubs (*Gila minaceae*) and Yaqui suckers. Yaqui catfish will frequent riffles and runs at night during feeding activity. Diet includes aquatic invertebrates, other fishes, and organic debris. Adults spawn in a depression or hole in the bank, and males will defend the nest and young for a period of time. Juveniles eventually move to riffles where they occupy shallow water between heavier substrates (Rinne and Minckley 1991).

Juvenile Yaqui catfish are profusely speckled, while adults are a fairly uniform dark gray to black dorsally and white to grayish beneath. The species is usually found in large streams in areas of medium to slow current over gravel and sand substrates. Besides this information on basic habitat preference, little is known about the life history and ecology of this fish (49 FR 34490).

Yaqui catfish are the only native catfish west of the Continental Divide. The historical range of the species most likely included the northernmost part of the Río Yaqui basin in Arizona and the Río Yaqui and Río Casas Grandes basins in Sonora and Chihuahua, Mexico. However, with the exception of a population of Yaqui catfish stocked in the upper Santa Cruz River in Arizona in 1899 (which persisted until the 1950's), no specimens documenting its presence in the U.S. are known. Yaqui catfish were probably extirpated from the wild in the U.S. prior to the 1960s when flows in Black Draw ceased.

Threats to the species include habitat modification and actual and potential hybridization with introduced, non-native catfishes (e.g., channel catfish and blue catfish). This species was federally listed as threatened, with critical habitat including all aquatic habitats of the main portion of San Bernardino NWR, on August 31, 1984. Critical habitat for the Yaqui catfish consists of all aquatic habitats on the San Bernardino NWR, the constituent elements of which include clean, unpolluted permanent water in streams with medium current and clear pools in the Río Yaqui drainage that are free of introduced exotic fishes (49 FR 34490).

Extirpated from the U.S., the species has subsequently been reestablished in Arizona. Initial collections of wild Yaqui catfish were made in 1987 and 1990 from the Rió Aros sub-basin. Additional collections totaling 100 catfish were made with electro-fishing equipment from three sites within the Rió Bavispe sub-basin (Tres Riós, La Taranga, & Cobora) during June 1995 and October 1995 and from Cajon Bonito during March 1996. These fish were transported to Dexter NFH to develop culture techniques, and fish were ultimately induced to spawn at Uvalde National Fish Hatchery during 1995, 1996, 1997 and 1999. On November 13, 1997, a total of 60 12-inch catfish and 100 6-inch catfish were stocked into Twin Pond on San Bernardino NWR, and a total of

100 12-inch catfish and 100 6-inch catfish were stocked into House Pond at Slaughter Ranch. All of the larger fish were implanted with Passive Integrated Transponder tags for future identification.

A total of 1,464 Yaqui catfish were released on October 26, 1999 at El Coronado Ranch. Limited population monitoring of this species has occurred at Twin Pond and House Pond during 2001, 2003, 2005, and 2006. Yaqui catfish are currently present, in unknown numbers, in Twin Pond on San Bernardino NWR, in House Pond on the Slaughter Ranch, and in "Big Tank" on El Coronado Ranch. While natural spawning in these three locations has yet to be documented, multiple age class catfish were first documented in House Pond by refuge staff during October 2005 monitoring efforts, indicating the possibility of natural reproduction. Numerous Yaqui catfish representing multiple age classes were present in Sonora's Cajon Bonito during fish surveys conducted in November 2006, but it is not known how far up the Río San Bernardino this species currently occurs (W. Radke, pers. comm.). It is anticipated that with current management activities and watershed improvements that aquatic sites within Black Draw will continue to improve and Yaqui catfish will reestablish in Black Draw on San Bernardino NWR. Yaqui catfish are considered WSC in Arizona and are not found in New Mexico. The species is listed as rare in Mexico by SEDESOL (1994).

Yaqui chub

The Yaqui chub is a medium sized fish of the family Cyprinidae (Minckley 1973) growing to a total of about five inches (13 cm) long. Until recently, *Gila purpurea* was thought to occur in the basins of the Ríos Sonora, Matape, and Yaqui in Arizona and Sonora, México (Hendrickson *et al.* 1980). In 1991, it was recognized that the chub in the Ríos Sonora and Matape and the Río Yaqui system downstream from San Bernardino Creek are a different species, *Gila eremica* (DeMarais 1991). *Gila purpurea* is endemic to San Bernardino Creek in Arizona and México and also the Willcox Playa basin in Arizona (Varela-Romero *et al.* 1990, DeMarais 1991).

The Yaqui chub was federally listed as endangered, with critical habitat including all aquatic habitats in the main portion of San Bernardino NWR, on August 31, 1984 throughout its range. Critical habitat for the Yaqui chub consists of all aquatic habitats on the San Bernardino NWR; the constituent elements of critical habitat include artesian fed ponds and clean, permanent water with deep pools and intermediate areas with riffles in the Río Yaqui drainage, areas of detritus or heavily overgrown cut banks, and the absence of introduced exotic fishes (49 FR 34490). In addition to their status under the Act, Yaqui chub are considered WSC in Arizona and are not known from New Mexico. The species is listed as endangered in Mexico by SEDESOL (1994).

Yaqui chub live in deep pools in creeks, ciénegas, and other stream-associated quiet waters. Habitat preferences vary by life stage, with young fish preferring marginal habitats and lower ends of riffles and adults preferring deep, permanent pools, undercut banks next to large boulders, debris piles, and roots of large trees (Hendrickson *et al.* 1980). Breeding males are a bluish-grey color while females are straw-yellow to light brown color (Minckley 1973). Spawning is protracted throughout the warmer months with the greatest activity in spring. Under the right conditions, spawning can also occur during the autumn (W. Radke, pers. comm.). Growth to maturity is rapid, often within the first summer of life; reproductive potential is therefore high and large populations can develop quickly from a few adults (DeMarais and Minckley 1993). Diet consists mostly of algae, insects, and detrital material (Galat and Gerhardt 1987).

The Yaqui chub has a very limited geographic range, occurring only at the headwaters of the Río Yaqui basin in Arizona and for a short distance, greater than a mile (about three km), into Mexico (Miller *et al.* 2005). Decline of the species probably began with regional arroyo cutting in the late 1800s when poor grazing practices helped destroy ciénegas and wetlands and contributed to watershed deterioration. The Río San Bernardino became incised by more than 25 ft in some areas, and streamside marshlands (ciénegas) were drained, except where locally maintained by springs or artesian wells. The fish approached extinction in the late 1960's due to habitat loss, but survived largely due to human intervention, including transplantation, hatchery production, habitat acquisition, renovation, creation, and reintroduction. Catastrophic drought in the mid-1970s further depleted populations (DeMarais and Minckley, 1993).

Managed populations of this species are currently reproducing and thriving on San Bernardino NWR in Bathhouse Spring, Black Draw, Double PhD Pond, the Hay Hollow Ponds, House Pond, the Minckley Ponds, North Fork, Oasis Pond, and the Twin Ponds, and in up to seven different ponds on El Coronado Ranch and throughout portions of West Turkey Creek (W. Radke, pers. comm.). Virtually all of those populations have been stocked into enhanced or artificially created habitats as part of the recovery program and have adapted well to the off-channel ponds established as refugia for this and other fish species. The population in Leslie Creek was stocked in 1969 with individuals taken from Astin Spring (Minckley and Brooks 1985). A population in Turkey Creek in the Chiricahua Mountains was stocked in 1986 and 1991 from Astin Spring (via Leslie Creek) stock raised at Dexter NFH. They are also found in most wetlands just south of San Bernardino NWR in Mexico and can pioneer upstream during flood events. Current populations have responded well to intensive management and have established large, viable populations in diverse habitats. Yaqui chub have not been documented in Astin Spring for several years, but could easily re-occupy the site during flood conditions. Most Yaqui chub populations continue to be threatened due to infestations by the non-native Asian tapeworm

Yaqui topminnow

The Yaqui topminnow is a small, live-bearing fish of the family Poeciliidae (Minckley 1973) occurring throughout shallow, warmer waters within the Río Yaqui Basin. Originally, the Yaqui topminnow was described as a full species by Girard (1859), but Minckley (1969) recognized the Gila and the Yaqui topminnow forms as subspecies of *Poeciliopsis occidentalis*. A subsequent publication by Minckley (1999) considers the Gila topminnow and the Yaqui topminnow to be separate species; *P. occidentalis and P. sonoriensis*, respectively (Hedrick, *et al.* 2001).

The Yaqui topminnow was federally listed as endangered without critical habitat on March 11, 1967 (32 FR 4001), although it remains fairly abundant and widespread in parts of Mexico. Yaqui topminnow are considered WSC in Arizona, and do not occur in New Mexico. The species is listed as threatened in Mexico by SEDESOL (1994).

The species typically lives in shallow, warm, quiet waters (e.g., springheads, stream edges, ciénegas, and marshes), but can disperse through any flowing water during the warm summer months. Preferred habitats consist of dense mats of algae and debris along stream margins or in eddies below riffles. Topminnow become most abundant in marshes, especially those fed by thermal springs or artesian outflows. Females may have 20 or more young per brood and can breed

at intervals of just 20 days. Reproduction occurs year round where winter temperatures are moderated by spring inflows, but may begin in early April and ends in October under conditions of fluctuating temperatures. Yaqui topminnow eat vegetation and aquatic insects, including mosquito larvae.

Yaqui topminnow were once found throughout the Rió Yaqui drainage in southeastern Arizona and in Sonora and Chihuahua, Mexico. Their populations were dramatically reduced in the U.S. because of habitat alteration and destruction. Threats to the species include competition with western mosquitofish, a widely introduced exotic, and plant community succession (i.e., to cattail marshes) within their limited aquatic habitats. The mosquitofish is a voracious predator that has already reduced formerly large and widespread populations of the native Gila topminnow (*Poeciliopsis occidentalis occidentalis*) in Arizona through both direct predation and through competition for food resources.

Yaqui topminnow are currently found in every permanent wetland on San Bernardino NWR, Slaughter Ranch, Rancho San Bernardino in Sonora, Leslie Creek, and in Astin Spring on the Malpai Ranch, where populations are relatively secure from mosquitofish introductions and habitat alteration (W. Radke, pers. comm.). The species has adapted well to numerous off-channel ponds established as refugia for this and other fish species on the refuge, it is thriving and reproducing, and it readily disperses into Río San Bernardino (Black Draw). Due to their dispersal capability, the species can be found anywhere in Black Draw, Hay Hollow Wash, and their tributaries during flood seasons, and can also disappear from particular wetland sites only to reappear years later. Wetland plant community succession, especially the proliferation and spread of cattail, continues to take over wetlands upon which topminnow depend.

Yaqui Fish - unlisted

The Yaqui fish not listed under the Act, but proposed for coverage under the MBHCP, include the Mexican longfin dace (also referred to as longfin dace – Yaqui form), Mexican stoneroller, and Yaqui sucker.

Mexican longfin dace

Longfin dace are members of the Family Cyprinidae, and adults reach up to about 3.5 in (8.9 cm) long. One of the most abundant, widely distributed native fish in the Southwest, the longfin dace may occur within particular habitats in very high densities. The Mexican longfin dace of the Río Yaqui drainage has been under study by D.A. Hendrickson and W.L. Minckley and is of particular interest because it is considered to be an as yet undescribed variety that has a more highly restricted range than the species as a whole (Miller *et al.* 2005). The range of the Río Yaqui variety includes the Sulphur Springs Valley and the San Bernardino Valley in Arizona southward throughout the Río Yaqui basin. While its formal description has not yet been completed, should its uniqueness be confirmed and accepted by taxonomists, the taxon could potentially be determined to be suitable for listing under the Act at a future time.

Mexican longfin dace are dark gray above and white below with a dark lateral band just above the lateral line. Sexes are best differentiated by the shape of their anal fin. Longfin dace use low elevation, sand bottomed desert streams through middle elevation habitats to clear, cool creeks in

the lower reaches of conifer zones (Miller *et al.* 2005). The longfin dace has a restricted, although variable, breeding season and breed at one year of age (Naiman and Soltz 1981). At Leslie Canyon NWR and in Silver Creek on Rancho San Bernardino in northern Sonora, Mexican longfin dace build shallow, saucer shaped depressions in the sand which they use as nests (W. Radke, per. comm.), though this behavior has apparently not been observed throughout their range in the Río Yaqui basin (Miller *et al.* 2005). This fish feeds on a wide variety of plant and animal foods (Grimm 1988), and young fish feed on microscopic crustaceans, detrital materials, and algae (Minckley 1973).

In deserts of the American Southwest, longfin dace are considered highly resistant to environmental extremes within their native ranges, and they will penetrate far into temporary waters at times of high precipitation and runoff (Deacon and Minckley 1974). Longfin dace are well adapted to streams that experience periodic, high-intensity flooding and are capable of migrating upstream during floods to occupy isolated perennial stream reaches (P. Warren, pers. comm.). During periods of almost complete desiccation of water courses due to evaporation, longfin dace are capable of persisting beneath water saturated mats of algae and debris, and at night when flow is resumed under reduced evaporation, the fish swim about and feed in just a few millimeters of water (Minckley and Barber 1971). Temporary streams with a few persistent pools can serve as refugia for longfin dace, a vagile species capable of reaching them when the stream has essentially ceased to exist (Naiman and Soltz 1981). SEDESOL listed this species (actually a composite of the two *Agosia* spp.) as threatened in 1994.

Mexican stoneroller

The Mexican stoneroller is a member of the family Cyprinidae, with adults reaching lengths of up to 4.5 in (11.4 cm). The species typically inhabits clear, fast riffles, chutes, and pools in moderate to high-gradient creeks and is often common in headwaters with gravel or sandy bottoms (Burr 1980, Miller *et al.* 2005). Breeding males and gravid females have been taken from March to June in Chihuahua, Sonora, and Arizona.

Its range is divided into two disjunct areas; the Río Grande system of the Big Bend region in southern Texas and the Río Yaqui system of northern Mexico and extreme southeastern Arizona. In Mexico, the species is widespread and can be regionally abundant (Miller *et al.* 2005). It is common in Cajon Bonito and is present in the Río San Bernardino (Black Draw) in northern Sonora, where individual Mexican stonerollers regularly disperse into Arizona during annual flood events (W. Radke, pers. comm.). In Arizona, the Mexican stoneroller historically occurred throughout the Río Yaqui basin and was originally described in the 1880s from Rucker Canyon in the Chiricahua Mountains, where it occurred naturally. Currently, the species occurs in Arizona in three locations; a population in Rucker Creek, small numbers in Río San Bernardino (Black Draw) on San Bernardino NWR, and a population introduced into West Turkey Creek (from Rucker Creek) during 2007 (W. Radke, pers. comm.).

Potential current threats to the species include aquifer pumping, reduction in stream flows, water diversion, drought, post-wildfire increased siltation, and predation by non-native green sunfish (*Lepomis cyanellus*) and rainbow trout (*Oncorhynchus mykiss*). Mexican stonerollers in Rucker

Canyon, along with those introduced into West Turkey Creek, were free of Asian tapeworm in 2007 (W. Radke, pers. comm.).

Watershed restoration work is being conducted on private lands and on refuge lands in the San Bernardino Valley, and positive results have already been achieved. In addition, extensive watershed enhancement is being done in northern Sonora on Rancho San Bernardino, which is further increasing quality habitat for this species. As perennial streamflow continues to increase on the San Bernardino NWR in Río San Bernardino (Black Draw) and in Hay Hollow Wash, it is expected that Mexican stonerollers will become successful in reestablishing breeding populations without the need for reintroduction efforts by humans.

In Arizona, the Mexican stoneroller is considered a WSC, and in Texas it is considered threatened. The species was listed as endangered in Mexico by SEDESOL in 1994, presumably due to local population declines (Miller *et al.* 2005).

Yaqui sucker

The Yaqui sucker is a member of the Family Catostomidae, and adults are known to reach a length of nearly 16 in (41 cm). The dorsal coloration of this fish is various shades of olive to tan with the head of adults often sharply bicolored. The belly is lighter, and fins are yellowish, often turning brighter orange in breeding males. The fish has large eyes and fleshy lips. The anal, pelvic, and pectoral fins are greatly expanded in breeding males (Minckley 1973). The genus *Catostomus* is recognized for its capacity to succeed in the widest range of habitat sizes (Naiman and Soltz 1981) and the Yaqui sucker exemplifies this wide ecological tolerance, occurring in pools and rapids of small to large desert and montane streams and in large river channels (Miller *et al.* 2005). The sucker is a benthic microvore (Naiman and Soltz 1981).

The species was initially described from the Río San Bernardino (Black Draw) a few meters south of the Arizona/Sonora border (Minckley 1973). The historical range of this species included the Río Yaqui basin in Sonora and Chihuahua, Mexico, where it remains fairly common, and in southeastern Arizona, where it is currently eliminated. In Arizona, the species historically inhabited the deeply incised creek and headwater springs of Río San Bernardino (Black Draw) up to an elevation of about 7,800 ft (2,378 m). Relatively little is known about the life history and ecology of the Yaqui sucker, although spawning is apparently protracted, lasting from late January to mid-August.

Reported to be abundant in Astin Spring (just upstream from San Bernardino NWR) in 1967, the species apparently disappeared by 1969 or 1970 during severe drought conditions. Potential current threats to the species include aquifer pumping and resulting reduction in stream flows, water diversion, drought, and post-wildfire increased siltation.

Large suckers show a proportionally larger response to increase in habitat volume, and adults are rarely present in small tributaries (Naiman and Soltz 1981). The species was found in good numbers at Cajon Bonito in Sonora during fish surveys conducted during 2005 and 2006 (W. Radke, pers. comm.). Extensive watershed restoration work is being conducted in the San Bernardino Valley on refuge lands and on private lands on both sides of the International Border

with Mexico, which is already leading to increased water quality and quantity within the historic range of this species. With increased perennial stream flow in Río San Bernardino (Black Draw) and in Hay Hollow Wash, it is expected that Yaqui suckers will become successful in reestablishing breeding populations without the need for reintroduction efforts by humans. The Yaqui sucker is listed as rare by SEDESOL (1994), perhaps on the basis of its increasing rarity in the northern parts of its range (Miller *et al.* 2005).

GRASSLAND SPECIES

Northern aplomado falcon

The northern aplomado falcon is one of three subspecies of the aplomado falcon and is the only subspecies recorded in the United States. This subspecies was listed by the FWS as an endangered species on February 25, 1986 (51 FR 6686). The northern aplomado falcon is also listed as endangered by the State of New Mexico and is considered "Wildlife of Special Concern" in Arizona. In Mexico, the northern aplomado falcon is listed as threatened by SEDESOL (1994). It once extended from Trans-Pecos Texas, southern New Mexico and southeastern Arizona, to Chiapas and the northern Yucatan along the Gulf of Mexico, and along the Pacific slope of Central America north of Nicaragua (USFWS 1990). Northern aplomado falcons were fairly common in suitable habitat throughout these areas until the 1940s. However, they subsequently declined rapidly and became extirpated as a breeding species from the United States after 1952. The last documented nesting pair of wild northern aplomado falcons in the United States prior to their extirpation was in Luna County, New Mexico, in 1952.

The decline of the northern aplomado falcon was caused by widespread shrub encroachment resulting from control of range fires and intense overgrazing (51 FR 6686; Burnham et al. 2002), and large-scale agricultural development in grassland habitats used by the northern aplomado falcon (Heady 1994; Keddy-Hector 2000). Pesticide exposure was likely a significant cause of the subspecies' extirpation from the United States with the initiation of widespread use of organochlorine pesticides, such as dichlorodiphenyltrichloroethane (DDT) and dichlorodiphenyldichloroethylene (DDE), after World War II, which coincided with the northern aplomado falcon's disappearance (51 FR 6686). Northern aplomado falcons in Mexico in the 1950s were heavily contaminated with DDT residue, and these levels caused a 25 percent decrease in eggshell thickness (Kiff et al. 1980). Such high residue levels can often result in reproductive failure from egg breakage (USFWS 1990). Use of organophosphate insecticides may also threaten northern aplomado falcons because insects and small, insectivorous birds are the species preferred prey items (Keddy-Hector 2000). Collection of northern aplomado falcons and their eggs may have also been detrimental to the subspecies in some localities. However, populations of birds of prey are generally resilient to localized collection pressure (USFWS 1990).

The species appears to be non-migratory throughout its range. Nesting chronology is somewhat variable, with egg-laying recorded from January to September, although eggs are usually laid during the months of March to May. Northern aplomado falcons do not build their own nests, but use nest sites constructed by corvids (e.g., Chihuahuan ravens) or large raptors. Thus, northern aplomado falcons are dependent on nesting activities of other stick nest-building birds and their

habitat requirements. Nest sites are found in structures such as multi-stemmed yuccas and large mesquite trees, as well as other trees.

Northern aplomado falcons feed on a variety of prey, including birds, insects, rodents, small snakes, and lizards. Ligon (1961) suggested that the food habits of northern aplomado falcons "consisted almost wholly of small reptiles, lizards, mice, other rodents, grasshoppers, and various other kinds of insects, rarely small birds except in winter when other food is lacking." Therefore in winter, factors affecting habitat suitability for migratory bird species may also affect the suitability of the habitat for northern aplomado falcons, which in turn can affect the potential for survival of northern aplomado falcons (USFWS 2002a). In eastern Mexico, small birds accounted for 97 percent of total prey biomass, but insects represented 65 percent of prey individuals (Hector 1985). In one study, 82 bird species were found in prey remains; of these, the most common were meadowlarks, common nighthawks, northern mockingbirds, western kingbirds, brown-headed cowbirds, Scott's oriole, mourning doves, cactus wrens, and pyrrhuloxia, suggesting a preference for medium-sized songbirds (USFWS 2002a). Documented invertebrate prey includes grasshoppers, beetles, dragonflies, cicadas, crickets, butterflies, moths, wasps, and bees (USFWS 1990). Differences in prey abundance and nest site availability can cause differences in home range size. Based on several studies, the FWS estimates northern aplomado falcon home range size to be approximately 34 km^2 (8,401 ac or 13.1 sections) (USFWS 1990; 2002a). For management purposes, this can be described by a circle with a radius of 2 miles around a particular habitat feature (e.g., a nest site).

Northern aplomado falcon habitat is variable throughout its range and includes palm and oak savannahs, various desert grassland associations, and open pine woodlands. Within these variations, the essential habitat elements appear to be open terrain with scattered trees, relatively low ground cover, an abundance of insects and small to medium-sized birds, and a supply of nest sites (USFWS 1990). In Mexico, reported habitat includes palm and oak savannas, open tropical deciduous woodlands, wooded fringes of extensive marshes, various desert grassland associations, and upland pine parklands (USFWS 1990). The historic range of the northern aplomado falcon in Texas, New Mexico and Arizona occurs within the Chihuahuan Desert, which is comprised of three basic community types: desert scrub, desert grasslands, and woodlands. The species' historic range also occurs in the coastal prairies of southern Texas Northern aplomado falcons are primarily associated with open grasslands that include scattered mesquite and/or yuccas (*Yucca torreyi* and *Y. elata*), although small patches of scrub and woodlands may be used (USFWS 2006b). Existing data suggest that the ecological status of Chihuahuan Desert grasslands currently occupied by northern aplomado falcons is high seral to potential natural community, or climax with significant basal cover of grass species. Montoya et al. (1997) reported occupied nesting habitat as having basal ground cover ranging from 29 to 70 percent with a mean of 46 percent. Woody plant density ranged from 5 to 56 plants/acre, with a mean of 31 plants/acre. Dominant woody plant species, comprising 74 percent of this community, were Mormon tea, soaptree yucca, sacahuista, mesquite, senecio, creosotebush, and baccharis. Site-specific habitat assessments should be conducted to further define whether the site of a given project or activity occurs within suitable habitat for this species.

In recent times, the intense overgrazing that resulted in shrub encroachment into grasslands has moderated, and improved range management techniques have been developed, including decreased stocking rates, stock rotation, prescribed burning, and other brush control methods (Archer 1994;

Heady 1994; Burnham et al. 2002). Furthermore, the use of DDT was banned in the United States in 1972 and in Mexico in 2000. Present threats to the northern aplomado falcon, including long-term drought, continued replacement of grassland communities with shrubs in Chihuahuan Desert grasslands, large-scale conversion of grasslands to agriculture, and the increased presence of the great-horned owl (*Bubo virginianus*), which preys upon the northern aplomado falcon, may be limiting recovery of this subspecies (71 FR 42298; Macías-Duarte et al. 2004). In contrast to these current threats, northern aplomado falcons appear to be relatively tolerant of human presence. They have been observed to tolerate approach to within 100 meters (m) (328 feet (ft)) of their nests by researchers, have nested within 100 m (328 ft) of highways in eastern Mexico (Keddy-Hector 2000), and are frequently found nesting in association with well-managed livestock grazing operations in Mexico and Texas (Burnham et al. 2002). Burnham et al. (2002) concluded that northern aplomado falcons would be able to coexist with most current land-use practices in the United States on the broad scale.

A recovery plan for the northern aplomado falcon was finalized by the FWS in 1990 (USFWS 1990). To address reestablishment of northern aplomado falcons in the United States, reintroduction of nestling northern aplomado falcons was identified by the Recovery Plan as a recommended methodology. To further aid reestablishment, reintroduction sites are carefully selected to optimize habitat suitability. Northern aplomado falcon reintroductions have been ongoing in southern Texas since 1985 on National Wildlife Refuges and private land under Safe Harbor Agreements. Consequently, by 2005, reintroductions had resulted in at least 44 pairs of northern aplomado falcons in southern Texas and adjacent Tamaulipas, Mexico, where no pairs had been recorded since 1942 (Jenny et al. 2004). The first nesting pair of northern aplomado falcons in south Texas subsequent to releases did not occur until 1995, however, by 2005, the Texas pairs had successfully fledged more than 244 young (Juergens and Heinrich 2005). In 2007, the Peregrine Fund found that 29 out of 32 territories surveyed in southern Texas were occupied (Angel Montoya, The Peregrine Fund, personal communication 2007a). There are likely more breeding pairs present in this area than what has been documented, considering areas of habitat that are inaccessible for surveys. Reintroduction of captive-bred northern aplomado falcons began in west Texas in 2002. The Peregrine Fund reported that 6 or 7 breeding pairs were found in west Texas in 2007, including a pair that successfully reproduced (Angel Montoya, The Peregrine Fund, personal communication, 2007b).

Reintroduction of captive-bred northern aplomado falcons began in New Mexico with the release of 11 birds in 2006 on the privately-owned Armendaris Ranch near Truth or Consequences. In 2007, a pair of northern aplomado falcons from this first year of reintroductions produced two fledglings on the ranch. In 2007, a total of 41 birds were released in New Mexico on private, State, and Bureau of Land Management and Department of Defense lands. Releases are planned to continue through 2015, with up to 150 northern aplomado falcons released in New Mexico each year.

Northern aplomado falcons in New Mexico and Arizona are included in a non-essential experimental population (NEP) designation under section 10(j) of the Act (71 FR 42298; USFWS 2006b). Historic sightings of northern aplomado falcons are concentrated in the southwestern corner of New Mexico from Sierra and Doña Ana counties to the Boot heel Region. Historic sightings from Otero County east are few. A pair of wild northern aplomado falcons successfully nested near Deming, New Mexico, in 2002. Within Arizona, the aplomado occurred in the

southeastern portion of the state, Cochise County. The last confirmed records of the species were from the Sulphur Springs Valley (1939), near Saint David (1940), and the border area near Rodeo, New Mexico, in 1977 (AGFD 1996).

Current threats to the aplomado falcon include human and/or livestock disturbance of territorial or nesting northern aplomado falcons and widespread conversion of suitable grassland habitat to human uses, including agriculture and International border protection. Intense overgrazing in grassland habitats in this area has moderated in recent decades, but some of its effects are still present in the quantity and quality of grasslands and nest trees for northern aplomado falcons. Management actions, particularly use of prescribed fire, are tools being used to restore the original landscape. Efforts to restore native grassland condition are underway by Federal and private landowners in the planning unit, including the Malpai Borderlands Group. Human disturbance from Customs and Border Patrol activities, such as construction of facilities, lighting, road construction, and enforcement, are expected to increase along the International Boundary.

The NEP designation for the northern aplomado falcon in New Mexico and Arizona allows landowners and managers to have greater flexibility when implementing projects. Under section 9 of the Act, individual species within a NEP area are treated as threatened regardless of the species' designation elsewhere in its range. Through section 4(d) of the Act, the FWS has greater discretion in developing management programs and special regulations for threatened species than endangered species. Section 4(d) of the Act allows the FWS to adopt necessary regulations to provide for the conservation of a threatened species. Regulations issued under section 4(d) for NEPs are usually more compatible with routine human activities in the reintroduction area. Under section 7 of the Act, we treat NEPs as threatened species when the NEP is located within a National Wildlife Refuge or unit of the National Park system, and therefore section 7(a)(1) and the consultation requirements of section 7(a)(2) of the Act apply in these units. Section 7(a)(1) requires all Federal agencies to use their authorities to conserve listed species. Section 7(a)(2) requires that Federal agencies, in consultation with the FWS, insure that any action authorized, funded, or carried out is not likely to jeopardize the continued existence of a listed species or adversely modify its critical habitat. When NEPs are located outside a National Wildlife Refuge or unit of National Parks, they are treated as proposed for listing and only two provisions of section 7 apply: section 7(a)(1) and section 7(a)(4). Section 7(a)(4) requires Federal agencies to confer, rather than consult, with the FWS on actions that are likely to jeopardize the continued existence of a proposed species. The results of a conference are advisory in nature and do not restrict agencies from carrying out, funding, or authorizing activities. The NEP designation exempts the take prohibitions of section 9 of the Act for non-Federal activities.

Based on information from reintroduction sites in Texas, ongoing current land management is not likely to have significant adverse effects on the northern aplomado falcon. Land management that provides for healthy grasslands with the proper component of nesting trees and a suitable prey base is compatible with the northern aplomado falcon. Information also suggests that northern aplomado falcons are not unduly disturbed by some human activities.

