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In Reply Refer To:
AESO/SE
02-21-05-F-0086
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December 12, 2006

Memorandum

To: Field Manager, Safford Field Office, Bureau of Land Management, Safford, Arizona

From: Field Supervisor

Subject: Reinitiated Biological and Conference Opinion on the effects of the Safford Resource Management Plan

Thank you for your request for reinitiation of formal section 7 consultation and conference on the final Safford District Resource Management Plan (FRMP), pursuant to the Endangered Species Act of 1973 (16 U.S.C. 1531-1544), as amended (Act). Section 7 consultation was conducted for the draft Safford District Resource Management Plan (DRMP) and Draft Environmental Impact Statement (DEIS), and a biological opinion was completed on April 5, 1990 (#02-21-88-F-0114). Since the opinion was issued several species have been listed and proposed for listing, critical habitat was designated or proposed, and new information has become available necessitating the need for reinitiation of consultation. This reinitiated biological opinion responds to your latest requests for reinitiation of consultation and conferencing, dated September 13, 2001, and February 20, 2003.

Topics addressed in this reinitiation include effects of your proposed action on the following species:

- Endangered southwestern willow flycatcher (*Empidonax traillii extimus*) and critical habitat.
- Endangered Huachuca water umbel (*Lilaeopsis schaffneriana spp. recurva*) and critical habitat.
- Threatened New Mexico ridge-nosed rattlesnake (*Crotalus willardi obscurus*) and critical habitat.
- Threatened Chiricahua leopard frog (*Rana chiricahuensis*).
- Endangered razorback sucker (*Xyrauchen texanus*) and critical habitat.
- Threatened loach minnow (*Tiaroga cobitis*) and proposed critical habitat.
- Threatened spikedace (*Meda fulgida*) and proposed critical habitat.
- Endangered Gila chub (*Gila intermedia*) and critical habitat.

The draft BO included consultation/conferencing for the cactus ferruginous pygmy-owl. This final BO does not include the pygmy-owl or proposed critical habitat because this species has been removed from the Federal list of endangered and threatened wildlife, and the proposed rule to designate critical habitat has been withdrawn (U.S. Fish and Wildlife Service 2006).

You have also requested concurrence from us that the proposed action may affect, but is not likely to adversely affect, the threatened Mexican spotted owl (*Strix occidentalis lucida*) and the endangered jaguar (*Panthera onca arizonensis*). We concur with these determinations, which are addressed in Appendix A at the end of this memorandum. Our concurrence for the MSO also addresses critical habitat.

This biological and conference opinion (BO) is based on information provided in the September 13, 2001, biological evaluation (BE), the FRMP, the Land Tenure Amendment to the FRMP (July 21, 1994) (Land Tenure Amendment), the Records of Decision (ROD) I (September 1992) and II (July 1994), updated memos, telephone conversations, site investigations, meetings between the Bureau of Land Management (BLM) and us, and other sources of information (all of this information is considered part of the proposed action). References cited in this BO are not a complete list of all available literature on the species of concern, management actions, and their effects, or on other subjects considered in this BO. A complete administrative record of this consultation is on file at our Phoenix office.

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CONSULTATION HISTORY

- April 5, 1990. We issued a biological opinion on the DRMP and DEIS (#02-21-88-F-114) (U. S. Fish and Wildlife Service 1990). We concluded that the proposed action was not likely to jeopardize the continued existence of the Gila topminnow, desert pupfish, peregrine falcon, bald eagle, Sanborn's long-nosed bat (now referred to as the lesser long-nosed bat), Cochise pincushion cactus, Arizona hedgehog cactus, spikedace, and loach minnow; and it was not likely to adversely modify the proposed critical habitat of the spikedace and loach minnow. Consultation history prior to April 5, 1990, can be found in that biological opinion.
- March 18, 1994. We issued an amendment to the 1990 BO that converted the conference finding for proposed critical habitat of the spikedace and loach minnow to a consultation finding that the DRMP is not likely to adversely modify or destroy designated critical habitat (U. S. Fish and Wildlife Service 1994).
- August 26, 1996. We received your memorandum (dated August 23, 1996) providing us with a list of species being considered in your BE for the reinitiation of consultation for the FRMP, and requesting that we respond if we believed additional species should be considered.
- September 24, 1996. We replied to your August 23, 1996, species list request.
- September 26, 1997. We issued the Programmatic Biological Opinion for the Safford/Tucson Field Offices' Livestock Grazing Program, Southeastern Arizona (Safford/Tucson Grazing BO) (#02-21-96-F-0160)¹ (U. S. Fish and Wildlife Service 1997), with amendments in 1998, 2000 and 2001.
- July 23, 1998. We received your request for reinitiation of formal consultation (dated February 27, 1998, and July 21, 1998) on the FRMP.
- October 2, 1998. We requested additional information to complete consultation.
- February 2, 2000. We received the additional information (dated January 31, 2000) from you that we requested on October 2, 1998, along with an updated BE.
- September 14, 2001. We received a revised request for reinitiation of section 7 consultation on the effects of the FRMP (dated September 13, 2001). You submitted this revised request because the Chiricahua leopard frog had been proposed for listing as threatened and critical habitat had been designated for two other species since the July 21, 1998, request. You also notified us that the planning area was now partially administered through the Tucson Field Office and partially administered through the Safford Field Office as a result changes in administrative boundaries.

- November 14, 2001. We acknowledged receipt of your latest request for consultation on the FRMP and stated that we would issue a biological opinion by February 25, 2002.¹
- January 30, 2002. We requested a 60-day extension of the formal consultation period.
- February 21, 2002. We received your memorandum (dated February 14, 2002) agreeing to the 60-day extension, and your request to review a draft BO before the final BO is issued.
- February 24, 2003. We received your memorandum (dated February 20, 2003) requesting and clarifying previous requests for reinitiation of formal consultation, including consultation or conferencing for loach minnow and spiketail critical habitat, the threatened Chiricahua leopard frog, and the proposed endangered Gila chub and its proposed critical habitat. In this request, you provided your analysis of the actions on Gila chub and proposed critical habitat.
- June 10, 2004. We issued a reinitiated biological opinion on the Gila Box Riparian National Conservation Area (RNCA)¹ (#02-21-92-F-0070R2) (Gila Box RNCA BO) (U. S. Fish and Wildlife Service 2004a).
- September 3, 2004. We issued a biological and conference opinion for the BLM's Statewide land use plan amendment for fire, fuels, and air quality management¹ (#02-21-03-F-0210) (BLM LUP Amendment BO) (U. S. Fish and Wildlife Service 2004b).
- June 17, 2005. We provided you a draft of the reinitiated biological and conference opinion for the FRMP.
- January 11, 2006. We received your comments on the draft reinitiated biological and conference opinion for the FRMP, including your request to confirm the draft conference opinions as the biological opinions for Gila chub, Gila chub critical habitat, and southwestern willow flycatcher critical habitat.
- March 2, 2006. We received your request by e-mail to include spiketail and loach minnow proposed critical habitat in the conference opinion.

BIOLOGICAL AND CONFERENCE OPINION

SCOPE OF THIS BIOLOGICAL AND CONFERENCE OPINION

This reinitiated BO is in effect for the FRMP until the FRMP is revised or reinitiation is otherwise requested and completed. This BO mostly addresses the effects of the FRMP at the land use plan-level because the FRMP, Final Environmental Impact Statement (FEIS), and BE

¹ These BOs cover program and often project-level activities and direction that fall under the umbrella of the Safford RMP.

address the effects of the proposed action on listed species primarily at that same broad, general level. However, actions proposed in the FRMP are a mix of land use plan-level, program-level, site-specific direction, and site-specific project actions. No further consultation for the land use plan-level, program-level, and some site-specific direction and projects proposed in the FRMP are needed unless one of the four reinitiation criteria is triggered (50 CFR 402.16). Site-specific actions covered in this consultation are identified in the following description of the proposed action. This consultation will not suffice for the consultations of other site-specific projects identified in the FRMP, and other site-specific projects to be identified later, because sufficient details are not provided about where or how they will be implemented. As stated in the FRMP, most site-specific projects implemented under the FRMP will require separate section 7 analysis and consultation, as needed. The BLM will be addressing other management actions in program, activity-level, and project-specific plans. These plans are subject to NEPA analysis and section 7 consultation, if necessary. The BLM will evaluate any action proposed on BLM lands to determine the impacts it will have on the environment, including threatened and endangered species. NEPA compliance (to the appropriate level of detail) will be conducted for every considered proposal on the BLM lands. In addition, all actions proposed in specific activity plans (allotment management plans, habitat management plans, wilderness management plans, etc) will be coordinated with the appropriate programs.

DESCRIPTION OF THE PROPOSED ACTION

The proposed action is implementation by the BLM of the preferred alternative as set forth in the FRMP for BLM lands of the Safford and Tucson Field Offices in eastern and southeastern Arizona. The Safford and/or Tucson offices have been implementing this FRMP since their Records of Decisions (September 1992; July 1994). The FRMP provides for the overall management guidance for administration of the planning area and makes specific land allocation decisions regarding identification of lands eligible for disposal, lands considered high priority for acquisition, designation of Areas of Critical Environmental Concern (ACECs), and limitation on use of BLM lands by off-highway vehicles (OHVs). The FRMP also identified which wildlife and plant species were to be considered as priority species in land management decisions. The FRMP and FEIS were developed to guide management of BLM lands and resources within the planning area for approximately 15 years. Section 202 of the Federal Land Policy and Management Act of 1976 requires the Secretary of the Interior to develop, maintain, and revise land use plans for managing BLM lands. To comply with that act, the Safford District (currently Field Office) prepared the FRMP.

The decisions resulting from the approved FRMP and Records of Decision determine which use or combination of uses the Field Offices will emphasize. Decisions also state which uses were not suitable. In certain cases, the decisions were specific and immediately implementable (e.g., designation of ACECs and identification of long-term management areas). In other instances, the BLM must prepare more specific activity plans and environmental analyses before implementing decisions (e.g., District Transportation Plan; acquisition, exchange, or disposal of specific tracts of land).

San Pedro RNCA. In 1989, BLM completed a land management plan for 47,668 acres of BLM lands along the upper San Pedro River. The San Pedro River Riparian Management Plan (San Pedro Plan) (Bureau of Land Management 1989) provides direction for managing that property's

natural and cultural resources. During the preparation of the San Pedro Plan, Congress designated these lands and adjacent BLM lands (total of 54,189 acres) as the San Pedro RNCA. The San Pedro Plan provides management direction for the riparian corridor and the adjacent uplands in the San Pedro RNCA, except for 6,521 acres that were acquired through Congressional action. Generally, the San Pedro Plan provides a framework for maintaining and enhancing the quality and quantity of water, riparian vegetation, wildlife, cultural resources, and paleontological resources. The FRMP incorporates the decisions of the San Pedro Plan and sets management direction for the 6,521 acres in the San Pedro RNCA not covered by the San Pedro Plan.

Only general decisions regarding livestock grazing in the planning area are made in the FRMP (e.g., continue grazing on portions of the San Pedro RNCA; general direction to plan and implement grazing strategies to enhance riparian areas). Grazing decisions were made in two prior documents, the 1987 “Upper Gila-San Simon Grazing Environmental Statement” and the 1987 “Eastern Arizona Grazing Environmental Impact Statement”. Additional site-specific guidance is found in the 1989 San Pedro River Riparian Management Plan and EIS, the 1996 BE for livestock grazing in the Safford/Tucson Field Offices, the 1998 Gila Box Management Plan, and subsequent biological opinions on these plans and BEs.

The 1990 consultation was for the DRMP. This reinitiation is for the FRMP. The major changes between the DRMP and FRMP were:

1. Wild and Scenic River eligibility and classification determinations have been made for five additional rivers: Aravaipa Creek, Turkey Creek, Swamp Springs-Hot Springs Canyon, Bonita Creek, and San Pedro River.
2. Specific areas of lands deemed suitable for acquisition were identified. Additions and corrections were made identifying areas for acquisition and lands available for disposal.
3. Congressional action in 1990 created six additional wilderness areas in the planning area during the development of the FRMP and FEIS. The new wilderness areas are: Needles Eye, North Santa Teresa, Fishhooks, Redfield Canyon, Dos Cabezas Mountains, and Peloncillo Mountains. In addition, the existing Aravaipa Canyon Wilderness was expanded.
4. Eleven ACECs were designated.
 - a. Some of the ACECs described in the DRMP are entirely within the boundaries of a wilderness area. ACEC prescriptions will be carried forward into the wilderness management plan where appropriate. In other cases, some of the ACEC lands are outside the wilderness boundaries. These lands were carried forward as ACEC but with adjusted acreages.
 - b. The same 1990 wilderness legislation created the Gila Box RNCA, which includes the Bonita Creek ACEC and a large portion of the Gila Box ACEC. ACEC prescriptions were carried forward into the RNCA management plan where appropriate. The remaining ACEC lands outside this RNCA were not designated.

- c. The Coronado Mountain ACEC was not designated.

GENERAL DESCRIPTION OF THE PROJECT AREA

The FRMP proposes management direction for over 1,400,000 acres of BLM land in southeastern Arizona (Figure 1; also see maps 1-27 of the FRMP). It includes all BLM lands in Graham, Greenlee, and Cochise counties and portions of Pinal, Pima, and Gila counties. The planning area is in a sparsely populated part of the State. The larger communities include Sierra Vista, Safford/Thatcher, Clifton/Morenci, Duncan, Willcox, Douglas, Bisbee, Tombstone, Benson, and Winkelman.

The planning area is located within the Basin and Range Physiographic Province south of the Colorado Plateau. The area's northwesterly trending mountain ranges reach elevations of almost 11,000 feet. Separating these mountain ranges are broad, flat, or gently sloping basins. BLM lands in the planning area range in elevation from about 1,900 to over 8,000 feet. The Province is subdivided into the mountain region, which includes the eastern half of the planning area, and the Sonoran Desert region, which includes the western half of the planning area. The Gila Mountains and the mountainous area near Clifton represent the transition zone between the Colorado Plateau and the Basin and Range Provinces. Among the numerous topographic units are the San Simon, Gila, Sulfur Springs, and San Pedro valleys and the Peloncillo, Dos Cabezas, Gila, Santa Teresa, Chiricahua, Mescal, Galiuro, Dragoon, and Mule mountains.

The entire area is within the Gila River watershed with the exception of two areas. These two areas are the Sulfur Springs Valley, which drains into the Willcox Playa, south of the town of Willcox; and the extreme southeastern part of the area, in the San Bernardino Valley, east of Douglas, which drains into the Rio Yaqui of Sonora. Major tributaries of the Gila River in the planning area are the San Francisco River, Eagle Creek, Bonita Creek, San Simon River, and San Pedro River.

Climatic conditions in the area are similar to those throughout the desert Southwest. Alternating lowlands and mountains create abrupt climatic changes over short distances. Higher elevations have cooler temperatures and more precipitation than valleys. The highest spot on BLM lands in the planning area is the Dos Cabezas Peaks at 8,363 feet above sea level. The lowest spot is in the northwestern portion of the planning area near Winkelman at about 1,900 feet above sea level. Average annual precipitation is around 22 inches at the highest elevations and about five inches in the lowest valley locations. Roughly half of the precipitation falls during the summer rainy season (July through September), with the remainder falling during winter. The highest temperatures exceed 110° F in the lowest locations, while the lowest temperatures are well below freezing in the high mountain locations.

The Soil Conservation Service has mapped most of the soils of the planning area. These surveys have either been published, or were conducted under contract with the Soil Conservation Service and unpublished. Soils in the area vary from very shallow (less than 10 inches deep) to deep (greater than 60 inches) and are derived from a wide variety of parent materials. The highly diverse parent materials, topography, and climates have created soils with a wide range in major soil characteristics.

Major upland vegetation communities (Brown *et al.* 1980) in the planning area are as follows: (listed from most to least abundant)

- Sonoran Desert Scrub
- Scrub-Grassland (Semidesert Grassland)
- Interior Chaparral
- Chihuahuan Desert Scrub
- Madrean Evergreen Forest and Woodland

Upland vegetation plays a pivotal role in protecting air, water, and soil resources. In sufficient amounts, upland vegetation controls soil erosion by wind and water, promotes infiltration of precipitation, and improves runoff water quality. Upland vegetation communities also provide important elements of wildlife habitat and are an important source of livestock forage in the planning area. BLM manages the vegetation resource for these multiple uses.

The watershed condition plays an important role in the condition of riparian streams. The watersheds need to be managed as a whole, and when they are not the riparian areas in the lower portions of the watershed are difficult at best to manage. The Upper Gila watershed above Calva, on the eastern side of San Carlos Apache Reservation, consists of 11,470 mi². The portion of the planning area in the watershed is 1,777 mi² or 15 percent. The Aravaipa watershed consists of 541 mi², of which the BLM manages 109 mi² or 20 percent. In both cases the lands managed by the BLM are on the lower end of the watershed.

The FRMP establishes management direction for more than 8,000 acres of desert riparian areas. Ranging from small isolated springs to portions of major river systems such as the San Pedro and Gila rivers, these areas are extremely important for the maintenance of water quality and as habitat for fish and wildlife populations, including threatened and endangered species. These communities serve important hydrologic functions and play a crucial role in producing aquatic habitat. They are also popular recreation areas.

Major species in the Southwestern Riparian Deciduous Forest and Woodland community (Brown *et al.* 1980) include cottonwood, willow, alder, sycamore, ash, and walnut. This community comprises about 2,000 acres of BLM lands in this area but is of major importance to wildlife and aquatic plants.

Action area

The action area includes all BLM lands within the planning areas, along with adjacent private, municipal, State and other Federal jurisdiction lands in which the effects of BLM activities implemented under the FRMP may manifest. These land managers have implemented management that could result in cumulative or other effects to listed species and critical habitat, including ground and surface water extraction, agriculture, and recreation.

ISSUES, MANAGEMENT CONCERNS, AND PROPOSED ACTIONS

The FRMP and FEIS presented and analyzed issues and management concerns identified by BLM planning team members, interagency consultation, the public, and BLM managers. A

summary of these issues and management concerns and the proposed actions developed to address them are presented in this document. Only the proposed actions that have not been implemented or are continuing actions are included in the proposed action. Actions that have been completed are also listed in this section, but are now part of the environmental baseline, and will not be addressed in the analyses for the species. The proposed action items are in normal font and the completed actions are in *italics*. Site-specific actions covered in this consultation are underlined (no further consultation for these actions is necessary unless one or more of the reinitiation criteria are triggered). Further details of the proposed action are presented in the BE and FRMP.

Issues

Issue 1. Access

Land ownership in southeastern Arizona varies from large blocks of BLM, national forest, and Tribal lands to small, scattered tracts of BLM, State, and private lands. Access problems, because there are no roads or trails, or no legal right to use existing roads or trails, prevent BLM from administering some tracts of BLM lands and prevent the public from legally accessing these lands. The decisions made for access were:

- Provide the necessary vehicular, horse, and foot access routes to meet the needs and responsibilities of the private parties and public entities present in the planning area. This includes managing existing and new roads and trails, and closing roads and trails, as needed.
- Obtain legal access, for public and/or administrative use, across private lands in 39 locations (see Appendix 1 in FRMP) and across other State and private lands in the future.
- A District Transportation Plan will be prepared that will define the road, trail, public, and administrative access needs on the planning area. Road construction, reconstruction, closures, maintenance, numbering, and signing, as well as access acquisition and retention, will be addressed in this plan.
- Reconstruct the following roads at the locations noted below to provide or improve vehicle access for the administration and use of BLM lands.
 - Left Fork of Markham Creek Road (approximately three miles at T. 3 S., R. 24 E., Sec. 36; T. 4 S., R. 24 E., Secs. 1, 12; and T. 4 S., R. 25 E., Secs. 6, 7, 18).
 - Military Trail (approximately three miles at T. 3 S., R. 16 E., Secs. 13, 14, 23).
 - Virgus Canyon Road (approximately one-half mile at T. 6 S., R. 18 E., Secs. 27, 34, 35).
 - Buckeye Canyon Road (approximately one mile at T. 13 S., R. 27 E., Secs. 26, 27, 34 and T. 14 S., R. 27 E., Sec. 9).
 - Other roads as determined in the future and included in the District Transportation Plan.
 - *Jackson Cabin Road has been reconstructed (approximately five and one-half miles at T.*

11 S., R. 20 E., Secs. 22, 26, 27, 35, 36; T. 12 S., R. 20 E., Secs. 1, 2, 11, 24; and T. 12 S., R. 21 E., Secs. 30, 31).

- Obtain legal administrative and public access across private, State and Tribal lands on existing foot and horse trails.
 - Safford-Morenci Trail where it crosses the San Carlos Indian Reservation (T. 4 S., R. 28 E., Sec. 31).
 - Safford-Morenci Trail where it crosses Bonita Creek (T. 5 S., R. 27 E., Secs. 10, 11).
 - Hell Hole Canyon Trail and trailhead at Dry Camp (T. 6 S., R. 19 E., Sec. 7).
 - Aravaipa Canyon Wilderness Trail from the west trailhead (at the administrative site) to the west boundary of the wilderness (T.6 S., R. 17 E., Secs. 13, 24).
 - Babocomari River Trail (T. 20 S., R. 20 E., Sec. 13 and T. 20 S., R. 21 E., Sec. 18).
- Access across BLM lands conveyed out of Federal administration will be reserved when needed.

Issue 2. Areas of Critical Environmental Concern and Other Types of Special Management

The BLM lands have a variety of important historical, cultural, scenic, and natural values. ACEC designations may be used to protect these values. They may also be used to identify and manage areas that are hazardous to human life and property. Other types of special management may also be used to protect important resource values. These include wild and scenic rivers and resource conservation areas. The decisions made were:

- *ACECs were designated where values were determined to be of the appropriate level of significance. Eleven ACECs containing 28,763 acres, in addition to three ACECs within the San Pedro RNCA containing 2,060 acres, were designated to protect important natural and cultural resources (See Table 2-1, Page 29, FRMP, the San Pedro Plan and the RODs). The ACECs that were designated were:*
 - *Turkey Creek, Table Mountain, Bear Springs Badlands, Guadalupe Canyon, Bowie Mountain, Dos Cabezas Peaks, Willcox Playa, 111 Ranch, Eagle Creek Bat Cave, Hot Springs Watershed, Desert Grassland RNA.*
 - *In San Pedro RNCA—St. David Cienega, San Pedro River, San Rafael.*
- Management prescriptions are being implemented for each ACEC as described in Table 2-1 and Appendix 2 in the FRMP.
- Individual management plans will be written for each ACEC. Management plans have been completed for the Hot Springs Watershed ACEC (as part of the Muleshoe Ecosystem Management Plan) and the Bear Springs Badlands ACEC. Implementation of the Muleshoe Ecosystem Management Plan and Bear Springs Badlands ACEC Plan are part of the

proposed action. Implementation of ACEC plans developed in the future may require section 7 consultation.

- Fourteen river segments (149 miles) will be studied for inclusion in the Wild & Scenic Rivers system. These river segments will be managed to protect their outstandingly remarkable values until Congress acts to designate them or release them to management under provisions of the applicable Resource Management Plan (see Appendix 3 in the FRMP for more information). These segments are:
 - Gila and San Francisco Rivers through the Gila Box area (five segments, 34.5 miles).
 - Gila River from Coolidge Dam to Hayden (three segments, 32 miles).
 - Aravaipa Creek (one segment, 11 miles).
 - Turkey Creek (one segment, 2.5 miles).
 - Swamp Springs Canyon (one segment, 2 miles).
 - Hot Springs Canyon (one segment, 6 miles).
 - Bonita Creek (one segment, 15 miles).
 - San Pedro River (one segment, 46 miles).
- Develop a coordinated resource management plan for Bear Springs Flat. These coordinated resource management plans establish management objectives to direct the development of future program activities toward the maintenance and enhancement of watershed conditions. *Plans have been completed for the Aravaipa Creek watershed and Muleshoe Ranch.* Continuing implementation of these two plans is part of the proposed action. Implementation of the Bear Springs Flat plan, when developed, may require section 7 consultation.
- Management goals for the Aravaipa Creek Watershed and Muleshoe Ranch are designed to maintain or restore the natural ecological processes, biological communities, and cultural resource values as practicable, while allocating and actively managing the full spectrum of compatible multiple uses. These goals will be achieved through the implementation of management actions as described in the ROD II.
- Management goals for the Bear Springs Flat are designed to protect sensitive Class I fossils and scenic values with impressive erosional features in the area. These goals will be achieved through the following management actions.
 - Allow livestock use in the Bear Springs Flat area, consistent with a livestock management plan to mitigate the adverse impacts on fossils of the area. Livestock forage use will not be permitted to exceed an average of 40 percent over a full grazing cycle (averaging 3 to 5 years duration). Specific livestock management actions will be developed at the activity plan level (Refer to the Safford/Tucson Grazing BO for current and detailed management direction in the area).

- o Evaluate progress in meeting the desired goals and objectives through appropriate monitoring studies.
- Revise the San Simon River Coordinated Resource Management Plan. The purpose of this plan is to direct development of program activities to maintain and enhance watershed condition. Implementation of this plan may require section 7 consultation.
- Cooperative livestock and watershed management studies will be conducted to restore native grasslands and improve the condition of the Aravaipa Watershed. These studies will investigate the best management techniques.

Issue 3. Off-Highway Vehicles

- The use of off-highway recreational vehicles (three- and four-wheeled all terrain vehicles, four-wheel drive pick ups, dirt bikes, etc.) has increased over the years and continues to grow. The BLM manages its lands for use by off-highway vehicles, but their use must be carefully controlled to prevent unacceptable changes to the land and its resources. The decisions made were:
 - All BLM lands within the planning area have been designated as open, closed, or limited with respect to off-highway vehicle use.
 - Hot Well Dunes (1,708 acres) was designated as open to off-highway vehicle use.
 - The following areas were designated as closed to off-highway vehicles:
 - o All designated wilderness areas (84,632 acres as of RODs)
 - o Turkey Creek above Oak Grove Canyon corral (102 acres)
 - o Desert Grasslands RNA ACEC (530 acres)
 - o Willcox Playa ACEC (2,475 acres)
 - o Hot Springs Canyon riparian area (140 acres)
 - Designated 1,310,713 acres of the BLM lands within the planning area as limited off-highway vehicle use. "Limited" off-highway vehicle use is restricted to existing roads and trails occurring at the time of designation and any new roads approved for construction during the life of the FRMP. These roads and trails were not specifically identified at the time, but will be addressed in the District Transportation Plan.
 - Designated off-highway vehicle use in the San Pedro RNCA (54,189 acres) and the Gila Box RNCA (20,900 acres) as limited and restricted to designated roads.