The NEP designation described the considerations to be used to evaluate northern aplomado falcon reintroduction sites. These considerations are equivalent to conditions that should be maintained in

order to provide suitable sites for reintroduction and thus be considered in the stressor profile. The considerations are:

1. Within or in proximity to potentially suitable habitat, including open grassland habitat that has scattered trees, shrubs, or yuccas for nesting and perching;

2. Supporting available prey for northern aplomado falcons (*i.e.,* insects, small to medium-sized birds, rodents, and/or reptiles);

3. With minimal natural and artificial hazards (*e.g.,* predators, open-water tanks) and where potential hazards can be minimized where practical;

4. With access for logistical support;

5. With a large extent of potentially suitable habitat surrounding a release site and its proximity to other similar habitats; and

6. With a willing landowner or land manager.

A detailed discussion of the current status of this northern aplomado falcon and existing threats to this species is included in our July 26, 2006, Final Rule for the Establishment of a Nonessential Experimental Population of Northern Aplomado Falcons in New Mexico (71 FR 42298) and is included herein by reference.

A complete list of consultations affecting this species in Arizona can be found on our website (http://www.fws.gov/southwest/es/arizona/) by clicking on the "Document Library" tab and then on the "Section 7 Biological Opinions" tab. Survey work and recovery projects also occur periodically, and are summarized in the appropriate land-management agency or AGFD and NMDGF documents.

Black-tailed prairie dog

The black-tailed prairie dog, formerly designated by the FWS as a candidate species, was removed from the candidate list in 2004 because it was found to be more abundant or widespread than previously believed and was not subject to the degree of threat sufficient to warrant continuing candidate status or issuance of a proposed or final listing (69 FR 51217). The black-tailed prairie dog is considered a WSC in Arizona and has no status in New Mexico. In Mexico, the black-tailed prairie dog was listed as threatened by SEDESOL (1994).

Prairie dogs occur only in North America. They are rodents within the squirrel family (Sciuridae) and include five species; the black-tailed prairie dog; the white-tailed prairie dog (*C. leucurus*); the Gunnison's prairie dog (*C. gunnisoni*); the Utah prairie dog (*C. parvidens*); and the Mexican prairie dog (*C. mexicanus*) (Pizzimenti 1975). The Utah and Mexican prairie dogs are currently listed as threatened (49 FR 22339, May 29, 1984) and endangered (35 FR 8495, June 2, 1970), respectively. Generally, the black-tailed prairie dog occurs east of the other four species in more mesic habitat.

Based upon the information currently available, FWS concurs with Pizzimenti's (1975) assessment of the black-tailed prairie dog as monotypic.

Prairie dogs are small, stout ground squirrels. The total length of an adult black-tailed prairie dog is approximately 14 to 17 in (37 to 43 cm) and the weight of an individual ranges from one to three lbs (0.5 to 1.4 kg). Individual appearances within the species vary in mixed colors of brown, black, gray, and white. The black-tipped tail is characteristic (Hoogland 1995). Black-tailed prairie dogs are diurnal, burrowing animals. They do not hibernate as do white-tailed, Gunnison's, and Utah prairie dogs (Hoogland 1995, Tileston and Lechleitner 1966).

Historically, black-tailed prairie dog colonies numbered in the many thousands and covered hundreds of thousands of acres. Black-tailed prairie dogs crop the vegetation in and around their colonies very close to the ground and often girdle and kill brush. The results, generally, are low-growing vegetation, a high percentage of bare ground, and an absence of brush in and around prairie dog colonies. Prairie dog towns are an ecosystem unto themselves, and many other species are often associated with and benefit from them, including black-footed ferret (*Mustela nigripes*), swift fox (*Vulpes velox*), mountain plover (*Charadrius montanus*), ferruginous hawk (*Buteo regalis*), and burrowing owl.

The historical range of the black-tailed prairie dog included portions of 11 states, Canada, and Mexico and may have encompassed as much as 600,000 square miles (965,606 square kilometers), with approximately 100,000,000 ac (40,486,565 hectares [ha]) of occupied habitat (65 FR 5476). Today, the species remains in 10 states; Colorado, Wyoming, Montana, North Dakota, South Dakota, Kansas, Nebraska, Oklahoma, Texas, and New Mexico. Significant contractions have occurred to this species' range, mainly around the eastern and southwestern periphery of the historical range. Black-tailed prairie dog complexes within the remaining range are small and widely scattered. This is primarily the result of three factors: conversion of rangelands to agriculture (about 1880-1920), large-scale control and eradication efforts (about 1918-1972), and the arrival of sylvatic plague within the species' range (beginning in the 1940s).

In Arizona, black-tailed prairie dogs historically occurred in the southeast corner of the state south of the Gila River and east of the Santa Cruz River. They were extirpated from the state by the 1930s (65 FR 5476). The species still occurs in New Mexico, but only in scattered remnant populations and primarily east of the Pecos River (65 FR 5476). Based upon evaluations of remote sensing data, about 60,000 ac (24,000 ha) of occupied black-tailed prairie dog habitat existed Statewide in 2002 (Bell, NMDGF, in litt 2002 and Thompson, NMDGF, in litt. 2003). Ground-truthing of this estimate is currently under way (Johnson *et al.* 2003). The FWS estimate (based upon a sum of site specific estimates) in the 12-month finding was 39,000 ac (16,000 ha) of occupied habitat. The 1961 Bureau of Sport Fisheries and Wildlife estimate was about 17,000 ac (7,000 ha). There are no extant complexes greater than 1,000 ac (400 ha) in New Mexico. The black-tailed prairie dog appears to be largely absent from western portions of its historical range in New Mexico, although a small population was established on the Diamond A Ranch in 1999. Nevertheless, more than 75 percent of the counties within the historical range of the species contain black-tailed prairie dogs (Luce, Prairie Dog Conservation Team Interstate Coordinator, in litt. 2002c). For specific sites, the U.S. Army provided an estimate of 330 ac (130 ha) of black-tailed

prairie dog occupied habitat at a Fort Bliss facility in New Mexico (Hoefert, U.S. Army, in litt. 2002). This estimate is the same as that reported in 2001.

The factors that led to extirpation of the species from Arizona are similar to those that caused range-wide population declines. In the early 1900s, biologists and scientists who defended the concepts of utilitarian management of wildlife targeted prairie dogs as the primary impediment to economic progress in the semi-arid West. They laid the cornerstone for the idea of prairie dogs as an aggressive pest in need of government subsidized eradication efforts (Oakes 2000). Poisoning is probably the primary cause of their extirpation from Arizona. Sylvatic plague was probably not a significant factor in reducing black-tailed prairie dog numbers in Arizona. While plague can occur anywhere in Arizona above 4500 ft (1372 m) in elevation, it is much more common in northern Arizona than in the southeastern portion of the state (Craig Levy, ADHS, pers. comm.). The Arizona Department of Health Services has documented sporadic plague outbreaks in southeastern Arizona, such as occurred in Cochise and Graham counties in the mid-1980s. These outbreaks occurred despite the absence of prairie dogs in southeastern Arizona, illustrating that many other rodent species are hosts for plague (Craig Levy, ADHS, pers. comm.).

Our August 18, 2004, Finding for the Resubmitted Petition To List the Black- Tailed Prairie Dog as Threatened (69 FR 51217) included a detailed status of the species for the black-tailed prairie dog. This Federal Register notice is available through our website: http://www.fws.gov/mountain-prairie/species/mammals/btprairiedog. Herein, we incorporate that status discussion by reference.

Western burrowing owl

The western burrowing owl is not currently listed under the Act, but it is considered by the FWS to be a species of concern and is protected under the Migratory Bird Treaty Act (MBTA). Formerly, it was listed as a Category 2 Candidate species for consideration to be listed as threatened or endangered, but was removed from this list in 1996 when Category 2 and 3 Candidate species were eliminated from the Candidate list. The western burrowing owl is protected in Arizona under Arizona Revised Statute Article 17 and is fully protected in New Mexico. In Mexico, the burrowing owl (*Athene cunicularia*) was listed as threatened by SEDESOL (1994).

The western burrowing owl is a small to medium-sized owl with long legs and prominent spotting and barring. It is a semi-fossorial species that lives and nests in the abandoned burrows of prairie dogs, ground squirrels, foxes, badgers, and other burrowing mammals, which it enlarges or modifies by digging with its feet. Although nocturnal, burrowing owls often perch conspicuously during daylight hours at the entrance to their burrows or on low nearby posts. Western burrowing owls nest singly or in pairs, and are often clustered in small colonies. Western burrowing owl flight is low, undulating, and often hovering like that of the kestrel.

Western burrowing owls typically inhabit grasslands, prairies, and open shrublands dominated by mesquite, yucca, and cactus at low, 2,800 to 5,500 ft (854 to 1,676 m) to middle, 5,000 to 7,500 ft (1,524 to 2,286 m) elevations. They are often associated with prairie dog communities, apparently because of the abundance of burrows in such areas. They also occur in open areas near human activities and habitations such as golf courses, airports, agricultural areas, and undeveloped lands in or near urban areas.

Generally, western burrowing owls breed in North America, but winter south of the U.S./Mexican border from Mexico south to Guatemala and El Salvador. In Arizona, the western burrowing owl is thought to be predominantly non-migratory (AGFD 2001a). The historical range of the species includes Arizona, California, Colorado, Idaho, Iowa, Kansas, Louisiana, Minnesota, Montana, North Dakota, Nebraska, New Mexico, Nevada, Oklahoma, Oregon, South Dakota, Texas, Washington, Wyoming, Canada, and Mexico. In Arizona and New Mexico, they are generally considered uncommon, but locally abundant. During a 2001-2002 survey conducted by the AGFD, burrowing owls were observed at 19 percent of 150 previously known sites checked (Brown and Mannan 2002). Most of these were observed along the lower Colorado River near Yuma, Arizona, where they were often associated with burrows along concrete-lined irrigation canals. According to this survey, microhabitats used by owls in order of decreasing occurrence were irrigation canals, prairie dog towns, creosote flats, canal/levees, pastures, grasslands, and fallow fields.

White-sided jackrabbit

The white-sided jackrabbit is not currently listed under the Act, but is considered by the FWS to be a species of concern. It was listed as threatened by the state of New Mexico on January 24, 1975. Arizona was not included in the species' distribution range in that listing (59 FR 58982). The species is not listed in Mexico.

The white-sided jackrabbit is one of four species of hares (Family Leporidae) occurring in New Mexico, which include the black-tailed jackrabbit (*L. californicus*), white-tailed jackrabbit (*L. townsendii*), and the snowshoe hare (*L. americanus*). The black-tailed jackrabbit occurs in sympatry with the white-sided taxon. The two species can be distinguished by the patterning of black and white on the ears; *L. callotis* has conspicuously white-tipped dorsal ear surfaces with the anterior ear surface conspicuously dark, while the opposite is true in *L. californicus*. Both species are able to expose varying amounts of white fur on their sides and flanks, but in the white-sided jackrabbit this pelage is more extensive and striking.

There are two recognized subspecies: *L .c. callotis* and *L .c. gaillardi* Mearns 1896 (Smithsonian National Museum of Natural History 2007). The white-sided jackrabbit (*L. c. gaillardi*) inhabits plateaus at high elevations, including the grassy plains of southwestern New Mexico (Hall 1981). The other subspecies (*L. c. callotis*) is confined to Mexico from the International Border south across the open plains of the Mexican Plateau to Oaxaca. This covers approximately 18 Mexican states including Chihuahua (Anderson 1972), Durango (Baker and Greer 1962), and probably Sonora (Carie 1997). In 1954, Hoffmeister and Goodpaster reported observation of what they believed to be white-sided jackrabbits along the west base of the Huachuca Mountains, Cochise County, Arizona (Hoffmeister 1986). Although never abundant, the species was common during that time. A female white-sided jackrabbit was collected in 1974 at a location one-half kilometer north of Cloverdale, Hildago County, New Mexico; this is seven miles east of the Arizona/New Mexico border and 20 miles southeast of Chiricahua, Cochise County, Arizona (Hoffmeister 1986). Later surveys conducted in the mid-1970s indicated the white-sided jackrabbit was maintaining a viable population; an estimated 200 individuals were recorded (NMDGF 1996). In New Mexico, the white-sided jackrabbit was found only in the Animas Valley on the Diamond A Ranch and in limited parts of the southern Playas Valley east of the Diamond A Ranch in southern Hidalgo

County (Bednarz 1977). As far as is currently known, New Mexico is the only documented place in the U.S. where the species now occurs.

This species remains highly elusive. It avoids hills or mountains, preferring level lands full of grasses, not trees and shrubs. It was reported only a few times after the species was discovered in 1892 along the U.S./Mexican International border (Mearns 1895). Two animals were later collected in the Playas Valley in 1931 (Anderson and Gaunt 1962). During investigations conducted between May and August 1976, Bednarz (1977) speculated that the number of white-sided jackrabbits in the Animas Valley was 250 to 300 individuals. Five years later, surveys revealed that sightings of black-tailed jackrabbits had increased 2.5 times and sightings of desert cottontails (*Sylvilagus audubonii*) by about four times, while white-sided jackrabbit sightings had decreased to approximately half of the mean reported by Bendarz (1977). Bednarz and Cook (1984) postulated that numbers of *L. callotis* had decreased as the density and vigor of grasses declined, while *L. californicus* and *S. audubonii* numbers increased in response to an increase in forb and shrub cover.

Some sexual dimorphism occurs in *L. callotis*; females are generally larger than males (Smithsonian National Museum of Natural History 2007). In New Mexico, white-sided jackrabbits are observed almost unvaryingly in pairs. Of three known pairs of the species collected in the state, all consisted of a male and a female (Bednarz 1977), suggesting that mated animals remain together on a long-term basis. Pair bonds may serve to ensure the sexes stay together all year, because densities of the species are generally low (Dunn *et al.* 1982). After establishment of the pair bond, the male defends the pair from other intruding males. The members of the pair are usually within 15-20 ft (4.6-6.1 m) of each other and run together when approached by intruders. Dunn, *et al.* (1982) reported the minimum breeding season for white-sided jackrabbits to be 18 weeks (mid-April to mid-August). Several litters are probably produced each year, with litter size appearing to average 2.2 young (Bednarz 1977). Their young tend to have a soft, woolly coat in early life and attain sexual maturity at a rapid rate. Breeding begins after the first calendar year following its birth (Smithsonian National Museum of Natural History 2007).

In the U.S. portion of the species' range, white-sided jackrabbits appear to be a virtual obligate of grasslands (Bednarz 1977, Conley and Brown 1977). In the Animas and Playa valleys of New Mexico, plants commonly found in areas inhabited by this species include blue grama (*Bouteloua gracilis*), black grama (*B. eriopoda*), tobosa (*Hilaria mutica*), buffalo grass (*Buchloe dactyloides*), wolftail (*Lycurus phleoides*), flatsedge (*Cyperus* spp.), snakeweed (*Gutierrezia sarothrae*), soap-tree yucca (*Yucca elata*), and honey mesquite (*Prosopis glandulosa*). More than 97 percent of all observations of this species have been in pure grasslands and less than three percent in grasslands with varying amounts of forbs and shrubs (Bednarz and Cook, 1984). In New Mexico, white-sided jackrabbits feed primarily on sedge nutgrass (*Cyperus* spp.), a sedge species (*Carex* spp.), and various shortgrass species including buffalo-grass (Bednarz 1977). Sedge nutgrass is the only non-grass item found in significant amounts in the animal's diet (NMDGF files). While the white-sided jackrabbit shares its range with the black-tailed jackrabbit, the two generally occupy different habitats (Conway 1976, NMDGF files), with white-sided jackrabbits being found in areas of pure grassland to the virtual exclusion of its congener. In areas where grassland is invaded by shrubs and forbs, *L. californicus* outnumbers *L. callotis* proportional to the extent of invasion.

The white-sided jackrabbit constructs and utilizes shelter forms averaging 15 in (38 cm) long, 20 in (51 cm) wide, and 7-8 in (17-20 cm) deep. The shelter form is usually located in clumps of grass and surrounded by dense stands of tobosa. It may also occupy underground shelters, but this behavior is rare (Smithsonian National Museum of Natural History 2007).

Daytime observations of white-sided jackrabbits are uncommon as the species is primarily nocturnal (NMDGF files); most of its activity occurs during the night or at dusk, particularly on clear nights with bright moonlight. Activity may be limited by cloud cover, precipitation, and wind, but temperature has little effect (Smithsonian National Museum of Natural History 2007).

Although many species of jackrabbit and hare are considered pests because they damage crops, fields, and orchards, the white-sided jackrabbit is usually not considered a pest and has no known adverse conditions on human property. Many species of rabbit and hare are also sought after their meat and fur; this is not the case for the species, as it is protected in most of its habitat region (Smithsonian National Museum of Natural History 2007).

Overall, the status of this species in New Mexico is unclear, as well as its far broader Mexican range. The overgrazing of domestic livestock may be one of the factors contributing to its decline and the apparent replacement by *L. californicus*, which is highly adaptable to these habitat changes (Smithsonian National Museum of Natural History 2007). In New Mexico, loss or degradation of grassland habitat within its restricted range is the primary threat to the white-sided jackrabbit.

MONTANE SPECIES

Mexican spotted owl

The Mexican spotted owl was listed as a threatened species in 1993 (58 FR 14248). The primary threats to the species were cited as even-aged timber harvest and stand-replacing wildfire, although grazing, recreation, and other land uses were also mentioned as possible factors influencing the Mexican spotted owl population. The FWS appointed the Mexican Spotted Owl Recovery Team in 1993, which produced the Recovery Plan for the Mexican Spotted Owl (Recovery Plan) in 1995 (USFWS 1995b). In Mexico, the Mexican spotted owl was listed as threatened by SEDESOL (1994).

A detailed account of the taxonomy, biology, and reproductive characteristics of the Mexican spotted owl is found in the Final Rule listing the Mexican spotted owl as a threatened species (58 FR 14248) and in the Recovery Plan (USFWS 1995b). The information provided in those documents is included herein by reference. Although the Mexican spotted owl's entire range covers a broad area of the southwestern U.S. and Mexico, the Mexican spotted owl does not occur uniformly throughout its range. Instead, it occurs in disjunct localities that correspond to isolated forested mountain systems, canyons, and in some cases steep, rocky canyon lands. Surveys have revealed that the species has an affinity for older, uneven-aged forest, and the species is known to inhabit a physically diverse landscape in the southwestern U.S. and Mexico.

The U.S. range of the Mexican spotted owl has been divided into six recovery units (RU), as discussed in the Recovery Plan. The primary administrator of lands supporting the Mexican spotted

owl in the U.S. is the Forest Service. Most owls have been found within Forest Service Region 3 (including 11 National Forests in Arizona and New Mexico). Forest Service Regions 2 and 4 (including two National Forests in Colorado and three in Utah) support fewer owls. According to the Recovery Plan, 91 percent of Mexican spotted owls known to exist in the U.S. between 1990 and 1993 occurred on lands administered by the Forest Service.

Historical and current anthropogenic uses of Mexican spotted owl habitat include both domestic and wild ungulate grazing, recreation, fuels reduction treatments, resource extraction (e.g., timber, oil, gas), and development. These activities have the potential to reduce the quality of Mexican spotted owl nesting, roosting, and foraging habitat, and may cause disturbance during the breeding season. Livestock and wild ungulate grazing is prevalent throughout Region 3 National Forest lands and overgrazing is thought to have a negative effect on the availability of grass cover for prey species. Recreation impacts are increasing on all forests, especially in meadow and riparian areas. There is anecdotal information and research that indicates that owls in heavily used recreation areas are much more erratic in their movement patterns and behavior. Fuels reduction treatments, though critical to reducing the risk of severe wildfire, can have short-term adverse effects to Mexican spotted owl through habitat modification and disturbance. As the population grows, especially in Arizona, small communities within and adjacent to National Forest System lands are being developed. This trend may have detrimental effects to Mexican spotted owl by further fragmenting habitat and increasing disturbance during the breeding season. West Nile Virus also has the potential to adversely impact the Mexican spotted owl. The virus has been documented in Arizona, New Mexico, and Colorado, and preliminary information suggests that owls may be highly vulnerable to this disease (Courtney *et al.* 2004). Unfortunately, due to the secretive nature of owls and the lack of intensive monitoring of banded birds, we will most likely not know when owls contract the disease or the extent of its impact to the Mexican spotted owl range-wide.

Currently, high-intensity, stand-replacing fires are influencing ponderosa pine and mixed conifer forest types in Arizona and New Mexico. Uncharacteristic, severe, stand-replacing wildfire is probably the greatest threat to Mexican spotted owl within the action area. As throughout the West, fire severity and size have been increasing within this geographic area.

A reliable estimate of the numbers of owls throughout its entire range is not currently available (USFWS 1995b), and the quality and quantity of information regarding numbers of Mexican spotted owl vary by source. USFWS (1991) reported a total of 2,160 owls throughout the U.S. Fletcher (1990) calculated that 2,074 owls existed in Arizona and New Mexico. However, Ganey *et al.* (2000) estimates approximately 2,950 ± 1,067 (SE) Mexican spotted owls in the Upper Gila Mountains RU alone. The FS Region 3 most recently reported a total of approximately 1,025 PACs established on NFS lands in Arizona and New Mexico (B. Barrera, pers. comm. June 18, 2007). The FS Region 3 data are the most current compiled information available to us; however, survey efforts in areas other than Forest Service lands have resulted in additional sites being located in all Recovery Units.

Researchers studied Mexican spotted owl population dynamics on one study site in Arizona (n = 63 territories) and one study site in New Mexico (n = 47 territories) from 1991 through 2002. The Final Report, titled "Temporal and Spatial Variation in the Demographic Rates of Two Mexican Spotted Owl Populations," (*in press*) found that reproduction varied greatly over time, while

survival varied little. The estimates of the population rate of change (Λ=Lamda) indicated that the Arizona population was stable (mean Λ from 1993 to 2000 = 0.995; 95 percent Confidence Interval = 0.836, 1.155) while the New Mexico population declined at an annual rate of about six percent (mean Λ from 1993 to 2000 = 0.937; 95 percent Confidence Interval = 0.895, 0.979). The study concludes that spotted owl populations could experience great (>20 percent) fluctuations in numbers from year to year due to the high annual variation in recruitment. However, due to the high annual variation in recruitment, the Mexican spotted owl is likely very vulnerable to actions that impact adult survival (e.g., habitat alteration, drought, etc.) during years of low recruitment.

Since the owl was listed, we have completed or have in draft form a total of 188 formal consultations for the Mexican spotted owl. These formal consultations have identified incidences of anticipated incidental take of Mexican spotted owl in 384 PACs. The form of this incidental take is almost entirely harm or harassment, rather than direct mortality. These consultations have primarily dealt with actions proposed by FS Region 3. In addition to actions proposed by FS Region 3, we have also reviewed the impacts of actions proposed by the Bureau of Indian Affairs, Department of Defense (including Air Force, Army, and Navy), Department of Energy, National Park Service, and Federal Highway Administration. These proposals have included timber sales, road construction, fire/ecosystem management projects (including prescribed natural and management ignited fires), livestock grazing, recreation activities, utility corridors, military and sightseeing overflights, and other activities. Only two of these projects (release of site-specific owl location information and existing forest plans) have resulted in BOs that the proposed action would likely jeopardize the continued existence of the Mexican spotted owl. The jeopardy opinion issued for existing Forest Plans on November 25, 1997 was rendered moot as a non-jeopardy/no adverse modification BO was issued the same day.

In 1996, we issued a BO on FS Region 3 adoption of the Recovery Plan recommendations through an amendment to their Land and Resource Management Plans (LRMPs) (USFWS 2005b). In this non-jeopardy BO, we anticipated that approximately 151 PACs would be affected by activities that would result in incidental take of Mexican spotted owls, with approximately 91 of those PACs located in the Upper Gila Mountains RU. In addition, on January 17, 2003, we completed a reinitiation of the 1996 Forest Plan Amendments BO, which anticipated the additional incidental take of five Mexican spotted owl PACs in Region 3 due to the rate of implementation of the grazing standards and guidelines, for a total of 156 PACs. Consultation on individual actions under these BOs resulted in the harm and harassment of approximately 243 PACs on Region 3 NFS lands. FS Region 3 reinitiated consultation on the LRMPs on April 8, 2004. On June 10, 2005, the FWS issued a revised BO on the amended LRMPs. We anticipated that while the Region 3 Forests continue to operate under the existing LRMPs, take is reasonably certain to occur to an additional 10 percent of the known PACs on NFS lands. We expect that continued operation under the plans will result in harm to 49 PACs and harassment to another 49 PACs. To date, consultation on individual actions under the amended Forest Plans, as accounted for under the June 10, 2005, BO has resulted in the incidental take of owls associated with 19 PACs. Incidental take associated with Forest Service fire suppression actions, which was not included in the LRMP proposed action, has resulted in the incidental take of owls associated with 12 PACs.

The final Mexican spotted owl critical habitat rule, August 31, 2004, designated approximately 8.6 million ac (1,976,847,052 ha) of critical habitat in Arizona, Colorado, New Mexico, and Utah,

mostly on Federal lands (69 FR 53182). Within this larger area, critical habitat is limited to areas that meet the definition of protected and restricted habitat, as described in the Recovery Plan. Protected habitat includes all known owl sites and all areas within mixed conifer or pine-oak habitat with slopes greater than 40 percent where timber harvest has not occurred in the past 20 years. Restricted habitat includes mixed conifer forest, pine-oak forest, and riparian areas outside of protected habitat.

The primary constituent elements for proposed Mexican spotted owl critical habitat were determined from studies of their habitat requirements and information provided in the Recovery Plan (USFWS 1995b). Since owl habitat can include both canyon and forested areas, primary constituent elements were identified in both areas. The primary constituent elements which occur for the Mexican spotted owl within mixed-conifer, pine-oak, and riparian forest types that provide for one or more of the Mexican spotted owl's habitat needs for nesting, roosting, foraging, and dispersing are in areas defined by the following features for forest structure and prey species habitat:

Primary constituent elements related to forest structure include:

- A range of tree species, including mixed conifer, pine-oak, and riparian forest types, composed of different tree sizes reflecting different ages of trees, 30 percent to 45 percent of which are large trees with diameter-at-breast height (dbh) of 12 inches or more;

- A shade canopy created by the tree branches covering 40 percent or more of the ground; and,

- Large, dead trees (snags) with a dbh of at least 12 inches.

Primary constituent elements related to the maintenance of adequate prey species include:

- High volumes of fallen trees and other woody debris;

- A wide range of tree and plant species, including hardwoods; and

- Adequate levels of residual plant cover to maintain fruits and seeds, and allow plant regeneration.

The forest habitat attributes listed above usually are present with increasing forest age, but their occurrence may vary by location, past forest management practices or natural disturbance events, forest-type productivity, and plant succession. These characteristics may also be observed in younger stands, especially when the stands contain remnant large trees or patches of large trees. Certain forest management practices may also enhance tree growth and mature stand characteristics where the older, larger trees are allowed to persist.

Given the range of this species, several Federal actions affect this species every year. A complete list of consultations affecting this species in Arizona can be found on our website (http://www.fws.gov/southwest/es/arizona/) by clicking on the "Document Library" tab and then on

the "Section 7 Biological Opinions" tab. Survey work and recovery projects also occur periodically, and are summarized in the appropriate land-management agency or AGFD and NMDGF documents.

New Mexico ridge-nosed rattlesnake

The New Mexico ridge-nosed rattlesnake (*Crotalus willardi obscurus*) was federally listed as threatened on August 4, 1978 (43 FR 34479). Primary factors cited as the basis for listing include habitat loss and modification within the species' range (including the possibility of stand-replacing fires), and collection. Collecting in the Animas Mountains between 1961 and 1974 may have totaled as many as 130 individual snakes and may have significantly affected that population (USFWS 1985). The New Mexico ridge-nosed rattlesnake is listed as endangered by the State of New Mexico. In Mexico, the ridge-nosed rattlesnake (*Crotalus willardi*) was listed as rare with special protections by SEDESOL (1994).

Critical habitat for the New Mexico ridge-nosed rattlesnake was designated concurrently with listing and consists of Bear, Spring, and Indian canyons in the Animas Mountains between 6,048 ft (1,844 m) and 8,320 ft (2,536 m) in elevation (43 FR 34479). The critical habitat primary constituent elements for the New Mexico ridge-nosed rattlesnake are:

- Dens are available which provide winter and summer retreats,
- Vegetation provides cover, and
- Lizards and rodents are abundant in the area and provide an adequate source of food items.

Activities that would impact designated critical habitat for the New Mexico ridge-nosed rattlesnake are not identified in the final designation, but activities that impact these constituent elements would include, but are not limited to; high-severity wildfire, excessive erosion and sedimentation into talus slides, and use of pesticides that may impact the forage base for this species.

The New Mexico ridge-nosed rattlesnake is a small, montane species, one of five ridgenose rattlesnake subspecies known from the southwestern U.S. and western Mexico. Adult females bear their young alive probably in late June to August; mean litter size is 5.4, ranging from two to nine (Applegarth 1980, Holycross and Goldberg 2001). Ridgenose rattlesnakes appear to move less frequently, move relatively short distances, and show high fidelity to specific dens or shelters compared to other rattlesnakes (USFWS 1997). They are most likely dormant during the winter months.

New Mexico ridge-nosed rattlesnakes are found in steep, rocky canyons with intermittent streams and on talus slopes at elevations ranging from approximately 5,500 to 8,500 ft (1, to 2,591 m) in the Animas Mountains and 5,000 ft to 6,200 ft (1,525 to 1890 m) in the Peloncillo Mountains. Access to rock shelters with moderate interstitial spaces is probably a key habitat component. At lower elevations, ridge-nosed rattlesnakes probably occur primarily in the bottoms of steep, heavily wooded canyons, while at higher elevations they may be found in woodlands, open woodlands, and

chaparral on exposed slopes and plateaus (USFWS 2002a). In both cases, mature woodlands appear to be an essential habitat element.

New Mexico ridge-nosed rattlesnakes currently occur in only three known populations; the Animas Mountains in southwestern New Mexico, Peloncillo Mountains in southwestern New Mexico and southeastern Arizona, and the Sierra San Luis in Sonora and Chihuahua, Mexico. In the U.S., the largest known population occurs in the Animas Mountains. The species was not discovered in the Peloncillo Mountains until 1987; since then, 27 individual snakes have been documented within 13 general areas running from upper Miller Canyon at the southern end of the range to south Skeleton Canyon at the northern end.

Our June 10, 2005, Programmatic Biological and Conference Opinion for the Continued Implementation of the Land and Resource Management Plans for the Eleven National Forests and National Grasslands of the Southwestern Region (USFWS 2005b) included a detailed Status of the Species for the New Mexico ridge-nosed rattlesnakes. This BO is available on our website at http://www.fws.gov/southwest/es/arizona/, under Document Library; Section 7 Biological Opinions. Herein, we incorporate that status discussion by reference."

Given the limited range of this species, only a few Federal actions affect this species, usually related to National Forest use, fire management, and U.S. border protection. A list of consultations affecting this species in Arizona can be found on our website (http://www.fws.gov/southwest/es/arizona/) by clicking on the "Document Library" tab and then on the "Section 7 Biological Opinions" tab. Survey work and recovery projects also occur periodically, and are summarized in the appropriate land-management agency or AGFD and NMDGF documents.

RIPARIAN SPECIES

Western red bat

Unless otherwise indicated, the following information on this species is from USFWS (2002b) and the Arizona Game and Fish Department website (http://www.azgfd.gov).

In the family Vespertilionidae, the western red bat (*Lasiurus blossevillii*) is not currently listed under the Act, but is considered by the FWS to be a species of concern. In Arizona, it is considered WSC and is protected through Order 14 of the Arizona Game and Fish Commission (as are all bats) and cannot be taken, alive or dead, nor imported, exported, or otherwise possessed without a special permit. In New Mexico, the NMDGF considers the western red bat a species of concern, as does California and Utah (WBWG 2005). It is a Forest Service sensitive species in Regions 3 and 5. The Western Bat Working Group classifies it as a Red or High Priority species (WBWG 2005). The western red bat has no status in Mexico.

The primary threats to the species are probably past and present loss of broad-leaf riparian communities throughout its range, and issues related to low population numbers (AGFD 2003). Predators of red bats include birds of prey, roadrunners, and mammals such as opossums, raccoons, and domestic cats (WBWG 2005). Human caused mortality includes being impaled on barbed

wire, entrapped on road surface oil, and flying into lighthouses and the radiator grills of automobiles (Myers and Hatchett 2000). Long-term population declines are suspected for the red bat, but, due to lack of data, have not been documented (AGFD 2003).

The western red bat is a medium-sized bat with a wingspan of 11 to 13 in (28-33 cm). They have short, round ears and dense shaggy fur. The pelage ranges from yellow-brown to bright orange with white-tipped hairs and a white bib beneath the neck. Males are usually more brightly colored than females. The wing membranes are jet black and the wingspan averages about 12 in (30 cm). As a result of recent genetics studies, the western red bat is now considered to be a separate species from the eastern red bat (*Lasiurus borealis*).

Unlike other bat families, many members of the Vespertilionidae Family (including the western red bat) roost in trees and migrate south for winter. While cavities in trees and saguaros are occasionally used as roosts, they are more typically found roosting in dense clumps of foliage in riparian or other wooded areas. The hanging bat resembles a dead leaf (AGFD 2003). Roosts are typically 5 to 35 ft (1.5-11 m) from the ground and are shaded from above and are open below, allowing the bats to drop into flight. Red bats typically roost alone. Red bats emerge from their roosts one to two hours after dark and forage on moths, beetles, and other flying insects and usually remain within approximately 1,000 yards (914 m) of the roost. They usually forage solitarily, although females and offspring occasionally forage in groups. Red bats will often forage around lights, including streetlights and floodlights. Western red bats mate between August and October; however, like most North American bats, the female stores sperm until spring, when fertilization occurs. Gestation lasts approximately 65 days and young are born between mid-May and June. Litters range from one to five pups (averaging 2), which begin flying when three to four weeks old. In late fall, red bats are thought to migrate to the southern part of their range, where most hibernate. Red bats will often migrate in groups (AGFD 2003). Males and females migrate at different times and have different summer ranges (AGFD 2003).

The habitat of western red bats is mid-elevation broad-leafed woodlands, particularly riparian areas with mature deciduous trees such as sycamores and cottonwoods, which are important roost areas. The species has an extensive, but patchy distribution and has been documented in New Mexico, Arizona, Texas, Utah, Nevada, and California; with the exception of California, however, actual records of red bats are very limited. There are only around 60 records for the red bat in Arizona (AGFD 2003, RECON 2002). During the winter, the species occurs in the lower latitudes of Central and South America. In Arizona and New Mexico, red bats are known to occupy areas from approximately 2,400 to 7,200 ft (731 to 2,195 m) in elevation.

The current loss of dense, mature cottonwood tree habitat throughout the western U.S. is believed to be a key factor in the seemingly declining abundance of *L. blossevillii* across its range. In September 2001, the Western Bat Working Group (WBWG) produced a Cottonwood/Sycamore Resolution identifying this concern. Because the red bat relies on riparian gallery forests for roosts and foraging, fire can directly affect this species through potential mortality and loss of roosting and foraging resources. Red bats are known to roost not only in trees, but also in the leaf litter that could be affected even by cool burns (WBWG 2005).

Western yellow-billed cuckoo

The western yellow-billed cuckoo is a candidate species under the Act (67 FR 40657). In response to a petition to list the species submitted in February 1998, the FWS issued a 12-month warranted but precluded finding (meaning that listing of the species is warranted but is precluded by higher priority listing actions) for the yellow-billed cuckoo western distinct population segment on July 25, 2001 (66 FR 38611). In Mexico, the western yellow-billed cuckoo has no status.

The yellow-billed cuckoo is a medium-sized, slender bird (about 12 in. [30 cm] in length and weighing about two ounces [57 g]) of the Family Cucilidae, whose members are characterized in part by zygodactyl feet (with two toes pointing forward and two backward). The species has a slender, long-tailed profile, with a fairly stout and slightly down-curved bill which is blue-black with yellow on the base of the lower mandible. Plumage is grayish-brown above and white below, with rufous primary flight feathers. The tail feathers are boldly patterned with black and white below. The legs are short and bluish-gray, and adults have a narrow, yellow eye ring. Juveniles resemble adults, except the tail patterning is less distinct, and the lower bill may have little or no yellow. Males and females differ slightly, as males tend to have a slightly larger bill.

Historically, the western yellow-billed cuckoo occupied and bred in riparian zones from western Washington (possibly southwestern British Columbia) to northern Mexico, including Oregon, Washington, southwestern Idaho, California, Nevada, Utah, western Colorado, Arizona, New Mexico, and western Texas (American Ornithologists Union 1998). Today, the species is absent from Washington, Oregon, and most of California, is likely extirpated in Nevada, is rare in Idaho and Colorado, and occurs in the balance of its range in riparian habitats that are much reduced from their previous extent and are heavily affected by human use (67 FR 40657, 66 FR 38626).

The western yellow-billed cuckoo has been associated with cottonwood (*Populus* spp.)-willow (*Salix* spp.) dominated riparian habitats (Hamilton and Hamilton 1965, Gaines 1974, Gaines and Laymon 1984, Laymon and Halterman 1986, 1987, 1989, Halterman 1991, Halterman and Laymon 1994, 1995). Cottonwood-willow remains the predominant and preferred habitat, but very tall screwbean-honey mesquite stands are also used. In addition, yellow-billed cuckoos have been found to utilize a mixture of tamarisk (*Tamarix* spp.) and cottonwood/willows (Corman and Magill, 2000). Gaines (1974) found that vegetative density, distance to water, and the length and width of the habitat area were important characteristics when surveying for cuckoos. Western yellow-billed cuckoos breed in large blocks of riparian habitats (particularly woodlands with cottonwoods and willows). Dense understory foliage appears to be an important factor in nest site selection, while cottonwood trees are an important foraging habitat in areas where the species has been studied in California (Halterman 1991).

The yellow-billed cuckoo arrives on the breeding grounds beginning in mid- to late May (Franzreb and Laymon 1993). Nesting activities usually take place between late June and late July, but may begin as early as late May, and continue to late August, depending on the season. Nest building takes two to four days. Nests are typically built in willow or mesquite thickets four to 10 ft (1 to 3 m), but as high as 35 ft (11 m) above the ground, and are usually well-hidden by foliage, and are almost always near water. Incubation begins as soon as the first egg is laid, and lasts 11 days. Clutch size is usually two or three eggs, and development of the young is very rapid, with a

breeding cycle of 17 days from egg-laying to fledging young. The young are fed large food items such as green caterpillars, tree frogs, katydids, and grasshoppers for the six-seven day nestling period. After fledging the young are dependent on the adults for at least two weeks.

Principal causes of riparian habitat losses are conversion to agricultural and other uses, dams and river flow management, stream channelization and stabilization, and livestock grazing. Available breeding habitats for yellow-billed cuckoos have also been substantially reduced in area and quality by groundwater pumping, and the replacement of native riparian habitats by invasive non-native plants (particularly tamarisk) (Groschupf 1987; Rosenberg *et al.* 1991). In Arizona, the greatest losses of riparian have occurred along the lower Colorado River valley and its major tributaries at elevations below about 3,000 ft (914 m) (66 FR 38611). Cuckoo numbers appear to have declined substantially in Arizona. In 1976 an estimated 846 yellow-billed cuckoo pairs occupied the lower Colorado River and five of its major tributaries (66 FR 38611), while in 1999, just 172 cuckoo pairs and 81 unmated adults were located during surveys of 221 miles (356 km) of riparian habitat (Corman and Magill 2000). Specific declines in cuckoo numbers in Arizona have been documented along the lower Colorado River and the Bill Williams River delta (Rosenberg *et al.* 1991).

Arizona is thought to contain the largest remaining cuckoo population in the western states (67 FR 40657). Currently in Arizona, cuckoos occur in a scattered fashion throughout the central, east-central, west-central, and southeastern parts of the state, with the majority of known populations occurring along the San Pedro, Verde, and Agua Fria rivers, Ciénega Creek and Sonoita Creek (Corman and Magill 2000).

Our June 10, 2005, Programmatic Biological and Conference Opinion for the Continued Implementation of the Land and Resource Management Plans for the Eleven National Forests and National Grasslands of the Southwestern Region (USFWS 2005b) included a detailed Status of the Species for the western yellow-billed Cuckoo. This BO is available on our website at http:// www.fws.gov/southwest/es/arizona/, under Document Library; Section 7 Biological Opinions. Herein, we incorporate that status discussion by reference.

Survey work and conservation projects for this candidate species occur periodically and are summarized in the appropriate land-management agency or AGFD and NMDGF documents.

ENVIRONMENTAL BASELINE

The environmental baseline includes past and present impacts of all Federal, State, or private actions in the action area, the anticipated impacts of all proposed Federal actions in the action area that have undergone formal or early section 7 consultation, and the impact of State and private actions which are contemporaneous with the consultation process. The environmental baseline defines the current status of the species and its habitat in the action area to provide a platform to assess the effects of the action now under consultation.

ACTION AREA

The action area includes the state and private lands that make up the permitted area and those Federal lands that may be affected indirectly by implementation of the draft MBHCP. The San

Bernardino NWR lies at the southern end (downstream) of the permit area in Arizona. The NWR contains Black Draw and adjacent perched rearing ponds that provide habitat for covered fish species that may be affected by the proposed action. Therefore, San Bernardino NWR is included in the action area. BLM parcels are scattered among the private and state trust lands, and while not covered by the permit, the action area includes these lands as they will be indirectly affected by the proposed action. Projects that may affect BLM managed lands will need to be coordinated among FWS, MBG, area ranchers, NRCS, and BLM to ensure compliance with the NEPA and the Act. Coronado National Forest Lands in the Peloncillo Mountains are not covered by the permit and are not likely to be affected by the proposed action; therefore, they are not included in the action area. Any coordination of activities between the Federal land management agencies and the MBHCP on the projects may need separate consultation as appropriate.

AQUATIC SPECIES

Chiricahua leopard frog

A. Status of the Species within the Action Area

In the Malpai Borderlands, Chiricahua leopard frogs currently occur at Rosewood Tank on the Magoffin Ranch, and Cloverdale drainage on the Diamond A Ranch (USFWS files; P. Warren, pers. comm.; and J. Stuart, pers. comm.). The only known dependable breeding sites within the action area are Rosewood tank and the stock tank near the house in Cloverdale drainage. Breeding probably occurs at other sites in the Cloverdale Creek area in wet years. The Chiricahua leopard frogs on the Magoffin Ranch and Cloverdale Creek are covered under the Malpai Borderlands Group's Safe Harbor Agreement (Lehman 2004).

B. Factors Affecting the Species' Environment in the Action Area

In the Malpai region, American bullfrogs are common in the San Bernardino Valley, including San Bernardino NWR and the Slaughter Ranch. Sportfish and bullfrogs were stocked at San Bernardino Ranch beginning in the 1950s (USFWS 2007). There are also numerous records for bullfrogs in western Hidalgo County, including the Animas Valley (Degenhardt *et al.* 1996). Scott (1992) reported bullfrogs and their tadpoles, black bullhead, green sunfish, and mosquitofish at the ciénega at the Diamond A Ranch headquarters. Scott also found black bullhead to be common in McKinney Tank. The status of tiger salamanders in the Malpai region is poorly understood. Degenhardt *et al.* (1996) did not find records for tiger salamanders in the Malpai region of New Mexico, and Scott (1992) did not find them on the Diamond A Ranch in 1990 and 1991. Rosen *et al.* (1996) noted *A. t. mavortium* in the San Bernardino Valley on Highway 80, Tom Ketchum Tank in the Pedrogosa Mountains, and at numerous sites in the Sulphur Springs Valley, and suggested it was likely introduced to the region in the 1960s or 70s. Radke (pers. comm. 2007) recently reported *Ambystoma* salamanders (likely *A. t. mavortium*) from a stock tank on the Magoffin Ranch, but their identity to species is unclear. Chytridiomycosis has been found in Chiricahua leopard frogs at Douglas High School and San Bernardino NWR, but the geographic extent of the disease in the Malpai Borderlands is unknown. Chiricahua leopard frogs are capable of coexisting with the disease at some localities, but not others. Generally, frog populations coexist with Chytridiomycosis at lower or warmer sites.

As discussed in the Status of the Species, pollutants from copper smelters may have affected Chiricahua leopard frogs directly (chemical contaminants) or indirectly (exacerbating the effects of chytridiomycosis). The smelter at Douglas operated from 1904 into the 1980s without pollution controls. Other smelters operated at Nacozari and Cananea, Sonora; however, the smelter at Cananea closed in 1999 and the Nacozari smelter is now equipped with pollution control devices. Precipitation collected in 1984-5 in southeastern Arizona had a depth-weighted mean pH of 4.63 and carried high levels of sulfate, arsenic, cadmium, copper, lead, and zinc. High acidity and sulfate concentration occurred when upper-level winds were from the directions of copper smelters, particularly those at Douglas and Cananea (Blanchard and Stromberg 1987). In regard to the northern leopard frog, waters no more acidic than pH 6.0 are optimal for fertilization and early development (Schlichter 1981). When exposed to waters of pH 5.5 for 10 days, 72 percent of northern leopard frogs died, versus a control group held in pH 7.0 that exhibited 3.5 percent mortality (Vatnick *et al.* 1999). These results suggest that precipitation may have been acidic enough in the Malpai Borderlands during the 1980s or earlier to affect Chiricahua leopard frog reproduction and survival. Whether contaminants have abated since the closure of the smelters is unknown.

Cattle grazing, which has occurred in the San Bernardino Valley since at least 1822, has likely affected Chiricahua leopard frogs in many ways. Intense livestock grazing during the late 1800's and early 1900's was likely a key cause of change in the structure and composition of montane forests, arroyo cutting and loss of ciénegas and riparian systems, replacement of grasslands by shrublands, and altered fire regimes (Hendrickson and Minckley 1984, Swetnam and Baisan 1996), although other factors such as logging, mining, loss of beaver populations, and climate change also likely contributed (Hereford 1993, Bahre 1995a and b, Geraghty and Miller, Inc. 1995). However, some adverse effects to the species and its habitat may still occur under certain circumstances as a result of improved managed livestock grazing activities (Sredl and Jennings 2005). These effects include trampling of eggs, tadpoles, and frogs; deterioration of watersheds; erosion and/or siltation of stream courses; elimination of undercut banks that provide cover for frogs; loss of wetland and riparian vegetation and backwater pools; and spread of disease and non-native predators (Arizona State University 1979, Hendrickson and Minckley 1984, Ohmart 1995, Jancovich *et al.* 1997, Belsky *et al.* 1999, Ross *et al.* 1999, Sredl and Jennings 2005, USFWS 2007). Increased watershed erosion caused by over grazing can accelerate sedimentation of deep pools used by frogs (Gunderson 1968). Sediment can alter primary productivity and fill interstitial spaces in streambed materials with fine particulates that impede water flow, reduce oxygen levels, and restrict waste removal (Chapman 1988). Eggs, tadpoles, metamorph frogs, and frogs hibernating at the bottom of pools or stock tanks are probably trampled by cattle (Bartelt 1998, Ross *et al.* 1999, USFWS 2007). At the same time, Chiricahua leopard frogs have benefited in many places by construction of stock tanks and other impoundments for cattle, which often create suitable frog habitats in environments that are otherwise too arid for ranid frogs. Grazing practices in the Malpai Borderlands, including conservative grazing and a grass bank on the Diamond A Ranch, have likely reduced effects of grazing on ranid frogs and their habitats relative to other areas of the Southwest. Chiricahua leopard frogs occur with livestock grazing almost throughout their range, and often thrive despite its adverse effects, so long as disease and introduced predators are absent.

Wildfire, prescribed fire, and fire suppression have all likely affected the distribution of the Chiricahua leopard frog in the Malpai Borderlands. Fire and subsequent degradation of watershed condition immediately after fires can result in dramatically increased runoff, sedimentation, and debris flow that can scour aquatic habitats in canyon bottoms or bury them, and ash flow that can create toxic conditions. Amphibian communities, including frog populations, can be significantly altered following prescribed fires. Post fire recovery may take 12 or more years for southern leopard frog (*Lithobates sphenocephalus*) populations (Schurbon and Fauth 2003). In Romero Canyon, Catalina Mountains, Pima County, Arizona, lowland leopard frogs and their habitat were severely reduced due to runoff and sedimentation following the Aspen Fire in 2003. Loss of occupied habitat also occurred in Buehman Canyon and probably other localities in the Catalina Mountains due to recent large scale, high-severity fires (Wallace 2003). At Saguaro National Park East, similar loss of lowland leopard frog habitat has also occurred due to post-fire sedimentation and ash flow (Don Swann, pers. comm. 2002). A population of leopard frogs (either Chiricahua or Ramsey Canyon leopard frogs) disappeared from Miller Canyon in the Huachuca Mountains of Arizona, after a 1977 crown fire in the upper canyon and subsequent erosion and scouring of the canyon during storm events (Tom Beatty, Miller Canyon, pers. comm. 2000). Additionally, smoke diffusion into water and ash flow can result in high levels of phosphorus and nitrogen (Spencer and Hauer 1991) with potentially toxic effects to frogs.

During fire suppression, dipping of water from stock tanks or other leopard frog habitats can reduce habitats and make them more susceptible to drying. In some cases, stock tanks are refilled after fires. Unless the water comes from a well or domestic water source, such action may facilitate the spread of non-native predators and disease. Fire retardants and suppressants, used regularly during fire suppression, are ammonia-based, which in itself can be potentially toxic; however, many formulations also contain yellow prussiate of soda (sodium ferrocyanide), which is added as an anticorrosive agent. Such formulations are toxic to a variety of aquatic and other organisms, including leopard frogs. Toxicity of these formulations is typically found to be low in the laboratory, but in the field toxicity to the southern leopard frog and rainbow trout has been found to be photoenhanced by ambient UV radiation (Calfee and Little 2003). Fire suppression activities can also affect leopard frogs and their habitat through improper placement of crew camps or staging areas. Suppression and prescribed fire can adversely affect frogs and frog habitat by directing fire into sensitive riparian areas or where habitats could be damaged by post-fire erosion or sedimentation.

Diamond A Ranch is planning to restore Cloverdale Cienega, located in the western division of the Ranch. A restoration hydrologist is collecting baseline data and planning the project in coordination with Sky Island Alliance, the private property owner, Coronado National Forest, and FWS. The goal of the project is to return surface flows from run off to the remnant cienega and expand this wetland from the current 60 acres of grass dominated wetland to the historical 150-acre extent of the wetland. The restoration project will be accomplished through removing a number of flow restriction structures and diverting water into the cienega from a channel originally constructed to transport runoff downstream and bypass the cienega. A primary breeding site for Chiricahua leopard frogs occurs upstream of Cloverdale cienega. This project has the potential to improve and increase suitable habitat within this drainage and help secure an existing population site, and possibly expand it into a watershed-wide metapopulation. Funding for implementation of this

restoration plan is being secured, and the partners are coordinating environmental compliance needs in the spring of 2008.

Huachuca water umbel

A. Status of the Species within the Action Area

One of the two Río Yaqui basin populations occurs in the San Bernardino/Leslie Creek NWR Complex, where the species occurs naturally in Leslie Creek. Patches of the plant were recently transplanted from Leslie Creek into Black Draw on San Bernardino NWR, the outlet of Twin-II Pond, and the upstream end of Twin-II Pond in an effort to ensure the persistence of Huachuca water umbel on the San Bernardino NWR. The patches in Twin-II Pond were outcompeted and essentially eliminated by other native wetland species, but the Black Draw patches are still viable (W. Radke, pers. comm.). The species also naturally colonized one pond on the refuge, although this population decreased as plant competition around the pond increased. No designated critical habitat for Huachuca water umbel is contained within the action area for the MBHCP.

B. Factors Affecting the Species' Environment in the Action Area

Limited numbers of populations and the small size of populations make the Huachuca water umbel vulnerable to extinction as a result of stochastic events that are often exacerbated by habitat disturbance. For instance, the restriction of this taxon to a relatively small area in southeastern Arizona and adjacent Sonora increases the chance that a single environmental catastrophe, such as a severe tropical storm or drought, could eliminate populations or cause extinction. In addition, populations are almost always isolated, which makes the chance of natural recolonization after extirpation less likely. Small populations are also subject to demographic and genetic stochasticity, which increases the probability of population extirpation (Wilcox and Murphy 1985, Shafer 1990).

A suite of non-native plant species has invaded wetland habitats in southern Arizona (Stromberg and Chew 1997), including those occupied by the Huachuca water umbel (Arizona Department of Water Resources 1994). In some cases, their effect on the Huachuca water umbel is unclear. On San Bernardino NWR, reestablished Huachuca water umbel patches in managed wetland ponds were all quickly outcompeted and essentially eliminated by other wetland species. Huachuca water umbel seems to do best along the stream courses where flooding and scouring periodically remove competing vegetation while the Huachuca water umbel persists due to its rhizomes. Bermuda grass (*Cynodon dactylon*) grows at San Bernardino NWR and outcompetes Huachuca water umbel. Watercress (*Rorippa nasturtium-aquaticum*) is another non-native plant now abundant along perennial streams in Arizona. Huachuca water umbel grows together with watercress at Leslie Canyon, but watercress does not appear to stress the Huachuca water umbel.

Lowland leopard frog

A. Status of the Species within the Action Area

Scott (1992) conducted extensive surveys for leopard frogs on the Diamond A Ranch during 1990 and 1991. He also searched for leopard frog specimens in museum collections from around the

country and talked to biologists and cowboys working in the area. The museum search yielded 14 leopard frog localities on the ranch. Most of these were Chiricahua leopard frog collections, but lowland leopard frogs were collected from Double Adobe Canyon, Animas Mountains, in 1985. Scott did not find leopard frogs at any of the 14 historical localities on the Diamond A Ranch and concluded that native ranid frogs had declined, but he thought they could occur at sites in the northern or eastern portions of the Animas Mountains. A lowland leopard frog was observed in Guadalupe Canyon, Hidalgo County, in 2000, which was the first observation of a lowland leopard frog in New Mexico since 1985 (Sredl 2005, J. Stuart, pers. comm. 2007). Lowland leopard frogs are reportedly common in water features around the ranch house in the Arizona portion of Guadalupe Canyon (L. Jones, pers. comm. 2007), and likely disperse both up and downstream in the canyon. Degenhardt *et al.* (1996) also reported the species from Pine Canyon.

West of the Diamond A in the Arizona portion of the Malpai Borderlands, lowland leopard frogs are found periodically at San Bernardino NWR and the Slaughter Ranch. The last observation was an adult at Twin Ponds on San Bernardino NWR on 9 June 2002. The species was last observed at the Slaughter Ranch (Snail Spring Ciénega) on 20 September 2001 (B. Radke, pers. comm. 2007). These frogs are likely immigrants from Los Ojitos and other ciénegas near the border on Rancho San Bernardino, Sonora, where lowland leopard frogs breed in co-occurrence with American bullfrogs (B. Radke, pers. comm. 2007). Radke observed lowland leopard frogs at Rancho San Bernardino as recently as May 6, 2005. Lowland leopard frogs that immigrate to San Bernardino NWR and the Slaughter Ranch apparently do not breed and likely become prey for bullfrogs.

Two lowland leopard frogs were also found near an impoundment and a ranch house about 328 ft (100 m) south of the Arizona/Sonora border in Guadalupe Canyon in August 2003 (J. Rorabaugh, pers. obs.). There is a concrete impoundment there where lowland leopard frogs may breed (although no evidence of breeding was observed). These frogs may have also dispersed from the population at the ranch house higher in Guadalupe Canyon. In Sonora, Radke (pers. comm. 2007) also reports observations at Cajon Bonito as recently as November 2006. There are numerous museum specimens from Cajon Bonito, as well. In total, these observations indicate there are currently breeding populations in Sonora near the border with periodic immigration into San Bernardino NWR, Slaughter Ranch, and Guadalupe Canyon. The species may breed in perennial or nearly perennial pools in Guadalupe Canyon or elsewhere at pools, springs, or stock tanks in the Peloncillo Mountains. There is also a possibility that lowland leopard frogs may still persist in canyons or stock tanks in the northern or eastern portions of the Animas Mountains. However, no documented breeding sites are known from within the action area

B. Factors Affecting the Species' Environment in the Action Area

The factors affecting lowland leopard frogs in the action area are the same as those affecting Chiricahua leopard frogs discussed above.

Northern Mexican gartersnake

A. Status of the Species within the Action Area

Since the late 1980s, northern Mexican gartersnakes have been known from only three localities in New Mexico (two in Grant County and one in Hidalgo County), but not within the action area (Degenhardt *et al.* 1996), and one locality in Arizona within the action area (San Bernardino NWR, Cochise County) (B. Radke, pers. comm.). Surveys conducted at the three New Mexico locations, outside the action area, in the last few years have yielded no records of the snake (NMDGF 2002), while only a single adult female has been observed on San Bernardino NWR in recent years (in 2005) (B. Radke, pers. comm.). This specimen was seen while on the move and could not be captured in hand which lends to some degree of uncertainty as a viable record. At this time, the species is considered extirpated from the San Bernardino NWR and is not currently known from any habitats in the immediate vicinity of the refuge. However, recovery efforts for this species may involve reestablishment efforts at the refuge in the future.

B. Factors Affecting the Species' Environment in the Action Area

Threats to the species include loss and degradation of its aquatic habitats as a result of dewatering, channel modification, conversion of habitats for agricultural use, poorly managed grazing, and other activities; introduction of non-native aquatic predators (especially bullfrogs) into those habitats; and over-collection (71 FR 56228).

Yaqui Fish - listed

Beautiful shiner

A. Status of the Species within the Action Area

Within the action area, managed populations of the Beautiful Shiner currently occur in two isolated wetlands on San Bernardino NWR.

B. Factors Affecting the Species' Environment in the Action Area

Threats to the continued existence of the beautiful shiner include habitat modification. Any human activities that potentially alter the quality or flow of water, flood control, groundwater pumping, and irrigation practices threaten this species. Plant succession, especially the proliferation and spread of submergent vegetation, continues to take over wetlands upon which beautiful shiner depend. All beautiful shiner populations in the U.S. continue to be threatened due to infestations by the non-native Asian tapeworm. With the proper Safe Harbor Agreements in place, beautiful shiner should be considered for introduction into any suitable waters within their historical range.

Yaqui catfish

A. Status of the Species within the Action Area

Managed populations of the Yaqui catfish currently occur in Twin Pond on San Bernardino NWR and in House Pond on the privately owned Slaughter Ranch. Natural spawning in these two locations has yet to be documented. Yaqui catfish are not present within Black Draw on the San Bernardino NWR.

B. Factors Affecting the Species' Environment in the Action Area

Threats to the continued existence of the Yaqui catfish include habitat modification and actual and potential hybridization with introduced, non-native catfishes (e.g., channel catfish and blue catfish). Any human activities that potentially alter the quality or flow of water, flood control, groundwater pumping, and irrigation practices threaten this species. Fish farming (channel catfish) within watersheds where Yaqui catfish occur should be halted and discouraged. With the proper Safe Harbor Agreements in place, Yaqui catfish should be considered for introduction into any suitable waters within their historical range.

Yaqui chub

A. Status of the Species within the Action Area

Managed populations of Yaqui chub are currently reproducing and thriving on San Bernardino NWR in Black Draw, Bathhouse Spring, Double PhD Pond, the Hay Hollow Ponds, the Minckley Ponds, North Fork, Oasis Pond, and the Twin Ponds, in House Pond on the privately owned Slaughter Ranch and on private land.

B. Factors Affecting the Species' Environment in the Action Area

Threats to the continued existence of the Yaqui chub include habitat modification. Any human activities that potentially alter the quality or flow of water, flood control, groundwater pumping, and irrigation practices threaten this species. Plant succession, especially the proliferation and spread of submergent vegetation, continues to take over wetlands upon which Yaqui chub depend. Most Yaqui chub populations continue to be threatened due to infestations by the non-native Asian tapeworm. With the proper Safe Harbor Agreements in place, Yaqui chub should be considered for introduction into any suitable waters on private land within their historical range.

Yaqui topminnow

A. Status of the Species within the Action Area

Yaqui topminnow are currently found in every permanent wetland on San Bernardino NWR, the privately-owned Slaughter Ranch, and in Astin Spring on the privately owned Malpai Ranch. The species has adapted well to numerous off-channel ponds established as refugia for this and other fish species on the refuge, and is thriving, reproducing, and dispersing readily into Black Draw. Due to their dispersal capability, the species can be found anywhere in Black Draw, Hay Hollow Wash, and their tributaries during flood seasons, and can also disappear from particular wetland sites only to reappear years later.