These decisions on how to manage vehicular use have been made and are therefore part of the environmental baseline. However, their implementation is a continuing action that is part of the proposed action. Most of these decisions are site-specific and are addressed in full to the project

level in this BO. In regard to lands designated limited to existing roads and trails, we are not aware of a listing or map of “existing” routes at the time of designation. Thus, although lands designated as such are covered in full herein, our analysis of effects to species may be incomplete. Nonetheless, we have based our analysis on the best information available to us regarding the location and extent of “existing” routes. Further analysis is warranted when the District Transportation Plan is drafted.

Issue 4. Riparian Areas

Riparian areas are valuable because of their importance to watershed protection, water quality, aquatic and terrestrial wildlife, threatened and endangered species, cultural resources, recreational opportunities, and livestock management. Special management attention is needed to ensure these fragile areas are protected and improved while providing for human use. The decisions made were:

- Riparian areas were identified in the FRMP (see Map #26 in the FRMP).
- In accordance with national and State BLM directives, BLM will manage riparian areas on BLM land within the planning area to achieve good to excellent condition on 75 percent of the riparian zone acreage by 1997. This likely has not been met, but management is continuing to achieve Proper Functioning Condition on at least 75 percent of the riparian areas.
- Incorporate riparian objectives into existing and future activity plans.
- In cooperation with Arizona Game and Fish Department, develop and implement a system to prioritize needed riparian area management. The priorities will be based on management objectives, resource condition, resource conflict, and the potential or capability of a riparian area to respond to treatment.
- Develop a riparian inventory system. Coordinate development and implementation of the system with other land-managing agencies.
- In cooperation with Arizona Game and Fish Department, complete the inventory of all riparian areas on BLM lands in the District to establish baseline condition.
- Establish a monitoring plan for selected riparian areas based upon the management priority system. Implement the plan and evaluate monitoring data. Continue to carry out needed changes in riparian area management through activity plans. Implementation of this plan may require section 7 consultation.
- Continue to file for in-stream flow water rights on perennial streams or rivers and water rights on springs and ponds to protect and maintain riparian vegetation.
- Continue to develop grazing systems and modify existing allotment management plans, as necessary, to best manage livestock use for the improvement of riparian areas and reduce non-point source water pollution.

- Do not permit firewood cutting in riparian areas.
- Permit the removal of non-native vegetation for improvement of riparian vegetation.
- Maintain and monitor representative relict riparian areas to provide a baseline for future management decisions.
- Build Timber Draw Dam on the San Simon River to reestablish stream channel and floodplain conditions to promote the redevelopment of the riparian ecosystem.
- Continue to manage the San Pedro RNCA and Gila Box RNCA according to the guidance in the existing management plan.
- Develop an environmental education program for schools and the public for riparian management.
- To achieve these results, the Field Offices will cooperate with individuals, private landowners, and State and other Federal agencies to develop and implement management practices to meet these goals.
- Retain riparian areas in BLM ownership unless disposal would be in the public interest, as determined by land use planning. Retaining riparian areas in BLM ownership is covered to the project level. Disposal of these areas may require section 7 consultation.

Management Concerns

Management Concern 1. Wildlife Habitat

- The Field Offices will coordinate and cooperate with all appropriate Federal, State, and local agencies to achieve FRMP wildlife management goals.
- Retain in BLM ownership all habitat essential to the survival or recovery of any threatened or endangered species, including habitat used historically by these species.
- Manage priority species and their habitats to maintain or enhance population levels. Priority species include threatened and endangered species; proposed, candidate, and State-listed species; important game animals; and other special status species. These species will be managed in accordance with established inter/intra-agency management plans. The Field Offices' management efforts will be directed toward the enhancement of biological diversity.
- Actively promote threatened and endangered species recovery to achieve eventual delisting.
- Management actions may include inventory, monitoring, transplantation, prescribed burning, wildfire suppression, spring and riparian vegetation protection, development of habitat management plans, and restrictions on animal damage control activities (including in listed species habitat that may threaten a species).

- Protect springs and associated indigenous riparian vegetation for wildlife water, cover, and forage.
- *The following ACECs were established to protect priority wildlife species and their habitat—Hot Springs Watershed, Guadalupe Canyon Outstanding Natural Area, and Eagle Creek Bat Cave.*

Management Concern 2. Lands and Realty

- Land Ownership Adjustment - The purpose of the program is to adjust land tenure in the planning area to achieve BLM resource management objectives and improve service to the public. Consolidation of land ownership within long-term management areas (LTMAs) and disposal of lands outside these areas will be considered to meet these objectives. No BLM or private lands will be acquired, exchanged, or disposed of without additional compliance with the NEPA and ESA through a site-specific analysis of a proposed action. See the Land Tenure Amendment for more details regarding criteria and locations.
 - *Land Acquisition – Established objectives for land acquisition and the characteristics these lands will possess (Page 36 in FRMP).*
 - *Designated 24 LTMAs in which the BLM will intensively manage BLM lands for their multiple resource values as defined in the Federal Land Policy and Management Act of 1976. BLM will retain all BLM lands (surface and subsurface estate) and may seek acquisition of State and private land within these areas (see Land Tenure Amendment).*
 - *Public (BLM) Land Disposal - Established objectives for disposal of BLM lands.*
 - All land-disposal actions are discretionary. BLM will evaluate lands it selects for disposal for significant natural and cultural resources, threatened and endangered plants and animals, floodplain/flood hazards, prime and unique farmlands, and other critical factors. These actions would trigger NEPA compliance, and BLM would conduct an effects analysis to listed species and their critical habitat. BLM would conduct section 7 consultation with USFWS according to the effects determination. Some of the factors considered during the NEPA process include the importance of the habitat or area to the overall abundance and distribution of the listed species or its critical habitat, the importance of Federal management to species survival, the foreseeable uses of the habitat or area in non-BLM ownership, and the difference between feasible Federal and non-Federal protection for the habitat or area. National BLM policy (Manual Section 6840.06) would factor into this decision, which states in part:
 - “Ensure activities affecting populations and habitats of T&E species are designed to be consistent with recovery needs and objectives. Screen all proposed actions to determine if T&E species and their habitats may be affected. Ensure no actions adversely affect the likelihood of recovery of any T&E species.”

- BLM may still consider disposal if the recipient would protect the species or critical habitat equally well under the Endangered Species Act, such as disposal to another Federal agency, non-Federal governmental agency, or private organization if the agency or organization's management would still achieve conservation purposes for the species.
- *Disposal Areas - BLM lands outside the 24 LTMA's may be considered for disposal. The FRMP identifies approximately 100,000 acres of BLM lands that are targeted for disposal by sale or exchange (see Land Tenure Amendment). However, disposal of all identified BLM lands is not required. Unforeseen land-management concerns, the presence of significant natural resources, or public concerns raised during the NEPA process may prevent disposal or may result in identification of other lands for disposal. However, disposal of other lands would require a land use plan amendment. The decision to consider these lands for disposal is completed and part of the environmental baseline; however, actual selection of specific parcels and their disposal are site-specific actions subject to future section 7, as appropriate.*
- *Five major utility corridors have been designated along existing lines (Page 36 in FRMP). Any future major cross-Field Office utility rights-of-way proposals will be encouraged to use these corridors.*
- *Two areas are established as right-of-way avoidance zones (Muleshoe Ranch, Bowie Mountain Scenic ACEC). Every attempt will be made to avoid these areas with major cross-Field Office rights-of-way to minimize or eliminate conflicts with sensitive resources.*
- *Attach needed site-specific environmental protection stipulations to all rights-of-way.*
- *Six areas are established as right-of-way exclusion areas. These include Gila Box RNCA, Dos Cabezas Peaks ACEC, Bear Springs Badlands ACEC, Willcox Playa NLA ACEC, wilderness study areas, designated wilderness areas, and Oliver Knoll Atmospheric Deposition Monitoring Station.*
- *Three communication sites were designated (Guthrie Peak, Juniper Flat in the Mule Mountains, and the west end of Dos Cabezas Mountains). Site plans will be prepared for all communication sites. BLM will analyze designation of new sites on a case-by-case basis.*
- *Complete the withdrawal review process. Revoke all withdrawals determined to no longer serve their original or intended purpose.*
- Withdraw ten acres for the Oliver Knoll atmospheric deposition monitoring station from the public land laws and the mining laws. Mineral leasing will be permitted with a "No Surface Occupancy" stipulation. The area will be established as an administrative site.
- Withdraw ten areas (7,286 acres) from mineral entry to preserve important resource values (see Table 2-3 and Page 37 in the FRMP; ROD II). BLM will consider future withdrawals on a case-by-case basis.

Management Concern 3. Outdoor Recreation and Visual Resource Management

- The Field Offices will endeavor to provide a variety of recreational opportunities that meet public demand and are compatible with BLM's stewardship responsibilities.
- *BLM designated six areas as special recreation management areas to manage current recreational use (Aravaipa Canyon/Turkey Creek, Gila Box/Bonita Creek, Christmas, Red Knolls/Bear Springs Badlands/Watson Wash, Hot Well Dunes, and additional lands in the San Pedro RNCA not previously included in the San Pedro Plan). Prepare and implement recreation area management plans for these areas as needed. Implementation of these plans may require section 7 consultation. One plan has been completed (Hot Wells Dunes). Implementation of the Hot Wells Dunes Plan is part of the proposed action.*
- Project plans will be prepared for nine additional areas in the planning area (see #4, Page 38 in the FRMP for a list). Implementation of these plans may require section 7 consultation.
- Aravaipa Canyon Wilderness will be managed under the existing wilderness plan.
- Evaluate new road construction and closure of some existing roads for possibilities to enhance recreation experiences.
- Continue to exclude livestock from 159 acres of BLM land around Fourmile Canyon Campground.
- *Unless otherwise established, the maximum length of stay for recreation purposes in any one location is 14 days. Ongoing implementation of this decision is part of the proposed action.*
- Field Offices' recreation road and sign needs will be developed. Field Office sign plans will be developed. Implementation of these plans may require section 7 consultation.
- *Designated all areas in the planning area as visual resource management Class I, II, III, or IV (see pages 38-39 and Table 2-4 in the FRMP). Implementation of these designations as part of future projects may require section 7 consultation.*

Management Concern 4. Energy and Minerals

- The Field Offices will encourage and foster the development of energy and mineral resources on BLM land without undue or unnecessary degradation to the other resources found on or near these lands.
- Review mining notices and plans of operation received under the surface management regulations (43 CFR 3809) for impacts to other resources. Mitigation and reclamation measures will be provided to prevent unnecessary or undue degradation of the environment. Reclamation bonds will be required consistent with current BLM policy.
- Manage the entry, sale, and lease of mineral and energy resources by following the proper regulations, withdrawals, no surface occupancy stipulations, and standard stipulations to protect areas of high and sensitive values.

- Withdraw ten areas from mineral entry to preserve important resource values (areas listed in Table 2-3 of the FRMP).
- Prohibit the sale of mineral materials in seven areas (9,960 acres) to preserve sensitive resources (see Table 2-5 in FRMP; ROD II).
- Sale of mineral materials (sand, gravel, etc.) and surface occupancy will not be permitted in areas with riparian vegetation (see Map 26 in FRMP).
- Issue mineral and energy leases with "no surface occupancy" in eleven areas (11,629 acres) to preserve sensitive resources (see Table 2-6 in FRMP; ROD II). Only the "no surface occupancy" portion of issuing leases has consultation covered to the project level in this BO. Other actions associated with issuing leases may require section 7 consultation.

Management Concern 5. Cultural Resources

- Manage cultural resources on BLM land within the planning area for the broad objectives of information potential, public values, and conservation. Actions include, among other actions, signing, controlling access, stabilization of sites, and inventory.

Management Concern 6. Soil Erosion

- The following objectives and actions will be implemented to resolve the Soil Erosion Management Concern.
 - o Reduce accelerated erosion.
 - o Restore eroded floodplains of the San Simon River and in the Bear Springs Flat area.
 - o Reduce silt and salts entering the Gila River from the San Simon River.
 - o Reduce non-point source pollution that could result from rangeland management and use activities.
- The following actions will be implemented to accomplish the soil erosion and salinity management objectives.
 - o Develop activity plans, where needed, to initiate rehabilitation of eroded areas.
 - o Construct Timber Draw Dam to continue efforts to rehabilitate eroded areas of the San Simon River.
 - o Continue reseeding grasses and riparian vegetation on restored areas behind erosion control structures.
- Manage livestock with fencing or other methods to protect these areas.
- Protect the eroded floodplain of the San Simon River through appropriate livestock management.

- Establish soil erosion studies at Hot Well Dunes to determine the effects of off-highway vehicle use.
- Limit off-highway vehicle use if erosion becomes unacceptable.
- Assess the land upstream of Oso Largo Dam to determine the need for maintenance of existing structures or the need for additional structures. Make all structures functional without adverse impacts to the Area of Critical Environmental Concern located in the upper end of the eroded area.
- Investigate methods to increase vegetation cover in the Bear Springs Flat area, without adversely affecting the Area of Critical Environmental Concern.
- Continue seasonal livestock use in the Bear Springs Flat area (refer to the Safford/Tucson Grazing BO for current and detailed management information).
- Cap or contain the flowing wells in the San Simon Watershed if salinity exceeds 3,000 ppm.

Management Concern 7. Vegetation

- Manage upland vegetation on BLM lands within the planning area for livestock use, watershed protection, reduction of non-point source pollution, threatened and endangered species protection, priority wildlife habitat, firewood, and other incidental human uses. Use best management practices and vegetation manipulation to achieve desired plant community management objectives. Treatments may include mechanical, chemical, and prescribed fire methods.
- *Identified four firewood cutting areas available to the public* (Page 45 in FRMP; ongoing firewood harvest in these areas is addressed to the project level), permitting up to 500 cords per year on BLM lands. Determine other areas appropriate for firewood cutting and the quantities available.
- Issue permits for vegetation products, other than firewood, as determined by public demand and on-site evaluation.

Management Concern 8. Water Resources

The following objectives and actions will be implemented to resolve the Water Resources Management Concern. These objectives are designed to support on-going programs (range, riparian, recreation, wildlife, etc.) while providing data to be used for future management decisions.

- The objective for management of groundwater is to conserve water for prudent resource management purposes. The following actions will be implemented to accomplish the groundwater management objective.
 - o Cap unusable or unsuitable wells to prevent contamination of aquifers and to contain highly saline water.

- o Restrict artesian flow to meet specific program needs.
- o Inspect and maintain water systems to prevent unnecessary loss of water.
- Initiate a groundwater study for the San Simon Watershed to determine the depth of the various aquifers, changes in the quantities of individual aquifers, the water quality of each aquifer, and availability of groundwater for BLM's resource management programs. Prepare a management plan for the use and conservation of water (quality and quantity).
- The objective for management of water quality is to maintain or enhance water quality at or above established standards for designated uses to meet management goals for each water source. BLM will adhere to Federal and State water quality laws and standards. The following actions will be implemented to accomplish the water-quality management objective.
 - o Support other resource programs in the implementation of this plan and monitor the effectiveness of planning decisions.
 - o Continue the existing water-quality testing program in the District (see Appendix 9).
 - o Initiate data collection where there is a suspected or known pollution threat or hazard to water quality.
 - o Develop an activity plan and initiate management actions needed to mitigate water quality degradation detected through monitoring. Implementation of this plan may require section 7 consultation.
 - o Develop a District Water Quality Monitoring Plan, including recommendations for Unique Waters nominations. Implementation of this plan may require section 7 consultation.
 - o Share data with other water-quality managing agencies.
- Evaluate Aravaipa Creek, Mescal Creek, Redfield Canyon, Swamp Springs Canyon, Hot Springs Canyon, and Bass Canyon to determine their suitability for Unique Waters designation. Nominate those that meet the required standards.
- Evaluate Turkey Creek, Deer Creek, and the Left Fork of Markham Creek (intermittent streams) for Unique Waters designation, if their flows become perennial. Nominate those that meet the required standards.
- Manage stream segments through BLM lands designated as Unique Waters to maintain or enhance water-quality standards, protect the associated resources, and use best management practices selected to reduce non-point source pollution that could result from rangeland management uses.
- Evaluate the long-term Districtwide resource management needs for ground and surface water.

- Evaluate Gila River, San Francisco River, Redfield Canyon, Hot Springs Canyon, Swamp Springs Canyon, Bass Canyon, Bonita Creek, and Mescal Creek to determine the quantities of in-stream flow (water rights) needed to meet resource management objectives. File with the State on the quantities needed to meet resource management objectives.
- Evaluate Turkey Creek, Deer Creek, Left Fork of Markham Creek, and Guadalupe Canyon (intermittent streams), if their flow becomes perennial, to determine the quantities of instream flow (water right) needed to meet resource management objectives. File with the State on the quantities needed to meet resource management objectives.
- Purchase water rights, when necessary, to protect threatened resource values.

Management Concern 9. Air Quality

- Manage the airshed over the BLM lands in the planning area as a Class II area unless designated as nonattainment areas or their classification is changed as the result of State procedures.
- All activities on BLM lands of the Field Offices will comply with the requirements of this management classification. The Field Offices' goal is to minimize unnecessary surface disturbance, rehabilitate eroding watersheds, coordinate prescribed fire programs with the Arizona Department of Environmental Quality, and continue operating the Oliver Knoll Atmospheric Deposition Monitoring Station.

Management Concern 10. Paleontological Resources

- Manage fossil resources on BLM land within the planning area to protect their scientific and public values.
- Prepare a paleontological resources management plan for the planning area to include activities aimed at protecting and managing representative Class I sites, preventing inadvertent damage, and providing opportunities for interpretation, education, and scientific research. Implementation of this plan may require section 7 consultation.
- Conduct field studies at Bear Springs Badlands, 111 Ranch, and Hot Well Dunes to inventory and monitor the fossil resources present and evaluate the condition of the resources and the effects of management actions on them.
- Prepare a detailed overview of the biological and geological history of the planning area, emphasizing the paleontological resources of the area.

San Pedro Riparian National Conservation Area

The principal concern of management is to protect and enhance the riparian ecosystem along the San Pedro River. Acquisition of the lands was and is primarily for their riparian or water-related values.

The following is a summary of major decisions made within the San Pedro Plan covering 47,668 acres of BLM land. See Appendix 2 in the BE and the San Pedro Plan for more detailed information.

1. General

- Continue inventories and studies as necessary to meet objectives determined in this document.
- Follow monitoring plans developed as a part of the San Pedro Plan (see Appendix 10 in the San Pedro Plan).
- Fence property boundaries to establish visual identification of the land ownership and reduce the probability of unauthorized use.
- Prepare environmental assessments to assess impacts of site-specific projects.
- Maintain property improvements that are needed for the administration of the area.

2. Recreation

- *Designated the entire area as a special recreation area.*
- Prepare project plans for all proposed facilities. Implementation of the plans may require section 7 consultation.
- Make the area available for recreation research.
- Allow commercial uses only if compatible with the management of the San Pedro.
- Prohibit off-road use by any type of vehicle. *Designated the area as limited to designated roads.*
- Develop parking lots, campgrounds, roads, trails, interpretive sites, day-use areas, vehicle pullouts, and/or other developments for public use in the following areas (see page 21 in the San Pedro Plan for more details).
 - o Develop facilities and interpretive displays in the Highway 90 area.
 - o Rebuild the San Rafael del Valle Road (Highway 90 to Hereford) for use as a motorized interpretive route and develop recreation sites.
 - o Develop a campground and other facilities in the Hereford area.
 - o *Developed a contact/interpretive facility, parking area, and picnic site in the Fairbank area.* Operation of these facilities is an ongoing action that is part of the proposed action.

- o Control access *and built an interpretive trail through the Presidio of Santa Cruz de Terrente site.* Use of the trail is an ongoing action that is part of the proposed action.
- o Restrict use *and built a display at the Boquillas Ranch.*
- o Develop a trail and associated improvements along the Babocomari River using the old railroad grade.
- o Develop a graveled road on the Boquillas Road between Fairbank and Charleston.
- o Develop road and recreation improvements on the Lewis Springs Road.
- o *Developed an interpretive site at Murray Springs.*
- o Develop an interpretive site at the Lehner Ranch.
- o Develop recreation improvements in the Charleston area.
- o At Palominas, develop a graded access road, and develop an interpretive highway pullout and picnic site.
- o Develop two to three dedicated outdoor environmental education field study areas of five to ten acres each.
- o Develop the recreational use of the existing railroad corridor.
- Overnight use is allowed by permit only.
- Allow dispersed recreation.
- Restrict campfires to designated locations.
- *Established firearms restrictions in certain areas.* Implementation of these restrictions is part of the proposed action.

3. Lands

- Authorize the acquisition of more lands for the San Pedro RNCA by mutual agreement via exchanges or purchases.
- Designate right-of-way corridor for major utilities at Charleston and Hereford.
- Evaluate other land use authorizations on a case-by-case basis.
- Restrict, maintain, and use existing right-of way, subject to stipulations that will protect resource values.
- Establish protective withdrawals for administrative and interpretive facilities as necessary for management of the area.

- Retain existing roads in the area for public and/or administrative use or close and rehabilitate them.

4. Water Resources

- Authorize water resource use only to the extent needed to achieve management objectives and protect water rights.
- Maintain water quality in accordance with State and Federal standards by implementing resource management actions.
- Plan activities to maintain existing surface and groundwater conditions.
- Follow all legal avenues to protect rights to surface and groundwater.
- Pump most of the irrigation wells only to protect potential water rights. Pump for an emergency use if a resource value becomes jeopardized.
- *Used one well on a short-term basis in one field for an experimental revegetation trial.*
- Close and cap unnecessary irrigation and non-irrigation wells.

5. Wildlife Habitat

- *Prepared a Habitat Management Plan for the NCA. Implementation of the plan is an ongoing action and part of the proposed action.*
- Manage terrestrial wildlife habitat to provide the best habitat for existing population levels of wildlife.
- Continue inventories and monitoring of terrestrial and aquatic vertebrates and habitats.
- Evaluate impacts of human use of the area on wildlife (including threatened and endangered species) and the riparian ecosystem. Minimize disturbance around important wildlife areas.
- Establish interpretation and environmental education programs on wildlife and habitat, with emphasis on the riparian ecosystem.
- Mitigate potential impacts to habitats to assure existing habitat diversity over time.
- Identify special management guidance to protect areas important for raptors and herons.
- Manage habitat through prescribed fire, plantings, installing watering sources, developing ponds and marshes, installing nest boxes, removal of non-native fish from existing ponds, and using non-irrigation wells in support of aquatic habitat.

6. Vegetation

- Prohibit firewood cutting (including the gathering of down and dead wood) within the San Pedro EIS area.
- Major vegetation improvement will be through natural processes. Abandoned farm fields may be used for experimental plantings or reseeded of native species. Some nonnative species presently found within the area may also be utilized.
- Authorize prescribed fires on a limited basis using prescriptions defined in the Fire Management Plan to improve vegetation or eliminate hazardous situations.
- Livestock grazing is prohibited in the RNCA for the life of the San Pedro Plan (through 2004), except for the 6,521 acres acquired when the RNCA was established. The acquired acres will continue for the term of the State grazing leases that were in place at the time of acquisition. Allotment categorization was changed from “Maintain” to “Improve” to intensively manage livestock on all allotments in the 6,521-acre area. If BLM proposes livestock grazing elsewhere in the RNCA in the future, consultation with this office will be conducted on that proposal, as needed.

7. Soils/Watershed

- Portions of existing berms and dikes along the eastern and western sides of the abandoned farm fields will be removed to allow natural drainages to reestablish.
- Side-channel erosion-control structures and watershed improvements will be provided, only if necessary, after approval of site-specific watershed project plans.

8. Fire

- Reduce the potential for damage to resources and structures within the area and to adjacent land owners’ properties. Do this by using fire breaks, both natural and constructed, as determined by resource and fire objectives. Emphasize the following areas:
 - o The southwestern portion of the area, where extensive fuels are within one mile of private dwellings.
 - o In the vicinity of the El Paso Natural Gas pipeline.
 - o Near any structures within the property.

9. Cultural Resources

- Preserve or enhance cultural resource values through management actions and the control of land uses.

- Authorize the preparation of a Cultural Resource Management Plan to allocate other cultural properties to scientific use, management use, public use, socio-cultural use, or conservation for future use. Implementation of this plan may require section 7 consultation.
- Manage most sites for their information potential through scientific studies.
- Manage a small number of sites for public values.
- Manage a few sites for conservation to protect and preserve representative samples of all the cultural resources in the area.

10. Paleontological Resources

- Manage all paleontological sites to preserve their scientific values and potential public use values.
- Inventory and monitor known sites and high potential areas.
- Protect significant paleontological resources by controlling other resources and land uses through avoidance, mitigation, and other measures. Collect significant fossils threatened by natural and human disturbance.

11. Minerals

- New mineral activities are prohibited in the RNCA by legislation. *Existing gravel operations outside the riparian area ceased at the expiration of the current lease (December 31, 1989).*

12. Visual

- Manage the RNCA's visual resources to preserve the outstanding scenery and to enhance areas impaired by human disturbances. *Visual resource management classes were designated.*

13. ACECs

- *The FRMP designated the three research natural area ACECs (St. David Cienega, San Pedro River and San Rafael, totaling 2,060 acres) that were recommended in the San Pedro Plan.*
- Apply the following management to these areas to preserve and enhance the identified special values:
 - o Prohibit developments and new rights-of-way.
 - o Encourage avoidance by recreation users.

- o Preserve and enhance vegetation communities.
- o Place signs where needed along the boundaries.
- o Control exotic vegetation.
- o Prohibit the introduction of non-native species.
- o Preclude public vehicular access.

14. Administrative Facilities

- Build an administrative facility at the Highway 90 location as part of the visitor contact and interpretive facility.
- Build a small facility at Fairbank to administer the northern end of the area.

15. Research

- Provide a facility at either Fairbank or the Highway 90 area for research in the natural and cultural sciences.

Conservation Measures

All species

- The BLM's compliance with the Endangered Species Act and NEPA policy will contribute to the conservation of the species.
- BLM will not jeopardize the continued existence of any species listed or proposed for listing as threatened or endangered.
- All proposed activity-level plans will be evaluated to prevent or mitigate any impacts that could degrade or destroy listed or proposed species and their designated or proposed critical habitat.
- All activity-level plans will be reviewed for section 7 compliance before becoming final.
- The potentially adverse effects of the FRMP will be tempered by legal guidelines that require the following: NEPA compliance and analysis, including threatened and endangered species evaluations, will be conducted for all future actions; compliance with the Endangered Species Act; avoidance of jeopardy situations; and promotion of recovery of listed and proposed species.
- The direction in the 'Arizona Standards for Rangeland Health and Guidelines for Grazing Administration' (effective August 21, 1995) will be incorporated in all plans affecting rangeland resources and grazing administration.