B. Factors Affecting the Species' Environment in the Action Area

Threats to the continued existence of the Yaqui topminnow include habitat modification. Any human activities that potentially alter the quality or flow of water, flood control, groundwater pumping, and irrigation practices threaten this species. Plant succession, especially the proliferation and spread of cattail, continues to take over wetlands upon which topminnow depend. A major threat to the species includes competition with, and predation from, the western mosquitofish. AGFD was recently issued a section 10(a)(1)(A) recovery permit for implementation of their Safe Harbor Agreement, which includes Yaqui topminnow. Yaqui topminnow should be considered for introduction into any suitable waters within their historical range.

Yaqui Fish – unlisted

Mexican longfin dace

A. Status of the Species within the Action Area

Mexican longfin dace currently occur in several wetlands on San Bernardino NWR and throughout portions of Río San Bernardino (Black Draw). Stronghold habitats consist of perennial portions of Black Draw on the refuge and Silver Creek within Rancho San Bernardino just south of the refuge in Sonora (W. Radke, pers. comm.).

B. Factors Affecting the Species' Environment in the Action Area

Breeding populations of the Mexican longfin dace occur on San Bernardino NWR and increasing water quality and quantity in Black Draw is expected to promote the natural repopulation of this species into previously unsuitable habitat. Each of these wetland habitats is separated from one another which reduce the threat of elimination due to large scale habitat damage or disease. However, the effects of long-term drought cannot be controlled, but can potentially be mitigated through holding fish in captivity or through reestablishment efforts.

Threats to the continued existence of the Mexican longfin dace include human activities that potentially alter the quality or flow of water. Flood control, groundwater pumping, and irrigation practices, particularly threaten this species. Non-native species (e.g. red shiner, crayfish, etc.) are another major threat to Mexican longfin dace. According to Rinne (2004a), because the fish fauna of this region are: 1) low in diversity (Rinne and Minckley 1991), 2) dispersed in isolated reaches of streams (Rinne 1995), 3) rapidly declining due to multiple effects (Rinne 2002, 2004b), and 4) largely comprised of threatened and endangered species of fishes, the effects of fire need to be considered when managing for this species.

Taxonomy and basic life history studies, additional investigation of reproductive activities (especially in the Río Yaqui basin), and work to determine the best removal methods of non-native species, are needed. In addition, there is a need for new and continuing inventory of their range to determine the status of this species, especially in smaller streams.

Mexican stoneroller

A. Status of the Species within the Action Area

The Mexican stoneroller occurs on San Bernardino NWR in portions of Black Draw, and as water quality improves and water quantity increases in Black Draw, natural repopulation of this species is expected in previously unsuitable habitat.

B. Factors Affecting the Species' Environment in the Action Area

Current threats to the Mexican stoneroller include loss of aquatic habitat through aquifer pumping, reduction in stream flows, water diversion, drought, post-wildfire increased siltation, and predation by non-native green sunfish and rainbow trout.

Yaqui sucker

A. Status of the Species within the Action Area

The Yaqui sucker was eliminated from Arizona around 1970 and currently does not exist in the action area. Increasing water quality and quantity in Black Draw is expected to promote the natural reestablishment and repopulation of this species into previously unsuitable habitat.

B. Factors Affecting the Species' Environment in the Action Area

Yaqui suckers will be translocated into ponds or streams at San Bernardino Ranch, once non-native fish are removed and habitat is restored. A captive population is being maintained at Dexter NFH (New Mexico).

Current threats to the Yaqui sucker include loss of aquatic habitat through aquifer pumping, reduction in stream flows, water diversion, drought, post-wildfire increased siltation, and potential predation by non-native fish. The San Bernardino aquifer needs to be protected and watershed restoration needs to continue on both the refuge and on adjacent private lands within the watershed. While the species is perhaps expected to repopulate suitable habitat within Black Draw, reestablishment of the fish into wetlands would speed up recovery efforts and help ensure increased genetic diversity.

GRASSLAND SPECIES

Northern aplomado falcon

A. Status of the Species within the Action Area

Formal surveys and reliable sightings submitted to USFWS show that a small number of falcons have been sighted in the United States during every decade since the 1960s (71 FR 42298). In addition, a resident pair of northern aplomado falcons in Luna County, New Mexico, bred successfully in 2002, fledging three young. These were the first known aplomado falcons produced

in either New Mexico or Arizona since the subspecies' extirpation as a breeding species in the 1950's. Another pair was reported near this site in 2002, but no nest was located and only one of the pair was present 2 days later (Meyer and Williams 2005). The 2002 nest represented the first successful reproduction by naturally occurring northern aplomado falcons in the United States in 50 years. Meyers and Williams (2005) reported at least eight individual falcons in Luna County between 2000 and 2004. The species occurred historically in Hidalgo County, and there have been five reports of aplomado falcons in or near the Animas Valley from the 1990s through the early 2000s (Meyer and Williams 2005). These sightings suggest that suitable habitat is likely to occur in the Malpai Borderlands for northern aplomado falcons to potentially nest there in the future. It is also likely that some landowners in the New Mexico portion of the Malpai Borderlands would participate in the reestablishment program being implemented under the non-essential experimental population designation (71 FR 42298). Figure 5-2 in Section 5.4.1.1 of the MBHCP depicts what is considered to be suitable or potential northern aplomado falcon habitat in the Malpai Borderlands.

B. Factors Affecting the Species' Environment in the Action Area

The primary factors affecting the northern aplomado falcon range-wide may have played a role in the absence of breeding individuals in the Malpai Borderlands. These are primarily linked to the alteration or degradation of grassland habitat. Historically, this was primarily from a reduction of grass cover and increase in woody vegetation resulting from unmanaged livestock grazing. This may further have resulted in a loss of yuccas, reducing available nest sites. However, in recent times, improved range management techniques have been developed and implemented in the action area, including decreased stocking rates, stock rotation, prescribed burning, and other brush control methods (Archer 1994; Heady 1994; Burnham et al. 2002). The use of DDT in Latin America may have reduced survival of birds that potentially could re-colonize the Malpai Borderlands, but this threat to the species is thought to be diminishing because DDT was banned in Mexico in 2000. Another present threat to the northern aplomado falcon in the action area is long-term drought because it reduces the quantity of the falcon's prey.

Black-tailed prairie dog

A. Status of the Species within the Action Area

In the Malpai Borderlands, large numbers of black-tailed prairie dogs were historically reported in the Animas and Playas valleys (NMDGF 2002); however, they have been gone for many years. The remnants of a colony were documented on the Alamo Hueco Ranch a few hundred yards east of the boundary with the Diamond A Ranch (Ben Brown, pers. comm.). In 2000, the Animas Foundation initiated an experimental reintroduction of black-tailed prairie dogs onto Diamond A Ranch. A total of 100 individuals were introduced onto four sites at McKinney Flats on the southeast corner of the ranch. Three of these introduced colonies have survived for five years and are reproducing (P. Warren, pers. comm.). There are no known black-tailed prairie dog colonies anywhere in the Malpai borderlands other than the three colonies on the Diamond A Ranch.

B. Factors Affecting the Species' Environment in the Action Area

Currently, black-tailed prairie dogs are restricted to the Diamond A Ranch within the action area. Threats to this population include impacts from loss of open grasslands, increased immigration and U.S. Border Patrol activities, sylvatic plague, and drought. Of these threats, the loss of open grasslands is the most significant, as past grazing practices and fire suppression activities decreased the occurrence of fire, leading to woody encroachment into grassland areas and thereby reducing available habitat for prairie dogs. Studies have shown that livestock forage utilization can have both beneficial and detrimental effects on prairie dog colonies (Licht and Sanchez 1993, Cheng and Ritchie 2005). Livestock utilization on the Diamond A Ranch is moderated according to prevailing forage conditions, including removal of all livestock during periods of drought; therefore, it is unlikely that livestock utilization poses a significant threat to the population of black-tailed prairie dogs on the Diamond A Ranch. The effects of increased immigration and Border Patrol activities likely are insignificant as well, as black-tailed prairie dog colonies are generally devoid of vegetation and provide little opportunity for resting or cover for immigrants. Sylvatic plague has not been documented in the black-tailed prairie dog colony on the Diamond A Ranch, but the population should continue to be monitored. Drought continues to be a threat throughout the desert southwest, which can lead to a decrease in food availability for the black-tailed prairie dog.

Western burrowing owl

A. Status of the Species within the Action Area

In the Malpai Borderlands area, western burrowing owls are permanent residents and breed in the Animas Valley and in the McKinney Flats' black-tailed prairie dog reintroduction area on Diamond A Ranch. They have also been observed in San Bernardino Valley and on San Bernardino NWR, and on some private and state land within the valley. They are often reported to be associated with banner-tail kangaroo rat dens or mounds (D. Decker, pers. comm.). Figure 5-3 of the MBHCP shows a generalized depiction of burrowing owl habitat in the Malpai Borderlands.

B. Factors Affecting the Species' Environment in the Action Area

Conserving burrowing mammal colonies is of primary importance to sustaining viable burrowing owl populations. They respond positively to grazing, but have a negative response (nest site loss) from human efforts to control squirrels and prairie dogs by poisoning (NMDGF 2002). Habitat alteration, fragmentation, and loss of edge habitat are causing population declines as well. Threats to the black-tailed prairie dog (above) are similar for the western burrowing owl, with the exception of sylvatic plague.

White-sided jackrabbit

A. Status of the Species within the Action Area

In the U.S., the range of the white-sided jackrabbit is in the Animas Valley and, at least formerly, the southern Playas Valley in Hidalgo County of New Mexico and is entirely encompassed within the action area of the MBHCP. The current status of the white-sided jackrabbit within the action

area is thought to be stable or declining. Black-tailed jackrabbits have increased with the increased shrub cover in the grasslands of the Animas and Playas valleys, and a decline in white-sided jackrabbits is thought to have occurred

B. Factors Affecting the Species' Environment in the Action Area

The primary factor affecting the distribution of the white-sided jackrabbit is the shrub invasion of the historical grassland community. The increase in shrub density favors black-tailed jackrabbits over the white-sided jackrabbit. The increase in shrub cover has occurred through a combination of fire suppression policies and intense livestock grazing during the late 1800s and early 1900s, which were likely the key causes of the replacement of grasslands by shrublands, and changes in the local fire regimes (Hendrickson and Minckley 1984, Swetnam and Baisan 1996). Grazing practices in the Malpai Borderlands, including conservative grazing and a grass bank on the Diamond A Ranch, have likely reduced the influences of grazing on shrub invasions of native grasslands. This combined with the Diamond A Ranch fire management program has reversed historical trends (USFWS files).

MONTANE SPECIES

Mexican spotted owl

A. Status of the Species within the Action Area

In the Malpai Borderlands, the species is known to be resident in the Animas Mountains on the Diamond A Ranch (Holycross et al. 2001, Skaggs 1988, Hubbard 1978). Holycross et al. (2001) documented the presence of Mexican spotted owls in Indian Creek on the north end of the Animas Mountains in 1994. NMDGF also have documented their occurrence at Aspen Springs (Appendix A). However, no formal surveys have been conducted in recent years. No critical habitat is designated in the action area of the MBHCP. Based upon elevation and vegetation community, there is approximately 22,776 h (56,257 ac) of potential Mexican spotted owl habitat within the Animas Mountains. This habitat could support up to 23 territories.

B. Factors Affecting the Species' Environment in the Action Area

Fire and fire management are the primary factors that can affect this species within the Action Area. High-severity fire effects reduce canopy and subcanopy cover, which can affect microclimate parameters and potentially availability of prey species. Fuel accumulations and forests overstocked with trees place spotted owl habitat at risk with respect to stand-replacing fires. After a large crown fire, habitat components for nesting, roosting, and foraging are reduced or eliminated. Small-scale natural fires and prescribed burns can reduce fuel loadings and create small openings and thinned stands that increase horizontal diversity and reduce the spread of high-severity crown fire (USFWS 1995b). The Animas Mountains have been under a natural fire regime since before The Nature Conservancy purchased the Diamond A Ranch in 1990 (Peter Warren pers. comm., Sayre 2005). Natural fuel accumulations have resulted in uncharacteristic fire effects, as seen in the 2006 Adobe Fire. The result of this fire was the loss of canopy cover in Indian Creek, one of the known Mexican spotted owl locations. It further altered the forest composition, and the potential for the

pine woodlands to reestablish is uncertain. The loss of habitat components is localized and due to regular fires in this mountain range, a mosaic of habitat types has been maintained across the range.

Due to the paucity of roads through and around the Animas Mountains, the impacts from illegal border activity have been relatively minor, and while illegal entrant warming and camp fires may increase the risk of fire in Mexican spotted owl habitat, it is relatively infrequent.

Human disturbance may occur related to fire suppression activities. Fire suppression activities have occurred in the Animas Mountains when natural resource values have been threatened (occupied New Mexico ridge-nosed rattlesnake habitat) and potentially could occur if human life or property were at risk. Human disturbance related to illegal border activities also is likely to occur, but as stated above, this would be infrequent due to the low level of activity in the Animas Mountains. The private landownership and management by the Animas Foundation limits recreational disturbance of Mexican spotted owl, as does the limited access to the mountains. Livestock grazing does not occur in the Animas Mountains.

New Mexico ridge-nosed rattlesnake

A. Status of the Species within the Action Area

One of the three mountain ranges this subspecies is known from is within the action area of the MBHCP, the Animas Mountains. Generally, New Mexico ridge-nosed rattlesnakes in the Animas Mountains occur from 5,970 ft (1,820 m) to 8,495 ft (2,590 m) in elevation (Degenhardt *et al*. 1996). Encounter rates in the Animas Mountains have been reported at one snake per 4.4 person-days of search time (Holycross 1995). New Mexico ridge-nosed rattlesnakes in the Animas Mountains are often found in association with talus slopes. New Mexico ridge-nosed rattlesnake designated critical habitat is completely contained within the action area, as discussed in the Status of Species.

B. Factors Affecting the Species' Environment in the Action Area

Factors affecting the New Mexico ridge-nosed rattlesnake and its associated habitat within the action area include illegal collection, wildfires, prescribed fires, and low to moderate levels of recreational activities. Potential threats to the subspecies include fuel wood harvest, mining, improper grazing management, and development (43 FR 34479).

Fire and fire management are the primary factor that can affect this species within the Action Area. High-severity fire effects reduce canopy and subcanopy cover, which can affect microclimate parameters and potentially availability of prey species. The Adobe Fire resulted in a loss of ground cover that has caused increased erosion and sediment accumulation in talus piles used as denning sites by New Mexico ridge-nosed rattlesnakes. The Adobe wildfire burned through designated critical habitat for this species, with much of the area in Indian Creek being subjected to high-severity fire effects. Much of the riparian and pine woodland overstory in Indian Creek was lost to this wildfire. Areas in Bear and Spring canyons appear to have been similarly affected, but an evaluation has not occurred. Several occupied talus slides in Indian Creek were partially buried in sediment and ash during post-fire runoff events. Preliminary results from prey base monitoring in

2007, shows no discernable difference inside and outside the burn area. Individual snakes that appeared healthy were located within the severely affected areas of Indian Creek. However, based upon preliminary observations in the Sierra San Luis, there may be some long-term demographic effects that need to be studied over time (Matt Goode, University of Arizona, pers com). Photo points were established in Indian Creek to monitor vegetation growth. New Mexico ridge-nosed rattlesnakes habitat component are found in other areas of the Animas Mountains, but no observations have been documented.

Fire and fire management in the Animas Mountains are described above under Mexican spotted owl environmental baseline.

Illegal border activity can increase the potential for fire starts from illegal cooking/warming fires and their occasional use for signaling Federal authorities for personal rescue. In addition, individual snakes may be killed by immigrates and smugglers based upon personal fear of rattlesnakes. The Animas Mountains are not open to the public and past threats from recreation, illegal collection are very low or non-existent. In addition, livestock management and wood harvesting no longer occur in the montane community of the Animas Mountains.

RIPARIAN SPECIES

Western red bat

A. Status of the Species within the Action Area

This species is uncommon throughout its range, including within the Malpai Borderlands. In the Malpai Borderlands, a population of western red bats occurs in Double Adobe Creek on Diamond A Ranch, which is apparently the only known population in New Mexico (L. Lewis, USFWS, pers. comm.). In the Arizona side of the Malpai Borderlands, a western red bat was captured and photographed by Sarah L. Schmidt on San Bernardino NWR at the Hay Hollow Wash windmill during August of 1996. It is also likely that western red bats are found in any riparian community with deciduous tress in the action area, such as those found in Black Draw, Double Adobe Creek, Guadalupe Canyon, and those areas identified in the MBHCP as habitat for yellow-billed cuckoo (Figure 5-3).

B. Factors Affecting the Species' Environment in the Action Area

Because of the limited amount of riparian mature hardwood communities, the lack of large perennial streams, and the lack of access to private and state trust lands within the action area, many of the threats to this species seen on a rangewide level are not found within the action area. Loss of riparian habitat from river-flow management and stream channelization and stabilization are not factors within the action area. The impacts of recreation on riparian areas are also not seen.

Livestock grazing is a primary economic activity throughout the action area, but the management of livestock as practiced by Malpai borderland ranchers on State Trust and private lands and the lack of livestock on the San Bernardino NWR has also resulted in promotion of and protection of mature riparian hardwood galleries. MBG activities to reduce erosion of soils off the uplands have helped

to stabilize wash and stream channels and promoted further development of riparian communities. Wildland fire still threatens riparian hardwood communities, but the active prescribed burn program on the Diamond A and the occasional prescribed burns on state and private lands have reduced the potential from high-severity wildfire from burning large portions of watersheds. This in turn has reduced the likelihood of large scale ash and debris flows that can scour and undermine existing riparian trees and set back riparian community development.

Western yellow-billed cuckoo

A. Status of the Species within the Action Area

In the action area, western yellow-billed cuckoos were first recorded in 1999 at the San Bernardino NWR, where they are a regular nesting species, in the San Bernardino Valley west of Guadalupe Canyon, and also within Guadalupe Canyon. Figure 5-3 of MBHCP shows the location of riparian areas in the borderlands where yellow-billed cuckoos either have occurred or where the habitat is considered suitable for the species.

B. Factors Affecting the Species' Environment in the Action Area

Because of the limited amount of riparian mature hardwood communities, the lack of large perennial streams, and the lack of access to private and state trust lands within the action area, many of the threats to this species seen on a rangewide level are not found within the action area. Loss of riparian habitat from river-flow management and stream channelization and stabilization are not factors within the action area. The impacts of recreation, grazing, and fire management are the same as for the western red bat, discussed above.

EFFECTS OF THE ACTION

Effects of the action refer to the direct and indirect effects of an action on the species or critical habitat, together with the effects of other activities that are interrelated and interdependent with that action which will be added to the environmental baseline. Interrelated actions are those that are part of a larger action and depend on the larger action for their justification. Interdependent actions are those that have no independent utility apart from the action under consideration. Indirect effects are those that are caused by the proposed action and are later in time, but are still reasonably certain to occur.

Direct and Indirect Effects

The proposed action is the issuance of a section 10(a)(1)(B) Incidental Take Permit to MBG for the incidental take of the covered species from implementation of the covered activities in the MBHCP. No direct effects are expected from the issuance of the permit on any covered species. All effects of implementing the covered activities proposed in the MBHCP are indirect effects of the permit issuance and are discussed below. Because of the scope of the covered activities and the similarity of effects on similar groups of species, this section is organized, for the most part, according to species habitat associations: Aquatic Species, Grassland Species, Montane Species,

and Riparian Species. Effects unique to specific species within these associations will be discussed separately, as will effects to designated critical habitat.

The section 9 prohibitions in the Act differ between animals and plants; however, for simplicity the following discussion of effects of covered activities to Huachuca water umbel is analogous to the discussion of the effects of take on the covered animal species.

AQUATIC SPECIES

Fire Management

The covered species of fish and Huachuca water umbel are located primarily on the San Bernardino NWR, down stream of the permit area. Astin Spring on the Malpai Ranch has supported topminnow, Chiricahua leopard frogs, lowland leopard frogs, and periodically Yaqui chub. It also has potential for other covered fish species especially during or after high water events. If Astin Springs is occupied by any of the covered aquatic species during fire management activities, immediate effects of fire management activities to these species may include mortality or injury from heat along the shoreline, infusion of the toxic component of smoke into the water, and local depletion of oxygen. Immediate effects of fire management activities can occur to terrestrial lowland and Chiricahua leopard frogs and Mexican gartersnakes if individuals of these species are dispersing through grassland vegetation communities or fire escapes into occupied riparian or wetland communities. These effects could include mortality and injury from flames, heat, and fire management activities, including mortality by vehicles and retardant drops. The likelihood of these effects is not high, as the frogs disperse primarily during humid or wet periods when fires are not likely to spread or escape. While Mexican gartersnakes may disperse at anytime, they are not common in the area, and dispersal outside of riparian communities is rare.

Post-fire effects on aquatic species are also likely to occur through short-term watershed degradation caused by increases in run-off carrying sediment, debris, and ash downstream into occupied habitats. Fire can lead to elevated soil particle transport due to short-term loss of soil-shielding vegetation and natural litter. Until re-growth occurs, this sediment and the ash resulting from fuel combustion may enter wetlands. The actual amount of erosion and resultant potential silt and ash discharge into drainages and perennial waters is highly variable, depending almost entirely on the intensity and duration of precipitation events. Studies have shown that large, post-fire hydrologic events can kill fish and frogs and extirpate local populations (Novak and White 1990; Propst *et al.* 1992; Bozek and Young 1994; Rinne 1975, 1996; Rieman *et al.* 1997, Wallace 2003). Recolonization rates for fish depend on the proximity and relative location of refuges, access from refuges to disturbed areas (i.e. no fish barriers), and the occurrence of complex life history traits and overlapping generations (Gresswell 1999; Dunham *et al.* 2003).

Accelerated runoff from upland areas can contribute to bank erosion in stream channels and siltation of riparian and aquatic plants. Accelerated soil erosion also leads to increased sediment-loading in streams. Post-fire erosional processes that deliver sediment to streams over long periods of time due to roads, fire lines, or the lack of re-vegetation can have long-term negative effects on aquatic ecosystems (Lotspeich *et al.* 1970; DeByle and Packer 1972). Fires generate ash, and incomplete combustion of materials creates charcoal. Elevated peak flow volumes and velocities

are associated with increased transport of ash and nutrients (Ffolliott *et al.* 2004). Heavy ash and soot loads in water clog the gills of fish and lead to acute and chronic chemical effects, including death. The runoff of ash contributes phosphoric nutrients to aquatic ecosystems, and the presence of charcoal in water is associated with reduced dissolved oxygen concentrations. Both ammonia and phosphorus levels have been documented to be above lethal limits to fish during fires (Spencer and Hauer 1991). Changes in the pH and dissolved oxygen can render habitat unsuitable for fish and amphibian larvae. As nutrient-filled ash flows into streams, it changes the pH and nutrient level of the water (Karle 2000).

Fires can alter aquatic food webs to the detriment of native fishes. Periphyton biomass has been documented to decrease initially after a fire, but then increase due to increased light availability and increased temperature (Minshall *et al.* 1990). Periphyton biomass would hypothetically decrease gradually to pre-fire levels as riparian vegetation reestablishes itself and increases stream shading (Minshall *et al.* 1989), although no studies have been conducted on the long-term effects of fire on periphyton communities.

The effects of fire on macroinvertebrates have been well studied since the early 1980s (La Point *et al.* 1983; Minshall *et al.* 1989, 1990, 1995, 1997; Roby 1989; Richards and Minshall 1992; Jones *et al.* 1993; Lawrence and Minshall 1994; Robinson *et al.* 1994; Roby and Azuma 1995; Mihuc *et al.* 1996; Minshall 2003; Spencer *et al.* 2003). Macroinvertebrate communities are strongly influenced by substrate instability associated with post-fire erosional processes. Effects include changes in functional feeding groups (La Point *et al.* 1983), more annual variation (Richards and Minshall 1992), abundance, diversity, and species richness (Roby 1989; Lawrence and Minshall 1994; Minshall *et al.* 1995; Mihuc *et al.* 1996; Minshall 2003). Changes can persist for many years. Roby (1989) found that diversity was lower in burned streams compared to reference streams nine years after a fire. Species best adapted to post-fire stream conditions can be characterized as those that prefer a broad range of physical habitat (Mihuc *et al.* 1996). Taxa that require specialized habitats respond much slower to disturbances such as fire (Mihuc *et al.* 1996).

In addition to temporary effects on fish habitat, post-fire fluvial adjustments can remove native fish habitat. Post-fire, sediment- and debris-bulked peak flows can result in downcutting of channels. Once downcut, subsequent floodflows may be contained entirely within the channel and unable to inundate now-perched floodplains (Rosgen 1996). Native fishes that require access to low-velocity floodplains to avoid being transported downstream and/or to colonize upstream areas will be adversely affected. Lateral erosion of stream channels will increase width to depth ratios, resulting in decreased unit velocities in the cross section. These decreased unit velocities will result in the deposition of larger particle sizes, often cobbles, in systems formerly dominated by gravels, and boulders in systems formerly dominated by cobbles. This aggradation of sediment can fill pools and other persistent features, reducing or eliminating habitat for native fishes.

The potential increase in sediment, combined with ash and debris could result in mortality and injury from physical trauma with debris, covering of respiratory surfaces of gills, and burying of individuals. These effects could occur to all life history stages of the fish species, Huachuca water umbel, and leopard frogs in the stream channel. Northern Mexican gartersnakes could be affected through short-term reduction or loss of prey base and suitable habitat, as pools are filled in and cover vegetation is buried or removed through scouring. Beyond the physical effects of debris and

sediment in runoff flows, ash from the fire is likely to result in temporary changes in water pH, dissolved oxygen, temperature, and other water quality parameters. This can result in loss of individuals of all life stages of fish, aquatic stages of leopard frogs, and small Mexican gartersnakes. Many Adult Mexican gartersnakes and leopard frogs would likely avoid these effects by leaving the water and waiting until the debris and ash flows pass, although the forage base of these species, including fish and aquatic invertebrates, may be reduced temporarily affecting the adults of these species.

The Chiricahua leopard frog recovery plan identifies restoring natural fire regimes as a recovery action (USFWS 2007). It puts forth a "rule of thumb" that to minimize watershed degradation no more than 20 percent of an occupied watershed should be burned at any one time in any three-year period. The watersheds referred to in the Recovery Plan are based upon 10-digit hydrological units (HUCs) which are subunits of the larger river drainage basins. In the action area, there are five 10-digit HUCs in the Colorado River, Yaqui River, and Rio Grande River basins that are addressed in the Recovery Plan. The MBHCP proposes a 25 percent annual maximum burn area within specified watersheds (Table 5-1 in the MBHCP), based upon the fire perimeter, and burning no more than 50% of these watersheds in a five-year period. The return interval would be no less than three years, but more likely will range from 5-11 years. The watersheds identified in the MBHCP range from 19.5 to 31.1 percent of the 10-digit HUCs, and the maximum size burn under the 5-year burn caps would be 15.5 percent of a 10-digit HUC. Therefore, the proposed fire parameters in the MBHCP are consistent with the recommendations of the Recovery Plan for Chiricahua leopard frogs.

Fires usually burn in a mosaic within the burn perimeter resulting in a range of 60-80 percent of the area actually burned. This would result in approximately 15-20 percent of the watershed actually consumed or disturbed by the fire. If the percent actually consumed is higher, the effects would vary depending on soil type, slope, precipitation, and the vegetation occurring between the burn and occupied habitat downstream. Since degradation of aquatic sites and watersheds are counter to the purposes set forth by the MBG in the MBHCP, it is anticipated that corrective actions will be taken, such as the funding and implementation of erosion control structures under the MBHCP and alterations in management in coordination with the Technical Advisory Team.

Fire management techniques, including prescribed fires, wildfire use, and suppression, can include the use of hand tools, heavy equipment, use of surface water, and the transfer of water from one source to another. These activities may result in the introduction of non-native invasive species that could result in changes in post fire plant communities. Amphibian chytrid may also be spread this way, especially through the transfer of water from one source to another. Amphibian chytrid has resulted in the loss of a number of population sites throughout Arizona and New Mexico. The effects of chytrid on leopard frog populations are discussed in the Chiricahua Leopard Frog Recovery Plan (USFWS 2007). The drying and cleaning of all equipment moving between aquatic sites should reduce the likelihood of spreading Amphibian chytrid in this manner. Bullfrog and non-native fish species may also be introduced into new waters through such water transfers. The minimization measures to clean, dry, and or sterilize all equipment should reduce the possibility of such effects. The information provided to burn crews and incident command teams concerning the location of aquatic covered species should also reduce these potential effects.

The populations of the covered fish species occur both within the channel of Black Draw and outside the channel in ponds perched on historical flood plain terraces. These ponds are the primary source of the populations in Black Draw, as individuals move through the pond water control structures into Black Draw through the outflow of the ponds. Fish in the channel are at risk from post-fire effects within the watershed, but recolonization is likely to occur quickly after such an event from the fish populations in the ponds as soon as perennial reaches below the ponds are reestablished.

Little precipitation occurs in the Malpai Borderlands during spring and fall, and while substantial rainfall can occur during winter, this precipitation rarely results in major runoff events. Heavy precipitation is most likely to occur with intense summer thunderstorms. The effects of these precipitation events may be felt in the natural wetland habitats in Black Draw, but not in the constructed ponds. Because of the geographic and topographic position of the San Bernardino NWR ponds, they do not typically receive inflow from overland run-off from precipitation, thus neither a significant amount of silt nor ash could be washed into San Bernardino NWR ponds occupied by fish if heavy rain followed a fire in the permit area.

The covered fish species in Astin Spring may also be similarly affected by post fire ash, debris, sediment, and higher water volumes as those fish in the channel of Black Draw. However, the spring water is likely to clear sooner due to the continued input of spring water, but fish recolonization will need to occur during high water events when fish are present in Black Draw and able to swim up stream to Astin Springs again.