Southwestern willow flycatcher

- For new access roads, bridges, utility lines, etc., through riparian areas, perform southwestern willow flycatcher surveys at a level sufficient to determine presence or absence in areas of potential conflict (potential habitat and critical habitat). Prepare detailed mitigation in consultation with USFWS and other agencies and groups.
- For existing roads, trails, utility corridors, bridges, etc., through riparian areas (especially critical and potentially suitable habitat) perform needed maintenance with the least possible habitat disturbance. Do not permit maintenance during the breeding season except in emergencies.
- For any land action, including land disposal, exchange, and mineral/energy exploration and development, institute consultation in cases where the following conditions are met:
 - Critical or potentially suitable habitat for the southwestern willow flycatcher is present within the area influenced by the action, and
 - The action could affect portions of riparian areas (or areas that have the potential to support riparian vegetation) so as to reduce the foliage height, riparian plant cover, or foliage density; increase human disturbance; or influence other factors important to the southwestern willow flycatcher.
- Institute willow flycatcher surveys as part of the monitoring program for riparian areas in the FRMP area as a means of assessing willow flycatcher response to management actions. Adjust management practices to increase the population. Use the number of breeding individuals as an indicator of population response.
- BLM will continue to implement the list of actions for the southwestern willow flycatcher identified in the Safford/Tucson Grazing BO on Pages 59-60, applying them to not only livestock management, but to all management when applicable.

Huachuca water umbel

- For new access roads, bridges, and utility lines through riparian areas, perform surveys at a level sufficient to determine the presence or absence within the construction zone. In critical habitat avoid existing plants and all microsites that could support the Huachuca water umbel. Re-route trails and roads to avoid erosion and damage to critical habitat.
- Prepare detailed mitigation in consultation with U.S. Fish and Wildlife Service and other agencies and groups.
- For existing roads, trails, utility corridors, and bridges through riparian areas, perform needed maintenance with the least possible habitat disturbance. Replant sites that cannot be avoided. Avoid existing plants and all microsites in critical habitat that could support Huachuca water umbel. Re-route trails and roads to avoid erosion and damage to critical habitat.

- For any land action, including sand and gravel operations, rights-of way, and mineral/energy exploration and development, institute consultation in cases where the following conditions are met:
 - o Critical or potential habitat for Huachuca water umbel is present within the area influenced by the action, and
 - o The action could affect riparian stream banks that support or could support the species. Avoid existing plants and all microsites in critical habitat that could potentially support the Huachuca water umbel. Re-route trails and roads to avoid erosion and damage to critical habitat and individual plants.
- Institute Huachuca water umbel surveys as part of the monitoring program to assess the response of the species to management actions. Adjust management practices to increase the population. Use the density of plant patches per mile of stream bank as an indicator of population response.

Razorback sucker, loach minnow, and spikedace

- Mining plans will have mitigation and stipulations to avoid undue or unnecessary degradation.

STATUS OF THE SPECIES

The purpose of this section is to summarize the best available information regarding the current rangewide status of each species analyzed in this document. Therefore, this BO contains abbreviated assessments of the status of each species. We used the best available information in our analyses for each species. Additional information regarding each species is contained in the administrative record for this consultation and other sources of information cited for each species.

Southwestern Willow Flycatcher

The southwestern willow flycatcher (flycatcher) was listed as endangered, without critical habitat, on February 27, 1995 (U.S. Fish and Wildlife Service 1995). The designation of flycatcher critical habitat was published in the Federal Register on October 19, 2005 (U. S. Fish and Wildlife Service 2005).

A final recovery plan for the flycatcher was signed by the Fish and Wildlife Service's Region 2 Director on August 30, 2002, and was released to the public in March 2003. The Plan describes reasons for endangerment and the current status of the flycatcher, recovery actions, management needs, and recovery goals.

The flycatcher breeds in dense riparian habitats from sea level in California to just over 8,000 feet in Arizona and southwestern Colorado. Flycatchers primarily use coyote, Geyer's, and Gooding's willow, boxelder (*Acer negundo*), saltcedar (*Tamarix* sp.), Russian olive (*Elaeagnus angustifolia*), and live oak (*Quercus agrifolia*) for nesting. Other plant species less commonly

used for nesting include buttonbush (*Cephalanthus* sp.), black twinberry (*Lonicera involucrata*), cottonwood (*Populus* sp.), white alder (*Alnus rhombifolia*), blackberry (*Rubus ursinus*), and stinging nettle (*Urtica* sp.). Based on the diversity of plant species composition and complexity of habitat structure, four basic habitat types have been identified for the flycatcher: monotypic willow, monotypic exotic, native broadleaf dominated, and mixed native/exotic (Sogge *et al.* 1997).

Declining flycatcher numbers have been attributed to loss, modification, and fragmentation of riparian breeding habitat, loss of wintering habitat, and brood parasitism by the brown-headed cowbird (*Molothrus ater*) (Sogge *et al.* 1997, McCarthy *et al.* 1998). Habitat loss and degradation are caused by a variety of factors, including urban, recreational, and agricultural development, water diversion and groundwater pumping, channelization, dams, and livestock grazing. Fire is an increasing threat to flycatcher habitat (Paxton *et al.* 1996), especially in monotypic saltcedar vegetation (DeLoach 1991) and where water diversions and/or groundwater pumping desiccates riparian vegetation (Sogge *et al.* 1997). Flycatcher nests are parasitized by brown-headed cowbirds, which lay their eggs in the host's nest. Feeding sites for cowbirds are enhanced by the presence of livestock and range improvements such as watering areas and corrals, agriculture, urban areas, golf courses, bird feeders, and trash areas. These feeding areas, when in close proximity to flycatcher breeding habitat, especially when coupled with habitat fragmentation, facilitate cowbird parasitism of flycatcher nests (Harris 1991, Tibbitts *et al.* 1994).

While numbers have increased in Arizona in a few specific areas, distribution throughout the State has changed little. Soon after listing, following the 1996 breeding season, 145 territories were known to exist in Arizona. In 2002, 430 territories were detected; a statewide increase of 285 territories (Smith *et al.* 2003). Since listing, there has been an increase of 243 territories (75 to 318) at Roosevelt Lake and at San Pedro/Gila River confluence. The increase in flycatcher detections is due in part to increased survey effort.

Recovery and survival of the flycatcher depends not only on numbers of birds, but territories/sites that are well distributed (U.S. Fish and Wildlife Service 2002). Currently, population stability in Arizona is believed to be largely dependent on the presence of two large populations at Roosevelt Lake and the San Pedro/Gila River confluence. Therefore, the result of catastrophic events or losses of significant populations either in size or location could greatly change the status and survival prospects of the bird.

There are currently 243 known flycatcher breeding sites in California, Nevada, Arizona, Utah, New Mexico, and Colorado (all sites from 1993 to 2002 where a resident flycatcher has been detected) holding approximately 1,153 territories (Sogge *et al.* 2003). It is difficult to arrive at a grand total of flycatcher territories since not all sites are surveyed annually to determine the actual abundance of birds. Also, sampling errors may bias population estimates positively or negatively (e.g., incomplete survey effort, double-counting males/females, composite tabulation methodology, natural population fluctuation, and random events) and it is likely that the total breeding population of flycatchers fluctuates. Numbers have increased since the bird was listed, and some habitat remains unsurveyed; however, after nearly a decade of intense surveys, the existing numbers are consistent with the upper end of Unitt's (1987) estimate. Rangelwide, the

population is comprised of extremely small, widely-separated breeding groups including unmated individuals. For example, in Arizona, 63 percent (29/46) of the sites where flycatchers were found in 2001 (Smith *et al.* 2002) were comprised of five or fewer territories. In Arizona during the 2001 season, all but the “The Salt River Inflow” site at Roosevelt Lake had 20 pairs or fewer (Smith *et al.* 2002). Rangewide, 76 percent of all sites from 1993 to 2001 had five or fewer flycatcher territories present at the site (Sogge *et al.* 2002). Conversely, across the bird’s range, there are fewer than six sites with greater than 50 territories (Sogge *et al.* 2002).

The distribution of breeding groups is highly fragmented, and often separated by considerable distance. In Arizona, about a 30-mile straight-line distance exists between breeding flycatchers at Roosevelt Lake, Gila County, and the next closest territories on the Verde River, Yavapai, and Maricopa counties.

The large distances between breeding groups and small size of those populations reduces meta-population stability and increases the risks of local extirpation due to stochastic events, predation, cowbird parasitism, and other factors (U.S. Fish and Wildlife Service 2002). Conversely, having 40 to 50 percent of the entire subspecies at just three locations can also create great instability should catastrophic events occur that would remove or significantly reduce habitat suitability at those places. Flycatchers no longer occur (based upon most recent years survey data) at 65 of the 221 sites located and/or tracked rangewide since 1993 (Sogge *et al.* 2002). All but two of these sites had less than five flycatcher territories present. The two exceptions (PZ Ranch on San Pedro River and Colorado River Delta at Lake Mead) were destroyed by fire and lake inundation, respectively. However, many more than five territories are expected to be lost at Roosevelt Lake in the near future when lake inundation occurs (as of April 2005 Roosevelt Lake was at a record high elevation). Greater meta-population stability through developing larger sites in closer proximity to each other is an important management need (U.S. Fish and Wildlife Service 2002).

Approximately 120,824 acres of critical habitat was designated in various counties in Arizona, California, Nevada, New Mexico, and Utah. The final designation of flycatcher critical habitat identified the primary constituent elements for the southwestern willow flycatcher. They are:

1. Riparian habitat in a dynamic successional riverine environment for nesting, foraging, migration, dispersal, and shelter that comprises:
 - a. Trees and shrubs of various species.
 - b. Dense riparian vegetation with thickets of trees and shrubs ranging in height from 6 to 98 feet, with lower-stature thickets of 6 to 13 feet tall, found at higher elevation riparian forests; and tall-stature thickets found at middle- and lower-elevation riparian forests.
 - c. Areas of dense riparian foliage, at least from the ground level up to approximately 13 feet above ground, or dense foliage only at the shrub level, or as a low, dense tree canopy.

- d. Sites for nesting that contain a dense (50 to 100 percent) tree and/or shrub canopy (the amount of cover provided by tree and shrub branches measured from the ground) (i.e., a tree or shrub canopy with densities ranging from 50 percent to 100 percent).
 - e. Dense patches of riparian forests that are interspersed with small openings of open water or marsh or shorter/sparser vegetation, which create a mosaic that is not uniformly dense. Patch size may be as small as 0.25 acre or as large as 175 acres.
2. 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); beetles (Coleoptera); butterflies/moths and caterpillars (Lepidoptera); and spittlebugs (Homoptera).

Huachuca Water Umbel

We listed the Huachuca water umbel (*Lilaeopsis schaffneriana* var. *recurva*) as an endangered species on January 6, 1997 (U. S. Fish and Wildlife Service 1997). 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 (U. S. Fish and Wildlife Service 1999). The umbel is an herbaceous, semi-aquatic perennial plant with slender, erect leaves that grow from creeping rhizomes. The leaves are cylindrical, hollow with no pith, and have septa (thin partitions) at regular intervals. The yellow/green or bright green leaves are generally 0.04 to 0.12 inch in diameter and often 1 to 2 inches tall, but can reach up to 8 inches tall under favorable conditions. Three to ten very small flowers are borne on an umbel that is always shorter than the leaves. The fruits are globose, 0.06 to 0.08 inch in diameter, and usually slightly longer than wide (Affolter 1985). 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.

Huachuca water umbel has been documented from 28 sites in Santa Cruz, Cochise, and Pima counties, Arizona, and in adjacent Sonora, Mexico, west of the continental divide (Haas and Frye 1997, Saucedo 1990, Warren *et al.* 1989, Warren *et al.* 1991, Warren and Reichenbacher 1991, Hoffman and Swetek 2004). The plant has been extirpated from six of the 28 sites. The 22 extant sites occur in four major watersheds - San Pedro River, Santa Cruz River, Rio Yaqui, and Rio Sonora. All sites are between 3,500 and 6,500 feet in elevation.

Huachuca water umbel has an opportunistic strategy that ensures its survival in healthy riverine systems, cienegas, and springs. In upper watersheds that generally do not experience scouring floods, the umbel occurs in microsites where interspecific plant competition is low. At these sites, the umbel occurs on wetted soils interspersed with other plants at low density, along the periphery of the wetted channel, or in small openings in the understory. The upper Santa Cruz River and associated springs in the San Rafael Valley, where a population of Huachuca water umbel occurs, is an example of a site that meets these conditions. The types of microsites required by the umbel were generally lost from the main stems of the San Pedro and Santa Cruz rivers when channel entrenchment occurred in the late 1800s to early 1900s. Habitat on the San

Pedro River is recovering, and Huachuca water umbel has recently been found along short reaches of the main channel in the upper river, and at Bingham Cienega on the lower San Pedro.

In stream and river habitats, Huachuca water umbel can occur in backwaters, side channels, and nearby springs. After a flood, it can rapidly expand its population and occupy disturbed habitat until interspecific competition exceeds its tolerance. This response was recorded at Sonoita Creek in August 1988, when a scouring flood removed about 95 percent of the Huachuca water umbel population (Gori *et al.* 1990). One year later, the umbel had recolonized the stream and was again codominant with watercress (*Rorippa nasturtium-aquaticum*, Warren *et al.* 1991). The expansion and contraction of Huachuca water umbel populations appear to depend on the presence of “refugia” where the species can escape the effects of scouring floods, a watershed that has an unaltered hydrograph, and a healthy riparian community that stabilizes the channel.

Density of umbel plants and size of populations fluctuate in response to both flood cycles and site characteristics. Some sites, such as Black Draw, have a few sparsely distributed clones, possibly due to the dense shade of the even-aged overstory of trees, dense non-native herbaceous layer beneath the canopy, and deeply entrenched channel. The Sonoita Creek population occupies 14.5 percent of a 5,385 square foot patch of habitat (Gori *et al.* 1990). Some populations are as small as 11 to 22 square feet. The Scotia Canyon population, by contrast, has dense mats of leaves. Scotia Canyon contains one of the larger Huachuca water umbel populations, occupying about 57 percent of the 4,756 foot perennial reach (Gori *et al.* 1990, Falk and Warren 1994).

While the extent of occupied habitat can be estimated, the number of individuals in each population is difficult to determine because of the intermeshing nature of the creeping rhizomes and the predominantly asexual mode of reproduction. A “population” of Huachuca water umbel may be composed of one or many genetically distinct individuals.

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 cienegas when above-average precipitation and flooding occurred in the late 1800s and early 1900s (Bahre 1991, Bryan 1925, Dobyns 1981, Hastings and Turner 1980, Hendrickson and Minckley 1984, Martin 1975, Sheridan 1986, Webb and Betancourt 1992, Hereford 1993). A major earthquake near Batepito, Sonora, approximately 40 miles south of the upper San Pedro Valley, resulted in land fissures and changes in groundwater elevation and spring flow, and may have preconditioned the San Pedro River channel for rapid flood-induced entrenchment (Hereford 1993, Geraghty and Miller, Inc. 1995). These events contributed to long-term or permanent degradation and loss of cienega and riparian habitat on the San Pedro River and throughout southern Arizona and northern Mexico. Much habitat of the Huachuca water umbel and other cienega-dependent species was presumably lost at that time.

Wetland degradation and loss continues today. Human activities such as groundwater overdrafts, surface water diversions, impoundments, channelization, improper livestock grazing, chaining, agriculture, mining, sand and gravel operations, road building, non-native species introductions, urbanization, wood cutting, and recreation all contribute to riparian and cienega habitat loss and

degradation in southern Arizona. The local and regional effects of these activities are expected to increase with the increasing human population.

Dredging extirpated the Huachuca water umbel from House Pond, near the extant population in Black Draw (Warren *et al.* 1991). The umbel population at Zinn Pond in St. David near the San Pedro River was probably lost when the pond was dredged and deepened. This population was last documented in 1953 (Warren *et al.* 1991).

Livestock grazing can affect the umbel through trampling and changes in stream hydrology and loss of stream bank stability; however, existence of the umbel appears to be compatible with well-managed livestock grazing (U.S. Fish and Wildlife Service 1997). In overgrazed areas, stream headcutting can threaten cienegas where the umbel occurs. Such headcutting occurs at Black Draw just south of the international boundary and at Los Fresnos, in the San Rafael Valley, Sonora, Mexico. Groundwater pumping has eliminated habitat in the Santa Cruz River north of Tubac, and threatens habitat in the San Pedro River. Portions of the San Pedro River occupied by the umbel could be dewatered within a few years unless measures are implemented very soon to halt or mitigate groundwater pumping in the Sierra Vista-Fort Huachuca area (ASL 1998). Severe recreational impacts in unmanaged areas can compact soils, destabilize stream banks, and decrease riparian plant density, including densities of the Huachuca water umbel. Populations in Bear Canyon in the Huachuca Mountains have been impacted by trampling and off-highway vehicles.

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 umbel is unclear; however, in certain microsites, the non-native Bermuda grass (*Cynodon dactylon*) may directly compete with the umbel. Bermuda grass forms a thick sod in which many native plants are unable to establish. Watercress is another non-native plant now abundant along perennial streams in Arizona. It is successful in disturbed areas and can form dense monocultures that can out-compete Huachuca water umbel populations.

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. Populations are in most cases isolated, as well, which make the chance of natural recolonization after extirpation less likely. Small populations are also subject to demographic and genetic stochasticity, which increase the probability of population extirpation (Shafer 1990, Wilcox and Murphy 1985).

Critical Habitat

The following areas are designated as critical habitat for Huachuca water umbel: 1.25 mi. of Sonoita Creek, 2.7 mi. of the Santa Cruz River, 3.4 mi. of Scotia Canyon, 3.8 mi. of Garden

Canyon, and 33.7 mi. of the San Pedro River. There are other smaller reaches of streams on the Coronado National Forest that are included in the critical habitat designation.

The primary constituent elements identified in the final rule (U. S. Fish and Wildlife Service 1999) as necessary for the survival and recovery of the Huachuca water umbel include, but are not limited to, the habitat components which provide the following:

- Sufficient perennial base flows to provide a permanently wetted substrate for growth and reproduction of Huachuca water umbel;
- A stream channel that is stable and subject to periodic flooding that provides for rejuvenation of the riparian plant community and produces open microsites for water umbel expansion;
- A riparian plant community that is stable over time and in which non-native species do not exist or are at a density that has little or no adverse effect on resources available for water umbel growth and reproduction; and
- Refugial sites in each watershed and in each stream reach, including but not limited to springs or backwaters of mainstem rivers that allow each population to survive catastrophic events and recolonize larger areas.

New Mexico Ridge-nosed Rattlesnake

We listed the New Mexico ridge-nosed rattlesnake (NMRR) (*Crotalus willardi obscurus*) as a threatened species with critical habitat on August 4, 1978, (U. S. Fish and Wildlife Service 1978). Critical habitat was also designated in Bear, Spring, and Indian canyons of the Animas Mountains from 6,048-8,320 feet elevation.

NMRR is a small (just over two feet total length) montane species known only from the Animas Mountains, Hidalgo County, New Mexico; Peloncillo Mountains, Hidalgo County, New Mexico, and Cochise County, Arizona; and the Sierra San Luis, Sonora and Chihuahua, Mexico (Campbell *et al.* 1989, Painter 1995, Degenhardt *et al.* 1996, Keegan *et al.* 1999). At the time of listing, this subspecies was not known to occur in the Peloncillo Mountains. *Crotalus willardi obscurus* is one of five subspecies of the ridge-nosed rattlesnake found from montane areas of southeastern Arizona and southwestern New Mexico, south through the Sierra Madre to Zacatecas, Mexico. The subspecies was first documented in the Arizona portion of the Peloncillo Mountains on October 24, 1996. *C. w. obscurus* may also occur in the Sierra Pulpita in Chihuahua (Barker 1991).

Crotalus willardi obscurus is an inhabitant of insular woodlands that were more widespread and continuous during Pleistocene glaciation events (Maldonado-Koerdell 1964, Barker 1992, Van Devender 1995). A Pleistocene fossil *Crotalus willardi* from the San Pedro River Valley (Mead 1975) suggests NMRRs tracked the distribution of the woodlands. When climates warmed and became drier, the ranges of this and other montane woodland reptiles, such as *Elgaria kingii*, *Eumeces callicephalus*, *Phrynosoma douglasii*, presumably contracted with that of the woodland communities and are now isolated on mountain tops in the Madrean region. Isolation and

subsequent evolution have contributed to subspecific differences within *Crotalus willardi* (Barker 1992). *Crotalus willardi obscurus* has been found in steep, rocky canyons with intermittent streams or on talus slopes at elevations ranging from approximately 5,200-8,500 feet (Campbell *et al.* 1989, Barker 1991, Painter 1995, Degenhardt *et al.* 1996, A. Holycross, Arizona State University, pers. comm., 1997), and likely occurs as low as 5,000 feet in the Peloncillo Mountains (Holycross 1999).

The subspecies is found primarily in areas of Madrean evergreen woodland and Petran montane coniferous forest (Brown 1982, Pase and Brown 1982). Dominant vegetation characterizing the habitat of this subspecies includes several species of oak (*Quercus* spp.), Douglas fir (*Pseudotsuga menziesii*), Apache pine (*Pinus engelmannii*), Chihuahua pine (*P. leiophylla* var. *chihuahuana*), Arizona madrone (*Arbutus arizonica*), manzanita (*Arctostaphylos pungens*), and grasses (Degenhardt 1972, Barker 1991, Degenhardt *et al.* 1996, Holycross 1998). Access to rock shelters with moderate interstitial spaces is probably a key habitat component (Barker 1991); however, the subspecies also uses perennial bunch grasses for cover (Painter 1995). NMRRs apparently move less frequently, move relatively short distances, and show high fidelity to specific rock shelter sites as compared to other rattlesnake species (Barker 1991, Holycross 1995a and 1995b). The highest rates of snake surface activity occur from July through October.

Females mate in summer or fall, and ovulation and fertilization probably occurs early the subsequent spring, followed by a 4-5 month gestation. Young snakes are live-born probably in late July through August (Holycross and Goldberg 2001). Mean litter size is 5.4; litter sizes for *C. willardi* range from 2-9 (Applegarth 1980, Holycross and Goldberg 2001). Fecal samples from 246 NMRRs and a literature record identified 95 identifiable prey species. Juvenile snakes primarily feed on spiny lizards (*Sceloporus* sp.) and centipedes (*Scolopendra* spp.), and some juveniles exhibit yellow tails that may be used to lure prey (Holycross 2000). Adults prey mostly on small mammals, spiny lizards, and passerine birds (Holycross *et al.* 2002). Based on more limited samples, other workers have come to similar conclusions regarding the diet of *C. w. obscurus* (Applegarth 1980, Barker 1991).

The subspecies occurs in three (or more), small disjunct populations. Encounter rates by experienced herpetologists suggest the densest populations may occur in portions of the Sierra San Luis, with comparatively moderate and low densities in the Animas and Peloncillo mountains, respectively (Holycross 1998). Densities probably vary greatly within mountain ranges, and encounter rates may not be indicative of population densities. Surveys for this subspecies in the Peloncillo Mountains require great effort and intensity, resulting in about 33 person-days per sighting, on the average, to locate a specimen (Smith *et al.* 2001). The viability of these small disjunct populations is sensitive to habitat destruction or modification, and collection. After publication of the Animas locality in 1961 (Bogert and Degenhardt 1961), the area was reportedly heavily collected. Harris and Simmons (1976) reported encountering 15 collectors from six States during August 1974 in the Animas Mountains. The U.S. Fish and Wildlife Service (1985) estimated that as many as 130 NMRR may have been collected in the Animas Mountains between 1961 and 1974. Collection during this period may have significantly affected the Animas population (Harris and Simmons 1976, U.S. Fish and Wildlife Service 1985). The Animas Mountains are privately owned, access to habitat areas is now strictly controlled, and the *C. w. obscurus* population there is now protected from collection.

The majority of the subspecies' suitable habitat in the Peloncillo Mountains is managed by the Coronado National Forest (CNF) and the BLM and is open to public use, providing greater opportunities for illegal collection.

Fire is an important threat to the subspecies and its woodland habitat (Smith *et al.* 2001, Barker 1991). Catastrophic, stand-replacing fire occurred in the snake's habitat in the Animas Mountains in 1989 (Swetnam and Baisan 1996), and in the Sierra San Luis in 1989 (Barker 1991) and before 1952 (Marshall 1957). The 1997 Maverick prescribed fire in the Peloncillo Mountains escaped containment and burned woodlands at high intensities in two of the 12 areas where *C. w. obscurus* had been observed in that mountain range. However, the snake persists at one site in the Sierra San Luis that burned catastrophically in 1989. Overgrazing can result in negative effects for the subspecies (U.S. Fish and Wildlife Service 1985, 1999), due to reduction in snake hiding cover, prey cover, and habitat reduction and alteration. Mining, commercial and recreational development, and logging practices remain potential threats (U.S. Fish and Wildlife Service 1985). Jim Jarchow (pers. comm. in Johnson [1983]) found that *C. w. willardi* suffers from a variety of diseases and pathogenic organisms; however, there is no evidence documenting that NMRR populations are threatened by disease (U.S. Fish and Wildlife Service 1985). Relatively small litter size and long female reproductive cycles suggest that NMRR populations are not capable of rapid growth, making them particularly sensitive to factors causing population decline (Holycross 2001, Holycross and Goldberg 2001).

Further information on the taxonomy, range, distribution, biology, and threats to the NMRR can be found in Applegarth (1980), Barker (1992, 1991), Campbell *et al.* (1989), Degenhardt (1972), Degenhardt *et al.* (1996), Johnson (1983), Painter (1995), Holycross *et al.* (2002), Holycross (2000, 1998, 1996, 1995a & b), Holycross and Douglas (1997), Holycross and Goldberg (2001), and Smith *et al.* (2001).

Chiricahua Leopard Frog

We listed the Chiricahua leopard frog (CLF) as a threatened species without critical habitat on June 13, 2002 (U. S. Fish and Wildlife Service 2002). We included a special rule to exempt operation and maintenance of livestock tanks on non-Federal lands from the section 9 take prohibitions of the Act. A draft recovery plan was completed in April 2006 (U.S. Fish and Wildlife Service 2006) and is expected to be finalized early in 2007. This frog is distinguished from other members of the *Rana pipiens* complex by a combination of distinctive morphological and genetic characters, and a distinctive call (Platz and Mecham 1979, Davidson 1996, Stebbins 2003). Threats to CLF include predation by nonnative organisms, especially bullfrogs (*Rana catesbeiana*), fish (including fish in the family Centrarchidae, such as *Micropterus* spp. and *Lepomis* spp.), and crayfish (*Orconectes virilis* and possibly others); 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. CLF has disappeared from more than 75 percent of its historical localities (Clarkson and Rorabaugh 1989, Jennings 1995, Rosen *et al.* 1996, Sredl *et al.* 1997, Painter 2000, Service files). Loss of CLF populations is part of a pattern of global

amphibian decline, suggesting other regional or global causes of decline may be important as well (Carey *et al.* 2001).