As the aquatic sites within Black Draw improve in quality and persistence, Huachuca water umbel is likely to be reestablished naturally or through management activities during the duration of the permit. If this occurs, Huachuca water umbel is also likely be affected by the increase in sedimentation and fire related debris and ash flow. Plants growing in the stream channel may be buried or physically stripped out of the substrate, and they may be affected by chemical changes in the water and substrate. These changes may stunt growth and remove plants, but they also add nutrients and result in dispersal of this species downstream to potential new locations.

Erosion Control

Immediate impacts to aquatic species are not anticipated from the proposed Erosion Control activities. These activities are typically not implemented in drainages when water is present, and the permit area does not include any known covered fish populations or Huachuca water umbel, with the exception of possibly Astin Springs. Mexican gartersnake and adult leopard frogs may be present in ephemeral washes where these activities may be implemented, but the type of erosion control activities described in the MBHCP are not likely to affect these species unless heavy equipment and vehicles are used. If such equipment is used, adult leopard frogs and Mexican gartersnakes could be killed under the tires or treads of vehicles. Amphibian chytrid can be spread through moving wet or dirty equipment form on site to another, especially if there are wetted soils or aquatic in these locations. The effects amphibian chytrid on leopard frogs are discussed in the Chiricahua Leopard Frog Recovery Plan (USFWS 2007). These effects will be minimized through proper cleaning and/or drying of all vehicle and tools before moving to new locations, as proposed in the MBHCP (MBHCPTWG and Lehman 2008).

Post-project effects of Erosion Control activities on aquatic species could include a temporary increase in sediment transport from the disturbed area around the erosion control structures placed up stream from occupied habitats. The effects would be similar to those described above under fire management activities minus the ash and debris, but because of the low impact of these structures that are typically used by the MBG, little ground disturbance occurs in installation and very little increase in sediment transport is anticipated (Zeedyk and Jansens 2006). Any increase that does occur would be temporary and not likely to be perceivable above background levels of sediment transport due to erosion. The long-term effects of these activities on covered aquatic species should be a reduction in sediment transported in run-off, a reduction in water run-off, better water infiltration and retention, and increases in perennial water availability (Zeedyk and Jansens 2006).

Mechanical Brush Control

Mechanical brush control activities would have effects similar to those described for erosion control activities, except that the possibility for immediate impacts would be less, as these activities would not occur within the riparian community or in drainages. So, even though heavy equipment would be used in the implementation of mechanical brush control, the potential for crushing adult leopard frogs and gartersnakes would be less due to the unlikelihood that these species would be found in the upland areas of the permit area. Post-project impacts on all aquatic species would be similar to those described above under fire management and erosion control activities from sediment transport downstream, but would be less likely due to mechanical brush control activities being implemented outside riparian areas, the buffer strip between project areas and drainages, and the long-term beneficial impact of these activities in increasing grass and forb cover, which reduces erosion and sediment transport. It is unlikely that mechanical brush control activities would introduce amphibian chytrid into an aquatic site, but the effects on the leopard frogs would be similar to those discussed under fire management and will be minimized through proper cleaning and/or drying of all vehicle and tools before moving to new locations.

Livestock Management

The MBHCP makes a distinction between livestock management, or livestock presence, and grazing, or herbivory. The applicant only requests coverage for livestock management under the section 10(a)(1)(B) incidental take permit, but the effects of herbivory are not independent of livestock management and are analyzed here as an interrelated/interdependent action.

Livestock management activities of Malpai area ranchers are not likely to immediately affect covered fish species or Huachuca water umbel, as these species are primarily found on the San Bernardino NWR, which is managed principally for these fish species and on which no livestock or grazing is permitted. In high-rainfall years, some of the fish resident on the San Bernardino NWR may disperse upstream to Astin Spring, a small, partially fenced riparian enclave within a 160 ac (65 ha) pasture on a nearby Malpai area ranch. In such a case, livestock management could result in mortality or harm as a result of trampling and increased sedimentation. If leopard frogs and Mexican gartersnakes are present in any aquatic site in the permit area, effects to these species could include: trampling-related mortality or harm to leopard frogs (especially in the case of eggs, tadpoles, and metamorphs) and Mexican gartersnakes, and degraded water quality due to trampling

(increased turbidity) and defecation. Only two dependable Chiricahua leopard frog breeding sites are currently known to be in the permit area, but these sites have refuges or enough habitat complexity to minimize any such effects from livestock presence. The breeding sites for lowland leopard frogs within the permit area are suspected to be in Guadalupe Canyon, where livestock are currently not present, but may be in the future. Therefore, livestock effects on eggs, tadpoles, and metamorph life stages of both leopard frog species is likely to occur at some level during the life of the permit. If recovery and conservation efforts are successful and the implementation of the draft MBHCP results in establishment of additional breeding sites, as expected; it is likely these species would be more widespread across the action area. The potential effects on both species would likely occur in more locations, but it is unlikely that livestock management would cause more than occasional mortality and not reduce the recovery potential of the Chiricahua leopard frog or conservation of the lowland leopard frog. While livestock foraging in the uplands is not likely to have immediate effects on any of the covered aquatic species, excessive and prolonged removal of vegetation through herbivory has the potential to reduce ground cover, reduce organic litter, and result in increased bare soil exposed to wind and water erosion. This can result in increased sediment transport in run-off and, consequently, increased effects to aquatic species as described above.

In addition, there is the possibility that livestock could transport amphibian chytrid from one aquatic site to another. For this to occur there would need to be an aquatic microclimate that could sustain the fungus for the trip from one water to another, such as in the hair, mud on the animal, or in the hoof keratin. This is also true of all wildlife species that may travel from one aquatic site to another, such as white-tailed deer, javelina, waterfowl, and aquatic insects. In addition, under drought conditions it may be necessary to fill livestock tanks with water to sustain livestock until the rainy season when the tanks could fill naturally. If the water source is from another body of surface water, there is the potential to spread amphibian chytrid in the same manner discussed under fire management above. The effects of chytrid on leopard frog populations are discussed in the Chiricahua Leopard Frog Recovery Plan (USFWS 2007).

In general, excessive and prolonged removal of grass, forbs, and other vegetation can expose more soil to erosion and destabilize the vegetation communities in a watershed. This could result in increases in invasive shrubs and an increase in erosion. These impacts are typical of livestock operations where no active management is applied to the movement of livestock. These are the type of livestock operations that historically have resulted in erosion and shrub invasions that the MBHCP is trying to correct through their covered activities. Most Malpai Borderlands ranchers are managing livestock under ranch management plans, developed with NRCS, which have resulted in improvements in rangeland conditions (FWS files). This is not to say that localized problems will not develop due to grazing and livestock management, but on a landscape level, the trends observed by the MBG monitoring have been towards improved watershed conditions (USFWS files).

Linear Facility Construction and Maintenance

The effects of linear facility construction to the two leopard frogs and Mexican gartersnake would be similar to that of erosion control and mechanical brush control activities if these species are found in the project area during construction, maintenance, and, on roads during vehicle use. Linear facility construction, maintenance and use can result in road mortality of dispersing leopard

frogs or gartersnakes; trapping of dispersing leopard frogs in pipeline trenches; and increased water run-off, erosion, and sediment transport into aquatic species' habitats. The downstream effects on covered aquatic species are similar to those described for fire management, erosion control, and mechanical brush control above. Fence line and pipeline construction usually will result in only temporary increases in sediment transport, but roads may result in a long-term increase in sediment transport depending on design and erosion control implemented with construction and maintenance of these ranch roads. These effects to the covered fish species and Huachuca water umbel would only occur if these facilities were routed directly through Black Draw or the watersheds that drain into Black Draw. The two leopard frogs and Mexican gartersnake could be affected if such facilities were routed above or through any perennial stream corridor in the permit area. Increased runoff and sediment transport may have a beneficial effect on Huachuca water umbel through scouring and deposition of sediments that would provide nutrients, disperse plants downstream, and provide new areas to colonize. Amphibian chytrid can be spread through moving wet or dirty equipment from one site to another, especially if there are wetted soils or aquatic sites in these locations. The effects of amphibian chytrid on leopard frogs are discussed in the Chiricahua Leopard Frog Recovery Plan (USFWS 2007). These effects will be minimized through proper cleaning and/or drying of all vehicles and tools before moving to new locations, as proposed in the MBHCP (MBHCPTWG and Lehman 2008).

Stocktank Use and Maintenance

Stocktank maintenance and use are likely to affect three of the aquatic species, the Chiricahua leopard frog, lowland leopard frog, and northern Mexican gartersnake. Covered fish species are only found on the San Bernardino NWR and Astin Spring, and Huachuca water umbel is only known to occur on San Bernardino NWR, and none of these species are known to occur in stock tanks within the permit area. The potential effects of these activities on leopard frogs and Mexican gartersnakes include: direct mortality or harm as a result of trampling effects; harm through water quality degradation as a result of trampling (increased turbidity) and defecation (eutrophication); mortality and harm from spread of amphibian chytrid from livestock use and equipment involved in maintenance; mortality, harm and harassment from emptying/drying stocktanks for maintenance; and mortality or harm as a result of heavy equipment use in the course of stocktank maintenance. Even when dry, leopard frogs and northern Mexican gartersnakes may still be present in cracks in the mud or rodent burrows on the edge of a stocktank. These leopard frogs and northern Mexican gartersnakes could be killed or injured when heavy equipment is used in and around the stocktank. Stocktank maintenance activities, while potentially resulting in some mortality of these three species, provide a benefit in maintaining aquatic sites on the landscape. The potential spread of amphibian chytrid from covered activities will be reduced through minimization measures in the MBHCP (MBHCPTWG and Lehman 2008), as described in the previous sections for fire management, erosion control, mechanical brush control, livestock management, and linear facilities. Additionally, the current distribution of these species within the action area limits the potential of these effects, but their distribution may increase if the anticipated improvements to watershed condition from implementation of the draft MBHCP are realized. However, the minimization measures, such as salvage efforts, should minimize injury or mortality associated with maintenance and use of livestock tanks on these species.

Recovery and Conservation Potential

The implementation of the MBHCP is anticipated to have short-term or ongoing adverse effects on covered aquatic species as discussed above. However, the implementation of MBHCP covered activities as a whole should improve watershed conditions through a reduction in erosion, sediment transport, and intensity of floods, and through an increase in water retention, which should result in slower release of storm water, increases in infiltration, and improvements to intermittent stretches of streams and potential development of perennial reaches. These watershed improvements would result from the reduction of shrub cover in the grassland ecosystem from the application of fire and mechanical brush control, and the reduction in sediment transport and downcutting through implementation of erosion control activities.

Livestock management is geared toward light to moderate grazing pressures in the Malpai Borderlands, which reduces some of the adverse effects of grazing and livestock presence. Construction of linear facilities is the only covered activity that may result in actual habitat loss for some species, through ranch road construction. However, construction and maintenance of fences and water distribution systems should result in improved livestock management. Furthermore, if any problems develop from livestock management, roads, drought, etc., they can be identified and corrective measures taken through implementation of the grassland improvement activities. These activities should result in less water running off the uplands and less erosion of sediment, promoting soil development and increased seed germination and growth. In addition, the water retention in the watershed should result in slower release of water downstream, which should reduce the intensity of flash floods and increase the length and duration water is present in downstream arroyos and washes that feed intermittent and perennial streams. Increasing the presence of water should increase the amount of available habitat for covered species in this association and assist in accomplishing recovery actions for the Yaqui fish species and Chiricahua leopard frog. Malpai Borderlands area monitoring data from 1996-2001 shows a general improvement in watershed condition, but the response was dependent on intensity of treatment effects and precipitation within the normal background of livestock management and normal land uses (Sundt 2001, 2005), occurring across the landscape.

GRASSLAND SPECIES

Fire Management

Fire management activities will primarily affect grassland species, as this vegetation community is the focus of most fire management in the Malpai Borderlands. The effects on covered grassland species during fire management would include mortality and injury of individuals as a result of direct exposure to fire, smoke inhalation, and crushing under vehicle tires or tracks used in fire management activities. Adults of all four covered grassland species are capable of surviving such fire effects by taking refuge in deep burrow systems or by flying or running away. This is facilitated by the natural mosaic pattern that most fires follow through grasslands, leaving areas of unburned vegetation and areas of bare ground that may act as refuge from the flames. The nestlings, pups, and juveniles of these species would be at higher risk of mortality or injury than the adults. In the case of northern aplomado falcons, nest structure damage and loss of active nests are possible from grassland fires.

The changes in covered species' habitat will include both short-term and long-term effects. The short-term effects will include the loss of cover due to the combustion of vegetation and standing detritus. This may expose white-sided jackrabbits to higher rates of predation, but also allow for easier detection of terrestrial predators. The reduction of shrubs will benefit the white-sided jackrabbit by improving the grassland habitats. It may benefit western burrowing owls and northern aplomado falcon by increasing their ability to detect prey species and conversely aid black-tailed prairie dogs in detecting predators farther away from their burrows. The loss of forage may impact white-sided jackrabbits, but the fire-adapted grassland community usually responds quickly, with plant species showing regrowth within several days post fire. The forage species in and around black-tailed prairie dog colonies are not likely to be impacted in this manner as the condition of these plants, cropped short by repeated black-tailed prairie dog grazing, is not likely to carry fire into the area around the colonies. Conversely, burrowing owl and northern aplomado falcon may see a reduction in prey species for a period after the initial effects of the fire. These prey species populations, however, will recover as the grassland community responds with higher diversity of grass and forb species, reduced invasive shrub component, and improved soil stabilization.

Erosion Control

Erosion control activities could affect covered grassland species both from digging or excavation and from noise and human activity. Effects of digging and excavation would consist primarily of possible damage or destruction of western burrowing owl burrows or nests. Because of the type of erosion control structures and the methods used to construct them, it is anticipated that effects on western burrowing owls will be minor and infrequent because they can be easily seen and avoided. Similar effects could occur to black-tailed prairie dog burrows or colonies if erosion control activities are undertaken in their immediate vicinity. However, black-tailed prairie dog burrows and towns are easily seen and avoided. If erosion control activities must occur in the vicinity of black-tailed prairie dog towns, they are unlikely to result in the collapse of burrows based upon the construction method used and the general structure of black-tailed prairie dog burrows. Disturbance-related impacts could affect burrowing owl and northern aplomado falcon nests, if adults are flushed from active nests. Of the grassland species, the western burrowing owl would be most likely to be affected by erosion control activities because it is by far the most widely distributed. Also, the juveniles and young of all grassland species are significantly more vulnerable than adults to the potential impacts of erosion control because of their relative inability to escape such impacts by flying or running away. Long-term beneficial effects of erosion control activities would include reducing the loss of the A soil-horizon and loss of nutrients out of the watershed. In areas where soil is captured behind erosion control structures, improved water infiltration and grass growth will enhance the habitat for the covered grassland species.

Mechanical Brush Control

The covered grassland species could be affected by the use of heavy equipment, ground-disturbance impacts, and disturbance from noise and human presence. The use of heavy equipment could result in the death of individuals that may get run over by tires or tracks, but this is probably limited to less mobile life stages, such as fledging western burrowing owls and northern aplomado falcons,

and juvenile white-sided jackrabbits and black-tailed prairie dogs. More likely is the crushing or collapsing of burrows and death or injury to individuals that may be trapped within. This could include western burrowing owls, black-tailed prairie dogs, and white-sided jackrabbits. Black-tailed prairie dogs are unlikely to be affected by mechanical brush control because the activity is unlikely to be undertaken in black-tailed prairie dog colonies due to the general lack of brush in the vicinity of active colonies. In addition, the burrows are deep, have multiple entrances, and the buffer area included in minimization measures would make such effects unlikely to occur, if at all. Northern aplomado falcon nests could be inadvertently knocked down if not detected prior to implementation of a project, but currently no nests are known from the action area. The reestablishment of northern aplomado falcons in the permitted area in New Mexico would likely include associated nest monitoring; therefore, avoidance of these effects on northern aplomado nests is likely. Disturbance from mechanical brush control and human presence associated with these activities would likely result in adverse effects on northern aplomado falcons or burrowing owls if adults were flushed from active nests; however, because brush control is carried out prior to the breeding cycles of the grassland species, the potential for disturbance-related impacts to young is unlikely.

Livestock Management

Two of the grassland species, the western burrowing owl and black-tailed prairie dog, utilize underground burrows for reproduction and shelter, which could be subject to damage as a result of livestock trampling. These species routinely co-exist with livestock in the Malpai Borderlands, and prior to the advent of livestock in the American west, routinely co-existed with naturally occurring large ungulates (e.g., antelope and bison) (Fritcher *et al.* 2004, Hoogland 1996, Murray 2005, Uresk *et al.* 1981); consequently, livestock management in conjunction with the presence of western burrowing owls and black-tailed prairie dogs is unlikely to result in population level effects to either of these species. Because black-tailed prairie dog burrow complexes are excavated with entrances extending straight down and deep before branching, burrows are unlikely to be impacted by livestock presence. Some western burrowing owls may be incidentally taken through the occasional destruction of burrows, which are often shallower. The effects of livestock management on white-sided jackrabbits are also likely to be minor, resulting at most in flushing jackrabbits from diurnal shelters from time to time. White-sided jackrabbits flushed from diurnal shelters run very short distances (i.e. usually 5-10 yards) before dropping into another shelter. This could conceivably result in increasing the predation risk for an individual, but only minimally. Northern aplomado falcons, on the other hand, could be affected by livestock if an active nest is disturbed through direct physical contact by livestock with the nest structure (e.g., by rubbing against it). This has been observed (BLM 2002) and could result in destabilization of a nest structure to the extent that the tree might eventually be lost, and, if it occurs during active nesting, disturbance of the nest to the extent that nestling care by adults might be interrupted or compromised. However, minimization measures in the MBHCP include fencing of these structures to avoid this type of take.

Livestock grazing is an activity interdependent with livestock management and could result in locally reducing cover and forage, and exposing more soil to erosion. The reduction in cover may expose white-sided jackrabbits to an increase in predation, but more likely this species will move to more suitable patches of habitat. Black-tailed prairie dog habitat is usually devoid of tall grass and forbs. This low-cropped vegetation is maintained by prairie dogs, as it provides better lines of site

to detect terrestrial predators, and livestock grazing seems to have little effect on prairie dog populations (Uresk and Paulson 1988, Miller *et al.* 1994, Whicker and Detling 1988, O'Meilia *et al.* 1982, Hoogland 1996). Conversely, reduction in cover may provide a benefit in prey detection to western burrowing owls and northern aplomado falcons. Increased erosion could occur, and loss of the A soil horizon may encourage further shrub encroachment. This may reduce habitat suitability for white-sided jackrabbits and to a lesser extent the other covered grassland species, but unlike historical grazing practices, these effects are unlikely to occur under current livestock grazing practices. However, if they do occur, they are likely to be localized and easily corrected through the MBHCP grassland improvement program. Malpai Borderlands area monitoring data from 1996-2001 shows a general improvement in watershed condition, but the response was dependent on intensity of treatment effects and precipitation more than the normal background of livestock management and land uses (Sundt 2001, 2005).

Linear Facility Construction and Maintenance

The grassland species could be affected by linear facility construction and maintenance through immediate mortality and disturbance-related impacts. The former would most likely affect the western burrowing owls, black-tailed prairie dogs, and white-sided jackrabbits through entrapment of individuals in collapsed burrows. This could occur if grading or trenching is carried out in the vicinity of the burrows and/or colonies of these animals. Similarly, disturbance effects to burrowing owl and northern aplomado falcon nests (e.g., as a result of noise) could occur if grading or trenching is carried out in the vicinity of the nest sites of these species during their breeding season (possibly resulting in interruptions in the care of eggs or nestlings). The loss of grassland species' habitat could also occur from the construction and maintenance of linear facilities. Permanent loss of habitat is only expected when new ranch roads are constructed. Such construction would be localized and would be expected to be less than four ac (two ha) per year, on average, in linear strips no wider than 35 ft (11 m) across.

Stocktank Use and Maintenance

Livestock tank maintenance and use are not likely to affect any of the grassland species. None of these species are found in livestock tanks. Heavy equipment use and human presence may result in disturbance of grassland species equivalent to that discussed above under mechanical brush control, but no physical contact with this equipment would be expected because of the spatial separation. Any species that uses livestock tanks for water would not be impacted by the presence of livestock, and the livestock tank maintenance is typically done while the tanks are dry. Transport of equipment may result in disturbance and crushing similar to that described above under mechanical brush control.

Recovery and Conservation Potential

The loss of regular fire, erosion, and conversion of grasslands into shrublands are the biggest threats to the covered grassland species and their habitats within the action area. The impacts of ranch management activities are relatively minor on a landscape level and will be more than mitigated through the grassland improvement activities proposed in the draft MBHCP. The anticipated improvements in grassland communities, and watersheds in general, should result in promoting

diversity of the plant communities, limit downstream impacts from erosion discussed above, and improve habitat conditions for northern aplomado falcon, black-tailed prairie dogs, western burrowing owls, and white-sided jackrabbits.

MONTANE SPECIES

Fire Management

Prescribed fire in the montane community is the only planned activity under the MBHCP in the Animas Mountains. Prescribed fire would occur during the inactive season of the New Mexico ridge-nosed rattlesnake and outside the breeding season of the Mexican spotted owl (March 1-August 31). The effects of applying cool season fire to montane species should be limited to possible harm or harassment of adult Mexican spotted owls present at the time of the fire, as a result of displacement effects; possible harm of New Mexico ridge-nosed rattlesnakes as a result of short-term habitat loss; and a remote possibility of direct mortality to any New Mexico ridge-nosed rattlesnakes present at the time of the fire as a result of burning if an individual is on the ground surface.

In addition, if an escaped prescribed fire or wildland fire enters the montane community, it could affect the covered montane species, especially if the fire behavior is extreme and the burn severity is high, resulting in loss of species habitat. The effects of escaped fire on the covered montane species could include possible harm or harassment of adult Mexican spotted owls present at the time of the fire, as a result of displacement effects; direct mortality to Mexican spotted owl eggs or nestlings if active owl nests are present at the time of the fire and if the fire should enter the canopy of the trees. Harm to New Mexico ridge-nosed rattlesnakes could occur as a result of starvation, predation, or exposure stemming from the destruction of vegetative cover. New Mexico ridge-nosed rattlesnakes present at the time of the fire could be killed if caught on the ground surface, or they could suffocate in their burrows if the fire is severe.

Other Covered Activities

Erosion control, mechanical brush control, livestock management, linear facilities construction and maintenance, and stocktank maintenance activities will not be undertaken within or near montane biotic communities under the MBHCP. Therefore, mortality, harm, or harassment of the species in this assemblage are not likely to occur as a result of such activities.

Recovery and Conservation Potential

Landscape scale, high-severity fire effects have developed into the largest threat faced by Mexican spotted owl and New Mexico ridge-nosed rattlesnake in the Animas Mountains. Recreation is limited due to land ownership, and grazing does not occur in the montane community in the Animas Mountains. While the Animas Mountains have been under a natural fire regime for several decades, uncharacteristic fire effects still occur at least on a local level, e.g. the Adobe Fire. Therefore, in addition to the existing “let burn” policy in the Animas Mountains, the addition of the cool season prescribed fire in areas identified with high fuel loads and vulnerable to fire effects can lessen the potential occurrence and extent of increased high-severity fire effects. Reducing fuel

loads should result in maintaining mixed age stands of trees, a diverse mix of woodland habitat available for Mexican spotted owl nest sites (USFWS 1995), and provide long-term protection of critical habitat and essential habitat for New Mexico ridge-nosed rattlesnake (USFWS 1985). Reducing fuel loads should also enhance the watershed level improvements for downstream aquatic, riparian, and grassland communities as discussed above.

RIPARIAN SPECIES

Fire Management

Managed fire is not planned in riparian areas under the MBHCP; however, the potential exists for a prescribed burn or a managed wildland fire (wildfire use) to inadvertently escape into riparian habitat. Escaped fire could result in mortality and injury of yellow-billed cuckoo and western red bats, including adults, eggs, chicks, and pups from fire, smoke inhalation, and as a result of suppression activities. Effects to the habitat of these species due to fire management could result in loss of riparian trees used for nesting and roosting. Loss of trees would be a longer-term effect, but this type of habitat alteration can be quite localized in the case of escaped prescribed fire or wildland fire use when riparian fuel moisture is high. If weather parameters change drastically and are outside prescription, severe fire behavior is possible and landscape level effects are possible. Large amounts of debris and ash from fire and erosion are likely to result in moist, high nutrient sediment deposits that will promote germination of replacement riparian trees downstream; therefore, the long-term effects of a fire escaping into riparian vegetation are the reestablishment of dynamic woody vegetation stands along perennial and ephemeral drainages in the Malpai Borderlands. These effects are most likely to occur in those riparian communities within the permit area adjacent to grassland habitat and not in Black Draw or Hay Hollow on the San Bernardino NWR, because Geronimo Trail would provide an adequate containment line in most cases. However, downstream post-fire effects could occur on the San Bernardino NWR.

Erosion Control

Because relatively few erosion problems occur in riparian communities in the Malpai Borderlands and the covered riparian species occupy the canopies of riparian vegetation, erosion control activities would affect these species relatively rarely and only as a result of disturbance. Disturbance is most likely to occur if erosion control activities are in tributaries to the streams with riparian communities or immediately adjacent to occupied riparian communities. Such disturbance would consist of the noise made by work crews and vehicle use, as well as human presence. If undertaken close enough to yellow-billed cuckoo nests, such activities could flush adult yellow-billed cuckoos from their nests resulting in interruption in the care of eggs or nestlings, potentially resulting in the loss of reproductive effort for those nests disturbed. Disturbance of roosting western red bats could result in harassment related take from bringing individuals out of torpor and increased energy needs in moving to a new roost site. In addition, these movements are likely to occur during the day which may expose individuals making such movements to an increase in potential predation by falcons and other birds of prey.

Mechanical Brush Control

Mechanical brush control activities will not be undertaken within riparian communities; therefore, immediate harm or mortality of the species in this assemblage is not anticipated. Furthermore, because mechanical brush control is carried out early in the year prior to the growing season and prior to the yellow-billed cuckoo nesting cycle, the potential for disturbance impacts from mechanical brush control in areas adjacent to riparian areas as a result of noise and human presence would be limited to western red bats, which can be found in the Malpai Borderlands area year-round. Disturbance of roosting western red bats could result in harassment related take from bringing individuals out of torpor and increased energy needs in moving to a new roost site. In addition, these movements are likely to occur during the day which may expose individuals making such movements to an increase in potential predation by falcons and other birds of prey. These effects should be minimized by the 250 ft (eight m) buffer that will be imposed around riparian areas.

Livestock Management

Malpai ranchers from time to time water their livestock in aquatic and associated riparian areas. This use would be unlikely to affect yellow-billed cuckoos or western red bats since both species use the riparian canopy for their activities (nesting and roosting, respectively), which is outside the range of immediate livestock impacts. The presence of livestock in riparian areas and associated streambeds could result in possible effects, such as bank erosion and collapse and reduction in willow and cottonwood recruitment through sapling herbivory over the long-term, if such use is sufficient to inhibit growth and replacement of riparian vegetation. Existing riparian vegetation is found in Guadalupe Canyon, Hay Hollow, Black Draw, Price Canyon, Tex Canyon, Silver Creek, Deer Creek, Double Adobe Creek, Animas Creek, and Cloverdale Creek.

Linear Facility Construction and Maintenance

Because the covered riparian species occupy the canopies of riparian vegetation, well above the area of ground-related disturbance, linear facility construction and maintenance would affect these species primarily as a result of disturbance-related impacts. These impacts could occur if grading or trenching is carried out in the vicinity of the riparian nest sites of yellow-billed cuckoos (which might flush adults from their nests and interrupt the care of eggs or nestlings), or in the vicinity of western red bat roosts (which might flush adult and juvenile bats from their roosts and result in displacement effects). The loss of riparian species habitat could also occur from the construction and maintenance of linear facilities if trees are removed as part of this work. Permanent loss of habitat is only expected when new ranch roads are constructed through riparian habitat. This would be localized and would be minimized to the maximum extent practicable. The maximum width of the linear disturbance would be limited to no greater than 35 ft (11 m).

Stocktank Use and Maintenance

Stocktanks are typically not placed in riparian areas where perennial surface water is present and do not develop large patches of riparian vegetation adjacent to them; therefore, stocktank use and

maintenance activities will not occur within riparian communities so mortality, harm, or harassment of the riparian species assemblage are not likely to occur as a result of such activities.

Recovery and Conservation Potential

While implementation of the MBHCP covered activities may result in some short-term adverse effects and potentially some minor ongoing effects, the overall improvements to the watersheds should result in improvements in the proper functioning condition of these riparian communities and associated aquatic sites. These improvements should reduce the severity of flash floods; increase the amount of time needed for water to move from the uplands through arroyos, washes, intermittent streams, and the length of perennial reaches of streams in and downstream from the action area; and promote riparian woodland development and protection of riparian woodlands. While livestock management may result in increased erosion at stream access points and crossings, and linear facilities may result in localized loss of habitat and points of sediment run-off, these impacts are relatively minor on the landscape level. When considered as a whole the implementation of the MBHCP should provide protection for existing and allow for expansion of riparian hardwood communities, and it should improve habitat conditions for western yellow-billed cuckoo, and western red bat.

CRITICAL HABITAT

This BO does not rely on the regulatory definition of "destruction or adverse modification" of critical habitat at 50 CFR 402.02 for this or any other species' effects analysis. Instead, we have relied upon the statute and the August 6, 2004, Ninth Circuit Court of Appeals decision in *Gifford Pinchot Task Force v. U.S. Fish and Wildlife Service* (No. 03-35279) to complete the respective critical habitat effect analyses.

Beautiful shiner

The effects of fire management, erosion control and mechanical brush control activities, livestock management, linear facility construction and maintenance, and stocktank use and maintenance may impact primary constituent elements of critical habitat through the temporary increase in sediment run-off and post-fire debris and ash flows through Black Draw on the San Bernardino NWR. The post-fire ash flows may also temporarily affect water chemistry in Black Draw. These effects are likely to temporarily affect the "clean, small, permanent streams with riffles, or intermittent creeks with pools and riffles" and the "clean and unpolluted water" constituent elements of critical habitat of the beautiful shiner (49 FR 34490). The long-term effects of the covered activities in MBHCP will result in improved watershed conditions when taken as a whole. It is anticipated that in the long term, implementation of the MBHCP should result in less erosion and sediment transport, and longer water retention, which should result in more perennial flows through Black Draw. This should improve water quality in Black Draw and increase the availability of water, both spatially and temporally, in Black Draw. The first perched rearing pond was constructed in 2003, and no fish habitat existed in Black Draw at the time of the critical habitat designation for the Yaqui fish. Implementation of the MBHCP should provide for the development of critical habitat constituent elements and the recovery of the beautiful shiner in Black Draw.

Huachuca water umbel

No designated critical is within or adjacent to the action area.

Yaqui catfish

The effects of fire management, erosion control and mechanical brush control activities, livestock management, linear facility construction and maintenance, and stocktank use and maintenance may impact primary constituent elements of critical habitat through the temporary increase in sediment run-off and post-fire debris and ash flows through Black Draw on the San Bernardino NWR. The post-fire ash flows may also temporarily affect water chemistry in Black Draw. The aquatic sites in Black Draw are currently missing the primary constituent elements of Yaqui catfish critical habitat; specifically Black Draw is not a "permanent stream of medium current with clear pools" (49 FR 34490). Over the 30-year time frame of the permit, implementation of the MBHCP is expected to improve the watershed conditions to the point that such constituent elements may occur in Black Draw. If they do develop in the future, effects would be similar to those for beautiful shiner critical habitat; therefore, no Yaqui catfish critical habitat will be adversely affected by the MBHCP covered activities. Rather, implementation of the MBHCP should provide for the development of critical habitat constituent elements and the recovery of the Yaqui catfish in Black Draw.

Yaqui chub

The effects of fire management, erosion control and mechanical brush control activities, livestock management, linear facility construction and maintenance, and stocktank use and maintenance may impact primary constituent elements of critical habitat through the temporary increase in sediment run-off and post-fire debris and ash flows through Black Draw on the San Bernardino NWR. The post-fire ash flows may also temporarily affect water chemistry in Black Draw. The aquatic sites in Black Draw are currently missing the primarily constituent elements of Yaqui chub critical habitat; specifically Black Draw does not contain "permanent water with deep pool and intermediate areas with riffles" (49 FR 34490). Over the 30-year time frame of the permit, implementation of the MBHCP is expected to improve the watershed conditions to the point that such constituent elements may occur in Black Draw. If they do develop in the future, effects would be similar to those for beautiful shiner critical habitat; therefore, no Yaqui chub critical habitat will be adversely affected by the MBHCP covered activities. Rather, implementation of the MBHCP should provide for the development of critical habitat constituent elements and the recovery of the Yaqui chub in Black Draw.

Mexican spotted owl

No designated critical habitat is within or adjacent to the MBHCP action area.

New Mexico ridge-nosed rattlesnake

Designated critical habitat for the New Mexico ridge-nosed rattlesnake is completely contained within the action area and the permit area. The only activities proposed in the MBHCP that would occur in or affect critical habitat for the New Mexico ridge-nosed rattlesnake are Fire Management

activities. The Adobe Fire in the summer of 2006 affected New Mexico ridge-nosed rattlesnake dens, vegetation that provides cover, and potentially the lizard and rodent prey base for this species. These primary constituent elements for New Mexico ridge-nosed rattlesnake still exist in portions of designated critical habitat. Fire management activities, especially escaped prescribed fire and wildland fire use, could affect critical habitat through the destruction of vegetation that provides cover, impacts to lizard and rodent populations, and potential sediment deposition from run-off events into dens. Further fire effects could set back regrowth of cover vegetation and prey populations.

The MBHCP proposes the use of cool season fires within the montane community specifically to limit the spatial impact and the potential for effects of wildland fires or escaped managed fires. The use of cool season fires should reduce the area impacted by such fires, assist in protecting the regrowth of cover vegetation, assist in the reestablishment of prey populations, and reduce the effects of erosion on denning sites. The effects of prescribed fire management are likely to be beneficial in protecting the reestablishment of primary constituent elements of New Mexico ridge-nosed rattlesnake critical habitat through reducing fuels that increase the potential for extreme fire behavior and severe adverse affects of wildland fire. Thus, implementation of the MBHCP should promote the recovery of the New Mexico ridge-nosed rattlesnake in the Animas Mountains.

CUMULATIVE EFFECTS

Cumulative effects include the effects of future State, tribal, local or private actions that are reasonably certain to occur in the action area considered in this BCO. Future Federal actions that are unrelated to the proposed action are not considered in this section because they require separate consultation pursuant to section 7 of the Act.

Activities may occur on private and State Trust Land within the Malpai Borderlands including water developments and pumping of underground aquifers, which may affect the MBHCP covered species.

Development pressure in and around Portal and Rodeo, Arizona, and north of the Malpai Borderlands is increasing as lands are sub-divided and sold as ranchettes. The pace of this development has slowed recently with the down turn in the housing market and economy. Regardless, development is likely to continue with the pace fluctuating with economic and housing market indicators. Development of these areas is likely to result in a higher probability of State Trust Lands being sold by auction and developed. Such development will result in more water use and a need for road improvements, which in turn will affect the perennial waters and increase wildlife mortality along roadways.

Additionally, cross-border activities along the U.S./Mexico border continue to increase, and impacts to the action area may include increases in human traffic; deposition of trash; new trails from human traffic; soil compaction and erosion; fire risk from human traffic; water depletion and contamination; introduction and spread of disease; and interference of survey, monitoring, and research. Natural events such as floods, the effects of which may be exacerbated by human activities, are also expected and have the potential to spread non-native species and/or significantly affect the species within the natural wetland areas.

The 2007 Intergovernmental Panel on Climate Change (IPCC) report outlines several scenarios that are virtually certain or very likely to occur in the 21st century; these are that 1) over most land, there will be warmer and fewer cold days and nights, and warmer and more frequent hot days and nights, 2) areas affected by drought will increase, and 3) the frequency of warm spells/heat waves over most land areas will likely increase. The IPCC makes equally sobering predictions for ecosystems; the resilience of many ecosystems is likely to be exceeded this century by an unprecedented combination of climate change, associated disturbances (e.g. flooding, drought, wildfire, insects), and other global drivers, and with medium confidence predict that approximately 20-30% of plant and animal species assessed so far are likely to be at an increased risk of extinction if increases in global average temperature exceed 1.5 – 2.5ºC (IPCC 2007).

Periods of drought in the southwest are not uncommon. However, the frequency and duration of dry periods may be altered by climate change. Anthropogenic climate change, and associated effects on regional climatic regimes, is not well understood, but the predictions for the Southwest indicate less overall precipitation and longer periods of drought. Seager *et al*. (2007) predict, based on broad consensus among 19 climate models, that the southwest will dry in the 21st century and that the transition to this drier state has already occurred. The increased aridity associated with the current on-going drought, and the 1950's drought will become the norm for the American southwest within a timeframe of years to decades, if the models are correct. The species, along with their habitat, will almost certainly be affected in some manner by climate change; the magnitude and extent of the change cannot be quantified at this time. The large land base of the MBHCP, 865,950 acres (1,353 m^2), and the range of elevations within the action area, 3,700 to 8,500 ft (1,128 to 2,591 m) should provide some buffer for the covered species and their habitats. It is likely that there will be changes in distribution of covered species and their habitats within the action area depending on the magnitude of the effects of climate change in this region. These effects will be observable through the covered species monitoring and addressed through adaptive management, changed circumstances (drought, severe fire effects, large-scale fires, and flooding), and through cooperative efforts of MBG, state, Federal, and private participants in the implementation of the MBHCP.

CONCLUSION

LISTED SPECIES

After reviewing the current status of the Chiricahua leopard frog, Huachuca water umbel, beautiful shiner, Yaqui catfish, Yaqui chub, Yaqui topminnow, Mexican spotted owl, and New Mexico ridge-nosed rattlesnake, the environmental baseline for the action area including additional effects from actions in the baseline that would occur over the period covered by this consultation, the effects of issuing an incidental take permit, effects of the other Federal actions including implementation of the MBHCP, and cumulative effects, it is our biological opinion that the proposed actions are not likely to jeopardize the continued existence of these eight species. Designated critical habitat for the Huachuca water umbel, beautiful shiner, Yaqui catfish, Yaqui chub, Mexican spotted owl, and New Mexico ridge-nosed rattlesnake is not likely to be destroyed or adversely modified. In making these determinations, we considered the following:

Chiricahua leopard frog

- The MBHCP minimization measures general to all species, specifically acreage caps and buffers around riparian areas, and measures specific to the Chiricahua leopard frog, including avoidance of critical time period, salvage and temporary holding of frogs prior to activities, and other measures identified in the MBHCP should reduce the potential and extent of incidental take of this species.

- The amount of incidental take anticipated will be offset through the high reproductive potential of this species.

- The long-term effects of the MBHCP taken as a whole will reduce sediment load in the run-off water and improve water retention in the watershed in the action area, resulting in less sediment deposition in aquatic habitats.

- Participation in the MBHCP will continue to promote implementation of Chiricahua leopard frog recovery actions on private lands within the Malpai Borderlands.

Huachuca water umbel

- Huachuca water umbel habitat only occurs on the San Bernardino NWR in the action area.

- The MBHCP minimization measures general to all species, specifically acreage caps and buffers around riparian areas, should reduce the potential and extent of effects on this species.

- Implementation of the MBHCP should assist in efforts to reestablish Huachuca water umbel in Black Draw and therefore, assist in its recovery. However, short-term effects of the MBHCP are likely to increase the scouring effects within Black Draw, which is needed for dispersal of this species.

- The long-term effects of the MBHCP taken as a whole will reduce sediment load in the run-off water, but increase water retention in the watershed feeding Black Draw. It may reduce the scouring effects of run-off events, but could provide more permanent wetted soils for reestablishment in Black Draw.

Beautiful shiner

- The beautiful shiner only occurs on the San Bernardino NWR within the action area.

- Beautiful shiners have been reestablished in the perched rearing ponds that flow into Black Draw, but they have not been detected in Black Draw. As aquatic sites within Black Draw continue to improve, it is reasonably certain that beautiful shiner will reestablish in the channel of Black Draw during the 30-year permit duration.

- The short-term effects of the MBHCP on beautiful shiner, should they occur in Black Draw in the future, are all from temporary increases in the sediment load, ash, and debris in run-off water in Black Draw.

- Incidental take of beautiful shiner would be limited to individuals that may disperse into the Black Draw channel over the 30-year term of the permit. These individuals would disperse through the overflow from the San Bernardino NWR rearing ponds

- The source populations in the rearing ponds are not anticipated to be affected by this action.

- The MBHCP minimization measures general to all species, specifically acreage caps and buffers around riparian areas, should reduce the potential and extent of incidental take of this species.

- The long-term effects of the MBHCP taken as a whole will improve the watershed condition and thus reduce sediment load in the run-off water and increase water retention in the watershed feeding Black Draw.

- Primary constituent elements of critical habitat will be impaired from temporary run-off events, but are expected to recover quickly after each run-off event.

- The long-term effects of the MBHCP, as a whole, should increase the area in Black Draw where the primary constituent elements are found and increase the duration of their presence; thus, the MBHCP should promote the recovery of the beautiful shiner.

Yaqui catfish

- Yaqui catfish currently only occur in rearing ponds on the San Bernardino NWR in the action area.

- Yaqui catfish are not present within Black Draw on the San Bernardino NWR and are not known to occur for 10 miles downstream of the U.S./Mexico border from the San Bernardino NWR in the Cajon Bonito.

- As aquatic sites within Black Draw continue to improve, it is reasonably certain that Yaqui catfish will reestablish in the channel of Black Draw on San Bernardino NWR during the 30-year permit duration.

- Incidental take of Yaqui catfish would be limited to individuals that may disperse into the Black Draw channel over the 30-year term of the permit. These individuals would disperse through the overflow from the San Bernardino NWR rearing ponds.

- The source populations in the rearing ponds are not anticipated to be affected by this action.

- The MBHCP minimization measures general to all species, specifically acreage caps and buffers around riparian areas, should reduce the potential and extent of incidental take of this species.

- The long-term effects of the MBHCP taken as a whole will reduce sediment load in the run-off water and increase water retention in the watershed feeding Black Draw.

- Primary constituent elements of critical habitat are currently missing from the aquatic habitat within the channel of Black Draw on the San Bernardino NWR, but could occur there in the future as a result of current management and watershed improvements resulting from implementation of the MBHCP.

- The long-term effects of the MBHCP, as a whole, should increase the area in Black Draw where the primary constituent elements are found and increase the duration of their presence and the ability of Yaqui catfish to inhabit Black Draw; therefore, implementation of the MBHCP should promote the recovery of the Yaqui catfish.

Yaqui chub

- Yaqui chub occur on the San Bernardino NWR in the action area.

- Yaqui chub have been reestablished in the perched rearing ponds that flow into Black Draw and have been documented to occur in Black Draw on San Bernardino NWR.

- The short-term effects of the MBHCP on Yaqui chub are all from temporary increases in the sediment load in run-off water in Black Draw.

- Incidental take of Yaqui chub would be limited to individuals in the Black Draw channel that originated from overflow of the San Bernardino NWR rearing ponds and will not affect the source populations in the rearing ponds. In addition, it is reasonably certain that Yaqui chub will recolonize Astin Spring during the 30-year permit duration and incidental take may also occur to individuals of this expanded population in the future.

- The MBHCP minimization measures general to all species, specifically acreage caps and buffers around riparian areas, should reduce the potential and extent of incidental take of this species.

- The amount of incidental take anticipated would be offset through the high reproductive potential of this species.

- The long-term effects of the MBHCP taken as a whole will reduce sediment load in the run-off water and increase water retention in the watershed feeding Black Draw.

- Primary constituent elements of critical habitat are currently missing from the aquatic habitat within the channel of Black Draw on the San Bernardino NWR, but could occur

there in the future as a result of current management and watershed improvements resulting from implementation of the MBHCP.

- The long-term effects of the MBHCP, as a whole, may result in primary constituent elements developing in the aquatic sites within the channel of Black Draw and the ability of Yaqui chub to persist in Black Draw; therefore, implementation of the MBHCP should promote the recovery of the Yaqui chub.

Yaqui topminnow

- Yaqui topminnow occur on the San Bernardino NWR and in Astin Spring in the action area.

- Yaqui topminnow have been reestablished in the perched rearing ponds that flow into Black Draw and have been documented to occur in Black Draw on San Bernardino NWR.

- The short-term effects of the MBHCP on Yaqui topminnow are all from temporary increases in the sediment load in run-off water in Black Draw.

- Incidental take of Yaqui topminnow would affect individuals in the Black Draw channel that originated from overflow of the San Bernardino NWR rearing ponds and those individuals in Astin Spring that originated from Black Draw. Incidental take will not affect the source populations in the rearing ponds.

- The MBHCP minimization measures general to all species, specifically acreage caps and buffers around riparian areas, should reduce the potential and extent of incidental take of this species.

- The amount of incidental take anticipated would be offset through the high reproductive potential of this species.

- The long-term effects of the MBHCP taken as a whole will improve the watershed condition and thus reduce sediment load in the run-off water and increase water retention in the watershed feeding Black Draw; therefore, implementation of the MBHCP should promote the recovery of the Yaqui topminnow.

Northern aplomado falcon

- Currently, there are no known breeding pairs of northern aplomado falcons nesting in the permit or action area; however, they may be reestablished in this area through the ongoing FWS reestablishment program in New Mexico.

- Northern aplomado falcon in New Mexico and Arizona are covered by a special rule designating them as an nonessential experimental population and exempting them from take prohibitions of section 9 of the Act for any non-Federal activities.

- The long-term effects of the MBHCP taken as a whole will improve the grassland community used by northern aplomado falcons by providing more open areas conducive to hunting and improving habitat of prey species which should promote successful reestablishment.

- If northern aplomado falcons are reestablished in the area, minimization measures that are general to all covered species, such as acreage caps and avoidance of critical time periods, will reduce the short-term adverse effects of the MBHCP activities on this species.

- Species specific recommendations are included in the MBHCP that would further minimize effects of implementation of the MBHCP on northern aplomado falcon.

Mexican spotted owl

- The only known occupied montane community in the action area is in the Animas Mountains, which is a relatively small portion of the range of Mexican spotted owls.

- The only covered activity that is planned for implementation in the Animas Mountains is cool season burning. Long-term benefits will result in reducing the potential for large, high-severity fires to occur in the montane community through reduction of fuels.

- Incidental take may occur from fire management activities if prescribed fire escapes into an occupied habitat or wildfire use in the montane community results in extreme fire behavior and unexpected fire-related effects.

- Minimization measures that are general to all covered species, such as acreage caps and avoidance of critical time periods, and specific to this species, will reduce the likelihood of an escaped fire occurring in Mexican spotted owl habitat and reduce the potential for incidental take and short-term adverse effects of the MBHCP activities on this species.

- No critical habitat occurs in the action area.

New Mexico ridge-nosed rattlesnake

- The Animas Mountains are one of three mountain ranges known to make up the range of the New Mexico ridge-nosed rattlesnake.

- The only covered activity that is planned for implementation in the Animas Mountains is cool season burning. Long-term benefits will result from reducing the potential for large, high-severity fires to occur in the montane community through reduction of fuels.

- Incidental take may occur from fire management activities, if a fire escapes into occupied habitat or wildfire use in the montane community results in extreme fire behavior and unexpected fire-related effects occur in the montane community.

- Minimization measures that are general to all covered species, such as acreage caps and avoidance of critical time periods, and minimization measures that are specific to this species, will reduce the likelihood of an escaped fire occurring in New Mexico ridge-nosed rattlesnake habitat and reduce the potential for incidental take and short-term adverse effects of the MBHCP activities on this species.

- The implementation of cool season burns should not result in adverse modification of primary constituent elements of critical habitat, and should actually reduce the likelihood that escaped fire or wildfire will severely affect critical habitat.

- The proposed action should result in protecting the regrowth and redevelopment of critical habitat primary constituent elements impacted by the Adobe Fire in 2006; thus, implementation of the MBHCP would help promote the recovery of the New Mexico ridge-nosed rattlesnake.

OTHER COVERED SPECIES

After reviewing the current status of the lowland leopard frog, northern Mexican gartersnake, Mexican longfin dace, Mexican stoneroller, Yaqui sucker, black-tailed prairie dog, western burrowing owl, white-sided jackrabbit, western red bat, and western yellow-billed cuckoo proposed for coverage in the HCP, the environmental baseline for the action area, the effects of the proposed actions, and cumulative effects, it is our conference opinion that the action, as proposed, is not likely to jeopardize the continued existence of the following unlisted species. Incidental take coverage under the section 10(a)(1)(B) permit can be extended upon the listing of these species as threatened or endangered. Upon listing of these species, NRCS should request reinitiation of consultation for these species. In making these determinations, we considered the following:

Lowland leopard frog

- Livestock tanks provide a larger conservation benefit than the potential adverse impacts that livestock use and regular maintenance may have on this species.

- Effects of covered activities are minimized through acreage caps, buffer zones, avoidance of critical time periods and other minimization measures identified in the MBHCP for this species, including salvage and temporary holding of frogs prior to the activities.

- The amount of incidental take anticipated would be relatively small and be offset through the high reproductive potential of this species.

- The long-term effects of the MBHCP taken as a whole will reduce sediment load in the run-off water and improve water retention in the watershed in the permit and action area, resulting in less sediment deposition in aquatic habitats.

- Participation in the MBHCP will encourage ranchers to maintain stocktanks that provide habitat for lowland leopard frogs and promote conservation.

Northern Mexican gartersnake

- Northern Mexican gartersnakes are currently only known from Black Draw on the San Bernardino NWR, but may be found in any aquatic sites within the action area.

- The action area is a small portion of the overall range of this species.

- Short-term effects of the MBHCP may result in incidental take of northern Mexican gartersnake from ash and debris flows post-fire. There may also be an increase in sediment in run-off water immediately after fire management, erosion control, and mechanical brush control activities; from livestock management, construction and maintenance of linear facilities; and livestock use and maintenance of livestock tanks. These effects may also result in temporary impacts to northern Mexican gartersnake prey base.

- Incidental take may also occur from the use of heavy equipment and vehicles associated with the covered activities, but this is expected to occur rarely because of the localized and sparse distribution of this species and the short distance this species is usually found from water.

- Incidental take may also occur from livestock management through trampling in and around aquatic sites, although this source of incidental take is likely to be minimal due to the mobility of northern Mexican gartersnakes.

- These effects are minimized through acreage caps, buffer zones, avoidance of critical time periods and other minimization measures identified in the MBHCP for this species.

- The long-term effects of the MBHCP taken as a whole will reduce sediment load in the run-off water and improve water retention in the watershed in the permit and action area, resulting in less sediment deposition in aquatic habitats.

- Participation in the MBHCP will encourage ranchers to maintain stocktanks that provide habitat for northern Mexican gartersnakes and promote conservation.

Mexican longfin dace

- Mexican longfin dace occur on San Bernardino NWR and may occur in Astin Spring within the action area.

- Mexican longfin dace have been reestablished in the perched rearing ponds that flow into Black Draw and have been documented to occur in Black Draw on San Bernardino NWR.

- The short-term effects of the MBHCP on Mexican longfin dace are all from temporary increases in the sediment load, ash, and debris in run-off water in Black Draw.

- Incidental take of Mexican longfin dace would affect individuals in the Black Draw channel that originated from overflow of the San Bernardino NWR rearing ponds and those individuals in Astin Spring that originated from Black Draw.

- Implementation of the MBHCP will not affect the source populations in the rearing ponds.

- The MBHCP minimization measures general to all species, specifically acreage caps and buffers around riparian areas, should reduce the potential and extent of incidental take of this species.

- The amount of incidental take anticipated would be offset through the high reproductive potential of this species.

- The long-term effects of the MBHCP taken as a whole will improve the watershed condition and thus reduce sediment load in the run-off water and increase water retention in the watershed feeding Black Draw. Therefore, implementation of the MBHCP should promote the conservation of the Mexican longfin dace.

Mexican stoneroller

- Mexican stonerollers occur on San Bernardino NWR and may occur in Astin Spring within the action area.

- Mexican stonerollers have been reestablished in the perched rearing ponds that flow into Black Draw and have been documented to occur in Black Draw on San Bernardino NWR.

- The short-term effects of the MBHCP on Mexican stonerollers are from temporary increases in the sediment load, ash, and debris in run-off water in Black Draw.

- Implementation of the MBHCP will affect individual Mexican stonerollers in the Black Draw channel that originated from overflow of the San Bernardino NWR rearing ponds or immigrate from downstream during spates, and those individuals in Astin Spring that originated from Black Draw.

- Implementation of the MBHCP will not affect the source populations in the rearing ponds.

- The MBHCP minimization measures general to all species, specifically acreage caps and buffers around riparian areas, should reduce the potential and extent of incidental take of this species.

- The amount of incidental take anticipated would be offset through the high reproductive potential of this species.

- The long-term effects of the MBHCP taken as a whole will improve the watershed condition and thus reduce sediment load in the run-off water and increase water retention in the

watershed feeding Black Draw; therefore, implementation of the MBHCP should promote the conservation of the Mexican stoneroller.

Yaqui sucker

- Yaqui sucker occur on the San Bernardino NWR in the action area.
- Yaqui sucker have been reestablished in the perched rearing ponds that flow into Black Draw and have been documented to occur in Black Draw on San Bernardino NWR.
- Implementation of the MBHCP will not affect the source populations in the rearing ponds.
- The short-term effects of the MBHCP on Yaqui sucker are from temporary increases in the sediment load in run-off water in Black Draw.
- Incidental take of Yaqui sucker will be limited to individuals in the Black Draw channel that originated from overflow of the San Bernardino NWR rearing ponds and will not affect the source populations in the rearing ponds. It is reasonably certain that Yaqui sucker will recolonize Astin Spring during the 30-year permit duration, and implementation of the MBHCP may affect individuals of this expanded population in the future.
- The MBHCP minimization measures general to all species, specifically acreage caps and buffers around riparian areas, should reduce the potential and extent of incidental take of this species.
- The amount of incidental take anticipated would be offset through the high reproductive potential of this species.
- The long-term effects of the MBHCP taken as a whole will reduce sediment load in the run-off water and increase water retention in the watershed feeding Black Draw; therefore, implementation of the MBHCP should promote the conservation of the Yaqui sucker

Black-tailed prairie dog

- Currently, there are only three known occupied black-tailed prairie dog colonies within the action area; these colonies occur on the Diamond A Ranch and are from a reestablishment effort. They represent a small portion of the species' range.
- Incidental take is not likely to occur from fire management activities due to the lack of fuels in and around black-tail prairie dog colonies.
- Incidental take may occur from erosion control activities, livestock management, and construction and maintenance of linear facilities. This would primarily be in the form of disturbance and potential collapse of occupied burrows.

- Mechanical brush control and livestock tank use and maintenance will not likely be needed or occur in the area of black-tailed prairie dog colonies.

- Potential incidental take would be minimized through avoidance of known occupied sites, ease of detection of new sites, and the minimization measures associated with the covered activities in the MBHCP.

- The long-term effects of the MBHCP taken as a whole will improve the grassland community used by black-tailed prairie dogs by reducing the shrub component, providing additional suitable habitat, and improving the area around colonies for potential expansion; thus, implementation of the MBHCP should promote the conservation of the black-tailed prairie dog.

Western burrowing owl

- Western burrowing owls are distributed across the grassland biotic communities within the action area. The action area represents a small portion of the species' range.

- Incidental take may occur from fire management activities, erosion control activities, mechanical brush control activities, livestock management, and construction and maintenance of linear facilities. This incidental take could include mortality and disturbance from human activities and use of heavy equipment and vehicles.

- Minimization measures that are general to all covered species, such as acreage caps and avoidance of critical time periods, and minimization measures that are specific to this species, will reduce the incidental take and short-term adverse effects of the MBHCP activities on this species.

- Livestock use and maintenance of livestock tanks is not likely to affect western burrowing owls due to the lack of habitat for this species adjacent to livestock tanks.

- The long-term effects of the MBHCP taken as a whole will improve the grassland community used by western burrowing owls by providing more open areas conducive to hunting and improving habitat of prey species; thus, implementation of the MBHCP should promote the conservation of the western burrowing owl.

White-sided jackrabbit

- White-sided jackrabbits are only found in the grassland community on the New Mexico portion of the action area.

- Incidental take may occur from effects of fire management activities, erosion control activities, mechanical brush control activities, livestock management, and construction and maintenance of linear facilities. This incidental take could include mortality and disturbance from human activities and use of heavy equipment and vehicles.

- Minimization measures that are general to all covered species, such as acreage caps and avoidance of critical time period, and minimization measures that are specific to this species, will reduce the incidental take and short-term adverse effects of the MBHCP activities on this species.

- Livestock use and maintenance of livestock tanks is not likely to affect white-sided jackrabbits due to the lack of habitat for this species adjacent to livestock tanks.

- The long-term effects of the MBHCP taken as a whole will improve the grassland community used by white-sided jackrabbits by reducing the shrub component, providing additional suitable habitat, and improving the area around colonies for potential expansion; thus, implementation of the MBHCP should promote the conservation of the white-sided jackrabbit.

Western red bat

- Western red bats range widely, but are localized in riparian hardwood galleries within the action area. The potential for this species to occur near individual project areas is limited.

- Incidental take may occur from fire management activities if a fire escapes into an occupied riparian area, erosion control activities, mechanical brush control activities, livestock management, construction and maintenance of linear facilities, and livestock tank maintenance, when riparian vegetation is present. This could include mortality from escaped fires or construction and maintenance of linear facility, and disturbance from human activities and use of heavy equipment and vehicles.

- Livestock use of livestock tanks is not likely to affect western red bats, as riparian vegetation galleries, to the extent that would be used by this species, do not develop around livestock tanks.

- Minimization measures that are general to all covered species, such as acreage caps and avoidance of critical time periods, will reduce the incidental take and short-term adverse effects of the MBHCP activities on this species.

- Minimization measures specific to riparian species, such as riparian buffers to reduce disturbance of western red bats and the likelihood of fire escaping into riparian vegetation, will reduce the incidental take and short-term adverse effects of the MBHCP activities on this species.

- The long-term effects of the MBHCP taken as a whole will reduce sediment load in the run-off water and increase water retention which should improve riparian hardwood galleries in quality and in quantity across the action area; thus, implementation of the MBHCP should promote the conservation of the western red bat.

Western yellow-billed cuckoo

- Western yellow-billed cuckoos range widely, but are localized in riparian hardwood galleries within the action area. Therefore, the potential for this species to occur near individual project areas is limited.

- Incidental take may occur from fire management activities, if a fire escapes into an occupied riparian area; erosion control activities; mechanical brush control activities; livestock management; construction and maintenance of linear facilities, and livestock tank maintenance, when riparian vegetation is present. This could include mortality from escaped fires or construction and maintenance of linear facility and disturbance from human activities and use of heavy equipment and vehicles.

- Minimization measures that are general to all covered species, such as acreage caps and avoidance of critical time period, and specific to this species, will reduce the incidental take and short-term adverse effects of the MBHCP activities on this species.

- Livestock use of livestock tanks is not likely to affect western yellow-billed cuckoo as riparian vegetation galleries, to the extent that would be used by this species, do not develop around livestock tanks.

- Minimization measures specific to riparian species, such as riparian buffers to reduce disturbance of western yellow-billed cuckoos and the likelihood of fire escaping into riparian vegetation, will reduce incidental take and short-term adverse effects of the MBHCP activities on this species.

- The long-term effects of the MBHCP taken as a whole will reduce sediment load in the run-off water and increase water retention which should improve riparian hardwood galleries in quality and in quantity across the action area; thus, implementation of the MBHCP should promote the conservation of the western yellow-billed cuckoo.

The conclusions of this biological opinion are based on full implementation of the project as described in the Description of the Proposed Action section of this document, including any Conservation Measures that were incorporated into the project design.