The CLF is an inhabitant of cienegas, pools, livestock tanks, lakes, reservoirs, streams, and rivers at elevations of 3,281 to 8,890 feet in central and southeastern Arizona; west-central and southwestern New Mexico; and in Mexico, northern Sonora, and the Sierra Madre Occidental of Chihuahua (Platz and Mecham 1984, Degenhardt *et al.* 1996, Sredl *et al.* 1997, Sredl and Jennings 2005). Reports of CLF from the State of Aguascalientes (Diaz and Diaz 1997) are questionable. The distribution of CLF south of central Chihuahua is unclear due to limited survey work and the presence of closely related taxa (especially *Rana montezumae*) in the southern part of the range of the CLF. In New Mexico, of sites occupied by CLFs 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 remaining locations are 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).

Northern populations of the CLF along the Mogollon Rim and in the mountains of west-central New Mexico are disjunct from those in southeastern Arizona, southwestern New Mexico, and Mexico. Recent genetic analyses support describing the northern populations as a distinct species (Benedict and Quinn 1999, Platz and Grudzien 1999, Goldberg *et al.* 2004). Goldberg *et al.* (2004) present evidence that *R. subaquavocalis* (Ramsey Canyon leopard frog) and *R. chiricahuensis* may be conspecific.

Die-offs of CLFs were first noted in former habitats of the Tarahumara frog (*Rana tarahumarae*) in Arizona at Sycamore Canyon in the Pajarito Mountains (1974) and Gardner Canyon in the Santa Rita Mountains (1977-78) (Hale and May 1983). From 1983-1987, Clarkson and Rorabaugh (1989) found CLFs at only two of 36 Arizona localities that had supported the species in the 1960s and 1970s. Two new populations were reported. During subsequent extensive surveys from 1994-2001, the CLF was found at 87 sites in Arizona, including 21 northern localities and 66 southern localities (Sredl *et al.* 1997, Rosen *et al.* 1996, Service files). In New Mexico, the species was found at 41 sites from 1994-1999; 31 of those were verified extant during 1998-1999 (Painter 2000). During May-August 2000, the CLF was found extant at only eight of 34 sites where the species occurred in New Mexico during 1994-1999 (C. Painter, pers. comm. 2000). The status of the species in Mexico is unknown.

The species is still extant in most major drainages in Arizona and adjacent areas of 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 (Painter 2000, Sredl *et al.* 1997, Service files). However, it has not been found recently in many rivers, valleys, and mountain 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, no recent records (1995 to the present) exist for the following mountain ranges or valleys: Pinaleno Mountains, Peloncillo Mountains, Sulphur Springs Valley, and Huachuca Mountains. Moreover, the species is now absent from all but one

of the southeastern Arizona valley bottom cienega complexes. In many of these regions, CLFs were not found for a decade or more despite repeated surveys. Recent surveys suggest that the species may have recently disappeared from some of the major drainages in New Mexico (R. Jennings pers. comm. 2004).

Disruption of metapopulation dynamics is likely an important factor in regional loss of populations (Sredl *et al.* 1997, Sredl and Howland 1994). CLF populations are often small and habitats are dynamic, resulting in a relatively low probability of long-term population persistence. Historically, populations were more numerous and closer together. If populations were lost due to drought, disease, or other causes, extirpated sites could be recolonized via immigration from nearby populations. As numbers of populations declined, populations became more isolated and were less likely to be recolonized if extirpation occurred. Also, most of the larger source populations along major rivers and in cienega complexes have disappeared.

The dispersal abilities of CLFs are key to determining the likelihood that suitable habitats will be colonized from a nearby extant population. Evidence exists to show substantial movements of leopard frogs and passive movement of tadpoles along stream courses. The maximum distance moved by a radio-telemetered Chiricahua leopard frog in New Mexico was 2.2 miles in one direction (R. Jennings, C. Painter, pers. comm. 2004). In 1974, Frost and Bagnara (1977) noted passive or active movement of Chiricahua and Plains (*Rana blairi*) leopard frogs for 5 miles or more along West Turkey Creek in the Chiricahua Mountains. In August 1996, Rosen and Schwalbe (1998) found up to 25 young adult and subadult CLFs at a roadside puddle in the San Bernardino Valley, Arizona; they believed that the only possible origin of these frogs was a stock tank located 3.4 miles away. Rosen *et al.* (1996) found small numbers of CLFs at two locations in Arizona that supported large populations of nonnative predators; the likely source of these animals was populations 1.2-4.3 miles distant. Streams are important dispersal corridors for young northern leopard frogs (Seburn *et al.* 1997). Rainfall or humidity may be an important factor in dispersal because odors carry well in moist air, making it easier for frogs to find other wetland sites (Sinsch 1991).

Within the last decade, a chytridiomycete skin fungus (*Batrachochytrium dendrobatidis*) has been recognized as an important contributor to global declines of frogs, toads, and salamanders (Speare and Berger 2000, Longcore *et al.* 1999, Berger *et al.* 1998, Daszak 2000, Hale 2001). Recently, retrospective analysis revealed presence of chytridiomycosis in African clawed frogs (*Xenopus laevis*) dating to 1938 (Weldon *et al.* 2004). Further evidence showed the disease was a stable endemic in southern Africa for at least 23 years before any chytrid-positive amphibian specimen was found outside of that region. African clawed frogs were exported from Africa for use in human pregnancy testing beginning in the 1930s. Weldon *et al.* (2004) suggest that Africa is the origin of the disease and that international trade in African clawed frogs was the means of disease dissemination. In Arizona, chytrid infections have been reported from four populations of CLFs (M. Sredl, Arizona Game and Fish Department, pers. comm. 2000), as well as populations of other several other frogs and toads (Bradley *et al.* 2002, Hale 2001, Davidson *et al.* 2000, Sredl and Caldwell 2000, Morell 1999). In New Mexico, chytridiomycosis was identified in a declining population near Hurley, and patterns of decline at 3 other populations are consistent with chytridiomycosis (R. Jennings, pers. comm. 2004). Most populations in the

Deep Creek Divide area of New Mexico were extirpated in 2003, probably due to chytridiomycosis (R. Jennings, pers. comm. 2004).

The fungus does not have an airborne spore, so it must spread via other means. Amphibians in the international pet trade (Europe and USA), outdoor pond supplies (USA), zoo trade (Europe and USA), laboratory supply houses (USA), and species recently introduced (*Bufo marinus* in Australia and bullfrog in the USA) have been found infected with chytrids, suggesting human-induced spread of the disease (Daszak 2000, Mazzoni *et al.* 2003). Free-ranging healthy bullfrogs with low-level chytridiomycosis infections have been found in southern Arizona (Bradley *et al.* 2002). Tiger salamanders and bullfrogs can carry the disease without exhibiting clinically significant or lethal infections. When these animals move, or are moved by people, among aquatic sites, chytridiomycosis may be carried with them (Collins *et al.* 2003). Other native or nonnative frogs may serve as disease vectors or reservoirs of infection, as well (Bradley *et al.* 2002). If chytrids were introduced to the Southwest via escaped or released African clawed frogs, then the disease may have spread across the landscape by human introductions or natural movements of secondarily-infected American bullfrogs, tiger salamanders, leopard frogs, or other anurans.

Chytrids could also be spread by people (and terrestrial animals) moving among various tanks and/or by personnel sampling aquatic habitats (Halliday 1998). The fungus can exist in water or mud and could be spread by wet or muddy boots, vehicles, cattle, and other animals moving among aquatic sites, or during scientific sampling of fish, amphibians, or other aquatic organisms. We and the Arizona Game and Fish Department use preventative measures to ensure the disease is not spread by aquatic sampling methods.

Numerous studies indicate that declines and extirpations of CLFs are at least in part caused by predation and possibly competition by nonnative organisms, including fish in the family Centrarchidae, bullfrogs, tiger salamanders (*Ambystoma tigrinum mavortium*), crayfish, and several other species of fish (Fernandez and Rosen 1996; 1998; Rosen *et al.* 1994; 1996; Snyder *et al.* 1996; Fernandez and Bagnara 1995; Sredl and Howland 1994; Clarkson and Rorabaugh 1989). For instance, in the Chiricahua region of southeastern Arizona, Rosen *et al.* (1996) found that almost all perennial waters investigated that lacked introduced predatory vertebrates supported CLFs. All waters except three that supported introduced vertebrate predators lacked CLFs. Sredl and Howland (1994) noted that CLFs were nearly always absent from sites supporting bullfrogs and nonnative predatory fish. Rosen *et al.* (1996) suggested further study was needed to evaluate the effects of mosquitofish, trout, and catfish on CLF presence.

Actions that result in changes to the water and structural quality and quantity of the leopard frog's habitats can result in negative impacts on the species. These actions include wildfire suppression, prescribed fire, wildland fire use, road management activities, recreational use, water extraction, and livestock grazing among other actions. Some of these actions in habitat and upslope may result in soil or ash depositing in occupied waters, decreasing the quantity or quality of water, and reducing riparian vegetation. The inflow of ash and sediment into a water body is capable of smothering eggs and tadpoles, resulting in a change in numbers of individuals. Sediment and ash flow can also inhibit respiration in macroinvertebrates, resulting in reduced density and composition of this primary food source for the CLFs. A reduction in the amount of

prey can ultimately affect leopard frog numbers and reproduction. The lack of vegetation in and upslope of habitat may result in less dependable water quantity and other structural characteristics that CLFs may require. These indirect effects have the capability of affecting the numbers and reproduction of the species and may result in a change in its distribution, if isolated populations are locally extirpated and recolonization from adjacent sites is not feasible.

Additional information about the CLF can be found in Painter (2000), Sredl *et al.* (1997), Jennings (1995), Degenhardt *et al.* (1996), Rosen *et al.* (1994, 1996), Sredl and Howland (1994), Platz and Mecham (1979, 1984), Sredl and Jennings (2005), and U.S. Fish and Wildlife Service (2006).

Razorback Sucker

The razorback sucker was listed as an endangered species October 23, 1991 (U.S. Fish and Wildlife Service 1991). The Razorback Sucker Recovery Plan was released in 1998 (U.S. Fish and Wildlife Service 1998). The Recovery Plan was updated with the Razorback Sucker Recovery Goals in 2002 (U.S. Fish and Wildlife Service 2002)

Critical habitat was designated in 15 river reaches in the historical range of the razorback sucker on March 21, 1994 (U. S. Fish and Wildlife Service 1994). Critical habitat included portions of the Colorado, Duchesne, Green, Gunnison, San Juan, White, and Yampa rivers in the Upper Colorado River Basin, and the Colorado, Gila, Salt, and Verde rivers in the Lower Colorado River Basin.

The razorback sucker was once abundant in the Colorado River and its major tributaries throughout the Basin, occupying 3,500 miles of river in the United States and Mexico (U.S. Fish and Wildlife Service 1993). Records from the late 1800s and early 1900s indicated that the species was abundant in the lower Colorado and Gila river drainages (Krisch 1889, Gilbert and Scofield 1898, Minckley 1983, Bestgen 1990).

Since 1997, significant new information on recruitment to the wild razorback sucker population in Lake Mead has been developed (Holden *et al.* 2000) that indicates some degree of successful recruitment is occurring. This degree of recruitment has not been documented elsewhere in the species' remaining populations.

Adult razorback suckers use most of the available riverine habitats, although there may be an avoidance of whitewater type habitats. Main channel habitats tend to be of low velocity such as pools, eddies, nearshore runs, and channels associated with sand or gravel bars (Bestgen 1990). Adjacent to the main channel, backwaters, oxbows, sloughs, and flooded bottomlands are also used by this species. From studies conducted in the upper Colorado River basin, habitat selection by adult razorback suckers changes seasonally. They move into pools and slow eddies from November through April; into runs and backwaters during May; into backwaters, eddies, and flooded gravel pits during June; and into runs and pools from July through October. In early spring, adults move into flooded bottomlands. They use relatively shallow water (ca. 3 feet deep) during spring and deeper water (5-6 feet) during winter.

Data from radio-telemetered razorback suckers in the Verde River showed they used shallower areas and slower velocities than in the upper basin. They avoided depths <1.3 feet, but selected depths between 2.0 and 3.9 feet, which likely reflected a reduced availability of deeper waters compared to the larger upper basin rivers. However, use of slower velocities (mean = 0.1 foot/sec) may have been an influence of rearing in hatchery ponds. Similar to the upper basin, razorback suckers were found most often in pools or runs over silt substrates, and avoided substrates of larger material (Clarkson *et al.* 1993).

Habitat needs of larval and juvenile razorback suckers are reasonably well known. In reservoirs, larvae are found in shallow backwater coves or inlets (U.S. Fish and Wildlife Service 1998). In riverine habitats, captures have involved backwaters, creek mouths, and wetlands. These environments provide quiet, warm water where there is a potential for increased food availability. During higher flows, flooded bottomland and tributary mouths may provide these types of habitats.

Razorback sucker diet varies depending on life stage, habitat, and food availability. Larvae feed mostly on phytoplankton and small zooplankton, and in riverine environments, on midge larvae. The diet of adults taken from riverine habitats consisted chiefly of immature mayflies, caddisflies, and midges, along with algae, detritus, and inorganic material (U.S. Fish and Wildlife Service 1998).

The primary constituent elements determined necessary for razorback sucker survival include, but are not limited to:

Water – This includes a quantity of water of sufficient quality (i.e. temperature, dissolved oxygen, lack of contaminants, nutrients, turbidity, etc) that is delivered to a specific location in accordance with a hydrological regime that is required for a particular life stage.

Physical Habitat – This includes areas of the Colorado River system that are inhabited or potentially habitable by fish for use for spawning, nursery, feeding, and rearing, or corridors between these areas. In addition to river channels, these areas also include bottomlands, side channels, secondary channels, oxbows, backwaters, and other areas in the 100-year flood plain, which when inundated provide spawning, nursery, feeding, and rearing habitats, or access to these habitats.

Biological -- Food supply, predation, and competition are important elements of the biological environment. Food supply is a function of nutrient supply, productivity, and availability to each life stage of the species. Predation and competition, although considered normal components of this environment, are out of balance due to the introduced non-native fish species in many areas.

The appropriate and desirable level of these factors may vary seasonally and is highly influenced by site-specific circumstances. Therefore, assessment of the presence/absence, level, or value of the constituent elements must include consideration of the season of concern and the characteristics of the specific location. The constituent elements are not independent of each other and must be assessed holistically, as a functioning system, rather than individually. In addition, the constituent elements should be assessed in relation to larger habitat factors, such as

watershed, floodplain, and streambank conditions, stream channel geomorphology, riparian vegetation, hydrological patterns, and overall aquatic faunal community structure.

Razorbacks persist on the Colorado River in Lakes Mead, Mohave, and Havasu and in the mainstem between the reservoirs and downstream of Lake Havasu. In the Gila, Salt, and Verde rivers of interior Arizona, stocking activities have created small populations but no recruitment of wild-born young has been observed in these populations. The wild adults in the Mohave population were estimated at 9,087 individuals in 1999 with an additional 3,104 repatriated sub-adults captured on the spawning grounds with the adults (Pacey and Marsh 1999). The Lake Mead population is estimated at 100-200 individuals (Welker and Holden 2003). Population estimates of wild or stocked individuals for other Colorado River sites are not available, but populations are very small.

Spawning by razorback suckers has been documented in Lakes Mead and Mohave. Large recruitment events after Lakes Mead and Mohave filled (in the 1930's and 1950's respectively), created the adult populations found there (summarized in Minckley *et al.* 1991). Recruitment into the Lake Mohave population has not occurred since that time, resulting in the decline from an estimated 60,000 adults in the 1980s to 2,698 in 2002 (Marsh *et al.* 2003) and an estimated 475 fish in 2004 (Marsh 2004). Wild populations in Lake Havasu and the river between Parker and Imperial dams are extremely small, and past stocking activities with marked fish, especially in the Parker Dam to Imperial Dam reach, confuse the identification of fish captured there. Recent declines in wild fish numbers are a result of the old adults that comprise these populations dying of old age. None of the populations are confirmed to be self-sustaining, with recent recruitment of wild-bred young only documented in Lake Mead (Welker and Holden 2003). Captures of small razorback suckers in a canal below Parker Dam may also represent some recruitment occurring in this area. The normal pattern seen for razorback populations in reservoirs is to die out approximately 40-50 years after formation of the reservoir as fish reach the end of their life span.

Loach Minnow and Spikedace

Loach minnow and spikedace were listed as threatened species in 1986 (U.S. Fish and Wildlife Service 1986a, b). The loach minnow and spikedace recovery plans were completed in 1991 (U.S. Fish and Wildlife Service 1991a, b). Critical habitat was first designated in 1994, but that designation and a subsequent designation were set aside by court order. Critical habitat was re-proposed for loach minnow and spikedace on December 20, 2005 (U.S. Fish and Wildlife Service 2005). The proposal is to designate approximately 633 river miles of critical habitat in New Mexico and Arizona. We anticipate completion of this designation in December 2006.

Our information indicates that, rangewide, more than 250 consultations have been completed or are underway for actions affecting loach minnow and spikedace. One-third of these opinions concerned the effects of grazing. One-third focused on roads, bridges, or agency planning. The remaining third dealt with timber harvest, fire, flooding, recreation, realty, animal stocking, water development, recovery, and water quality issues.

Although loach minnow and spikedace are currently listed as threatened, we have found that a petition to uplist the species to endangered status is warranted. A reclassification proposal is pending; however, work on it is precluded due to work on other higher priority listing actions (U.S. Fish and Wildlife Service 1994).

Loach minnow is a small, slender, elongate fish with markedly upwardly-directed eyes (Minckley 1973).). Historical range of loach minnow included the basins of the Verde, Salt, San Pedro, San Francisco, and Gila rivers (Minckley 1973, Sublette *et al.* 1990). Habitat destruction plus competition and predation by nonnative species have reduced the range of the species by about 85 percent (Miller 1961, Williams *et al.* 1985, Marsh *et al.* 1989). Loach minnow remains in limited portions of the upper Gila, San Francisco, Blue, Black, Tularosa, and White rivers and Aravaipa, Turkey, Deer, Eagle, Campbell Blue, Dry Blue, Pace, Frieborn, Negrito, Whitewater and Coyote creeks in Arizona and New Mexico (Barber and Minckley 1966, Silvey and Thompson 1978, Propst *et al.* 1985, Propst *et al.* 1988, Marsh *et al.* 1990, Bagley *et al.* 1995, USBLM 1995, Bagley *et al.* 1996). Loach minnow is a bottom-dwelling inhabitant of shallow, swift water over gravel, cobble, and rubble substrates (Rinne 1989, Propst and Bestgen 1991). Loach minnow uses the spaces between, and in the lee of, larger substrate for resting and spawning (Propst *et al.* 1988; Rinne 1989). It is rare or absent from habitats where fine sediments fill the interstitial spaces (Propst and Bestgen 1991). Some studies have indicated that the presence of filamentous algae may be an important component of loach minnow habitat (Barber and Minckley 1966). Loach minnow feed exclusively on aquatic insects (Schrieber 1978, Abarca 1987). Loach minnow live between two and three years with reproduction occurring primarily in the second summer of life (Minckley 1973, Sublette *et al.* 1990). Spawning occurs in March through May (Britt 1982, Propst *et al.* 1988); however, under certain circumstances loach minnow also spawn in the autumn (Vives and Minckley 1990). The eggs of loach minnow are attached to the underside of a rock that forms the roof of a small cavity in the substrate on the downstream side. Limited data indicate that the male loach minnow may guard the nest during incubation (Propst *et al.* 1988, Vives and Minckley 1990).

Spikedace is a small silvery fish whose common name alludes to the well-developed spine in the dorsal fin (Minckley 1973). Spikedace historically occurred throughout the mid-elevations of the Gila River drainage, but is currently known only from the middle and upper Gila River, and Aravaipa and Eagle creeks (Barber and Minckley 1966, Minckley 1973, Anderson 1978, Marsh *et al.* 1990, Sublette *et al.* 1990, Jakle 1992, Knowles 1994, Rinne 1999). The species also may occur in the upper Verde River. It has not been documented in the Verde River since 1999 despite annual surveys; additional survey work is needed to determine its current status there. Habitat destruction along with competition and predation from introduced non-native species are the primary causes of the species' decline (Miller 1961, Williams *et al.* 1985, Douglas *et al.* 1994). Spikedace live in flowing water with slow to moderate velocities over sand, gravel, and cobble substrates (Propst *et al.* 1986, Rinne and Kroeger 1988). Specific habitat for this species consists of shear zones where rapid flow borders slower flow, areas of sheet flow at the upper ends of mid-channel sand/gravel bars, and eddies at the downstream riffle edges (Propst *et al.* 1986). Spikedace spawns from March through May with some yearly and geographical variation (Barber *et al.* 1970, Anderson 1978, Propst *et al.* 1986). Actual spawning has not been observed in the wild, but captive studies indicate eggs are laid over gravel and cobble where they adhere to the substrate. Spikedace lives about two years with reproduction occurring primarily in one-year

old fish (Barber *et al.* 1970, Anderson 1978, Propst *et al.* 1986). It feeds primarily on aquatic and terrestrial insects (Schreiber 1978, Barber and Minckley 1983, Marsh *et al.* 1989).

Recent biochemical genetic work on both loach minnow and spikedace indicates that there are substantial differences in genetic makeup between remnant loach minnow populations and between remnant spikedace populations (Tibbets 1993). Remnant populations occupy isolated fragments of the Gila River basin. Based upon her work, Tibbets (1992, 1993) recommended that the genetically distinctive units of loach minnow and spikedace should be managed as separate units to preserve the existing genetic variation.

Proposed Critical Habitat

Proposed critical habitat for both loach minnow and spikedace includes approximately 633 river miles in Arizona and New Mexico, organized into four complexes for each species. The stream segments within each of the complexes are defined using legal descriptions to identify the upstream and downstream limits (see U.S. Fish and Wildlife Service 2005) and by the area of bankfull width of the particular stream, plus 300 feet on either side of the stream's edge at bankfull (see Rosgen 1996 for a discussion of bankfull). The four complexes for loach minnow are: the Black River complex in Apache and Greenlee counties, Arizona; the Middle Gila/Lower San Pedro/Aravaipa Creek River complex in Pinal and Graham counties, Arizona; the San Francisco and Blue Rivers complex in Pinal and Graham counties, Arizona, and Catron County, New Mexico; and the Upper Gila River Complex in Catron, Grant, and Hidalgo counties, New Mexico. The four complexes for spikedace are: the Verde River complex in Yavapai County, Arizona; the Middle Gila/Lower San Pedro/Aravaipa Creek River complex in Pinal and Graham counties, Arizona; the San Francisco and Blue Rivers complex in Pinal and Graham counties, Arizona, and Catron County, New Mexico; and the Upper Gila River Complex in Catron, Grant, and Hidalgo counties, New Mexico.

Primary constituent elements of critical habitat for loach minnow and spikedace were identified in the proposed rule (U.S. Fish and Wildlife Service 2005) as necessary for the survival and recovery of this species. Each stream segment contains at least one of the primary constituent elements and requires special management consideration. There are five primary constituent elements for each species, which are: 1) permanent and flowing water with low levels of pollutants; 2) sand, gravel, and cobble substrates with low or moderate amounts of fine sediment and substrate embeddedness; 3) streams that have low gradients appropriate for each species, appropriate water temperatures for each species, pool, riffle, run, and backwater components, and abundant aquatic insect food; 4) habitat with no or low levels of detrimental, nonnative fish species that allow persistence of loach minnow and spikedace and their habitat; and 5) areas within perennial, interrupted stream courses that are periodically dewatered but that serve as connective corridors between occupied or seasonally occupied habitat and through which the species may move when the habitat is wetted.

The appropriate and desirable level of these factors may vary seasonally and is highly influenced by site-specific circumstances. Therefore, assessment of the presence/absence, level, or value of the key components must include consideration of the season of concern and the characteristics of the specific location. The key components are not independent of each other and must be

assessed holistically, as a functioning system, rather than individually. In addition, the key components need to be assessed in relation to larger habitat factors, such as watershed, floodplain, and streambank conditions, stream channel geomorphology, riparian vegetation, hydrological patterns, and overall aquatic faunal community structure.

The status of loach minnow and spikedace is declining rangewide. They are currently restricted to 419 miles of streams. Loach minnow current range represents only 15 to 20 percent of their historical range and spikedace current range represents only 10 to 15 percent of their historical range (U.S. Fish and Wildlife Service 2000). In occupied areas, loach minnow and spikedace may be common to very rare. Loach minnow and spikedace are common only in Aravaipa Creek, the Blue River, and limited portions of the San Francisco, upper Gila, and Tularosa rivers in New Mexico (U.S. Fish and Wildlife Service 2000).

Gila Chub

We listed the Gila chub as endangered with critical habitat on November 2, 2005 (U.S. Fish and Wildlife Service 2005). Historically, Gila chub have been recorded from rivers, streams, and spring-fed tributaries throughout the Gila River basin in southwestern New Mexico, central and southeastern Arizona, and northern Sonora, Mexico (Miller and Lowe 1967, Rinne and Minckley 1970, Minckley 1973, Rinne 1976, DeMarais 1986, Propst 1999, and Weedman *et al.* 1996). Today the Gila chub has been restricted to small, isolated populations scattered throughout its historical range.

Decline of Gila chub is due to habitat loss from past and current dewatering of rivers, springs, and cienegas (e.g. from diversions, impoundments, and groundwater pumping), poor land management practices (e.g. excessive livestock grazing) resulting in erosion and arroyo formation, and the concomitant introduction of predacious and competing non-indigenous fish species (Miller 1961, Minckley 1985). Life history information can be found in the status review (Weedman *et al.* 1996), the final rule (U.S. Fish and Wildlife Service 2005), and references cited therein.

The Gila chub is a small-finned, deep-bodied, chunky, darkly colored member of the minnow family Cyprinidae. Adult males average about 6 inches in total length; females can exceed 8 inches. Gila chub commonly inhabit pools in smaller streams, springs, and cienegas, and can survive in small artificial impoundments (Miller 1946, Minckley 1973, Rinne 1975). Highly secretive, preferring quiet, deeper waters, especially pools, or remaining near cover like undercut banks, terrestrial vegetation, boulders, and fallen logs, they feed on large and small aquatic and terrestrial invertebrates and sometimes other small fishes, organic debris, aquatic plants, and diatoms (Rinne and Minckley 1991).

Gila chub occur in New Mexico only in Turkey Creek (Grant County); in Arizona, they occur in Indian, Larry, Little Sycamore, Silver, Spring, Sycamore, and Walker creeks and Lousy Canyon (Yavapai County), Sabino Canyon (Pima County), Sheehy Spring and O'Donnell Creek (Santa Cruz County), Cienega Creek (Pima and Santa Cruz Counties), Redfield and Bass canyons (Graham and Cochise Counties), Babocomari River (Santa Cruz and Cochise counties), the San Carlos and Blue rivers (Gila and Graham counties), Harden Cienega and Dix creeks, (Greenlee

County), Eagle Creek (Graham and Greenlee Counties), and Bonita Creek (Graham County); in Mexico, Gila chub occur in Cienega los Fresnos and Cienega la Cienegita (Varela-Romero *et al.* 1992, Weedman *et al.* 1996).