INCIDENTAL TAKE STATEMENT

Section 9 of the Act and Federal regulations pursuant to section 4(d) of the Act prohibit the take of endangered and threatened species, respectively, without special exemption. Take is defined as to harass, harm, pursue, hunt, shoot, wound, kill, trap, capture or collect, or to attempt to engage in any such conduct. "Harm" is further defined (50 CFR 17.3) to include significant habitat modification or degradation that results in death or injury to listed species by significantly impairing essential behavioral patterns, including breeding, feeding, or sheltering. "Harass" is defined (50 CFR 17.3) as intentional or negligent actions that create the likelihood of injury to listed species to such an extent as to significantly disrupt normal behavior patterns which include, but are not limited to, breeding, feeding or sheltering. "Incidental take" is defined as take that is

incidental to, and not the purpose of, the carrying out of an otherwise lawful activity. Under the terms of section 7(b)(4) and section 7(o)(2), taking that is incidental to and not intended as part of the agency action is not considered to be prohibited taking under the Act provided that such taking is in compliance with the terms and conditions of this Incidental Take Statement. This incidental take statement addresses the total amount of incidental take identified for both the issuance of the section 10(a)(1)(B) permit, and the implementation of these same activities by NRCS as discussed in this BCO.

The measures described below are non-discretionary, and must be undertaken by USFWS and NRCS so that they become binding conditions of any grant or permit issued, as appropriate, for the exemption in section 7(o)(2) to apply. We and NRCS have a continuing duty to regulate the activity covered by this incidental take statement. If we or NRCS (1) fail to assume and implement the terms and conditions or (2) fail to require the (applicant) to adhere to the terms and conditions of the incidental take statement through enforceable terms that are added to the permit or grant document, the protective coverage of section 7(o)(2) may lapse. In order to monitor the impact of incidental take, the applicant must report the progress of the action and its impact on the species to the USFWS as specified in the incidental take statement. [50 CFR §402.14(i)(3)].

Sections 7(b)(4) and 7(o)(2) of the Act generally do not apply to listed plant species. However, limited protection of listed plants from take is provided to the extent that the Act prohibits the removal and reduction to possession of federally listed endangered plants from areas under Federal jurisdiction, or for any act that would remove, cut, dig up, or damage or destroy any such species on any other area in knowing violation of any regulation of any State or in the course of any violation of a State criminal trespass law.

AMOUNT OR EXTENT OF TAKE

It is not possible to apportion the amount or extent of take that may occur from MBG's implementation of the MBHCP from NRCS' funding and implementation of conservation practices, because MBG and NRCS will jointly implement many of the activities and because the effects of the MBHCP and conservation practices are on a landscape level. Therefore, this Incidental Take Statement combines the incidental take that will occur from the MBHCP ITP and NRCS' conservation practices in the permit area.

AQUATIC SPECIES

Chiricahua and lowland leopard frog

The FWS anticipates incidental take of Chiricahua and lowland leopard frogs will be difficult to detect for the following reasons:

- these species have small body sizes for most of their life history (eggs, tadpoles, and metamorphs),

- losses may be masked by seasonal fluctuations in numbers or other causes (e.g., cannibalism),

- the species occurs in habitats that make detection difficult, and

- run-off events that could result in incidental take are likely to carry off or bury any dead or injured individuals.

Current erosion in the action area results in sediment being transported into aquatic sites throughout the action area, and ash and debris may be transported downstream into aquatic sites throughout the action area after wildland and prescribed fire events on the Coronado NF in the upper watersheds. Incidental take of these species resulting from the implementation of the MBHCP by MBG, enrolled ranchers, and NRCS will be difficult to differentiate from these other sources of mortality; therefore, incidental take from the MBHCP will be measured indirectly based upon the direct relationship between the area impacted and the amount of sediment, ash, debris, and water that would be transported in run-off events.

Incidental take of Chiricahua and lowland leopard frogs in the form of harm, harass, and mortality is anticipated from spread of amphibian chytrid, sediment, ash, debris flows, run-off, cattle presence, and vehicle use or other surface-disturbing activities related to implementation of MBHCP covered activities: fire management, erosion control, mechanical brush control, construction and maintenance of linear facilities, livestock management, and livestock tank use and maintenance. Due to the type and intensity of effects, the response of Chiricahua and lowland leopard frogs to these effects, and the complexity of the breeding sites within the action area, we do not expect the level of incidental take to result in the extirpation of the known breeding sites of these species in the permit area. In the future, as new breeding sites are established through recovery efforts for Chiricahua leopard frogs and conservation efforts for lowland leopard frogs, and implementation of the MBHCP as discussed above in the effects section, the level of incidental take anticipated may result in extirpation of some new breeding sites, but should not result in reducing long-term recovery and conservation potential within the action area from implementation of the MBHCP by MBG, enrolled ranchers, or NRCS provided that:

- Not more than twenty-five percent (25%) of the ground surface area of any individual watershed shall be burned as a result of the combined total acreage of all managed fires (including prescribed burns and wildland fires) undertaken in accordance with the MBHCP together with all wildfires occurring in a watershed within any given one-year calendar period (based upon total acreage within burn perimeter); and

- Not more than fifty percent (50%) of the ground surface area of any individual watershed shall be burned as a result of the combined total acreage of all managed fires (including prescribed burns and wildland natural fires) undertaken in a watershed in accordance with the MBHCP together with all wildfires occurring in a watershed within any given five-year calendar period (based upon total acreage within burn perimeter); and

- Mechanical brush control activities under the MBHCP do not exceed 2,000 ac (809 ha) per calendar year in the permitted area; and

- Clearing related to construction or maintenance of linear facilities will be no greater than 35 ft (11 m) in width and result in no more than 4 acres of new disturbance on average annually.

Because of the difficulty in detecting individuals and the relation of the acres impacted (in terms of extent and intensity) to the likelihood of take occurring, take will be measured indirectly by acres of disturbance, in accordance with the acreage caps identified above. In addition, we anticipate incidental take of one population site of Chiricahua leopard frog and one population site of lowland leopard frogs as a result of livestock tank use and maintenance, erosion control, and livestock management, every five years on average for the duration of the incidental take permit.

The watersheds in the action area to which the watershed burn caps apply are shown in Figure 5-4 of the MBHCP. Nine such watersheds have been identified: (i) San Simon Creek; (ii) Silver Creek; (iii) Black Draw; (iv) Astin Spring; (v) Guadalupe Canyon; (vi) Clanton Draw; (vii) Cloverdale Canyon; (viii) Animas Creek; and (ix) Playas Creek. Applicable burn cap acreages for each watershed are outlined in Table 5-1 of the MBHCP.

Northern Mexican gartersnake

The FWS anticipates incidental take of northern Mexican gartersnakes will be difficult to detect for the following reasons:

- this species has a small body size and is easily scavenged,

- the species often occurs in complex, wetted habitat with high biodegradation rates which makes detection difficult, and

- run-off events are likely to carry off or bury any dead or injured individuals.

Current erosion in the action area results in sediment being transported into aquatic sites throughout the action area. Ash and debris may be transported downstream into aquatic sites throughout the action area after wildland and prescribed fire events on the Coronado NF in the upper watersheds. The incidental take of this species resulting from the implementation of the MBHCP by MBG, enrolled ranchers, and NRCS will be difficult to differentiate from these other sources of mortality on the Coronado NF; therefore, incidental take from the MBHCP will be measured indirectly based upon the relation between the area impacted and the amount of sediment, ash, debris, and water that would be transported in run-off events.

Incidental take of northern Mexican gartersnake, should this species be re-established in the action area, in the form of harm, harass, and mortality is anticipated from sediment, ash, debris flows, run-off, cattle presence, and vehicle use related to implementation of MBHCP covered activities: fire management, erosion control, mechanical brush control, and construction and maintenance of linear facilities, livestock management, and livestock tank use and maintenance. Due to the type and intensity of effects, and the response of northern Mexican gartersnakes to these effects, we do not expect the level of incidental take to result in extirpation of existing breeding sites for the northern Mexican gartersnake as a result of implementation of the MBHCP. In the future, as new occupied

sites are reestablished through recovery efforts and implementation of the MBHCP as discussed above in the Effects section, the level of incidental take anticipated may result in extirpation of some new breeding sites, but should not result in reducing long-term recovery and conservation potential within the action area from implementation of the MBHCP by MBG, enrolled ranchers, or NRCS provided that:

- Not more than twenty-five percent (25%) of the ground surface area of any individual watershed shall be burned as a result of the combined total acreage of all managed fires (including prescribed burns and wildland fires) undertaken in accordance with the MBHCP together with all wildfires occurring in a watershed within any given one-year calendar period; and

- Not more than fifty percent (50%) of the ground surface area of any individual watershed shall be burned as a result of the combined total acreage of all managed fires (including prescribed burns and wildland natural fires) undertaken in a watershed in accordance with the MBHCP together with all wildfires occurring in a watershed within any given five-year calendar period; and

- Mechanical brush control activities under the MBHCP do not exceed 2,000 ac (809 ha) per calendar year in the permitted area; and

- Clearing related to construction or maintenance of linear facilities will be no greater than 35 ft (11 m) in width and result in no more than 4 acres of new disturbance on average annually.

Because of the difficulty in detecting individuals and the relation of the acres impacted (in terms of intensity and extent) to the likelihood of take occurring, take will be measured indirectly by acres of disturbance in accordance with the acreage caps identified above. In addition, we anticipate incidental take from livestock tank use and maintenance, erosion control, and livestock management of 15 individuals killed or injured during the term of the permit. This is based upon the lack of currently occupied sites, the potential for reestablishment, infrequency of incidental take from these activities, and the difficulty in detecting individuals.

The watersheds in the action area to which the watershed burn caps apply are shown in Figure 5-4 of the MBHCP. Nine such watersheds have been identified: (i) San Simon Creek; (ii) Silver Creek; (iii) Black Draw; (iv) Astin Spring; (v) Guadalupe Canyon; (vi) Clanton Draw; (vii) Cloverdale Canyon; (viii) Animas Creek; and (ix) Playas Creek. Applicable burn cap acreages for each watershed are outlined in Table 5-1 of the MBHCP.

Yaqui Fish – listed and unlisted

The FWS anticipates incidental take of listed Yaqui fish species (beautiful shiner, Yaqui catfish, Yaqui chub, and Yaqui topminnow) and unlisted Yaqui fish (Mexican longfin dace, Mexican stoneroller, and Yaqui sucker) will be difficult to detect for the following reasons:

- these species have small body sizes,

- losses may be masked by seasonal fluctuations in numbers or other causes (e.g., oxygen depletions for aquatic species),

- the species occurs in habitat that makes detection difficult, and

- run-off events that could result in take are likely to carry off any dead or injured individuals.

Current erosion in the San Bernardino Valley results in sediment being transported through Black Draw, and ash and debris may be transported downstream through Black Draw after wildland and prescribed fire events on the Coronado NF in the upper watershed. The incidental take of these species in Black Draw resulting from the implementation of the MBHCP by MBG, enrolled ranchers, and NRCS will be difficult to differentiate from these other sources of mortality; therefore, the anticipated level of incidental take from the MBHCP will be based upon the direct relation between the area impacted and the amount of sediment, ash, debris, and water that would be transported in run-off events.

Currently, incidental take of beautiful shiner and Yaqui catfish are not likely to occur until anticipated watershed improvements are realized and these species become reestablished within the Black Draw channel, which may lead to dispersal up to Astin Spring, which is located off of the San Bernardino NWR. Incidental take anticipated from livestock management or linear facility construction and maintenance in the form of direct mortality of Yaqui sucker, Yaqui chub, Mexican longfin dace, and Mexican stoneroller (all of which periodically occur in Black Draw) is not likely to occur until anticipated watershed improvements are realized and dispersal up Hay Hollow to Astin Spring, can occur. However, during the proposed 30-year term of the permit, implementation of the draft MBHCP and of recovery and conservation actions for these fish species is expected to result in establishment of permanent base flows in Black Draw. With these permanent flows, there is potential for future reestablishment of these species within the channel of Black Draw during the duration of the proposed permit. There is also potential for these species to disperse up Hay Hollow during high flows and become reestablished in Astin Spring. Therefore, in the future, incidental take of beautiful shiner, Yaqui catfish, Yaqui chub, Yaqui topminnow, Mexican longfin dace, Mexican stoneroller, and Yaqui sucker in the form of harm, harass, and mortality is anticipated during the proposed duration of the permit from sediment, ash, debris flows, run-off, cattle presence, and vehicle use related to implementation of MBHCP covered activities: fire management, erosion control, mechanical brush control, livestock management, and construction and maintenance of linear facilities.

The increased potential for incidental take is associated with increased distribution within the historical range of these species. We anticipate that the level of incidental take of each species would not preclude long-term recovery and conservation potential within the action area from implementation of the MBHCP by MBG, enrolled ranchers, or NRCS provided that:

- Not more than twenty-five percent (25%) of the ground surface area of any individual watershed draining into Black Draw shall be burned as a result of the combined total acreage of all managed fires (including prescribed burns and wildland fires) undertaken in the watershed in accordance with the MBHCP together with all wildfires occurring in the watershed within any given one-year calendar period; and

- Not more than fifty percent (50%) of the ground surface area of any individual watershed draining into Black Draw shall be burned as a result of the combined total acreage of all managed fires (including prescribed burns and wildland natural fires) undertaken in the watershed in accordance with the MBHCP together with all wildfires occurring in the watershed within any given five-year calendar period; and

- Mechanical brush control activities under the MBHCP do not exceed 2,000 ac (809 ha) per calendar year in the permitted area; and

- Clearing related to construction or maintenance of linear facilities will be no greater than 35 ft (11 m) in width and result in no more than 4 acres of new disturbance on average annually.

Because of the difficulty in detecting individuals and the relation of the acres impacted (in terms of intensity and extent) to the likelihood of take occurring, take will be measured indirectly by acres of disturbance in accordance with the acreage caps identified above. The downstream effects of erosion control activities within in the permit area is not expected to rise to the level of take for the covered fish species, due to the small areas of disturbance related to this activity, the small amount of increased sediment transport that is possible, the tolerance of desert fish to turbid and sediment laden water, and the distance from the permit area to the occupied locations in Black Draw on the San Bernardino NWR. Incidental take of covered fish species from livestock management activities will be relatively minor compared to the potential incidental take associated with fire management, mechanical brush control, and construction and maintenance of linear facilities, therefore, incidental take of covered fish species will be exceeded if the younger cohorts of the covered fish present in Black Draw on the San Bernardino NWR are missing from population monitoring samples two years in a row, when no other activity can account for such losses in the populations of the covered fish species. In addition, Astin Spring is the only place in the action area where direct contact between livestock and covered fish species is possible. However, because of the ephemeral nature of the covered fish populations within this site, due to drought, natural population fluctuations, and natural extirpations of this site, we anticipate incidental take of all fish species in Astin Spring due to livestock management over the term of the permit.

Two watersheds identified in the MBHCP, Figure 5-4 of the MBHCP, drain into Black Draw; these are: Black Draw and Aston Spring (also known as Astin Spring). The surface acreages in these watersheds are presented in Table 5-1 of the MBHCP.

GRASSLAND SPECIES

Northern aplomado falcon

The FWS anticipates northern aplomado falcon will be affected as a result of this proposed action. Under the special rule establishing the experimental nonessential status under section 10(j) of the Act for northern aplomado falcon in Arizona and New Mexico, northern aplomado falcons within Arizona and New Mexico are exempt from the section 9 prohibitions of incidental take in the Act for non-Federal actions. In addition, no northern aplomado falcon are known to be in residence in

the action area, but it is anticipated that in the 30-year duration of the section 10(a)(1)(B) incidental take permit, individuals will become established in the action area through the FWS reestablishment program. The following levels of incidental take are identified below, but do not become effective, unless the special rule establishing the experimental nonessential status of the northern aplomado falcon in Arizona and New Mexico is revoked, changed or otherwise set-a-side.

In the future, through reestablishment efforts in New Mexico we anticipate northern aplomado falcons could be present in appropriate habitat throughout the action area. Incidental take of northern aplomado falcon in the form of harm, harass, and mortality of young life stages (eggs, hatchling, and young fledglings) is anticipated from implementation of MBHCP covered activities: fire management, mechanical brush control, and livestock management. The amount of take will be directly related to the success of the reestablishment efforts, dispersal of offspring from nest sites, and the improvements of the watershed conditions from the successful implementation of the MBHCP. Therefore, as northern aplomado falcons become reestablished in the action area, the probability of incidental take will increase. However, incidental take of the initial birds reestablished into New Mexico and their nest sites is unlikely as they will be regularly monitored and protected through cooperative agreements with participating landowners. Furthermore, because the nest sites of subsequent generations will likely be dispersed within and outside of the action area, and nest sites are relatively small in size and dispersed across suitable habitat in the action area, effects of implementation are not likely to impact a large percentage of nest sites or birds at any one time, and implementation of minimization measures will reduce the amount of potential incidental take. Therefore, the level of incidental take anticipated may result in loss of some reestablished nest sites and individuals, but should not result in reducing long-term recovery potential within the action area from implementation of the MBHCP by MBG, enrolled ranchers, or NRCS provided that:

- Not more than twenty-five percent (25%) of the ground surface area of any individual watershed shall be burned as a result of the combined total acreage of all managed fires (including prescribed burns and wildland fires) undertaken in accordance with the MBHCP together with all wildfires occurring in a watershed within any given one-year calendar period (based upon total acreage within burn perimeter); and

- Not more than fifty percent (50%) of the ground surface area of any individual watershed shall be burned as a result of the combined total acreage of all managed fires (including prescribed burns and wildland natural fires) undertaken in a watershed in accordance with the MBHCP together with all wildfires occurring in a watershed within any given five-year calendar period (based upon total acreage within burn perimeter); and

- Mechanical brush control activities under the MBHCP do not exceed 2,000 ac (809 ha) per calendar year in the permitted area; and

- Clearing related to construction or maintenance of linear facilities will be no greater than 35 ft (11 m) in width and result in no more than 4 acres of new disturbance on average annually.

Because of the difficulty in detecting individuals and the relation of the acres impacted (in terms of intensity and extent) to the likelihood of take occurring, take will be measured indirectly by acres of disturbance in accordance with the acreage caps identified above. Disturbance of northern aplomado falcons may occur as a result of erosion control activities and livestock tank maintenance, but we do not anticipate that it will rise to the level of take due to implementation of conservation measures. We anticipate incidental take in the form of up to 2 nests destroyed over the term of the permit, as a result of livestock impacts, based upon the infrequency of aplomado falcon nests in the action area and because reestablishment sites will be monitored and protected.

The watersheds in the action area to which the watershed burn caps apply are shown in Figure 5-4 of the MBHCP. Nine such watersheds have been identified: (i) San Simon Creek; (ii) Silver Creek; (iii) Black Draw; (iv) Astin Spring; (v) Guadalupe Canyon; (vi) Clanton Draw; (vii) Cloverdale Canyon; (viii) Animas Creek; and (ix) Playas Creek. Applicable burn cap acreages for each watershed are outlined in Table 5-1 of the MBHCP.

Black-tailed prairie dog

Incidental take of black-tailed prairie dog in the form of harm, harass, and mortality is anticipated from direct contact with flame, smoke, and vehicle use related to implementation of MBHCP covered activities: fire management, mechanical brush control, and construction and maintenance of linear facilities. Due to the type and intensity of effects, the low probability of incidental take occurring based upon the anticipated effects, and the limited distribution of black-tailed prairie dogs within the action area, we do not expect the level of incidental take to result in the extirpation or significant decline in any of the three reestablished black-tailed prairie dog towns in the action area. Furthermore, if further conservation actions for this species occur within the action area, we do not anticipate a significant increase in the probability or amount of incidental take within the action area as a result of implementation of the MBHCP. Therefore, we do not anticipate that the level of incidental take should reduce the long-term conservation potential for this species within the action area from implementation of the MBHCP by MBG, enrolled ranchers, or NRCS provided that:

- Not more than twenty-five percent (25%) of the ground surface area of any individual watershed shall be burned as a result of the combined total acreage of all managed fires (including prescribed burns and wildland fires) undertaken in accordance with the MBHCP together with all wildfires occurring in a watershed within any given one-year calendar period (based upon total acreage within burn perimeter); and

- Not more than fifty percent (50%) of the ground surface area of any individual watershed shall be burned as a result of the combined total acreage of all managed fires (including prescribed burns and wildland natural fires) undertaken in a watershed in accordance with the MBHCP together with all wildfires occurring in a watershed within any given five-year calendar period (based upon total acreage within burn perimeter); and

- Mechanical brush control activities under the MBHCP do not exceed 2,000 ac (809 ha) per calendar year in the permitted area; and

- Clearing related to construction or maintenance of linear facilities will be no greater than 35 ft (11 m) in width and result in no more than 4 acres of new disturbance on average annually.

Because of the difficulty in detecting individuals and the relation of the acres impacted (in terms of intensity and extent) to the likelihood of take occurring, take will be measured indirectly by acres of disturbance in accordance with the acreage caps identified above. Erosion control and livestock tank use and maintenance activities may result in the disturbance of black-tailed prairie dogs, but is unlikely to rise to the level of take based upon conservation measures. Based upon the co-evolution of black-tailed prairie dogs and large ungulates and the architecture of a black-tailed prairie dog burrow, we do not anticipate take to occur as a result of livestock management.

The watersheds in the permit area to which the watershed burn caps apply are shown in Figure 5-4 of the MBHCP. Nine such watersheds have been identified: (i) San Simon Creek; (ii) Silver Creek; (iii) Black Draw; (iv) Astin Spring; (v) Guadalupe Canyon; (vi) Clanton Draw; (vii) Cloverdale Canyon; (viii) Animas Creek; and (ix) Playas Creek. Applicable burn cap acreages for each watershed are outlined in Table 5-1 of the MBHCP.

Western burrowing owl

The FWS anticipates incidental take of western burrowing owls will be difficult to detect for the following reasons:

- the large action area
- the scattered distribution of burrowing owls throughout grasslands of the action area,
- the large scale of project areas for some covered activities, and
- losses may be masked by seasonal fluctuations in numbers due to reproduction and migration.

The level of take for western burrowing owls will be measured based upon the area of disturbance associated with covered activities. There is a direct relation between the size of the project and the potential number of individuals within or near that project area.

Incidental take of western burrowing owls in the form of harm, harass, and mortality is anticipated from flames, heat, smoke, human activities, and use of heavy equipment and vehicles related to implementation of MBHCP covered activities: fire management, mechanical brush control, and construction and maintenance of linear facilities. Due to the type and intensity of effects, the species' response to these effects, the dispersed distribution of western burrowing owls across the grassland community in the action area, and full implementation of species specific minimization measures, we do not expect the level of incidental take to result in the extirpation of western burrowing owls from any watershed within the action area. Furthermore, if future conservation actions for this species occur within the action area and grassland improvement activities result in higher densities and wider distribution within the action area, we anticipate an increase in the

amount of incidental take as a result of implementation of the MBHCP within the action area. However, we do not anticipate the level of incidental take to reduce the long-term conservation potential for this species within the action area from implementation of the MBHCP by MBG, enrolled ranchers, or NRCS provided that:

- Not more than twenty-five percent (25%) of the ground surface area of any individual watershed shall be burned as a result of the combined total acreage of all managed fires (including prescribed burns and wildland fires) undertaken in accordance with the MBHCP together with all wildfires occurring in a watershed within any given one-year calendar period (based upon total acreage within burn perimeter); and

- Not more than fifty percent (50%) of the ground surface area of any individual watershed shall be burned as a result of the combined total acreage of all managed fires (including prescribed burns and wildland natural fires) undertaken in a watershed in accordance with the MBHCP together with all wildfires occurring in a watershed within any given five-year calendar period (based upon total acreage within burn perimeter); and

- Mechanical brush control activities under the MBHCP do not exceed 2,000 ac (809 ha) per calendar year in the permitted area; and

- Clearing related to construction or maintenance of linear facilities will be no greater than 35 ft (11 m) in width and result in no more than 4 acres of new disturbance on average annually.

Because of the difficulty in detecting individuals and the relation of the acres impacted (in terms of intensity and extent) to the likelihood of take occurring, take will be measured indirectly by acres of disturbance in accordance with the acreage caps identified above. Disturbance of western burrowing owls may occur as a result of erosion control activities, livestock tank maintenance, and livestock management, but is not likely to rise to the level of take due to implementation of conservation measures.

The watersheds in the permit area to which the watershed burn caps apply are shown in Figure 5-4 of the MBHCP. Nine such watersheds have been identified: (i) San Simon Creek; (ii) Silver Creek; (iii) Black Draw; (iv) Astin Spring; (v) Guadalupe Canyon; (vi) Clanton Draw; (vii) Cloverdale Canyon; (viii) Animas Creek; and (ix) Playas Creek. Applicable burn cap acreages for each watershed are outlined in Table 5-1 of the MBHCP.

White-sided jackrabbit

The FWS anticipates incidental take of white-sided jackrabbit will be difficult to detect for the following reasons:

- the large action area

- the scattered distribution of white-sided jackrabbits throughout grasslands of the action area,

- the large scale of project areas for some covered activities, and

- losses may be masked by seasonal fluctuations in numbers.

The level of take for white-sided jackrabbit will be measured based upon the area of disturbance associated with covered activities. There is a direct relation between the size of the project and the potential number of individuals within or near a project area.

Incidental take of white-sided jackrabbits in the form of harm, harass, and mortality is anticipated from flames, heat, smoke, human activities, and use of heavy equipment and vehicles related to implementation of MBHCP covered activities: fire management, mechanical brush control, and construction and maintenance of linear facilities. Due to the type and intensity of effects, the species response to these effects, the relatively limited distribution of white-sided jackrabbits within the New Mexico portion of the action area, the limited number of known individuals, and full implementation of species specific minimization measures, we do not expect the level of incidental take to result in the extirpation of white-sided jackrabbits from the action area. If the grassland improvement activities implemented under the MBHCP result in a reduction of shrub cover, we expect that there will be a corresponding increase in the number and distribution of white-sided jackrabbits. Therefore, we anticipate an increased probability or amount of incidental take as a result of implementation of the MBHCP within the action area to occur. However, we do not anticipate the level of incidental take to reduce the long-term conservation potential for this species within the action area from implementation of the MBHCP by MBG, enrolled ranchers, or NRCS provided that:

- Not more than twenty-five percent (25%) of the ground surface area of any individual watershed shall be burned as a result of the combined total acreage of all managed fires (including prescribed burns and wildland fires) undertaken in accordance with the MBHCP together with all wildfires occurring in a watershed within any given one-year calendar period; and

- Not more than fifty percent (50%) of the ground surface area of any individual watershed shall be burned as a result of the combined total acreage of all managed fires (including prescribed burns and wildland natural fires) undertaken in a watershed in accordance with the MBHCP together with all wildfires occurring in a watershed within any given five-year calendar period; and

- Mechanical brush control activities under the MBHCP do not exceed 2,000 ac (809 ha) per calendar year in the permitted area; and

- Clearing related to construction or maintenance of linear facilities will be no greater than 35 ft (11 m) in width and result in no more than 4 acres of new disturbance on average annually.

Because of the difficulty in detecting individuals and the relation of the acres impacted (in terms of intensity and extent) to the likelihood of take occurring, take will be measured indirectly by acres of disturbance in accordance with the acreage caps identified above.

Erosion control, livestock tank maintenance and use, and livestock management activities may result in the disturbance of white-sided jackrabbits, but they are unlikely to rise to the level of take based upon conservation measures and the precocial nature of new-born white-sided jackrabbits.

The watersheds in the permit area to which the watershed burn caps apply are shown in Figure 5-4 of the MBHCP. Nine such watersheds have been identified: (i) San Simon Creek; (ii) Silver Creek; (iii) Black Draw; (iv) Astin Spring; (v) Guadalupe Canyon; (vi) Clanton Draw; (vii) Cloverdale Canyon; (viii) Animas Creek; and (ix) Playas Creek. Applicable burn cap acreages for each watershed are outlined in Table 5-1 of the MBHCP.

MONTANE SPECIES

Mexican spotted owl

The FWS anticipates incidental take of Mexican spotted owls in the form of harm, harass, and direct mortality from decisions and actions related to wildland fire use and escaped managed fire; and in the form of harm and harass from the cool season burns implemented under the MBHCP. Due to the type and intensity of effects, the species response to these effects, the relatively limited likelihood of implementing this option under the MBHCP, the limited number of known individuals, and full implementation of species specific minimization measures, we do not expect the level of incidental take to result in the extirpation of Mexican spotted owls from the action area. If implementation of the cool season burns results in lowering the size or frequency of severe fire effects in the Animas Mountains and the seral stage of the montane woodlands are not reset to an earlier seral stage or type converted, there may be a corresponding increase in the number of nest sites and their distribution across the Animas Mountains. Therefore, we anticipate an increased probability or amount of incidental take as a result of implementation of the MBHCP within the action area to occur. However, we do not anticipate the level of incidental take to reduce the long-term recovery potential for this species within the action area from implementation of the MBHCP by MBG, enrolled ranchers, or NRCS provided that:

- Not more than twenty-five percent (25%) of the ground surface area of any individual watershed shall be burned as a result of the combined total acreage of all managed fires (including prescribed burns and wildland fires) undertaken in accordance with the MBHCP together with all wildfires occurring in a watershed within any given one-year calendar period; and

- Not more than fifty percent (50%) of the ground surface area of any individual watershed shall be burned as a result of the combined total acreage of all managed fires (including prescribed burns and wildland natural fires) undertaken in a watershed in accordance with the MBHCP together with all wildfires occurring in a watershed within any given five-year calendar period; and

- Managed fire shall not be undertaken within or permitted to occur on any area in the Malpai Borderlands more frequently than once every three years, except in "blackline" areas where narrow strips may be burned more frequently to secure burn management units.

Because of the difficulty in detecting individuals and the relation of the acres impacted (in terms of intensity and extent) to the likelihood of take occurring, take will be measured indirectly by acres of disturbance in accordance with the acreage caps identified above.

The watersheds in the permit area to which the watershed burn caps apply are shown in Figure 5-4 of the MBHCP. The Animas Mountains falls within three of these watersheds in the action area: (i) Cloverdale Canyon; (ii) Animas Creek; and (iii) Playas Creek. Applicable burn cap acreages for each watershed are outlined in Table 5-1 of the MBHCP.

New Mexico ridge-nosed rattlesnake

The FWS anticipates incidental take of New Mexico ridge-nosed rattlesnakes will be difficult to detect for the following reasons:

- small body size,
- cryptic coloration, and
- large scale of fire management activities likely to occur.