Most known extant Gila chub populations are small. Only one, Cienega Creek, is considered stable and secure; about two thirds are considered stable but threatened, and a third are unstable and threatened (Weedman *et al.* 1996). Reestablishment of Gila chub has been attempted in three Arizona sites; two are believed to be extant, in Lousy Canyon and Larry Creek, which are tributaries to the Agua Fria River.

Our records indicate that, rangewide, twelve informal or formal conferences or consultations have been completed or are underway for actions affecting Gila chub.

Critical Habitat

Critical habitat for Gila chub includes approximately 160 miles of stream reaches in Arizona and New Mexico, organized into seven river units. The stream segments within each of the seven units are defined longitudinally by upstream and downstream limits (see U.S. Fish and Wildlife Service 2005) and laterally by the area of bankfull width of the particular stream, plus 300 feet on either side of the stream's edge at bankfull (see Rosgen 1996 for a discussion of bankfull). Briefly, the seven areas are: the Upper Gila River Area, including Turkey Creek, Harden Cienega, Dix Creek, Eagle Creek, and East Eagle Creek in Greenlee County, Arizona, and Grant County, New Mexico; the Middle Gila River Area, including Mineral Creek in Gila and Pinal counties, Arizona; the Babocomari River Area, including O'Donnell Canyon and Turkey Creek in Santa Cruz County, Arizona; the Lower San Pedro River Area, including Bass, Hot Springs, and Redfield canyons in Cochise and Graham counties, Arizona; the Lower Santa Cruz River Area, including Cienega Creek, Mattie Canyon, Empire Gulch, and Sabino Canyon in Pima County, Arizona; the Upper Verde River Area, including Walker Creek, Red Tank Draw, Spring Creek, and Williamson Valley Wash in Yavapai County, Arizona; and the Agua Fria River Area, including Little Sycamore, Sycamore, Indian, Silver, and Larry creeks and Lousy Canyon in Yavapai County, Arizona.

Primary constituent elements of critical habitat for Gila chub were identified in the final rule (U.S. Fish and Wildlife Service 2005) as necessary for the survival and recovery of this species. Each stream segment contains at least one of the primary constituent elements or requires special management consideration. In the proposed rule, we discussed the biological needs of the species upon which the primary constituent elements are based, listed seven primary constituent elements for the species, and discussed the specific elements in each of the proposed stream segments (U.S. Fish and Wildlife Service 2005). The seven primary constituent elements are summarized here: 1) perennial pools, areas of higher velocity between pool areas, and areas of shallow water among plants or eddies all found in small segments of headwaters, springs, or cienegas of smaller tributaries; 2) water temperatures for spawning, and seasonally appropriate temperatures for all life stages; 3) water quality with reduced levels of contaminants; 4) adequate food base consisting of invertebrates and aquatic plants; 5) sufficient cover; 6) habitat devoid of nonnative species detrimental to Gila chub or habitat; and 7) streams that maintain a natural flow pattern including periodic flooding.

The constituent elements of critical habitat are generalized descriptions and ranges of selected habitat factors that are critical for the survival and recovery of Gila chub. The appropriate and desirable level of these factors may vary seasonally and is highly influenced by site-specific circumstances. Therefore, assessment of the presence/absence, level, or value of the constituent elements must include consideration of the season of concern and the characteristics of the specific location. The constituent elements are not independent of each other and must be assessed holistically, as a functioning system, rather than individually. In addition, the constituent elements need to be assessed in relation to larger habitat factors, such as watershed, floodplain, and streambank conditions, stream channel morphology, riparian vegetation, hydrological patterns, and overall aquatic faunal community structure.

For additional information about the Gila chub see Desert Fishes Team (2003), Minckley and DeMaris (2000), Propst (1999), Weedman *et al.* (1996), Rinne and Minckley (1991), DeMaris (1986), and Minckley (1985, 1973).

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.

Past consultations in the action area.

Some of the major Section 7 consultations with the BLM or in which BLM was a cooperating agency that have addressed one or more species being addressed in this BO are listed below. These consultations were for actions that were either completely or partially implemented, or are being implemented, in the action area.

- Safford/Tucson Grazing BO and amendments/reinitiations (Programmatic Biological Opinion for the Safford/Tucson Field Offices' Livestock Grazing Program, Southeastern Arizona, September 26, 1997, Consultation Number 2-21-96-F-160). Addresses permitting and operation of 288 grazing allotments in the Safford and Tucson Field Office's jurisdictions through 2006.
- Dos Pobres - San Juan Project (June 11, 2002; Consultation Number 02-21-99-F-007). Addresses adverse and beneficial impacts to listed species if land is exchanged between the BLM and Phelps-Dodge Corporation. BLM would acquire Phelps Dodge lands along the Gila River and other parcels in Arizona. Phelps Dodge would acquire lands adjacent to its privately owned properties north of Safford, Arizona.
- BLM LUP Amendment BO (Biological and Conference Opinion for the BLM Arizona Statewide Land Use Plan Amendment for Fire, Fuels, and Air Quality Management, September 3, 2004, Consultation Number 02-21-03-F-0210). Addresses fuel treatments,

prescribed fires, wildland fire use, and wildfire suppression throughout Arizona on BLM lands.

- Gila Box RNCA BO (Reinitiation of Consultation/Conference on the Gila Box RNCA Interdisciplinary Activity Plan, June 10, 2004, Consultation Numbers 02-21-92-F-0070 R2, 02-21-96-F-0160 R7). Addresses the effects of proposed activities in the Gila Box RNCA on listed species.
- Proposed Baker Prescribed Fire in the Peloncillo Mountains (April 20, 2001; Consultation Number 02-21-01-F-070). Addresses impacts of a prescribed fire on listed species, specifically the New Mexico ridge-nosed rattlesnake.
- Maverick Prescribed Burn (August 10, 2000; Consultation Numbers 02-21-92-F-350, 02-21-92-F-478, 02-21-96-F-114, 02-21-98-F-287, and 02-21-00-F-237). Addresses impacts of a series of prescribed fires on listed species, some of which were implemented, or will be implemented, in the action area.
- Reintroduction of Beaver, San Pedro RNCA (June 17, 1998; Consultation Number 02-21-97-F-097). Addresses impacts of reintroducing beavers in the San Pedro RNCA on listed species.
- Peloncillo Programmatic Fire Management Plan on the Coronado National Forest (March 18, 2005; Consultation Number 02-21-04-F-0474). Addresses the effects of implementing a fire management plan in the Peloncillo Mountains in southeastern Arizona.

A. Status of the species within the action area

Southwestern Willow Flycatcher

Flycatcher habitat within the action area is located in the Middle Gila/San Pedro Management Unit (MU) within the Gila Recovery Unit. This habitat, administered by the Safford Field Office, is located on the Gila River and San Pedro River.

Flycatchers are surveyed at numerous sites along the Gila River in the action area. The only consistent breeding areas for breeding flycatchers are in the Winkelman area and Gila Valley (Smith *et al.* 2002, 2003, 2004, Munzer *et al.* 2005, English *et al.* 2006). Some of the sites in the Winkelman area and the western portion of the Gila Valley are located on and adjacent to BLM lands. All other sites are on private or state lands.

Almost all survey sites on the San Pedro River with documented breeding flycatchers are located downstream of Redington. Only one territory on the lower San Pedro River, near Cascabel, Arizona in 1995, has been located on BLM lands. To date, only two flycatcher nests have been documented on the San Pedro RNCA; in 1997 a nest was located on Kingfisher Pond and in 2005 a nest was located near Hereford Bridge. No other breeding flycatchers have been documented on the San Pedro RNCA (Smith *et al.* 2002, 2003, 2004, Munzer *et al.* 2005,

English *et al.* 2006). Flycatchers likely use riparian areas on the San Pedro River (and elsewhere) in the action area during migration.

There is critical habitat (USFWS 2005) designated within the upper Gila Management Unit and the Middle Gila/San Pedro Management Unit (USFWS 2002) in the action area. The Gila River has a portion of one segment and all of another segment of critical habitat in the Upper Gila MU. The longest segment starts at the upper end of Earven Flat, through the Gila Valley (Safford) to the San Carlos Apache Tribal Boundary. Another segment ranges from the Arizona-New Mexico border to Duncan, Arizona. The Middle Gila/San Pedro MU includes portions of the Gila and San Pedro rivers. Critical habitat on the San Pedro River starts 3.5 miles upstream of the Hot Springs Canyon confluence and ends at the Gila River confluence. Critical habitat on the middle Gila River starts at the Dripping Springs Wash confluence and ends at Ashurst-Hayden Diversion Dam (U.S. Fish and Wildlife Service 2005).

Huachuca Water Umbel

All Huachuca water umbel populations in the action area are found on the San Pedro Riparian National Conservation Area (SPRNCA), where the species has been monitored since 2000. The latest report (2001) documents 43 patches of the water umbel along 31.7 miles within the SPRNCA. This was the first comprehensive survey along the San Pedro. Approximately 40 percent of these patches are new locations. All of these patches are within designated Huachuca water umbel critical habitat. The entire 33.7 miles of critical habitat on the San Pedro River is within the SPRNCA. There are no other areas of BLM land or other areas in the action area designated as critical habitat for the water umbel.

New Mexico Ridge-nosed Rattlesnake

Holycross and Smith (2001) evaluated habitat of NMRR in the Peloncillo Mountains and prepared a map of potential core habitats, based upon a comparison of the known occupied locations and the potential available habitat within the Peloncillo Mountains. This mapping effort did not attempt to cover all habitats used by NMRR, but only the canyon woodlands that are typically used during the active season. Areas probably or likely supporting a deme of *C. w. obscurus* are mapped as 3 and 4 habitat (we equate this to reasonably certain that the species is present) and areas very unlikely to support a deme of *C. w. obscurus* are mapped as 1 and 2 habitat. Potential habitat that burned destructively in the Maverick prescribed fire was also delineated. These burned areas may no longer support the species; however, NMRR have recently been found in Study Canyon in the Sierra San Luis that burned catastrophically in 1989 (Setser pers. comm. 2003), suggesting snakes may persist in or recolonize some of these areas. A total of 275 habitat patches were identified in the Peloncillos; including 232 ranked as 3 and 4 habitat (approximately 5,000 acres), 13 polygons ranked as 1 or 2 habitat (approximately 324 acres), and 30 polygons that burned in the Maverick prescribed fire (approximately 560 acres). Habitat within the action area include five patches of Habitat 3 and 4 southwest of Bunk Robinson Peak and west of Little Bunk Robinson Spring totaling 88 acres. In this same general area, four additional habitat patches, totaling 42 acres, were identified that were burned destructively in the Maverick Prescribed Fire within the action area. During that fire an estimated 90-100 percent of the woodland overstory was burned or consumed. The 2003 Baker II prescribed fire resulted in high intensity fire effects in two of the habitat polygons in the action

area, totaling approximately 17 acres (Helbing 2004). These 17 acres were ranked as 3 or 4 habitat (Holycross and Smith 2001).

Based upon the relative encounter rate of individuals among the three known occupied mountain ranges, population density within the Peloncillo Mountains is probably relatively low (Holycross 1998). No individuals of this subspecies have been found on the BLM-administered lands to date, but very little effort has been spent surveying for this subspecies within the action area.

Chiricahua Leopard Frog

In the action area, the CLF is known currently or historically from cienegas, pools, livestock tanks, lakes, reservoirs, streams, and rivers at elevations above about 3,200 feet in southeastern Arizona (Pima, Santa Cruz, and Cochise counties). Although surveys are incomplete, there are no known extant populations on BLM lands within the action area. The only extant populations of CLF on BLM lands near the planning area of which we are aware are at Cienega Creek/Empire Cienega, Pima County, where the species is found in the creek and in adjacent stock tanks. CLFs could potentially occur elsewhere on BLM lands. The species was found on or near BLM lands 2.5 miles north of Courtland, Cochise County, in 1977, but has not been found there since. CLFs have been found near BLM lands in Guadalupe Canyon, Cochise County, as recently as 1994, and they still possibly occur at this locality and elsewhere in the Peloncillo Mountains on Coronado National Forest and private lands. The species occurred on the upper San Pedro River, but has not been observed there since 1979 and is probably excluded by an abundance of non-native predators. CLF was found in Redfield Canyon/Jackson Canyon in the Galiuro Mountains in 1991, but has not been found there since. CLF occurred at many locations in the Galiuro Mountains in the 1990s, but populations have crashed there for unknown reasons, and currently the species is only known from one site on the northeastern slope, which is not close to any BLM lands.

Other BLM or adjacent lands in the action area where CLF occurs or could potentially occur include: Cochise County: 1) Mule Mountains (no records for the species, but poorly surveyed due to limited access – old records nearby in the Sulphur Springs Valley), 2) Swisshelm Mountains (extant population in the Leslie Canyon National Wildlife Refuge adjacent to BLM lands, which is the only known extant population in the action area), 3) northeastern Chiricahua Mountains (recent records from near Portal and Paradise; however, populations appear to have drastically declined over the last decade and the species may be extirpated from that mountain range); Graham County: 4) upper Bonita Creek (1980's records for the species near Tule Tubs and Ash Creek on the San Carlos Reservation suggest the species could be present in the upper Bonita Creek area).

Razorback Sucker

Within the project area, razorback suckers may occur in small numbers in the Gila and San Francisco rivers, and in Bonita and Eagle creeks. Historical razorback sucker habitat in the planning area included the San Pedro, San Francisco, and Gila rivers, and Bonita and Eagle creeks (U.S. Fish and Wildlife Service 1998). Physical habitat condition on BLM lands is largely undetermined, but Minckley and Sommerfeld (1979) stated that the Gila River through the Gila Box "...is one of the last, low-desert unmodified streams in the American Southwest." They also concluded that the Gila River had the potential to support fishes such as the woundfin minnow, Colorado pikeminnow, bonytail chub, flannelmouth sucker, and razorback sucker. The biological component of the habitat has been altered by the loss of co-occurring native fishes, and the addition of predatory and competitive non-native fishes (Minckley *et al.* 1991, Marsh and Brooks 1990).

A rare riverine situation exists in the Safford segment of the Gila River: the natural hydrograph remains unimpaired by large dams (U.S. Fish and Wildlife Service 1993). Flooded bottomland is not a common habitat feature along the BLM portions of the Gila or San Francisco rivers or Bonita Creek. The other habitat elements described above do occur on the Gila and San Francisco rivers. Flows can be very low in the late spring and summer, leaving large pools connected by a small ribbon of flow. Bonita Creek is a medium-sized stream averaging about 10 cubic feet per second (cfs) of flow. It is not likely to support a viable razorback sucker population but may provide habitat for spawning adults and growth of young suckers, which can then migrate downstream to the Gila River. A large razorback sucker was reported from Bonita Creek in 1991 (see BE).

The condition of riparian habitat bordering the Gila River was inventoried for proper functioning condition. The riparian condition ranged from nonfunctional to functional—at risk or fully functional. Most of the riparian areas on the Gila and San Francisco rivers were sparsely vegetated and set far back from the waters' edge, having only a small influence on river habitat and character. Presently, the banks are vegetating and providing cover for better razorback sucker habitat. Bonita Creek was found to have reaches determined to be functional—at risk and properly functioning. Riparian development influences fish habitat to a large degree on Bonita Creek, where it closely follows the edge of the aquatic habitat.

Critical habitat on BLM-administered and other lands within the action area is located on the Gila River and its 100-year flood plain from the Arizona-New Mexico border downstream to Coolidge Dam; including San Carlos Reservoir to the full pool elevation (U.S. Fish and Wildlife Service 1994).

Historically, the razorback sucker was found in the Gila River upstream to the New Mexico border (Bestgen 1990), but was likely extirpated by the late 1970s. Razorback suckers were re-introduced into the Gila River and its tributaries between 1981 and 1989; however, there is no evidence that introductions have established self-sustaining populations. These transplants were not formally monitored until 2001, when a baseline fisheries inventory was conducted in the Gila Box portion of the Gila River. The inventory found no razorback suckers. No razorback suckers were found during depletion surveys of a plunge pool below the Eagle Creek diversion

dam in 1996 (SWCA 1997). The BLM reported a large razorback sucker found in Bonita Creek in 1991.

Small or very small numbers of released razorback suckers may survive in the Gila River and Bonita and Eagle creeks. Fish may have also moved upstream into the San Francisco River.

The Gila River and its tributaries, Eagle and Bonita creeks, and the San Francisco River are largely perennial with mean annual discharges of 183 cfs for the Gila River at Clifton, 187 cfs for the San Francisco River at Clifton, and 42 cfs for Eagle Creek. The lower portion of Bonita Creek, within the Gila Box RNCA, is not gauged. Peak flood flows in excess of 140,000 cfs have been reported on the Gila and San Francisco rivers in the planning area.

Loach Minnow and Spikedace

Known occupied loach minnow and spikedace habitat on or downstream from BLM lands in the action area occurs in Aravaipa Creek within Aravaipa Canyon, west of Safford. Loach minnow also occur in Deer Creek and Turkey Creek (in Aravaipa Canyon), and the San Francisco River. Spikedace also occur in Eagle Creek within the action area. All other occupied habitat is located upstream from BLM lands, or in drainages owned or managed by other agencies or landowners, and not adjacent to BLM lands. Potential habitat may exist in other creeks and rivers that flow through BLM lands in the action area, but none of these areas have been specifically identified.

Aravaipa Creek supports the most protected loach minnow and spikedace populations due to special use designations on BLM land, substantial ownership and protective management by The Nature Conservancy, and fish barriers located downstream to prevent invasion of non-native fish species. Loach minnow are found from the downstream non-native fish barriers upstream to above Turkey Creek (Peter Rienthal, U. Arizona, pers. comm., October 13, 2004), and in Deer Creek upstream from its confluence with Aravaipa Creek to the Aravaipa Canyon Wilderness boundary. Spikedace are found from the mid point of the canyon at Horse Camp Wash upstream to above Turkey Creek (Peter Rienthal, U. Arizona, pers. comm., October 13, 2004). It is believed that spikedace did occur throughout the canyon at one time. Spikedace has been virtually absent from the lower reaches of Aravaipa Canyon since the 1970s. Spikedace numbers have increased in the upper reaches of Aravaipa Canyon as a result of aquatic habitat improvement. The riparian area recovered from livestock grazing and other impacts which allowed vegetation to establish on the streambanks. The previous wide, shallow channel became narrower and deeper. This created the conditions preferred by spikedace (Peter Rienthal, U. Arizona, pers. comm. October 13, 2004). Specific numbers and trend information are difficult to describe because it was necessary to use different fish survey methods due to the varied conditions in the different reaches. These conditions can change from one year to the next. It is difficult to extrapolate population data when different survey methods are used from year to year, but the intensive monitoring has demonstrated that loach minnow and spikedace persist in the Aravaipa Creek area, and the populations are likely stable.

The distribution of the loach minnow in the San Francisco River in Arizona is poorly understood. The first known record of the loach minnow in the Arizona portion of the river was in 1977 (Anderson and Turner 1977), although it had been recorded in the upstream New Mexico portion

of the San Francisco River since the 1940's (LaBounty and Minckley 1972). Since 1977, loach minnows have been found at several locations on the Arizona portion of the San Francisco River, although in low numbers (Anderson and Turner 1977, Minckley and Sommerfeld 1979, J.M. Montgomery Consulting Engineers 1985, Papoulias *et al.* 1989, Bagley *et al.* 1995). The loach minnow was found during recent surveys at the confluence of the San Francisco River and Hickey Canyon and at the Apache-Sitgreaves Forest/BLM boundary (Bagley *et al.* 1995). Loach minnow distribution downstream of the Forest/BLM boundary is less clear. Surveys conducted in 1983-84 located no loach minnow below Hickey Canyon (J.M. Montgomery Consulting Engineers, 1985). However, P.C. Marsh (Bureau of Land Management 1996) reported loach minnow in the San Francisco River above Clifton. Recent fish surveys (August 2004) in this area found no loach minnow. Only one individual native fish (a desert sucker) was found, but numerous non-native species were documented. These species include competitors and predators of loach minnow, including red shiner, channel catfish, flathead catfish, and smallmouth bass (H. Blasius, Fisheries Biologist, pers. comm., November 3, 2004). Suitable habitat exists for several miles below the Forest/BLM boundary, however, these areas include non-native aquatic species at levels that may limit occupancy. The downstream distribution of the loach minnow in the San Francisco River likely fluctuates over time depending upon water levels, flooding, and other factors that may move loach minnow downstream onto BLM, State, and private lands for short periods of time.

Spikedace currently occurs in Eagle Creek in the action area near the San Carlos Reservation boundary. All locations are on private lands, but BLM land is located upslope from the creek.

Loach minnow critical habitat has been designated in Complex 3 (including Aravaipa Creek, Turkey Creek, and Deer Creek) and Complex 4 (including San Francisco River and Eagle Creek) within the action area. Spikedace critical habitat has been designated in Complex 3 (including Gila River, Lower San Pedro, and Aravaipa Creek) and Complex 4 (including Eagle Creek) within the action area. Aravaipa Creek is occupied by both loach minnow and spikedace. The San Francisco River may be occupied by loach minnow. Eagle Creek is occupied by spikedace. All areas designated for loach minnow in Complex 3 (33 miles) are within the action area, with all of Turkey Creek, all of Deer Creek, and most of the eastern portion of Aravaipa Creek on BLM lands. Over ten miles of the San Francisco River (Complex 4) are within the action areas, and includes BLM, state, and private lands. A small portion of the critical habitat along Eagle Creek downstream of the San Carlos Reservation is within the action area, but none of it is on BLM lands.

Gila Chub

Within the action area, Gila chub occupy headwaters, springs, and cienegas of smaller tributaries that have perennial flows, deeper pools and eddies, and good cover such as overhanging vegetation and undercut banks, in the Gila and San Pedro drainages. Specifically, Gila chub occupy four localities in the action area. These are Bonita Creek, Bass Canyon, Hot Springs Canyon, and Redfield Canyon. Because Gila chub are a secretive species (Rinne and Minckley 1991) and most of the known recent and historical locations continue to lack extensive surveys since the status review by Weedman *et al.* (1996), the species may persist in some of the locations now considered extirpated, and may occur in localities as yet undiscovered. Although

Gila chub have not been found in some of these localities in recent years, these streams may still be occupied, given the secretive nature of this species, and a general lack of comprehensive surveys.

Gila chub critical habitat has been designated in three localities in the action area. These are Bass Canyon, Hot Springs Canyon, and Redfield Canyon, which are also occupied by Gila chub. As described in the “Status of the Species, Gila chub” section, designated critical habitat reaches are defined in the final rule to list the species (U.S. Fish and Wildlife Service 2005) with linear endpoints and laterally as the stream at bankfull width including a 300-foot buffer on either side of the stream. There are over 15 miles of critical habitat on or near BLM lands in the action area. We have incomplete information on the condition of the primary constituent elements of critical habitat in the action area; however, all of the critical habitat units contain one or more of the primary constituent elements.

B. Factors Affecting the Species’ Environment Within The Action Area

In this section we summarize the most important factors that have affected listed species and their habitats in the action area. We also refer the reader to the Environmental Baseline in our September 26, 1997, the Safford/Tucson Grazing BO, and the Affected Environment in the DRMP and FRMP, which together contain extensive land use histories and other information relevant to the ways in which past and current activities affect species.

Common Factors For All Species

The FRMP identified various BLM plans and projects to be developed and implemented under the FRMP. Plans include Ecosystem Management Plans, Interdisciplinary Activity Plans, riparian management plans, Wilderness Management Plans, Recreation Management Plans, and a District Transportation Plan. Not all plans have been developed (e.g., District Transportation Plan), but some plans have been completed and are being implemented (e.g., Hot Wells Dunes Recreation Management Plan, Muleshoe Ecosystem Management Plan), and others are in process (e.g., Aravaipa Canyon Wilderness Management Plan). Other plans not specifically addressed in the FRMP, but which fall under the direction of the FRMP, have been or will be completed, (e.g., Allotment Management Plans). Specific projects have also been completed under the direction of the FRMP. Some of these plans and projects have been addressed through various consultations, including their impacts on the species. None of these consultations resulted in jeopardy to the species.

The action area includes adjacent private, municipal, State, and other Federal jurisdiction lands in which the effects of BLM activities implemented under the Safford FRMP may manifest. These other land managers have and continue to implement management that could result in impacts to this species, including agriculture, livestock grazing, mining, other forms of development, and recreation. All of these Federal, State, municipal, and private actions may have impacted these species in varying degrees, including short-term and long-term changes in habitat quality and quantity, and possibly disturbance to some species if present. These actions probably have had both positive and negative impacts on the species and their habitat quality and quantity.

Southwestern Willow Flycatcher

The most significant factor that has affected flycatchers within the action area is habitat loss through fragmentation and vegetation modification. There are numerous agricultural fields located along the Middle Gila and San Pedro rivers. Habitat patches and critical habitat located adjacent to these agricultural fields can be affected by herbicide and defoliant drift and direct application. These patches can also be burned when fields are burned to remove crop residue.

River channel modification to protect fields, bridges, and other structures also have affected site suitability and existing habitat patches. Suitable and potential habitats found within the critical habitat can also be affected. Groundwater pumping and water diversions for both agricultural and municipal-use have lowered water table depths to a degree that precludes establishment and maintenance of native riparian species. Control or modification of the natural river flood regime has eliminated the major mechanism for cottonwood and willow regeneration and establishment in these areas.

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The Gila Box RNCA and San Pedro RNCA protect large riparian areas along the Gila and San Pedro rivers. Critical habitat is not proposed in either area. Livestock are only trailed through limited portions of the Gila Box RNCA. Livestock are excluded from the majority of the San Pedro RNCA. Flycatchers have been documented nesting in the San Pedro RNCA only in 1997 and 2005. Flycatcher nesting has not been documented in the Gila Box RNCA. However, potential or suitable habitat may be present in both areas. Migrant flycatchers are present each spring in both areas. Flycatchers on BLM lands are also impacted by trespass livestock accessing breeding or potential habitats from adjacent private and State lands (U.S. Fish and Wildlife Service 1997, USFWS files, Phoenix). Species that are unpalatable to livestock, such as saltcedar, may become the dominant woody species in these areas. Tall and dense saltcedar woodlands are the most available and occupied breeding habitat for flycatchers below 4,000 feet in Arizona. Other unpalatable species, such as seepwillow, which lack structure and density needed for nesting habitat, can also replace native species.

The action area includes adjacent private, municipal, State, and other Federal jurisdiction lands on which the effects of BLM activities implemented under the Safford FRMP may manifest.

These other land managers have and continue to implement management that could result in impacts to this species, including agriculture, livestock grazing, mining, other forms of development, and recreation.