Incidental take is anticipated in the form of harm, harass, and direct mortality from decisions and actions taken during wildland fire use and escaped managed fire events. Incidental take from cool season burns is expected to be primarily in the form of harm, based upon removal of ground cover and vegetation. Mortality can occur during cool season burns, but is not anticipated to be high because New Mexico ridge-nosed rattlesnakes should be aestivating during the cool season burn period, although rare surface activity during cool season has been documented. Mortality would occur from direct exposure to flame and smoke from MBHCP related fire management activities. Take related to heavy equipment and vehicle use is not anticipated due to the lack of roads, and terrain in the montane community would preclude the use of heavy equipment. We anticipate the level of take for New Mexico ridge-nosed rattlesnake to correspond to the area of disturbance associated with covered activities. If implementation of the cool season burns reduces the size or frequency of severe fire effects in the Animas Mountains, it would preclude the seral stage of the montane woodlands from resetting to an earlier seral stage or type converting, resulting in a corresponding increase in the amount of suitable habitat for New Mexico ridge-nosed rattlesnakes across the Animas Mountains. Therefore, we anticipate an increased probability or amount of incidental take as a result of implementation of the MBHCP within the action area to occur. However, we do not anticipate the level of incidental take to reduce the long-term recovery potential for this species within the action area from implementation of the MBHCP by MBG, enrolled ranchers, or NRCS provided that:

- Not more than twenty-five percent (25%) of the ground surface area of any individual watershed shall be burned as a result of the combined total acreage of all managed fires (including prescribed burns and wildland fires) undertaken in accordance with the MBHCP

together with all wildfires occurring in a watershed within any given one-year calendar period; and

- Not more than fifty percent (50%) of the ground surface area of any individual watershed shall be burned as a result of the combined total acreage of all managed fires (including prescribed burns and wildland natural fires) undertaken in a watershed in accordance with the MBHCP together with all wildfires occurring in a watershed within any given five-year calendar period; and

- Managed fire shall not be undertaken within or permitted to occur on any area in the Malpai Borderlands more frequently than once every three years, except in "blackline" areas where narrow strips may be burned more frequently to secure burn management units.

Because of the difficulty in detecting individuals and the relation of the acres impacted (in terms of intensity and extent) to the likelihood of take occurring, take will be measured indirectly by acres of disturbance in accordance with the acreage caps identified above.

The watersheds in the permit area to which the watershed burn caps apply are shown in Figure 5-4 of the MBHCP. The Animas Mountains falls within three watersheds in the action area: (i) Cloverdale Canyon; (ii) Animas Creek; and (iii) Playas Creek. Applicable burn cap acreages for each watershed are outlined in Table 5-1 of the MBHCP.

RIPARIAN SPECIES

Western red bat

The FWS anticipates incidental take of western bat in the form of harm, harass, and mortality from decisions and actions related to wildland fire use and escaped managed fire and from construction and maintenance of linear facilities if riparian woodlands are impacted; and harass from mechanical brush control activities if project areas are close to riparian woodlands. Incidental take will be difficult to detect for the following reason(s):

- this species has a small body size,
- the species occurs in habitat that makes detection difficult, and
- the species is secretive by nature.

The level of incidental take for western red bat anticipated is based upon the area of disturbance associated with the MBHCP covered activities and the likelihood of a western red bat being within or near a project area. We do not anticipate the level of incidental take to reduce the long-term recovery potential for this species within the action area from implementation of the MBHCP by MBG, enrolled ranchers, or NRCS provided that:

- Not more than twenty-five percent (25%) of the ground surface area of any individual watershed shall be burned as a result of the combined total acreage of all managed fires (including prescribed burns and wildland fires) undertaken in accordance with the MBHCP

together with all wildfires occurring in a watershed within any given one-year calendar period; and

- Not more than fifty percent (50%) of the ground surface area of any individual watershed shall be burned as a result of the combined total acreage of all managed fires (including prescribed burns and wildland natural fires) undertaken in a watershed in accordance with the MBHCP together with all wildfires occurring in a watershed within any given five-year calendar period; and

- Mechanical brush control activities under the MBHCP do not exceed 2,000 ac (809 ha) per calendar year in the permitted area; and

- Clearing related to construction or maintenance of linear facilities will be no greater than 35 ft (11 m) in width and result in no more than 4 acres of new disturbance on average annually.

Because of the difficulty in detecting individuals and the relation of the acres impacted (in terms of intensity and extent) to the likelihood of take occurring, take will be measured indirectly by acres of disturbance in accordance with the acreage caps identified above. Erosion control, livestock tank maintenance and use, and livestock management activities may result in the disturbance of western red bats, but they are unlikely to rise to the level of take based upon implementation of conservation measures.

The watersheds in the permit area to which the watershed burn caps apply are shown in Figure 5-4 of the MBHCP. Nine such watersheds have been identified: (i) San Simon Creek; (ii) Silver Creek; (iii) Black Draw; (iv) Astin Spring; (v) Guadalupe Canyon; (vi) Clanton Draw; (vii) Cloverdale Canyon; (viii) Animas Creek; and (ix) Playas Creek. Applicable burn cap acreages for each watershed are outlined in Table 5-1 of the MBHCP.

Western yellow-billed cuckoo

The FWS anticipates incidental take of western yellow-billed cuckoo in the form of harm, harass, and mortality from decision and actions related to wildland fire use and escaped managed fire and from construction and maintenance of linear facilities if riparian woodlands are impacted; and harass from mechanical brush control activities if project areas are close to riparian woodlands. Incidental take will be difficult to detect for the following reason(s):

- this species has a small body size,
- the species occurs in habitat that makes detection difficult, and
- the species is secretive by nature

The level of incidental take anticipated for western yellow-billed cuckoo is based upon the area of disturbance associated with the MBHCP covered activities and the likelihood of a western yellow-billed cuckoo being within or near a project area. We do not anticipate the level of incidental take to reduce the long-term recovery potential for this species within the action area from implementation of the MBHCP by MBG, enrolled ranchers, or NRCS provided that:

- Not more than twenty-five percent (25%) of the ground surface area of any individual watershed shall be burned as a result of the combined total acreage of all managed fires (including prescribed burns and wildland fires) undertaken in accordance with the MBHCP together with all wildfires occurring in a watershed within any given one-year calendar period; and

- Not more than fifty percent (50%) of the ground surface area of any individual watershed shall be burned as a result of the combined total acreage of all managed fires (including prescribed burns and wildland natural fires) undertaken in a watershed in accordance with the MBHCP together with all wildfires occurring in a watershed within any given five-year calendar period; and

- Mechanical brush control activities under the MBHCP do not exceed 2,000 ac (809 ha) per calendar year in the permitted area; and

- Clearing related to construction or maintenance of linear facilities will be no greater than 35 ft (11 m) in width and result in no more than 4 acres of new disturbance on average annually.

Because of the difficulty in detecting individuals and the relation of the acres impacted (in terms of intensity and extent) to the likelihood of take occurring, take will be measured indirectly by acres of disturbance in accordance with the acreage caps identified above. Erosion control, livestock tank maintenance and use, and livestock management activities may result in the disturbance of western yellow-billed cuckoos, but they are unlikely to rise to the level of take based upon implementation of conservation measures.

The watersheds in the permit area to which the watershed burn caps apply are shown in Figure 5-4 of the MBHCP. Nine such watersheds have been identified: (i) San Simon Creek; (ii) Silver Creek; (iii) Black Draw; (iv) Astin Spring; (v) Guadalupe Canyon; (vi) Clanton Draw; (vii) Cloverdale Canyon; (viii) Animas Creek; and (ix) Playas Creek. Applicable burn cap acreages for each watershed are outlined in Table 5-1 of the MBHCP.

The FWS will not refer the incidental take of any migratory bird for prosecution under the Migratory Bird Treaty Act of 1918, as amended (16 U.S.C. §§ 703-712), if such take is in compliance with the terms and conditions (including amount and/or number) specified herein.

EFFECT OF THE TAKE

In the accompanying biological opinion, the FWS determined that this level of anticipated take is not likely to result in jeopardy to the covered species or destruction or adverse modification of critical habitat.

REASONABLE AND PRUDENT MEASURES AND TERMS AND CONDITIONS

The mitigation, minimization, avoidance, survey, monitoring, and reporting measures provided in the Conservation Plan are incorporated herein by reference as reasonable and prudent measures and terms and conditions to address the incidental take of the covered species. The full description of these reasonable and prudent measures is in Section 5.0 of the MBHCP and is incorporated herein by reference. No additional reasonable and prudent measures were identified during the consultation. Reporting requirements to document the implementation of reasonable and prudent measures and terms and conditions are included in Section 5.10 of the MBHCP. As long as those reporting requirements are met, the requirements of this incidental take statement will be met. NRCS may submit a separate annual report on their activities or may submit a joint report with MBG on activities covered by this BCO within the permit area.

The proposed MBHCP and its associated documents clearly identify anticipated impacts to affected species likely to result from the proposed taking and the measures that are necessary and appropriate to minimize those impacts. All minimization measures described in the proposed HCP, together with the terms and conditions described in the section 10(a)(1)(B) permit issued with respect to the proposed HCP, are hereby incorporated by reference as reasonable and prudent measures and terms and conditions within this incidental take statement pursuant to 50 CFR 402.14(I). Such terms and conditions are non-discretionary and must be undertaken for the exemptions under section 10(a)(1)(B) and section 7(o)(2) of the Act to apply. If the permittees fail to adhere to these terms and conditions, the protective coverage of the section 10(a)(1)(B) permit and section 7(o)(2) may lapse.

For the NRCS, all minimization measures described in the proposed HCP, together with the terms and conditions described in the section 10(a)(1)(B) permit issued with respect to the proposed MBHCP, are hereby incorporated by reference as reasonable and prudent measures and terms and conditions within this incidental take statement pursuant to 50 CFR 402.14(I). Such terms and conditions are nondiscretionary and must be undertaken for the exemption under section 7(o)(2) of the Act to apply. If the NRCS fails to adhere to these terms and conditions, the protective coverage of section 7(o)(2) may lapse.

The incidental take coverage for the nine listed species included in the MBHCP becomes effective on the signing of the section 10(a)(1)(B) permit, and the acceptance of the BCO by NRCS. For the 10 unlisted species covered by the MBHCP, the incidental take statement or permit will become effective upon the listing of these species as threatened or endangered under the Act.

Disposition of Dead or Injured Listed Species

Upon locating a dead, injured, or sick listed species initial notification must be made to the FWS's Law Enforcement Office, 2450 W. Broadway Rd, Suite 113, Mesa, Arizona, 85202, telephone: 480/967-7900, within three working days of its finding. Written notification must be made within five calendar days and include the date, time, and location of the animal, a photograph if possible, and any other pertinent information. The notification shall be sent to the Law Enforcement Office with a copy to this office. Care must be taken in handling sick or injured animals to ensure

effective treatment and care and in handling dead specimens to preserve the biological material in the best possible state.

CONSERVATION RECOMMENDATIONS

Section 7(a)(1) of the Act directs Federal agencies to utilize their authorities to further the purposes of the Act by carrying out conservation programs for the benefit of endangered and threatened species. Conservation recommendations are discretionary agency activities to minimize or avoid adverse effects of a proposed action on listed species or critical habitat, to help implement recovery plans, or to develop information.

Sections 2(c) and 7(a)(1) of the Act direct Federal agencies to utilize their authorities to further the purposes of the Act by carrying out conservation programs for the benefit of listed species. Conservation recommendations are discretionary agency activities to minimize or avoid effects or a proposed action on listed species or critical habitat, to help implement recovery plans, or to develop information on listed species. The recommendations provided here do not necessarily represent any Federal agency's complete fulfillment of the section 2(c) or 7(a)(1) responsibilities for the Chiricahua leopard frog, beautiful shiner, Yaqui catfish, Yaqui chub, Yaqui topminnow, Huachuca water umbel, northern aplomado falcon, Mexican spotted owl, or New Mexico ridge-nosed rattlesnake. In furtherance of the purposes of the Act, we recommend implementing the following discretionary actions:

- As an implementing agency for the MBHCP, NRCS should participate in organized recovery planning for the covered species to ensure coordination of the MBHCP conservation efforts with programs elsewhere in the species range.

- NRCS should provide guidance on new technologies for the successful improvements in watershed conditions and vegetation communities within the Malpai Borderlands for use by other regulatory agencies (such as the Corps of Engineers for the Clean Water Act section 404 permit program) and other interested landowners that would enhance the conservation program benefits derived from those programs.

- NRCS should work with other partners to develop similar efforts to restore watershed function through landowner conservation groups that improve habitat, remove threats, and contribute to recovery of these species.

In order for the FWS to be kept informed of actions minimizing or avoiding adverse effects or benefiting listed species or their habitats, we request notification of the implementation of any conservation recommendations.

REINITIATION NOTICE

This concludes the biological and conference opinion for section 10(a)(1)(B) incidental take permit associated with the Malpai Borderlands HCP and for NRCS to implement similar actions as described within the MBHCP within the action area. You may ask us to confirm the conference opinion as a biological opinion issued through formal consultation if the proposed species is listed

or critical habitat is designated. The request must be in writing. If we review the proposed action and find there have been no significant changes in the action as planned or in the information used during the conference, we will confirm the conference opinion as the biological opinion for the project and no further section 7 consultation will be necessary.

After listing as threatened or endangered and any subsequent adoption of this conference opinion, the Federal agency shall request reinitiation of consultation if: (1) the amount or extent of incidental take is exceeded; (2) new information reveals effects of the agency action that may affect the species in a manner or to an extent not considered in the conference opinion; (3) the agency action is subsequently modified in a manner that causes an effect to the species that was not considered in this opinion; or (4) a new species is listed or critical habitat designated that may be affected by the action. These same criteria define when reinitiation is required for currently listed species, in cases where discretionary Federal agency involvement or control over the action has been retained (or is authorized by law). For listed species, in instances where the amount or extent of incidental take is exceeded, any operations causing such take must cease pending reinitiation.

The incidental take statement provided in this conference opinion, for the unlisted species, the candidate species and listed species with special rules, does not become effective until the species is listed or the special rule is removed, and the conference opinion is adopted as the biological opinion issued through formal consultation. At that time, the project will be reviewed to determine whether any take of the proposed species has occurred. Modifications of the opinion and incidental take statement may be appropriate to reflect that take. No take of the proposed species may occur between the listing of the species and the adoption of the conference opinion through formal consultation or the completion of a subsequent formal consultation. Although not required, we recommend that the Federal agency implement the reasonable and prudent measures and terms and conditions herein prior to our final listing decision. If the species is subsequently listed, implementation of reasonable prudent measures and terms and conditions in any conference opinion adopted as a biological opinion is mandatory.

This concludes formal consultation on proposed issuance of a section 10(a)(1)(B) incidental take permit to the Malpai Borderlands Group and on covered activities implemented by NRCS within the action area.

For further information please contact Marty Tuegel (x232) or Sherry Barrett (x223) of my Tucson staff at (520) 670-6150. Please refer to the consultation number, 22410-2006-F-0408, in future correspondence concerning this project.

Steven L. Spangle, Field Supervisor — Date: 8/12/08

Acting Deputy Regional Director — Date: 11 September 2008

cc: Regional Director, Fish and Wildlife Service, Albuquerque, NM (ARD-ES)
Field Supervisor, NMESFO, Fish and Wildlife Service, Albuquerque, NM
Director, Arizona Game and Fish Department, Phoenix, AZ (Attn: J. Aves)
Director, New Mexico Fish and Game Department, Santa Fe, NM (Attn: J. Stuart)
Assistant Field Supervisor, Fish and Wildlife Service, Tucson, AZ
Regional Supervisor, Arizona Game and Fish Department, Tucson, AZ (Attn: J. Scott)

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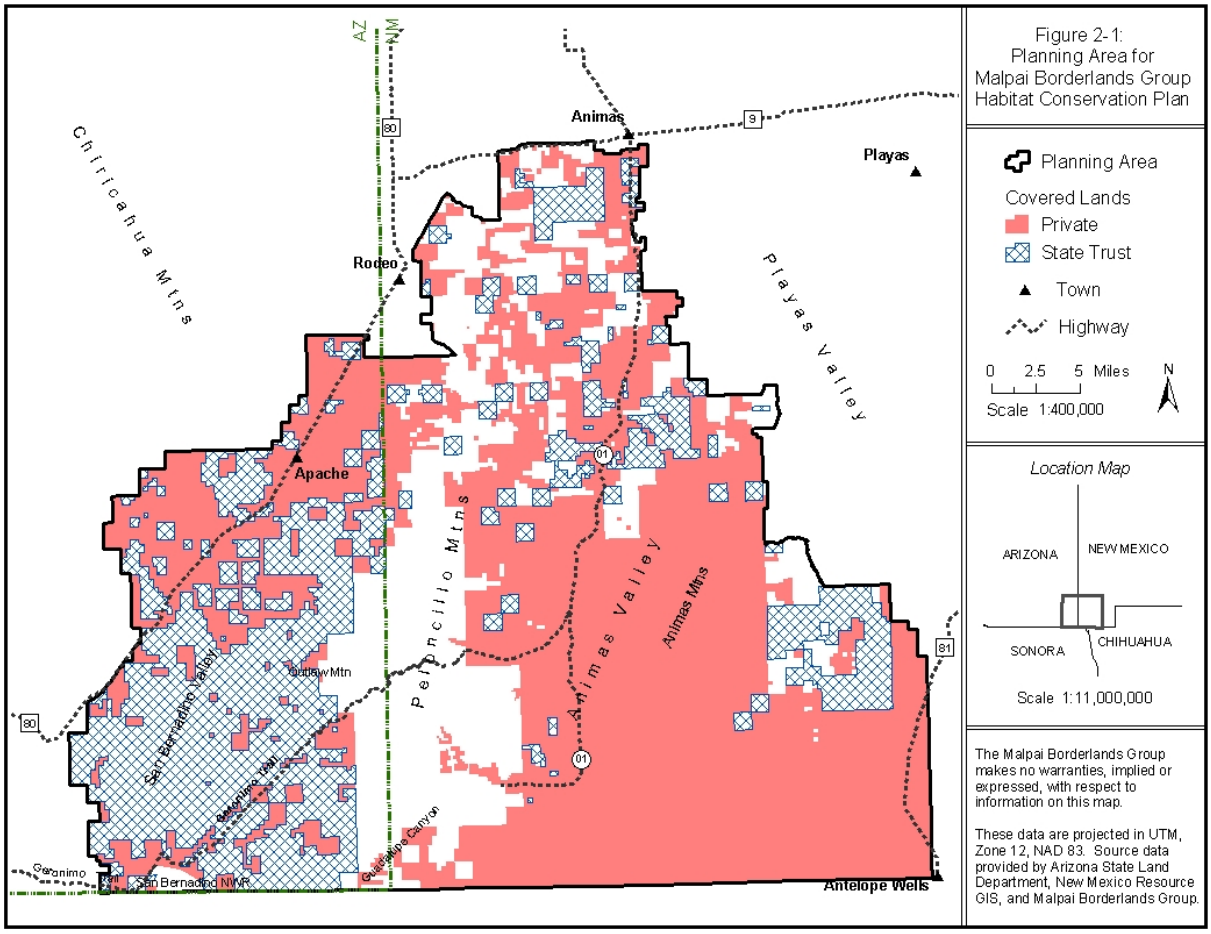
FIGURE 1. Action Area



APPENDIX A

This Appendix contains all concurrences with "may affect, not likely to adversely affect" determinations.

Cochise pincushion cactus (*Coryphantha robbinsorum*)

The final rule listing the Cochise pincushion cactus as threatened was published on January 9, 1986 (51 FR 952). Critical habitat has not been designated. The plant is found exclusively on limestone hills in southeastern Cochise County, Arizona and northern Sonora, Mexico. The entire range of this species within the U.S. is within the action area. Threats to the species include collecting, potential mineral exploration and development, and habitat degradation from livestock use, wildlife, and feral animals. Our April 4, 2007, Cochise Pincushion Cactus (*Coryphantha robbinsorum*) 5-year Review: Summary and Evaluation included a detailed Status of the Species for the Cochise pincushion cactus. This document is available on our website at http://www.fws.gov/southwest/es/arizona, under Document Library; Documents by Species.

Conclusion

We concur that the proposed action may affect, but is not likely to adversely affect the Cochise pincushion cactus, based upon the following:

- Fire is unlikely to carry through the habitat of this species and impact more than a few individuals during the life of the permit.

- Erosion control activities, mechanical brush control activities, construction and maintenance of linear facilities are unlikely to occur within the range of this species due to rocky slopes and soil conditions.

- The annual monitoring that FWS has been conducting on this species will allow avoidance of individuals if erosion control activities, mechanical brush control activities, or the construction and maintenance of linear facilities occurs within the range of this species.

- The landowner/permittee has voluntarily modified the livestock management within the known areas of occurrence to avoid impacts to this species.

- No construction of livestock tanks is anticipated, as a livestock tank is already located in the area and maintenance of this livestock tank will not impact suitable habitat of Cochise pincushion cactus.

- The long-term effects of the MBHCP taken as a whole are not likely to have a positive or negative effect on this species or its habitat.

Jaguar (*Panthera onca*)

The non-U.S. population was listed as endangered in March 1972 (37 FR 6476). The geographic extent of the listing was expanded to include jaguars in the U.S. on July 22, 1997 (62 FR 39147). It is the largest species of cat native to the Western Hemisphere. Individuals in Arizona have been found in Sonoran desertscrub up through subalpine conifer forest. The loss and modification of habitat, shooting, and predator control have contributed to its decline

Conclusion

We concur that the proposed action may affect, but is not likely to adversely affect the jaguar, based upon the following:

- Impacts to jaguar habitat from the construction of water wells, distribution pipelines, livestock tanks, and fences are expected to be relatively small compared to the home range of a jaguar given its mobility and its ability to cover large areas in its normal activities.

- The proposed action avoids fires in riparian areas, which likely serve as movement corridors for the jaguar. The canopy cover will not be removed through the proposed action, and the prescribed fire should have little effect on the use of these areas by jaguars.

- The proposed action does not involve habitat type conversion or the fragmentation or blocking of movement corridors that jaguars may use between Mexico and the United States.

- The prey base for the jaguar (white-tail and mule deer) may be enhanced, in the short term, by the prescribed fire. Long-term changes in vegetation structure may also enhance the prey base.

- Long-term benefits to jaguars of the conservation activities through this Agreement are possible.

Lesser Long-nosed Bat

Our June 10, 2005, Programmatic BO for the Continued Implementation of the Land and Resource Management Plans for the Eleven National Forests and National Grasslands of the Southwestern Region (USFWS 2005b) included a detailed Status of the Species for the Lesser Long-nosed Bat. This BO is available on our website at http://www.fws.gov/arizonaes, under Document Library; Section 7 Biological Opinions. Herein, we incorporate that status discussion by reference.

This species is known from grasslands and arid scrublands below 5500 ft in elevation. In Arizona, lesser long-nosed bats arrive in mid-April, roosting in caves, abandoned mine shafts and tunnels. Young are typically born in maternity colonies in mid-May. Females and young remain in maternity roosts and forage below about 3500 ft until approximately mid-July. At this time the range expands and bats are found up to about 5500 ft in areas of semi-desert grassland and lower oak woodland. These bats typically leave southern Arizona by late September to early October.

Conclusion

We concur with the determination that the action may affect, but is not likely to adversely affect the lesser long-nosed bat, based upon the following:

- Cool season burns will be implemented outside the season when the bats are present in the Animas roost, and no impacts to the roost itself are anticipated.

- Fuel reduction from cool season burns will reduce the likelihood of catastrophic fires that may affect this species when it is present in the Animas roost.

- No other covered activities will be implemented in the montane community.

- The effects of the implementation of the other covered activities as proposed in the MBHCP are anticipated to be relatively small compared to the availability of foraging resources for this species within the action area.

Mexican Long-nosed Bat

Our June 10, 2005, Programmatic BO for the Continued Implementation of the Land and Resource Management Plans for the Eleven National Forests and National Grasslands of the Southwestern Region (USFWS 2005b) included a detailed Status of the Species for the Mexican long-nosed Bat. This BO is available on our website at http://www.fws.gov/arizonaes, under Document Library; Section 7 Biological Opinions. Herein, we incorporate that status discussion by reference.

Mexican long-nosed bats occupy mid- to high- elevations (1,550 to 9,300 ft) in the Upper Sonoran and Transition Life Zones (U.S. Forest Service 2004). They are one of the most arid adapted members of the Glossophaginae subfamily (Koopman 1981). This species is known from northern and central Mexico, southwestern Texas, and southwestern New Mexico (Arita and Humphrey 1988, Hensley and Wilkins 1988, USFWS 1994). They are migratory, spending September through May in Mexico, where they give birth during April and May to early June. Then they move northward to Texas and southern New Mexico (Texas Parks and Wildlife Department 2007). No records of this species are known from Arizona; the nearest suspected roost is in the Animas Mountains. Within New Mexico, two specimens taken in Hidalgo County in 1963 and 1967 in southwestern New Mexico were determined to be *L. nivalis* (Wilson 1985, Arita and Humphrey 1988). Their presence was reconfirmed when they were netted over a tank in Hidalgo County in 1992 (Hoyt *et al.* 1994), 2003, and 2004 (M. Bogan, USGS, 2004, unpubl. data). A sympatric roost for Mexican long-nosed bats and lesser long-nosed bats was found in the Animas Mountains in 2004 (M. Bogan, USGS, 2004, unpubl. data).

Conclusion

We concur with the determination that the action may affect, but is not likely to adversely affect the Mexican long-nosed bat, based upon the following:

- Cool season burns will be implemented outside the season when the bats are present in the Animas roost, and no impacts to the roost itself are anticipated.

- Fuel reduction from cool season burns will reduce the likelihood of catastrophic fires that may affect this species when it is present in the Animas roost.

- No other covered activities will be implemented in the montane community.

- The effects of the implementation of the other covered activities as proposed in the MBHCP are anticipated to be relatively small compared to the availability of foraging resources for this species within the action area.

Southwestern Willow Flycatcher

The southwestern willow flycatcher was listed as endangered, without critical habitat on February 27, 1995 (60 FR 10694). On October 19, 2005, we designated critical habitat for the southwestern willow flycatcher (70 FR 60886). A total of 737 river miles across southern California, Arizona, New Mexico, southern Nevada, and southern Utah were included in the final designation.

A final recovery plan for the southwestern willow flycatcher was released in 2002 (USFWS 2002c). The recovery plan describes the reasons for endangerment and the current status of the species, addresses important recovery actions, includes detailed issue papers on management issues, and provides recovery goals. Recovery is based on reaching numerical and habitat-related goals for each specific Management Unit established throughout the subspecies range and establishing long-term conservation plans (USFWS 2002c).

Our June 27, 2006, BO on the effects of the proposed construction of the Florence-Kelvin Bridge over the Gila River (22410-2006-F-0429) included a detailed Status of the Species for the Southwestern Willow Flycatcher. This BO is available on our website at http://www.fws.gov/arizonaes, under Document Library; Section 7 Biological Opinions. Herein, we incorporate that status discussion by reference.

Critical habitat for southwestern willow flycatcher in Arizona includes portions of the Virgin River Gorge, Verde River, Gila River, Salt River, Tonto Creek, San Pedro River, Little Colorado River, and Big Sandy River. The primary constituent elements of critical habitat include:

- Riparian habitat in a dynamic successional riverine environment (for nesting, foraging, migration, dispersal, and shelter) that comprises:

    - Various species of native willow (*Salix* spp.), boxelder (*Acer negundo*), tamarisk (*Tamarix ramosissima*), Russian olive (*Eleagnus angustifolia*), buttonbush (*Cephalanthus occidentalis*), cottonwood (*Populus fremontii*), stinging nettle (*Urtica dioica*), alder (*Alnus* spp.), velvet ash (*Fraxinus velutina*), poison hemlock (*Conium maculatum*), blackberry (*Rubus ursinus*), seep willows (*Baccharis* spp.), oaks (*Quercus* spp.), rose (*Rosa* spp.), sycamore (*Platinus wrightii*), false indigo (*Amorpha californica*), Pacific poison ivy (*Toxicodendron diversilobum*), grape

(*Vitus arizonica*), Virginia creeper (*Parthenocissus quinquefolia*), Siberian elm (*Ulmus pumila*) and walnut (*Juglans hindsii*);

- Dense riparian vegetation with thickets of trees and shrubs ranging in height from six to 98 ft (2-30 m). Lower-stature thickets (two to four m or six to 13 ft tall) are found at higher elevation riparian forests, and tall stature thickets are found at middle- and lower elevation riparian forests;

- Areas of dense riparian foliage at least from the ground level up to approximately four m (13 ft) above ground or dense foliage only at the shrub level, or as a low, dense tree canopy;

- Sites for nesting that contain a dense tree and/or shrub canopy (the amount of cover provided by tree and shrub branches measured from the ground) (i.e., tree or shrub canopy densities ranging from 50 to 100 percent);

- Dense patches of riparian forests that are interspersed with small openings of open water or marsh, or shorter/sparser vegetation that creates a mosaic that is not uniformly dense. Patch size may be as small as 0.1 ha (0.25 ac) or as large as 70 ha (175 ac); and

- A variety of insect prey populations found within or adjacent to riparian floodplains or moist environments, including flying ants, wasps, and bees (Hymenoptera); dragonflies (Odonata); flies (Diptera); true bugs (Hemiptera); beetles (Coleoptera); butterflies/moths and their larvae (Lepidoptera); and spittlebugs (Homoptera) (70 FR 60886, FWS 2005).

Rangewide, the population is comprised of extremely small, widely separated breeding groups including unmated individuals. Rangewide, 83 percent of all sites from 1993 to 2004 had 0 to five flycatcher territories present (Durst *et al.* 2006). Removing the extirpated sites, the percentages are similar; 69 percent of all sites have between one and five territories. Conversely, across the southwestern willow flycatcher's range, there are only three percent of all sites with greater than 50 territories (Durst *et al.* 2006).

We concur with the determination that the action may affect, but is not likely to adversely affect the southwest willow flycatcher and designated critical habitat, based upon the following:

- No critical habitat is designated within or adjacent to the action area.

- No southwestern willow flycatcher breeding sites or suitable breeding habitat are currently known from within the action area.

- The only known sightings of southwestern willow flycatchers in the action area are of migrating individuals, which are not likely to be affected by the proposed action.