The replacement of native riparian species with exotics such as saltcedar has changed the historical fire regime in these areas. Mature cottonwood trees are often killed by fire, but mature willows and mesquites, as well sapling native trees, can re-sprout from the root crowns. Saltcedar typically resprouts vigorously after fire. Saltcedar becomes established in riparian communities where native species are stressed from water table declines from pumping and diversions, excessive livestock grazing, or where flow regimes have been changed or eliminated that allow for native vegetation regeneration. As in the case with willow, saltcedar aggressively re-sprouts after burning; however, saltcedar is more efficient in water acquisition and thus gains a competitive edge (Busch and Smith 1992). Saltcedar flammability increases with the build-up of dead and senescent woody material within the plant and community. Dense stands of saltcedar can be highly flammable in areas where limited or non-existent flooding allows litter to accumulate on the floodplain (U.S. Fish and Wildlife Service 2002).

Despite being implicated as a cause for the decline of riparian bird species in the Southwest, saltcedar often supports nesting flycatchers (Owen and Sogge 2002). In Arizona, over 75 percent of flycatcher nests located between 1995 and 2000 were located in a saltcedar tree (Paradzick *et al.* 2001). However, the majority of nests (70 – 76 percent 2001 through 2003) were located in mixed stands where either native species or saltcedar were dominant; monotypic saltcedar stands were used much less (14 – 18 percent) (Smith *et al.* 2002, Smith *et al.* 2003, and Smith *et al.* 2004). Recent studies (Owen and Sogge 2002; Drost *et al.* 2001) indicate that saltcedar not only provides adequate nesting habitat, but insect numbers are also sufficient in saltcedar to provide food for adults and young flycatchers.

Riparian fires tend to burn during the summer breeding season, having a direct effect on nesting flycatchers. Nests and fledglings can be destroyed and killed. Adults may be able to move to unburned sites and re-nest; however, delayed breeding results in lower overall success (U.S. Fish and Wildlife Service 2002). As stands become more saltcedar-dominated, fire frequency would be expected to increase. Indirectly, when saltcedar stands are repeatedly burnt, their suitability as nesting habitat is lost until adequate re-growth occurs resulting in decreased suitable habitat availability over time (U.S. Fish and Wildlife Service 2002).

All of these Federal, State, municipal, and private actions may have impacted this species in varying degrees, including short-term and long-term changes in habitat quality and quantity, and possibly disturbance to flycatchers if present. These actions probably have had both positive and/or negative impacts on the species and its habitat quality and quantity.

Huachuca Water Umbel

Huachuca water umbel populations can be affected by improper livestock grazing. Trampling of plants and bank habitat can negatively affect this species. The effects from livestock grazing were analyzed in the Safford/Tucson BLM Grazing BO.

Trespass cattle have been and continue to be a problem in the SPRNCA. By 1997, a total of 79 trespass cattle had been removed from the SPRNCA (U.S. Fish and Wildlife Service 1997, USFWS files, Phoenix). During fisheries surveys in 2003, Stefferud and Stefferud (2003) observed light trespass cattle use and impacts at Hereford and moderate damage to riparian resources at Highway 90. At Charleston, they observed trespass cattle sign for the first time in 2003. Damaged streambanks and browsing of riparian vegetation was noted at Fairbank in 1996 and 1997, but not since then.

Beaver were reestablished in the SPRNCA in 2000 and have now established a population there. Although the effects of the reestablishment were expected to be mixed, the dams and impoundments created by the beaver were anticipated to potentially recreate marshy, cienega conditions that could benefit water umbel (U.S. Fish and Wildlife Service 1998). Effects of the beaver on water umbel and its habitat have not been investigated.

Portions of the SPRNCA are heavily used by recreationists and undocumented aliens. Fires have become more common in the SPRNCA. It is not known if these activities are currently affecting water umbel populations. The patches of water umbel seem to be increasing in the SPRNCA; more monitoring of the species' distribution in the SPRNCA is needed before any conclusions can be made.

See "Common Factors For All The Species" for a discussion of other factors.

New Mexico Ridge-nosed Rattlesnake

The portion of the action area that intersects the range of the NMRR is within the Malpai Borderlands area in the southeastern corner of Arizona. This rangeland is actively grazed and currently managed on a landscape scale through the coordinated efforts of private landowners, Arizona State Land Department, BLM, and U.S. Forest Service. As part of this cooperative management strategy, two prescribed burns and a fire management plan have been consulted on in this area: Maverick Burn, Baker II Burn, and Peloncillo Programmatic Fire Management Plan. The Maverick burn escaped the fire lines and impacted habitat in several of the core habitats identified by Holycross and Smith (2001) (see discussion above). While excessive cattle grazing has been identified as a factor that could alter habitat, section 7 consultation for grazing on Federal lands has already been completed, with some consultations being reinitiated. Illegal collection of this animal occurs in this population and remains a threat. Most of this activity probably occurs in and near major roads through the Peloncillo Mountains.

See "Common Factors For All The Species" for a discussion of other factors.

Chiricahua Leopard Frog

See "Common Factors For All The Species" for a discussion of factors affecting the CLF within the action area.

Razorback Sucker

The action area includes adjacent private, municipal, State, and other Federal jurisdiction lands. These land managers are currently implementing management that could result in impacts to this species, including ground and surface water extraction, agriculture, and recreation.

All of these Federal, State, municipal, and private actions could impact this species in varying degrees, including short-term and long-term increases and decreases in sedimentation, water quality, water flow and levels, and riparian vegetation quality. These actions will probably have both positive and negative impacts on the habitat quality and quantity for this species.

With the exception of Upper Bonita Creek, razorback sucker habitat within the planning area supports several non-native fish species. These non-native species prey on or compete with razorback suckers, limiting the potential for self-sustaining populations (Minckley et al. 1991)

See “Common Factors For All The Species” for a discussion of other factors.

Loach Minnow and Spikedace

Currently, the primary management action factor affecting loach minnow and spikedace in Aravaipa Canyon may be the permitted hiking that occurs in Aravaipa Creek. Access to the Aravaipa Canyon Wilderness is administered by the BLM, Safford Field Office. BLM Wilderness Area permits are required to access both the east and west ends of the Aravaipa Canyon Wilderness. The BLM issues up to 50 permits per day to hike in this area. However, fifty permits are not issued every day, particularly on weekdays and the hot summer months. Hikers access this canyon through loach minnow and spikedace habitat in Aravaipa Creek. Not all hikers travel the entire 11 miles, nor is all hiking concentrated in the streambed. Much of the canyon is traveled by routes on the flood plain and upper terrace. The majority of hikers enter Aravaipa Canyon from the west-end.

Despite riparian and aquatic habitat improvement, the presence of non-native fish which compete or prey upon loach minnow and spikedace may be the most significant and difficult factor to correct that affects loach minnow and spikedace within the action area. Two fish barriers were constructed by the Bureau of Reclamation in 2001 in the lower reaches of Aravaipa Creek to prevent non-native fishes in the San Pedro River from entering this area.

See “Common Factors For All The Species” for a discussion of other factors.

Gila Chub

Many of the factors affecting the species are the same as those described in the status of the species section. Habitat loss and degradation have occurred concurrent with invasion of nonindigenous fish species. Anthropogenic changes include past and current dewatering of rivers, springs, and cienegas, diversion of water channels, impoundments, and regulation of flow, and land management activities, including livestock grazing and fire management. Poor land use

practices have promoted erosion and arroyo formation and the introduction of predacious and competing nonindigenous fish species (Miller 1961, Minckley 1985).

See “Common Factors For All The Species” for a discussion of other factors.

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.

Implementation of the direction in the FRMP may result in both negative and positive effects to species and their habitat, including any designated or proposed critical habitat in the action area. These effects are addressed by Issue and Management Concern. All of the actions would occur on BLM lands. The effects described as a result of these actions could occur not only on BLM lands but possibly also on adjacent lands in action area. The direct effects to individuals would only occur if the species occurs in the action area. Populations of some species are currently known in the action area, with some on BLM lands. Specific project proposals developed under the FRMP will evaluate the likelihood of species presence and possible effects to determine the need for future consultation.

Note: This biological and conference opinion does not rely on the regulatory definition of “destruction or adverse modification” of critical habitat at 50 C.F.R. 402.02. Instead, we have relied upon the statutory provisions of the Act to complete the following analysis with respect to designated and proposed critical habitat.

Southwestern Willow Flycatcher

Issue 1. Access.

Reduction of roads, as proposed, would mostly have beneficial effects on the flycatcher and critical habitat, especially those roads through and adjacent to the habitat. Road reduction should improve aquatic habitat and associated riparian vegetation in most areas, depending on the closure technique, through a decrease in sediment and runoff entering riparian habitats. Increased sediment and runoff into drainages is possible from a road closure if that closure does not include sufficient soil stabilization efforts. Poorly designed or un-maintained roads can concentrate sediment flow and runoff into drainages and affect aquatic and riparian resources. Excessive sediment into a river channel will cause aggradation or deposition. The river channel fills up with sediment forcing higher flood flows onto the floodplain because of decreased channel capacity. Under this scenario, floodplain inundating flows would increase in frequency. Riparian vegetation regeneration may be impeded from higher flows, reducing the site potential to develop flycatcher habitat. Excessive sediment delivery can cause bar formation from deposition within the channel. These bars concentrate flow into the banks resulting in lateral

erosion. If suitable/potential habitat is present at these locations it could be undercut and removed from this action. The FRMP does not describe how road closures will be implemented, but, considering the direction for managing wildlife habitat, riparian areas, and other resources, we anticipate that most increases in sediment will be short-term, with an anticipated long-term decrease of sediment load into most of the drainage systems.

Reduction of open roads in and adjacent to habitat will reduce the impacts to vegetation in those riparian areas and decrease the chance of harassing flycatchers. However, if breeding flycatchers are present in the vicinity of remaining vehicle crossings, reproduction activities could be affected, possibly resulting in the abandonment of nests with eggs, nestlings, and fledglings. Human collision with nest trees and spilling the eggs or young onto the ground have been documented near high-use recreational areas (U.S. Fish and Wildlife Service 2002). Adults would be able to leave the area and potentially re-nest if the current nest or fledglings are destroyed.

Increasing access to BLM lands could result in both positive and negative effects to the species and its habitat. If maintenance is improved by the BLM acquiring access along existing trails and roads, the result could be less sediment in any drainage. Increasing access by constructing new roads and trails could increase:

- Sediment in drainages, regardless of the proposed maintenance;
- The likelihood of human-caused fire;
- Direct disturbance of nests, perhaps resulting in nest abandonment and re-nesting in less suitable habitat.

None of the specific proposed road reconstruction projects are located in or adjacent to known breeding flycatchers or critical habitat. None of the trails in which legal access may be obtained are in or adjacent to known breeding flycatchers or critical habitat. The Red Knolls Road, for which legal access may be obtained, is near critical habitat, but this road is already used by the public. No effects to the constituent elements for critical habitat are expected if legal access is obtained. With management direction for wildlife habitat, riparian areas, and other resources, we anticipate that effects of any increase in public use of occupied or critical habitat will be minimal. Obtaining legal access for any roads or trails, whether listed in the FRMP or proposed at a later date, will be addressed either through site-specific projects or through the District Transportation Plan. As riparian conditions improve through management prescribed in the FRMP, we expect flycatchers will breed in the future on BLM lands on both the Gila and San Pedro rivers.

Issue 2. Areas of Critical Environmental Concern and Other Types of Special Management

No ACECs include known nesting flycatchers or critical habitat. The Gila Box RNCA likely includes migratory habitat, and the San Pedro River RNCA includes nesting habitat, and likely migratory habitat. Management for these RNCAs includes maintaining and improving riparian

habitat and managing for native plant species. This direction should maintain or improve potential habitat in these areas for possible future colonization and migration by flycatchers.

Fourteen river segments (149 miles) will be studied for inclusion in the Wild & Scenic Rivers system. None of the river segments include occupied flycatcher habitat or critical habitat. Some of these river segments may provide potential/suitable flycatcher habitat. These river segments will be managed to protect their outstandingly remarkable values until Congress acts to designate them or release them to management under provisions of the applicable Resource Management Plan. This management is expected to maintain or improve habitat for this species (in appropriate areas).

Issue 3. Off-highway Vehicles

Vehicles are limited to designated routes only in the San Pedro RNCA and the Gila Box RNCA, where the majority of BLM's potential and suitable habitat for flycatchers exists in the action area. On all other BLM lands that may include potential habitat and critical habitat, vehicles are restricted to existing roads and trails that were present when the FRMP was finalized and any new roads approved for construction during the life of the FRMP. Restricting vehicle use throughout most of the planning area to existing roads and trails has minimized the effects of off-route vehicle use of the habitat by limiting the impacts to riparian vegetation and the species, as described Issue 1. This action also limits or prevents the development of new unauthorized routes on BLM lands.

Issue 4. Riparian Areas

Riparian areas that include critical habitat are located along the lower San Pedro River and the Gila River around Winkelman. Other riparian areas along the San Pedro and Gila rivers may include suitable or potential habitat (such as in the Gila Box and San Pedro RNCAs). All of these areas are anticipated, in general, to maintain their current condition, or possibly improve, based on the direction for riparian areas including:

- Riparian areas on BLM land within the planning area will be managed to achieve good to excellent condition on 75 percent of the riparian zone (RMP states by 1997).
- Riparian objectives will be incorporated into existing and future activity plans.
- Riparian areas will be retained in public ownership unless disposal would be in the public interest, as determined by land use planning.
- Firewood cutting will not be permitted.
- Grazing systems will be developed and existing allotment management plans will be modified, as necessary, to best manage livestock use for improvement of riparian areas and reduce non-point source water pollution.

Management Concern 1. Wildlife Habitat

The flycatcher is a priority species under the FRMP, which directs the BLM to manage the species and its habitats to maintain or enhance population levels. Management actions will be implemented to accomplish this goal, including transplantation, prescribed burning, wildfire suppression, and development and implementation of habitat management plans. All of these actions will likely have beneficial effects on the flycatcher, but it is possible for short-term negative effects to occur (such as with prescribed burning resulting in a temporary increase in erosion, but in the long term, we anticipate increased soil stabilization resulting from increased herbaceous plant cover). Specific effects are not known until specific actions are identified.

Management Concern 2. Lands and Realty

Designating Gila Box Ecosystem, Northwest and Southwest Gila Valleys, and the San Pedro RNCA as LTMA's could benefit flycatchers and their critical habitat. Other identified LTMA's with potentially suitable habitat would benefit flycatchers if they become occupied in the future (e.g. Muleshoe and Aravaipa LTMA's). The BLM will retain all BLM lands (surface and subsurface estate) within these areas. State and private lands within these LTMA's could be acquired, reducing the impacts of fragmented land ownership on flycatchers. These lands would be intensely managed for their multiple resource values. The consolidation of larger blocks of BLM lands (instead of the more checkerboard pattern in some areas) will allow the BLM to better manage the area as a whole. This will allow the BLM to implement actions that benefit flycatcher habitat where present.

Land disposal could adversely affect flycatchers if potential/suitable habitat is involved or if disposal lands are within close proximity of habitat. Activities initiated on disposed lands, which contain or are adjacent to habitats on BLM land, could have direct or indirect effects to the flycatcher. These actions may include vegetation clearing, which would fragment or destroy habitats and change river channel and flood plain conditions where downstream erosion may affect habitat. Residential development adjacent to habitat on BLM lands may increase predation from free-roaming pets, predators that are attracted to urbanization, and increased cowbird parasitism. It is unlikely that the disposal of lands outside of these areas may result in the loss of potential flycatcher habitat because retention of riparian areas (Issue 4) and management of benefit to listed species are emphasized. If lands are disposed of to individuals or groups that protect and enhance habitats, this would be a benefit to flycatchers. While most of the lands identified for disposal do not overlap suitable habitat or critical habitat, a few parcels in the Gila Valley (downstream of Safford) likely fall within the boundaries. Opportunities to develop breeding habitat may not be possible if these parcels are disposed. This is unlikely to occur because the FRMP directs that no actions will adversely affect the likelihood of recovery of any listed species. These parcels, as with all other land disposals, would be reviewed under NEPA, and would require section 7 consultation if effects to listed species or critical habitat are anticipated.

Two utility corridors have been designated along existing lines across the Gila River (Duncan and east of Safford) that include critical habitat. Another utility corridor has been designated that goes through the San Pedro RNCA, which includes suitable and potential habitat, including

nesting habitat. Maintenance and additional utility installations could result in harassment, harm, or death of flycatchers. These activities could affect existing or future nesting habitat through reduction of willow and other plants used for nesting. Construction or maintenance activities could disturb flycatchers during reproduction if these sites are occupied at the time, decreasing the likelihood of successful reproduction. Migrating flycatchers could collide with power lines that cross the river; however, Skagen (1995) recorded no flycatchers on the upper San Pedro River during April and early May 1989-1994, and few flycatchers have been detected on the RNCA during annual spring and summer surveys from 1996 to the present (see Sferra *et al.* 1997, McCarthey *et al.* 1998, Paradzick *et al.* 1999, 2000, and 2001). Flycatchers may migrate through the RNCA more commonly in the fall (C. Van Riper, pers. comm. 2005). Use of these corridors will also decrease the likelihood that large utility projects will be located in other areas, thus decreasing the likelihood of affecting suitable, potential, and critical habitat in other areas. Utility locations outside of these corridors will be subject to NEPA, and would require section 7 consultation if effects to listed species or critical habitat are anticipated.

Management Concern 3. Outdoor Recreation

The BLM would provide a variety of recreational opportunities that meet the public demand and are compatible with BLM's stewardship responsibilities. Road, bridge, and trail construction crossings within occupied habitats during the breeding season may have the direct effect of harassment, injury, or death of flycatchers resulting from nest destruction. Removal of nest trees would cause the loss of eggs and nestlings. Nest tree loss outside of the nesting period may reduce productivity during subsequent nesting seasons. Flycatchers exhibit nest site fidelity. From 1997 through 2000, 66 to 78 percent of flycatchers known to have survived from one breeding season to the next returned to the same breeding site; conversely, 22 to 34 percent of returning birds moved to different sites (Luff *et al.* 2000). A large percentage (75 percent) of known surviving 2000 adults returned in 2001 to their same breeding site (Kenwood and Paxton 2001). Actual construction, if done during the breeding season, could harass birds to a point of causing nest abandonment and death to that particular clutch of eggs or nestlings. These breeding adults may attempt to breed again the same season, but late breeders have lower overall productivity rates (Whitfield and Strong 1995).

Increased recreational accessibility in flycatcher habitat could increase the likelihood of wildfires resulting from campfires or cigarettes. Riparian fires commonly occur during the flycatcher breeding season. Wildfires would result in direct loss of nests, eggs, and nestlings if they occur during the breeding season. Fire suppression actions may directly affect the birds through mortality or harassment. Nestlings may suffer mortality; however, adults would likely escape the fire. Rivers and streams in many areas are the largest source of available water for fire suppression efforts. Water is often pumped directly from the river or dipped by helicopter water buckets. These activities may result in harassment and disturbance of any breeding or migrating flycatchers in the area.

Water recreation (rafting, kayaking, etc) on the Gila River, when conditions permit, may disturb nesting flycatchers in occupied breeding sites. Current occupied sites are on portions of the Gila River that are mostly private land. There are no launch or departure sites designated within these reaches; however, rafters and kayakers are likely to pass through these areas, resulting in

temporary disturbance. BLM currently authorizes rafting in the Gila Box RNCA where nesting flycatchers have not been documented. As habitat conditions improve from riparian management, additional breeding sites may establish in the Gila Box RNCA where increased water recreational use and facilities (launch and access points) may increase the potential to disturb nest sites.

Maintaining existing, and developing new, road and trail uses, along with other recreational uses, may directly affect the species as described in Issue 1. While the possibility for negative impacts from the actions described above cannot be completely eliminated, the direction of the FRMP for listed species and other areas of concern will minimize recreation-associated impacts.

Recreation Area Management Plans will be developed for identified recreational areas, including areas that may contain flycatcher habitat (e.g. Gila Box/Bonita Creek and Christmas area). We anticipate that these plans will include management that may have positive and negative effects on the species, but specifics of these plans are unknown at this time. These plans may require section 7 consultation.

Management Concern 4. Energy and Minerals

Mineral and energy development could affect this species or its habitat, but minerals and energy will be developed with the least damage to other resources in the area. These actions would also be subject to the NEPA and Endangered Species Act processes. Prohibiting mineral sales and issuing mineral and energy leases “with no surface occupancy” in all riparian areas outside of the ACECS (4,458 acres) will minimize potential impacts on the flycatcher and its habitat.

Management Concerns 5 (Cultural Resources), 9 (Air Quality), and 10 (Paleontological Resources)

It is unlikely that cultural, paleontological, or airshed resource management will affect the flycatcher, except possibly in relation to providing cultural or paleontological interpretive development, or during excavation of cultural sites. Any possible impacts will be addressed at the project level.

Management Concern 6. Soil Erosion

Minimizing soil erosion, as proposed, will help maintain or enhance flycatcher habitat. Managing upland vegetation can enhance the species’ habitat by improving the watershed to decrease non-point source pollution. Rehabilitation efforts have the possibility of actually increasing soil erosion in the short-term (e.g., prescribed burning, structural improvements), but in the long term soil erosion is likely to decrease in most areas under the FRMP. A decrease in soil erosion will result in a decrease in sediment movement in river systems containing flycatcher habitat. This is particularly true for the Gila River downstream of the San Simon confluence, due to actions proposed to reduce silt entering the Gila from the San Simon River and watershed.

Management Concern 7. Vegetation

The BLM will manage upland vegetation on BLM lands within the planning area for livestock use, watershed protection, reduction of non-point source pollution, threatened and endangered

species protection, priority wildlife habitat, firewood, and other incidental human uses. They will use best management practices and vegetation manipulation (including mechanical, chemical, and fire) to achieve desired plant community management objectives. Some of these uses could affect the flycatcher.

Management practices that improve upland vegetation conditions and increase forage may benefit flycatchers by decreasing livestock dependency on grazing within riparian areas. Increased production of key forage species would increase upland sustainability, reduce the need to graze riparian pastures, and may result in livestock using more of the forage in the uplands (either through livestock taking advantage of the increased forage availability or through pasture management).

BLM will implement prescribed fires and manage wildland fires in various portions of the planning area. Wildfire would be suppressed as needed and prescribed fire would be applied to the landscape as needed to meet the objectives of the FRMP and the specific areas. These actions have been consulted upon at the program level as part of the BLM LUP Amendment BO.

Other vegetation management actions, such as mechanical treatments, and noxious and invasive weed control, could affect the flycatcher. Noxious weeds documented in the planning area include Malta and yellow star thistle, and African rue. Invasive species considered for control include saltcedar, sweet resin bush, and buffelgrass. The Safford Field Office has identified mixed native/saltcedar for treatment on the Gila River within the Gila Box RNCA. Habitat assessments in the RNCA were completed in 2004, and a small patch near the mouth of Spring Canyon was identified as suitable habitat. Flycatcher surveys were conducted in 2005. To date, only a few migrant flycatchers and no nesting birds have been found in the Gila Box RNCA.

Despite saltcedar invasion being implicated as a cause for the decline of riparian bird species in the southwest, the flycatcher often nests in habitats dominated by saltcedar (see Environmental Baseline). If selective removal of saltcedar within these mixed stands increases the potential for suitable habitat to develop, these projects would benefit flycatchers. However, removal is probably equally likely, or more likely, to reduce habitat quality for flycatchers, at least temporarily. Temporary removal of dense vegetation, in this case saltcedar, may reduce the stand's suitability until native species become established or saltcedar reestablishes to provide dense vegetation cover. Riparian restoration projects that do not address underlying causes of riparian degradation (e.g. altered hydrology, livestock grazing, etc) often fail to achieve their objectives (Briggs 1996).

Saltcedar areas that may have the potential to provide flycatcher habitat may be managed to restore the native vegetation. Saltcedar removal in these areas that allows the establishment of native species, such as arrowweed and quailbush, which do not provide flycatcher habitat, would be detrimental to flycatchers and some other riparian woodland bird species.

Appendix H., in the flycatcher Recovery Plan, "Exotic plant species in riparian ecosystems of the U.S. Southwest" (U.S. Fish and Wildlife Service 2002) discusses different scenarios when active and passive exotic species control should occur in occupied or unoccupied suitable habitats. The major determining factors are whether or not the stressors that preclude native riparian

vegetation establishment can be controlled or eliminated. In cases where this is not possible, it is recommended that saltcedar not be removed in occupied or unoccupied suitable habitats. (U.S. Fish and Wildlife Service 2002).

With the emphasis that the FRMP directs for management of riparian, soil, watershed, and listed species habitats (among other issues and management concerns), it is likely that vegetation management will generally benefit the flycatcher, although some specific actions may have negative effects. Grazing, fire, and other vegetation treatments have or will be addressed at more specific levels as part of specific projects or management plans.

Management Concern 8. Water Resources

Habitat for the flycatcher may be enhanced by the BLM through acquisition of instream flow water rights on the Gila and San Pedro rivers and tributaries, designating and managing some of the tributaries of the Gila and San Pedro rivers as unique waters, implementing and acting on the results of monitoring programs and studies, controlling the availability and use of groundwater for the districts' programs, purchasing water rights to protect resource values, and adopting best management practices for BLM-managed activities. These activities have the potential to not only maintain current water quality and quantity in flycatcher habitat, but possibly to improve habitats in the future. Specific effects will be addressed in future site-specific actions under the FRMP.

Conservation Measures

Conservation measures for all species would decrease the likelihood of adverse effects on the flycatcher, and contribute to the recovery of the species. Specific measures for the flycatcher include conducting surveys in riparian areas before a project is implemented, performing maintenance activities in riparian areas with the least possible disturbance, monitoring flycatcher response to management actions, and implementing for all actions, where appropriate, the list of conservation actions for flycatcher identified in the Safford/Tucson Grazing BO on pages 57-61. These measures, while not eliminating all adverse affects, would help to minimize adverse effects to current and potential flycatcher reproduction, and habitat quality and quantity.

Huachuca Water Umbel

All the known populations and critical habitat of the umbel in the action area are located on the SPRNCA. Other populations and critical habitat are not anticipated to be impacted by the proposed actions of the FRMP because of distance to BLM lands, or the sites are located upstream of BLM lands. Our effects analysis for the umbel mainly analyzes the decisions of the San Pedro plan on populations and critical habitat, and include other effects analysis of the FRMP direction as appropriate.

1. (General), 9 (Cultural Resources), and 10 (Paleontological Resources)

It is unlikely that the general management actions, cultural resource management, or paleontological resource management will impact the water umbel, except possibly in relation to

providing interpretive development or during excavations. Any possible impacts will be addressed at the project level.

2. Recreation

Restricting vehicle use to designated routes throughout the SPRNCA has and continues to minimize the effects of off-route vehicle use of the habitat by limiting the impacts to riparian vegetation and the species in the habitat. The effectiveness of these designations is dependent in part on public education and enforcement.

Various recreational and interpretive sites and trails were identified in the San Pedro Plan. Installation of these sites and trails likely will not impact known umbel populations directly since analysis of the impacts and consultation, if necessary, will be conducted for each of these plans, and plants will be avoided. Use of these sites and trails have the potential for impacting known umbel sites by hikers and horse riders going off the sites and trails, but this is anticipated to be minimal since location of these sites will be incorporated into these project plans, and management actions will be adjusted to protect, and, ultimately, increase populations. Off-trail use not associated with recreational sites or trails occurs in some areas that may be impacting water umbel. All these uses may be directly impacting some individual plants, but are unlikely to be altering the site characteristics for the water umbel.

3. Lands

Designation of utility corridors (two corridors go through the SPRNCA) and subsequent authorization of utility projects within them could affect this species or its habitat if it is present within any of these areas. Right-of-way applications will be subject to NEPA and the Endangered Species Act processes, which would eliminate or minimize potential impacts.

The acquisition and disposal of BLM lands is likely to have little or no negative impacts on existing water umbel or its critical habitat. Occupied umbel areas or critical habitat will not be impacted since no lands within the SPRCA will be disposed. There may be a benefit to umbels and their critical habitat by acquiring lands within and outside of the SPRCA. Depending on the location, acquiring some lands upstream which support umbels and/or critical habitat, or acquisition of parcels in the watershed of the SPRNCA, may allow the BLM to more effectively manage habitat conditions for the species, water use, and watershed condition.

4. Water Resources

Water umbel and its critical habitat may be enhanced by the BLM seeking instream flow water rights, implementing monitoring programs, initiating studies, controlling the availability and use of groundwater for the districts' programs, purchasing water rights to protect resource values, and adopting best management practices for BLM-managed activities. All these activities have the potential to not only maintain current water quality and quantity in umbel areas, but possibly to improve unoccupied habitats in the future. Specific effects will be addressed in future site-specific actions under the FRMP.

5. (Wildlife Habitat), 6. (Vegetation), 7. (Soils/Watershed), 8. (Fire), and 12. (Visual)

The BLM will manage wildlife habitat, vegetation, soils/watershed, and fire on BLM lands within the planning area for livestock use, watershed protection, reduction of non-point source pollution, threatened and endangered species protection, priority wildlife habitat, firewood, and other incidental human uses. They will use best management practices and vegetation manipulation (including mechanical, chemical and fire) to achieve desired plant community management objectives. Some of these uses could affect the umbel.

As presented in the 'Status of the Species', livestock grazing can affect the umbel through trampling and changes in stream hydrology and loss of stream bank stability; however, existence of the umbel appears to be compatible with well-managed livestock grazing (U.S. Fish and Wildlife Service 1997). Approximately 6,000 acres are currently grazed in SPRNCA, but only one of these allotments (Brunchow Hill allotment #5251) has sites occupied by umbels. Trespass cattle occur elsewhere in the SPRNCA, and grazing in the uplands outside of the SPRNCA affect the umbel indirectly by affecting the watershed of the San Pedro River. The effects from livestock grazing were analyzed in detail in the Safford/Tucson BLM Grazing BO.

BLM will implement prescribed fires and manage wildland fires in various portions of the planning area. Wildfire would be suppressed as needed, and prescribed fire would be applied to the landscape as needed to meet the objectives of the FRMP and the SPRNCA. The BLM will suppress wildfire, as needed, in areas that support Huachuca water umbel. Wildland fire use will not be used in the SPRNCA. Refer to the BLM LUP Amendment BO for detailed analyses of the effects of these activities on the water umbel and its critical habitat.

With the emphasis that the FRMP directs for management of riparian, soil, watershed, and listed species habitats (among other issues and management concerns), it is likely that vegetation management will generally benefit the umbel, though some specific actions may have negative effects. Grazing, fire, and other vegetation treatments will be addressed at more specific levels as part of projects or management plans.

11. Minerals

The SPRNCA is withdrawn from new mineral entry and mineral leasing laws. Existing gravel operations (at the time SPRCA was designated) outside the riparian area ceased at the expiration of that lease (December 31, 1989). No further impacts on known umbel sites or CH will occur because of mineral activities.

13. Areas of Critical Environmental Concern

ACECs are designated for special management emphasis because of unique or sensitive resources. One of the factors for some of these designated areas includes riparian values. Management of these areas require the development and implementation of ACEC management plans that direct special emphasis to maintain or improve the condition of the resources in these areas. The habitat quality for this species in some ACECs may be maintaining or improving

based on the emphasis of the ACEC direction. Specific effects will remain unknown until plans are complete.

Three research natural area ACECs (St. David Cienega, San Pedro River, and San Rafael, totaling 2,060 acres) were established in the SPRNCA. Specific direction for these areas in the San Pedro plan includes additional limits on recreation, vehicle, and utility use as compared with the rest of the SPRNCA. These additional limits should increase the likelihood of maintaining or increasing the presence of umbels.

14. (Administrative Facilities) and 15. (Research)

Facilities for administration and research may and have been constructed in the SPRNCA. These facilities are outside any sites occupied by umbel or their CH. It is unlikely that construction, maintenance or use of these areas would adversely affect the umbel. Any possible impacts will be addressed at the project level.

The proposed action of the FRMP, including the San Pedro plan and conservation measures proposed for Huachuca water umbel (as discussed in previous sections), should adequately protect most known populations of water umbel. The possibility exists that an unknown new patch of water umbel may be affected by some actions, but we anticipate that this will be a minor and temporary effect, as there are patches of water umbel distributed along the entire SPRNCA, providing a source for recolonization.

The analysis is the same for critical habitat; constituent elements (mainly bank stabilization) may be affected, but we anticipate this effect to be localized and not affecting the entire stretch of critical habitat in the SPRNCA.

Conservation Measures

Conservation measures for all species would decrease the likelihood of adverse effects on the water umbel, and contribute to the recovery of the species. These measures include contributing to the conservation of the species, not jeopardizing the continued existence of the species, and complying with section 7 of the ESA. The BLM has committed to additional conservation measures regarding livestock grazing activities (see Safford/Tucson Grazing BO) and fire management projects (see Appendix B of BLM LUP Amendment BO). Specific conservation measures for the water umbel would result in maintaining and possibly improving conditions for the species. Measures such as avoiding plants and microsites that could support the water umbel, re-routing trails and roads to avoid effects to critical habitat, maintaining structures with the least disturbance to plants and habitat, replanting of plants, surveys, and monitoring will all contribute to maintaining the plants and habitat for the species. Some individuals may be affected, but the conservation measures will result in maintaining the habitat characteristics for water umbel to reestablish.

New Mexico Ridge-nosed Rattlesnake

Populations are currently known in the action area, but not on BLM lands. We assume that NMRR is reasonably certain to inhabit the 3 and 4 potential core habitats identified in Holycross and Smith (2001) within the action area on BLM lands, possibly including patches burned during the Maverick and Baker II prescribed fires. Specific project proposals developed under the FRMP will evaluate the possible effects to determine the need for future consultation.

Issue 1. Access

Actions proposed by BLM regarding vehicle access could have both positive and negative effects to the species. Reduction of roads, if any, in the Peloncillo Mountains would mostly have beneficial effects on the individuals, especially those roads through and adjacent to the habitat. The FRMP does not describe how road closures will be identified or implemented, but depending on where roads are closed, the reductions may help to decrease the chance for illegal collecting of this species, and decrease the likelihood of wildfires ignited by humans. Reduction of open roads in and adjacent to habitat may reduce the chances for direct mortality of NMRRs that may cross a road or that may be killed during a wildfire. Continued use of existing roads would maintain the chances for illegal collection and direct mortality of NMRRs crossing roads or killed in a fire. Increasing access by constructing new roads and trails could increase the likelihood of illegal collection and mortality. The FRMP proposes no road reconstruction or acquisition of legal access across non-BLM lands in or near the habitat of this snake. Changes in access that may impact this species is unknown, because the FRMP is not specific on locations of projects within the range of the snake. These actions will be addressed either through site-specific projects or through the District Transportation Plan.

Issue 2. Areas of Critical Environmental Concern and Other Types of Special Management

No ACECs, wilderness areas, or other special areas on BLM lands include identified habitat for the NMRR, or are adjacent to identified NMRR habitat. Specific management of these special areas is not anticipated to affect the NMRR or its habitat.

Issue 3. Off-highway Vehicles

All public lands within the planning area are designated as open, closed, or limited with respect to off-highway vehicle use. All vehicle use in NMRR areas is restricted to existing roads and trails occurring at the time of designation as well as any new roads approved for construction during the life of the FRMP. Restricting vehicle use through these areas to existing roads and trails will minimize access to habitat areas, reducing the likelihood of NMRR mortality from vehicles, illegal collection, and human-caused fire starts, as described for Issue 1.

Issue 4. Riparian Areas

Management of riparian areas will not affect the NMRR because none of the delineated Riparian Areas are located within or near NMRR habitat (see Map 26 of the FRMP).

Management Concern 1. Wildlife Habitat

The NMRR is a priority species under the FRMP, which directs the BLM to manage the species and its habitats to maintain or enhance population levels. Management actions will be implemented to accomplish this goal, including prescribed burning, wildfire suppression, and development of habitat management plans. All of these actions will likely have beneficial effects on NMRR, but it is possible for short-term negative effects to occur (such as with prescribed burning resulting in changes to habitat characteristics that may not benefit the species). Implemented actions eventually could result in positive effects (such as increased soil stabilization from the increase in herbaceous plant density and reduction in the likelihood of catastrophic fire). Specific effects are not known until specific actions are identified.

Management Concern 2. Lands and Realty

The acquisition and disposal of BLM lands could have positive, negative, or no impacts on the NMRR or its habitat. One LTMA is identified in extreme southeastern Arizona, and includes a small portion of identified habitat for the species. These areas emphasize the acquisition of other ownership lands that may provide a benefit to the species and its habitat if those lands acquired include potential NMRR recovery habitat. The consolidation of larger blocks of BLM lands (instead of the more checkerboard pattern in some areas) will allow the BLM to better manage the area as a whole. This will allow the BLM to implement actions that benefit NMRR habitat if present in these areas. The FRMP did not identify any specific parcels for disposal within the habitat of the snake. However, future disposal of parcels in other areas is possible through an amendment of the FRMP. No utility corridors or communication sites were designated in or near the habitat of the snake. The FRMP emphasizes management to benefit listed species and not to implement actions that would result in jeopardy to the species, reducing the likelihood that disposal of these lands would occur if NMRR habitat is present.

Rights-of-way applications could be issued in the general area of identified habitat, but the applications will be subject to NEPA and the Endangered Species Act processes, which would eliminate or minimize potential impacts.

Management Concern 3. Outdoor Recreation and Visual Resource Management

BLM will provide a diversity of recreational experiences in the planning area. Some of these actions could affect NMRR through road and trail use and recreation developments. Maintaining existing and developing new road and trail uses, along with other recreational uses, may facilitate direct effects to the species as described in Issue 1. While the possibility for mortality from the actions described above cannot be completely eliminated, the direction of the FRMP for listed species, riparian areas, and other areas of concern will minimize recreation-associated impacts.

Management Concern 4. Energy and Minerals

Mining is a potential threat to the snake (U.S. Fish and Wildlife Service 1985); however, we are not aware of current or proposed mining activity in the range of the snake in the Peloncillo

Mountains. The FRMP proposes no mineral withdrawals or other special stipulations or limitations on mining in the Peloncillo Mountains. Mineral and energy development could affect this species or its habitat, but minerals and energy will be developed with the least damage to other resources in the area. These actions would be addressed at the project level.

Management Concerns 5 (Cultural Resources), 8 (Water Resources), 9 (Air Quality), and 10 (Paleontological Resources)

It is unlikely that cultural, water, air quality, or paleontological resource management will impact the NMRR, except possibly in relation to providing cultural or paleontological interpretive development or during excavation of cultural sites. Any possible impacts will be addressed at the project level.

Management Concern 6. Soil Erosion

Minimizing soil erosion will help maintain or enhance NMRR habitat. Managing upland vegetation can enhance the species' habitat by improving the watershed to decrease erosion, and maintaining vegetation characteristics. Rehabilitation efforts have the possibility of actually increasing soil erosion in the short-term (e.g., prescribed burning, structural improvements), but soil erosion is likely to decrease in most areas under the FRMP. No specific soil erosion actions are proposed in the FRMP for the Peloncillo Mountains. Effects of specific plans will be evaluated through the NEPA and section 7 consultation processes.

Management Concern 7. Vegetation

The BLM will manage upland vegetation on BLM lands within the planning area for livestock use, watershed protection, reduction of non-point source pollution, threatened and endangered species protection, priority wildlife habitat, firewood, and other incidental human uses. They will use best management practices and vegetation manipulation (including mechanical, chemical, and fire) to achieve desired plant community management objectives. Some of these uses could affect the NMRR.

Implementing vegetation management actions has the potential to increase snake predation due to loss of ground cover and greater periods of surface exposure as more time and energy may be devoted to foraging. There may be changes in snake prey (arthropods, lizards, and small birds and mammals) availability, distribution, or reproductive patterns, and long-term alteration of NMRR suitable habitat.

Excessive grazing can result in negative effects to the subspecies (U.S. Fish and Wildlife Service 1985, 1999; and Safford/Tucson Grazing BO), due to reduction in snake hiding and prey cover, habitat reduction and alteration, and subsequent alteration of fire frequency and intensity. Trampling of snakes by cattle and mortality due to other grazing activities (travel on roadways, etc) are also possible (see Safford/Tucson Grazing BO). Appropriate grazing intensities in or adjacent to habitats of the NMRR will still have some negative impacts on the habitat characteristics, but well-managed livestock grazing systems are likely compatible with

maintaining habitat quality for NMRR. These threats are addressed more specifically in the grazing Biological Opinions listed under “Past consultations in the action area”.

The BLM will implement prescribed fires and manage wildland fires in various portions of the planning area. Wildfire would be suppressed as needed, and prescribed fire would be applied to the landscape as needed to meet the objectives of the FRMP and the specific areas. Refer to the BLM LUP Amendment BO and the Peloncillo Programmatic Fire Management Plan on the Coronado National Forest (U. S. Fish and Wildlife Service 2005) for detailed information. Note that the BLM LUP BO did not anticipate incidental take for the NMRR; however, incidental take was anticipated for the Peloncillo Programmatic Fire Plan. That plan addresses prescribed fire planning on lands of both the Coronado National Forest and adjacent BLM lands in the Peloncillo Mountains, which include habitats of the NMRR. Because the Peloncillo Plan is a component of fire planning in the FRMP, and for the reasons discussed in the BO for that plan, we find herein that incidental take is reasonably certain to occur as a result of fire management planning proposed in the FRMP.

Other vegetation management actions, such as mechanical treatments and noxious weed control, could affect the NMRR through alteration of habitat or direct mortality. With the emphasis that the FRMP directs for management of riparian, soil, watershed, and listed species habitats (among other issues and management concerns), it is likely that vegetation management will generally benefit the NMRR, though some specific actions may have negative effects. Effects of grazing activities on NMRR have already been addressed to the project level (see Safford/Tucson Grazing BO). Fire and other vegetation treatments will be addressed at more specific levels as part of projects or management plans. The FRMP proposed no specific vegetation management actions in the Peloncillo Mountains.

Conservation Measures

Conservation measures for all species would decrease the likelihood of adverse effects on the NMRR and contribute to the recovery of the species.

Chiricahua Leopard Frog

Effects described below would only occur if CLFs occur in the action area. Although surveys are incomplete, the only population of CLF currently known in the action area is in Leslie Canyon, Swisshelm Mountains, which is on the Leslie Canyon National Wildlife Refuge near BLM lands. Any actions in the Swisshelm Mountains upstream of, and adjacent to, Leslie Canyon could affect the extant population of CLF. Effects of the proposed action on BLM lands may extend downstream or otherwise into the habitats of the CLF. We discussed in the environmental baseline other locations in the action area that could be potentially occupied by CLF. Specific project proposals developed under the RMP will need to evaluate the likelihood of species presence and possible effects to determine the need for future consultation.

Issue 1. Access.

Actions proposed by BLM regarding vehicle access could have both positive and negative effects to the species, if it is present in the action area. Reduction of roads would mostly have beneficial effects on the habitat and individuals, especially those roads through and adjacent to the habitat. Road reduction should improve aquatic habitat and associated riparian vegetation in most areas, depending on the closure technique, through a decrease in sediment entering any drainage. Increased sediment into drainages is possible from a road closure if that closure does not include sufficient soil stabilization efforts. Sedimentation can kill eggs and larval frogs and decrease aquatic habitat. A road closure could also have an indirect effect by diverting traffic to another area or route, with possible adverse or positive effects to frogs and their habitats. Changes in vehicle access will also change the likelihood of non-native species introductions and the spread of disease in areas affected by access policies, because the distribution and introduction of non-native species and disease can be facilitated by human activities. The FRMP does not describe how road closures will be identified or implemented, but, considering the direction for managing wildlife habitat, riparian areas, and other resources, we anticipate that most increases in sediment will be short-term, but in the long-term sedimentation into most drainage systems is expected to decrease. Reduction of open roads in and adjacent to habitat will reduce impacts to vegetation in those riparian areas and decrease the chance of killing frogs (if present or if they become established during the life of the project). However, if frogs are present in the vicinity of remaining vehicle crossings, egg masses, tadpoles, and young frogs could potentially be injured or killed by vehicles. Larger frogs would probably hop or swim away and avoid injury, at least during the warmer months. During the winter CLFs could be on the bottom of pools, which if traversed by a vehicle, could result in death or injury. Dispersing frogs could also be killed on roads through upland areas.

Increasing access to BLM lands could result in both positive and negative effects to the species and its habitat. If maintenance improves after BLM acquires access along existing trails and roads, the result could be less sediment in drainages. However, increasing access by constructing new roads and trails could increase:

- Sediment in drainages, regardless of the proposed maintenance;
- The likelihood of human-caused fire;
- The likelihood of introducing chytridiomycosis or non-native predators into unaffected areas;
- The likelihood of CLF mortality on roads.

Reconstructing roads and providing additional access through and adjacent to habitat could also result in impacts to frogs as described in the previous paragraphs. With direction for wildlife habitat, riparian areas, and other resources, we anticipate these types of impacts will be minimal. The FRMP proposes reconstruction of roads at five specific locations, and proposes to acquire legal trail access across non-BLM lands at five other sites. CLF are not known currently or historically from any of these sites; although some locations (e.g., Babocomari River Trail, Safford-Morenci Trail, and others) could occur near potential habitat. The FRMP proposes to acquire legal access on existing roads at 39 locations. Some of the locations in Bonita Creek, San Pedro River, Guadalupe Canyon, Aravaipa Creek, and southern Galiuro Mountains cross in or near potential CLF habitat. Existing use of these roads may change if legal access is acquired,

but it is unlikely it will measurably increase over existing legal and illegal use. Other specific changes in access that may impact this species are unknown since the FRMP is not specific in regard to other locations. These actions will be addressed either through site-specific projects or through the District Transportation Plan.

Issue 2. Areas of Critical Environmental Concern and Other Types of Special Management

ACECs are designated for special management emphasis because of unique or sensitive resources. One of the factors for some of these designated areas includes riparian values. Management of these areas requires the development and implementation of ACEC management plans that direct special emphasis to maintain or improve the condition of the resources in these areas. Elements of habitat quality under the control of the BLM for this species in ACECs with potentially suitable or suitable frog habitat (Gila Box RNCA, Swamp Springs-Hot Springs Watershed ACEC, Guadalupe Canyon Outstanding Natural Area ACEC, and Willcox Playa National Natural Landmark ACEC) are expected to maintain or improve based on the emphasis of the ACEC direction and proposed management prescriptions. Special Management Prescriptions will likely maintain or improve the potential CLF habitat in these areas. The prescriptions include, depending on the ACEC, acquiring private inholdings, prohibiting woodcutting, restricting off-highway vehicle use, and managing the areas to improve riparian values. Specific effects will remain unknown until plans are complete.

Fourteen river segments (149 miles) are being studied for inclusion in the Wild & Scenic Rivers system. Segments in the Gila Box, Aravaipa Canyon, and Hot Springs Canyon area may provide habitat for this species. The segments will be managed to protect their values until Congress acts to designate them or release them to management under provisions of the applicable Resource Management Plan. This management is expected to maintain or improve physical and vegetation elements of habitat quality under the control of the BLM (in appropriate areas).

Coordinated management plans for the Aravaipa Creek watershed, Muleshoe Ranch, and Bear Springs Flat will be developed and implemented. Bear Springs Flat is likely outside of the distribution of the species (too low in elevation or outside of historically occupied areas). Of the three, only the Muleshoe Ecosystem Management Plan is completed. CLF could potentially occur in this planning area. Implementation of the plan is expected to result in the maintenance or improvement of physical and vegetation habitat elements important for this species that are under the control of the BLM. However, nonnative species invasions, and spread and effects of disease, which are difficult, if not impossible to control even with intensive management, could or may have already rendered the Muleshoe area unsuitable as habitat for CLF. Recreation or other activities authorized under the plans may lead to increased spread of non-native species and disease. Specific effects of implementing the Aravaipa Creek watershed plan will remain unknown until the plan is complete, but the effects are anticipated to be similar to the Muleshoe Ecosystem Management Plan.

Issue 3. Off-highway Vehicles

All BLM lands within the planning area are designated as open, closed, or limited with respect to off-highway vehicle use. The only area designated as open to off-highway vehicle use is the Hot

Well Dunes (1,708 acres), which is unlikely to provide habitat for this species (open, sandy desert with little water). All vehicle use is closed in wilderness areas, parts of Turkey Creek, Willcox Playa ACEC, and Hot Springs Canyon riparian area; and vehicles are limited to designated routes only in the Gila Box and San Pedro RNCAs, with the remaining 1,310,713 acres of the BLM lands within the action area restricted to existing roads and trails occurring at the time of designation as well as any new roads approved for construction during the life of the FRMP. Restricting vehicle use throughout most of the planning area to existing roads and trails, and vehicle closures or limiting vehicles to designated routes in specific sites with potential for CLF (e.g., Gila Box RNCA, Hot Springs Canyon, Willcox Playa ACEC), have and continue to minimize the effects of off-route vehicle use of the habitat by limiting sediment load from the surrounding lands into streams, and limiting the impacts to riparian vegetation and the species in the habitat, as described Issue 1. The effectiveness of these designations is dependent in part on public education and enforcement.

Issue 4. Riparian Areas

Some of the riparian areas in the upper Gila River, San Pedro River, and Aravaipa and Muleshoe areas may have the characteristics of frog habitat (see discussion above and Environmental Baseline). Physical and vegetation characteristics of CLF habitat in these areas are anticipated, in general, to maintain their current condition, or possibly improve, based on the direction for riparian areas including:

- Riparian areas on BLM land within the planning area will be managed to achieve good to excellent condition (Proper Functioning Condition) on 75 percent of the riparian zone (RMP states by 1997).
- Riparian objectives will be incorporated into existing and future activity plans.
- Riparian areas will be retained in public ownership unless disposal would be in the public interest, as determined by land use planning.
- Grazing systems will be developed and existing allotment management plans will be modified, as necessary, to best manage livestock use for improvement of riparian areas and reduced non-point source water pollution.

These actions are likely to maintain the physical and vegetation aspects of frog habitat, where they occur, but sites could still be degraded or lost due to non-native species introductions or spread of disease facilitated by recreation, livestock grazing activities, or other actions authorized under the FRMP. Water quality or quantity in riparian areas could be degraded due to authorized mining activities.

Management Concern 1. Wildlife Habitat

The CLF is a priority species under the FRMP, which directs the BLM to manage the species and its habitats to maintain or enhance population levels. Management actions will be implemented to accomplish this goal, including transplantation, prescribed burning, wildfire suppression, and

development of habitat management plans. All of these actions will likely have beneficial effects on CLF, but it is possible for short-term negative effects to occur (such as with prescribed burning resulting in a temporary increase in erosion, but eventually resulting in increased soil stabilization from the increase in herbaceous plant density and reduction in the likelihood of catastrophic fire). Development of Habitat Management Plans is proposed for the Gila Box, Aravaipa/Muleshoe, and Peloncillo Mountains where CLF may occur. Inventories for priority wildlife species, including the CLF, are proposed throughout the planning area, and have been ongoing for a number of years. Specific effects are not known until HMPs are completed and specific actions are identified.

Management Concern 2. Lands and Realty

The acquisition and disposal of BLM lands could have positive, negative, or no impacts on the CLF or its habitat. The FRMP proposes disposal of lands in the Swisshelm Mountains, which are adjacent to occupied CLF habitat on the Leslie Canyon National Wildlife Refuge. The BLM lands are generally on the western slope of the Swisshelms, and not in the Leslie Canyon watershed. However, disposal and subsequent development of these properties for residential or other uses could increase public visitation of Leslie Canyon, result in increased groundwater pumping, or otherwise facilitate adverse effects to the frog or its habitat. The effects of such disposals would need to be evaluated in NEPA documents and project-level section 7 consultation with this office. Similarly, disposal of lands near Portal on the eastern slope of the Chiricahua Mountains, proposed in the FRMP, could facilitate development and similar adverse effects to any remaining CLF in that area. CLF occurred until recently in east Turkey Creek, Silver Creek, and Cave Creek, although they have not been seen in these areas for 3-4 years.

Designating LTMA that emphasize the acquisition of other ownership lands may provide a benefit to the species and its habitat if those lands acquired include frog populations or existing or potential recovery habitat. The consolidation of larger blocks of BLM lands (instead of the more checkerboard pattern in some areas) will allow the BLM to better manage the area as a whole. This will allow the BLM to implement actions that benefit CLF habitat if present in these areas. Retention of riparian areas and management to benefit listed species are emphasized in the FRMP, reducing the likelihood that disposal of lands outside of LTMA may result in the loss of potential CLF habitat. However, frogs often occur in upland livestock stock tanks away from riparian areas and could be affected by disposal of such lands and subsequent changes in land uses.

Designation of five utility corridors, a right-of-way avoidance zone in the Muleshoe area, and right-of-way exclusion areas in the Gila Box and other areas will increase the likelihood that large utility projects will be concentrated in certain areas, decreasing the likelihood that such projects will occur in areas that may include possible CLF habitat. Authorization of utility projects that could affect this species or its habitat within and outside of the utility corridors will be subject to NEPA and the Endangered Species Act processes, which would eliminate or minimize potential impacts to this species. Excluding rights-of-way in wilderness areas, wilderness study areas, Dos Cabezas Peaks, Gila Box, and Willcox Playa, and designating avoidance zones at Muleshoe Ranch and Bowie Mountain Scenic ACEC, will prevent potential impacts to this species and its habitat if found there.

Management Concern 3. Outdoor Recreation and Visual Resource Management

BLM will provide a diversity of recreational experiences in the planning area. Some of these actions could affect CLF through construction and maintenance of roads, trails, and recreation developments, as well as their usage by the public. Existing and increasing road and trail use may facilitate effects directly to the species. If frogs are present in the vicinity of vehicle crossings through occupied habitat, egg masses, tadpoles, and young frogs could potentially be injured or killed by vehicles. Larger frogs would probably hop or swim away and avoid injury, at least during the warmer months. During the winter CLFs could be on the bottoms of pools, which if traversed by a vehicle, could result in death or injury.

Parking areas, trailheads, restrooms, and other developments will be provided in some areas of the planning area. The installation, location, and use of some of these developments will result in recreational users trampling vegetation and banks, but such effects are likely to be localized and minimal. Hikers and vehicles that pass through habitat could potentially introduce chytridiomycosis (if not already present), which could negatively impact frog populations. Public use may increase the risk of human-caused fire, which can potentially result in direct impacts to frogs and indirect adverse effects from habitat degradation. However, directing public use to these managed areas is much less risky than more dispersed recreational use.

The BLM will incorporate various measures in their recreational management plans and other plans (ACECs, wilderness management plans, etc.) to manage for CLF and other listed species (when appropriate). Potential effects of such developments in the Gila Box RNCA have already been addressed to the project level in the Gila Box RNCA BO. A recreational plan is proposed for the Guadalupe Canyon area, in which appropriate recreational management for protection of CLF and other sensitive species and resources would be considered. While potential for mortality and adverse effects to habitat quality and quantity from the actions described above cannot be completely eliminated, the direction of the FRMP for listed species, riparian areas, and other areas of concern will minimize recreation-associated impacts. Because the CLF is not currently known to occur on BLM lands in the action area, effects of recreational activities on the species will likely be small and indirect.

Management Concern 4. Energy and Minerals

Mineral and energy development could affect this species or its habitat, but minerals and energy will be developed with the least damage to other resources in the area. These actions would also be subject to the NEPA and Endangered Species Act processes. Withdrawing Gila Box RNCA from mineral entry and prohibiting mineral sales in Gila Box RNCA and riparian areas has the potential to minimize potential impacts on the species and its habitat. No surface occupancy would be stipulated in any mineral leases in the Gila Box RNCA and riparian areas, which has additional potential to protect the species and its habitat, if it occurs in these areas. Mitigation and reclamation measures would be required in mining plans of operation, consistent with the surface management regulations and the Endangered Species Act.

Management Concerns 5 (Cultural Resources), 9 (Air Quality), and 10 (Paleontological Resources)

It is unlikely that cultural, paleontological, or airshed resource management will impact CLF, except possibly in relation to providing cultural or paleontological interpretive development, or during excavation of cultural sites. Any possible impacts will be addressed at the project level.

Management Concern 6. Soil Erosion

Minimizing soil erosion will help maintain or enhance CLF habitat. Managing upland vegetation can enhance the species' habitat by improving the watershed to decrease sedimentation and nonpoint source pollution. Rehabilitation efforts have the possibility of actually increasing soil erosion in the short-term (e.g., prescribed burning, structural improvements), but soil erosion is likely to decrease in the long-term in most areas under the FRMP. No specific soil erosion control projects are proposed in or near potential or occupied habitats of the CLF. The effects of such projects carried out under the FRMP would have to undergo project-level analyses.

Management Concern 7. Vegetation

The BLM will manage upland vegetation on BLM lands within the planning area for livestock use, watershed protection, reduction of non-point source pollution, threatened and endangered species protection, priority wildlife habitat, firewood, and other incidental human uses. They will use best management practices and vegetation manipulation (including mechanical, chemical, and fire) to achieve desired plant community management objectives. Some of these uses could affect the CLF.

Adverse effects to the CLF and its habitat as a result of vegetation management actions may occur under certain circumstances. These effects include: facilitating dispersal of non-native predators; trampling by livestock of egg masses, tadpoles, and frogs; possible incidental ingestion by livestock (of small larvae or eggs while drinking); deterioration of watersheds; degraded water quality and subsequent toxic effects on frogs; erosion and/or siltation of stream courses; elimination of undercut banks that provide cover for frogs; loss of cover provided by wetland and riparian vegetation; loss of backwater pools; and spread of disease (U. S. Fish and Wildlife Service 2002, Belsky *et al.* 1999, Ross *et al.* 1999, Bartelt 1998, Ohmart 1995, Hendrickson and Minckley 1984, Arizona State University 1979, Jancovich *et al.* 1997).

Maintenance of viable populations of CLF is thought to be compatible with well-managed livestock grazing. Throughout the range of CLF, grazing occurs in most of CLF's habitats. For instance, one large and healthy population of CLF coexists with cattle and horses on the Tularosa River in New Mexico (Randy Jennings, Western New Mexico University, pers. comm. 1995). Throughout their range, CLFs are often found living in earthen livestock tanks. Livestock often heavily use these tanks, yet CLFs persist at these sites, often for decades. Nevertheless, livestock grazing activities can degrade habitats and result in mortality of individual frogs or loss of populations.

In 1998, sixty-three percent of extant CLF localities in Arizona were stock tanks, versus only 35 percent of extirpated localities (Sredl and Saylor 1998); suggesting Arizona populations of this species have fared better in stock tanks than in natural habitats. Stock tanks provide small patches of habitat that are often dynamic and subject to drying and elimination of frog populations; however, Sredl and Saylor (1998) also found that stock tanks are occupied less frequently by non-native predators (with the exception of bullfrogs) than natural sites. If CLFs are present in stock tanks or will be in the future, they may benefit from creation and maintenance of those tanks, but adverse effects may occur as well. Construction of stock tanks has in some cases replaced, destroyed, or altered natural wetland habitats. Creation or maintenance of livestock waters in arid environments may also provide the means for non-native predators such as bullfrogs and crayfish to move across landscapes that would otherwise serve as barriers to their movement. Cattle can remove bankline vegetation that provides escape cover for frogs and a source of insect prey. However, dense shoreline or emergent vegetation in the absence of grazing may favor some predators, such as garter snakes (*Thamnophis* spp.), and CLFs may benefit from the basking and foraging habitat created by cattle when they open up banklines through grazing and hoof action. Also, maintenance of livestock tanks can result in death or injury of frogs. Tanks are periodically dredged out to remove silt. Dredging is usually conducted when the tank is dry or nearly dry. However, as tanks dry out, frogs take refuge in cracks in the mud around tanks or clumps of remaining emergent vegetation. At Walt's Tank on the Coconino National Forest in September 2002, several CLFs were rescued out of cracks. If backhoes or other equipment had been brought in to dredge out the tank at that time, these frogs would have certainly perished.

CLFs, particularly eggs, tadpoles, and metamorphs, are probably trampled by cattle on the perimeter of stock tanks and in pools along streams where cattle have access (Bartelt 1998, Ross *et al.* 1999, U. S. Fish and Wildlife Service 2002). Working in Nye County, Nevada, Ross *et al.* (1999) found a dead adult Columbia spotted frog (*Rana luteiventris*) in the hoof print of a cow along a heavily grazed stream. They observed numerous other dead frogs in awkward postures suggesting traumatic death, likely due to trampling. In Idaho, Bartelt (1998) documented near-complete loss of a metamorph cohort of boreal toads (*Bufo boreas*) due to trampling by sheep at a livestock tank. Juvenile and adult frogs can probably often avoid trampling when they are active; however, leopard frogs are known to hibernate on the bottoms of ponds (Harding 1997), where they may be subject to trampling during the winter months.

CLFs can be adversely affected by degraded water quality caused by cattle urine and feces. At Headquarters Windmill Tank on the Coronado National Forest in the Chiricahua Mountains of southeastern Arizona, Sredl *et al.* (1997) documented heavy cattle use at a stock tank that resulted in degraded water quality, including elevated hydrogen sulfide concentrations. A die-off of CLFs at the site was attributed to cattle-associated water quality problems, and the species has been extirpated from the site since the die-off occurred (U. S. Fish and Wildlife Service 2002). Larval frogs may be particularly susceptible to nitrogenous compounds that can be associated with grazing (Schepers and Francis 1982, Boyer and Grue 1995). Toxicity could result from high concentrations of un-ionized ammonia (Schuyttema and Nebeker 1999), particularly in combination with primary-production induced elevation in pH.

Grazing activities could result in spread of infectious disease. Chytrid fungus can survive in wet or muddy environments and could conceivably be spread by livestock carrying mud on their hooves and moving among frog habitats. Personnel working at an infected tank or aquatic site and then traveling to another site, thereby transferring mud or water from the first site, could also spread this disease. Chytrids could be carried inadvertently in mud clinging to wheel wells or tires, or on shovels, nets, boots, or other equipment. Chytrids cannot survive complete drying; if equipment is allowed to thoroughly dry, the likelihood of disease transmission is greatly reduced. Bleach, quaternary ammonia, or other disinfectants can also be applied to tools and vehicles and will kill chytrids (Longcore 2000). Grazing activities could also increase the susceptibility of frogs to disease. Degraded water quality, threat of trampling, or other stressors caused by grazing activities could alter immune response of frogs, making them more susceptible to disease (Carey *et al.* 1999).

Transfer of chytrids and non-native predators could occur during introductions of fish or other aquatic organisms. Permittees haul water to tanks and troughs. If the water source contains fish, bullfrogs, or crayfish, these animals may be transported inadvertently with the water to a site occupied by the CLF. Bullfrogs (Bradley *et al.* 2002), tiger salamanders (Davidson *et al.* 2003), and likely other organisms, can carry chytrids from one site to another (in addition to chytrids carried via water or mud from infected sites). In addition to potentially spreading disease, any introduced non-native predators would likely prey upon and may eliminate CLFs from the site to which the water was hauled.

The BLM will implement prescribed fires and manage wildland fires in various portions of the planning area. Wildfire would be suppressed as needed and prescribed fire would be applied to the landscape as needed to meet the objectives of the FRMP and the specific areas. These actions and their effects on the CLF were addressed at the program level in the BLM LUP Amendment BO. We anticipate that the BLM would build into their fire management plans standard measures to minimize potential effects to CLF and their habitat because BLM would manage fire with the objective of improving and protecting the resources in the planning area.

Other vegetation management actions, such as mechanical treatments and noxious weed control, could affect CLF. These impacts are similar to what has been described for this species above, including affecting water quality, sediment movement, direct mortality, and impacts to riparian vegetation.

With the emphasis that the FRMP directs for management of riparian, soil, watershed, and listed species habitats (among other issues and management concerns), it is likely that vegetation management will generally benefit the CLF, though some specific actions may have negative effects, particularly in the short term. Grazing, fire, and other vegetation treatments will be addressed at more specific levels as parts of projects or management plans. No specific actions are proposed in the Vegetation element of the FRMP that would affect CLF or its occupied or potential habitats.

The CLF population in Leslie Canyon may indirectly be affected by actions on BLM lands nearby. The main actions that could affect this population are prescribed fire and wildfire suppression. While the indirect effects of prescribed fire upstream/upslope of this population

could result in increased sedimentation and other effects, these effects would likely be minimal since the BLM would implement fire management plans that include measures to minimize effects to CLF and the habitat. Wildfire suppression actions have a higher likelihood of resulting in measurable effects to CLF since actions that may be needed to control or slow a wildfire may result in some measures being only partially implemented. These actions may result in changes in habitat quality and possibly mortality of one or more stages of CLF. Refer to the Statewide Land Use Amendment BO, which is incorporated in this BO, for more specific information on the effects of prescribed fire and fire suppression on the CLF and its habitat.

Management Concern 8. Water Resources

Habitat for the CLF may be enhanced by the BLM seeking instream flow water rights and unique waters designations, implementing monitoring programs, initiating studies, controlling the availability and use of groundwater for the Districts' programs, purchasing water rights to protect resource values, and adopting best management practices for BLM-managed activities. These activities have the potential to not only maintain current water quality and quantity in CLF habitat, but possibly to improve habitats in the future. The FRMP proposes to evaluate Swamp Springs, Redfield, Hot Springs, and Bass canyons in the Galiuro Mountains for their suitability as Unique waters. For these sites, which have potential to support CLF, the BLM would nominate those sites that meet the standard requirements for such designation. Acquisition of instream flow rights would be investigated or sought for areas that may contain potential habitat. If obtained, these rights should help maintain flows in these aquatic systems necessary for persistence of the CLF. Specific effects will be addressed in the future for other site-specific actions under the FRMP.

Conservation Measures

Conservation measures for all species would decrease the likelihood of adverse effects on the CLF, and contribute to the recovery of the species.

Razorback Sucker

Issue 1. Access

Reduction of roads, as proposed, would mostly have beneficial effects on razorback sucker critical habitat on the Gila River, especially those roads through and adjacent to the habitat. Road reduction should improve aquatic habitat and associated riparian vegetation in most areas, depending on the closure technique, through a decrease in substrate disturbance in the river channel and protection of riparian vegetation on the banks. Increased sediment into smaller tributaries, such as Bonita Creek, is possible from a road closure if that closure does not include sufficient soil stabilization efforts. Un-maintained roads can cause continual sedimentation problems. Sedimentation can kill eggs and larval fish and reduce suitability of the primary constituent elements of critical habitat that address specific substrate type and substrate embeddedness thresholds needed for spawning.

The FRMP does not describe how road closures will be implemented, but, considering the direction for managing wildlife habitat, riparian areas, and other resources, we anticipate that most increases in sediment will be short-term, but, in the long-term, sedimentation into most of the drainage systems is expected to decrease. Reduction of open roads in and adjacent to habitat will reduce the impacts to vegetation in those riparian areas and decrease the chance of killing razorback sucker (if they occur or become established). However, if razorback sucker are spawning at remaining vehicle crossings, eggs and young fry could potentially be injured or killed by vehicles.

Increasing access to BLM lands could result in both positive and negative effects to the species and its habitat. If the BLM maintains existing trails and roads, the result could be less sediment in any drainage in the long-term. Short-term impacts that may occur during the actual maintenance may include heavy equipment in the creek bed increasing sedimentation, destroying spawning beds, and crushing egg masses and young fry, and water diverted from the work site resulting in direct mortality. However, increasing access by constructing new roads and trails could increase:

- Sediment in drainages, regardless of the proposed maintenance;
- The likelihood of human-caused fire.

Effects of specific proposals for access issues in the Gila Box, where the proposed action has the greatest potential to affect critical habitat and razorback suckers, were addressed in a previous biological opinion (U.S. Fish and Wildlife Service 1994). None of the specific road reconstruction projects proposed in the FRMP would affect critical habitat or razorback suckers. The FRMP proposes to acquire trail access across non-BLM lands where the Safford-Morenci trail crosses Bonita Creek, and road access across private lands along the Upper Bonita Creek Road. If such access is acquired, vehicle travel across Bonita Creek may have effects similar to those described above, but it is unlikely to increase over existing legal and illegal use. With regard to additional site-specific access projects under the FRMP, given direction for wildlife habitat, riparian areas and other resources, we anticipate these types of impacts will be minimal. These actions will be addressed either through site-specific projects or through the District Transportation Plan.

Issue 2. Areas of Critical Environmental Concern and Other Types of Special Management

No ACECs are designated in or near sucker critical habitat. Critical habitat occurs and razorback suckers may occur within the Gila Box RNCA. A plan has been completed for the Gila Box RNCA, and formal consultation was completed for the effects of that plan on razorback suckers. The plan and our biological opinion provide measures and actions that will limit impacts to individuals and habitat, and provide for the improvement of habitat conditions for the species. However, presence of non-native predatory fishes, particularly in the Gila River, will continue to limit opportunities for razorback sucker recovery in this area.

Fourteen river segments (149 miles) are being studied for inclusion in the Wild & Scenic Rivers system. Razorback sucker critical habitat is present in the Gila Box portions of the Gila River that were recommended for this designation. These segments which include Bonita Creek, Eagle Creek, and the San Pedro River are historical razorback sucker habitat. These river segments

may provide habitat for this species. These segments will be managed to protect their values until Congress acts to designate them or release them to management under provisions of the applicable Resource Management Plan. This management is expected to maintain or improve physical and vegetation aspects of habitat for this species (in appropriate areas).

Issue 3. Off-highway Vehicles

Vehicle use in the Gila Box RNCA is limited to designated routes only. This is also the case in the San Pedro RNCA, which is historical habitat for razorback suckers. The remaining areas of current and historical habitat within the planning area are designated as restricted to existing roads and trails occurring at the time of designation as well as any new roads approved for construction during the life of the FRMP. Restricting vehicle use in areas of critical habitat or historically-occupied habitat to existing roads and trails will minimize the effects of on- and off-route vehicle use of the habitat by limiting sediment load from the surrounding lands into streams, and limiting the impacts to riparian vegetation and the species' habitat, as described for Issue 1.

Issue 4. Riparian Areas

Identified riparian areas are located along most of the Gila River and some tributaries within BLM land in the planning area. The critical habitat in these riparian areas is anticipated, in general, to maintain current physical and vegetation conditions, or possibly improve, based on the direction for riparian areas including:

- Riparian areas on BLM land within the planning area will be managed to achieve good to excellent condition on 75 percent of the riparian zone (FRMP states by 1997).
- Riparian objectives will be incorporated into existing and future activity plans.
- Riparian areas will be retained in public ownership unless disposal would be in the public interest, as determined by land-use planning.
- Grazing systems will be developed, and existing allotment management plans will be modified, as necessary, to best manage livestock use for improvement of riparian areas and reduce non-point source water pollution.

Despite these management actions to maintain or enhance habitat, presence of non-native predatory fishes will continue to limit the opportunities for recovery of razorback sucker in the Gila River.

Management Concern 1. Wildlife Habitat

The razorback sucker is a priority species under the FRMP, which directs the BLM to manage the species and its habitats to maintain or enhance population levels. Management actions will be implemented to accomplish this goal, including transplantation, prescribed burning, wildfire suppression, and development of habitat management plans. All of these actions will likely have

beneficial effects on razorback sucker, but it is possible for short-term negative effects to occur (such as with prescribed burning resulting in a temporary increase in erosion - but in the long term erosion should decrease as a result of increased soil stabilization caused by an increase in herbaceous plant cover). Development of a Habitat Management Plan is proposed for the Gila Box, which is expected to provide additional direction for enhancing or recovering the razorback sucker in this area. However, specific effects of this and other plans and actions under the FRMP are not known until specific plans and actions are identified and proposed.

Management Concern 2. Lands and Realty

Designating the Gila Box Ecosystem and Southwest Gila Valleys as LTMA's could benefit razorback sucker and critical habitat. These portions of the Gila River are designated as razorback sucker critical habitat. Other identified LTMA's with potential habitat would benefit razorback sucker if they become occupied in the future (San Pedro RNCA, Muleshoe LTMA). The BLM will retain all BLM lands (surface and subsurface) estate within these areas. State and private lands within these LTMA's could be acquired, reducing the impacts of fragmented land ownership on razorback suckers and critical habitat. These lands would be intensively managed for their multiple resource values.

The objectives established for land acquisition (Pages 35-36 in the FRMP) include identifying those lands with riparian habitat, within watersheds of important riparian areas, and that contain high-value wildlife habitat (including threatened and endangered species habitat). Acquisition of these lands would benefit razorback sucker if the lands were managed to protect and enhance habitat. The consolidation of larger blocks of BLM lands (instead of the more checkerboard pattern in some areas) will allow the BLM to better manage the area as a whole. This will allow the BLM to implement actions that benefit razorback sucker habitat if present in these areas.

Land disposal could adversely affect razorback sucker if potential/suitable habitat is involved or if disposal lands are within close proximity of habitat. Few BLM lands adjacent to critical habitat (Sanchez to Geronimo) have been identified for disposal. Activities initiated on disposed lands adjacent to critical habitat on BLM land could have direct or indirect effects to razorback sucker. These actions may include vegetation clearing, which would fragment habitats and change river channel and floodplain conditions where downstream erosion may affect habitat. Residential development adjacent to habitat on BLM lands may increase disturbance to habitat with increased recreational use, water withdrawal, and groundwater pumping. If lands are disposed of to individuals or groups that protect and enhance habitats this would be a benefit to razorback sucker. All land disposals would be reviewed under NEPA and section 7 consultations.

Two utility corridors designated in the FRMP cross the Gila River south of Clifton. While site-specific effects to critical habitat has occurred in these corridors, maintaining these corridors will decrease the likelihood that large utility projects will be located in other areas of critical habitat. The establishment of the Gila Box RNCA as a right-of-way exclusion area will benefit sucker critical habitat by eliminating surface disturbance from construction and maintenance of utilities. Rights-of-way applications will be subject to NEPA and the Endangered Species Act processes, which would eliminate or minimize potential impacts.

Management Concern 3. Outdoor Recreation and Visual Resource Management

The BLM will provide a diversity of recreational experiences in the planning area. Some of these actions could affect razorback sucker through road and trail use and recreational developments.

Water recreation (rafting, kayaking, etc.) on the Gila River, when conditions permit, may disturb suckers in occupied reaches. Rafters and kayakers use these areas, resulting in temporary disturbance.

Existing and increasing road and trail use may facilitate direct effects to the species. If razorback sucker are present in the vicinity of vehicle crossings in the Gila River or Bonita Creek, egg masses and young fry could potentially be injured or killed by vehicles. Adult fish would probably swim away and avoid injury.

Parking areas, trailheads, restrooms, and other developments will likely be provided in some areas of the planning area, such as Bonita Creek and the Gila Box. The installation, location, and use of some of these developments will result in recreational users trampling vegetation, stream banks, and stream beds. Public use may increase the risk of human-caused fire, which can potentially result in direct impacts to razorback sucker through water quality degradation and indirect adverse effects to their habitat. However, directing public use to these managed areas is much less risky than more dispersed recreational use.

The BLM will incorporate various measures in their recreation management plans and other plans to manage for razorback sucker and its critical habitat and other listed species (when appropriate), including the riparian and special recreation management areas of the Gila Box RNCA, and other lands in the San Pedro RNCA. Specific recreational project proposals for the Gila Box area are covered in a previous consultation (U.S. Fish and Wildlife Service 1994, Gila Box Reinitiation). While potential mortality and changes in habitat quality and quantity from the actions described above cannot be completely eliminated, the direction of the FRMP for listed species, riparian areas, and other areas of concern will minimize recreation-associated impacts. Mortality of razorback sucker in the action area is unlikely to occur due to actions carried out under the FRMP, extirpation of the species from the majority of its historical range, and, if suckers occur in the action area, the very low numbers along the Gila River and its tributaries.

Management Concern 4. Energy and Minerals

Mineral and energy development could affect this species or its habitat, but minerals and energy will be developed with the least damage to other resources in the area. These actions would also be subject to the NEPA and Endangered Species Act processes. Withdrawing the Gila Box RNCA from mineral entry and prohibiting mineral sales and surface occupancy in this and riparian areas will minimize adverse impacts on the razorback sucker, its critical habitat, and historical or potential habitats.

Management Concerns 5 (Cultural Resources), 9 (Air Quality), And 10 (Paleontological Resources)

It is unlikely that cultural, paleontological, or airshed resource management will impact razorback sucker, except possibly in relation to providing cultural or paleontological interpretive development, or during excavation of cultural sites. Any possible impacts will be addressed at the project level.

Management Concern 6. Soil Erosion

Minimizing soil erosion, as proposed, will help maintain or enhance razorback sucker habitat. Managing upland vegetation can enhance the species' habitat by improving the watershed to decrease non-point source pollution, sedimentation, and variability in flows through the species' habitat. Rehabilitation efforts have the possibility of actually increasing soil erosion in the short-term (e.g., prescribed burning, structural improvements), but in the long term soil erosion is likely to decrease in most areas under the FRMP. A decrease in soil erosion will result in a decrease in sediment movement in occupied and razorback sucker critical habitat. Erosion and sediment flow into the Gila River from the San Simon River is of particular concern. In this area, the BLM proposes to construct Timber Draw Dam to help rehabilitation of eroded lands, manage livestock in that area to improve the watershed, and cap or contain flowing wells in the San Simon Watershed if salinities exceed 3,000 ppm. These activities are expected to increase downstream water quality and reduce sediment loads in the Gila River.

Management Concern 7. Vegetation

The BLM will manage upland vegetation on BLM lands within the planning area for livestock use, watershed protection, reduction of non-point source pollution, threatened and endangered species protection, priority wildlife habitat, firewood, and other incidental human uses. They will use best management practices and vegetation manipulation (including mechanical, chemical and fire) to achieve desired plant community management objectives. Some of these uses could affect the razorback sucker.

Management practices that improve upland vegetation conditions and increase forage would benefit razorback sucker critical habitat by improving watershed condition and decreasing livestock dependency of grazing within riparian areas. With the exception of limited trailing, authorized livestock are excluded from designated critical habitat within Bonita Creek and the Gila River in the Gila Box RNCA. Winter season grazing also occurs on three miles of the Gila River in critical habitat on the Smuggler Allotment, upstream of the Gila Box RNCA boundary. Increased production of key forage species would increase upland sustainability and reduce the need to graze riparian pastures. Grazing activities to the project level are addressed in the Safford/Tucson Office's grazing program BO and its amendments.

The BLM will implement prescribed fires and manage wildland fires in various portions of the planning area. Wildfire would be suppressed as needed and prescribed fire would be applied to the landscape as needed to meet the objectives of the FRMP and the specific areas. These actions have been recently consulted upon as part of the BLM LUP Amendment BO. Prescribed fire as grazing management tool is addressed to the project level in the Safford/Tucson Office's

grazing program BO. Because the BLM would manage fire with the objective of improving and protecting the resources in the planning area, we assume BLM would build into their fire management plans standard measures to minimize potential effects to razorback sucker and its critical habitat.

Firewood cutting areas and other policies concerning firewood collection by the public should have little or no effect on razorback sucker or its habitat.

With the emphasis that the FRMP directs for management of riparian, soil, watershed, and listed species habitats (among other issues and management concerns), it is likely that vegetation management will generally benefit the razorback sucker, though some specific actions may have negative effects. Grazing, fire, and other vegetation treatments will be addressed at more specific levels as part of projects or management plans.

Management Concern 8. Water Resources

Razorback sucker and its designated critical habitat may be enhanced by the BLM seeking instream flow water rights and unique waters designations in the Gila River and its tributaries, implementing monitoring programs, initiating studies, controlling the availability and use of groundwater for the districts' programs, purchasing water rights to protect resource values, and adopting best management practices for BLM-managed activities. These activities have the potential to not only maintain current water quality and quantity for razorback sucker and its critical habitat, but possibly to improve habitats in the future. Specific effects will be addressed in future site-specific actions under the FRMP.

Conservation Measures

Conservation measures for all species would decrease the likelihood of adverse effects on the razorback sucker and contribute to the recovery of the species. A specific measure for razorback sucker is that mining plans will have mitigation and stipulations to avoid undue or unnecessary degradation. This measure, while not eliminating all adverse affects, would help to minimize effects to current and potential razorback sucker habitat.

Loach Minnow and Spikedace

Issue 1. Access

Actions proposed by BLM regarding vehicle and public access could have both positive and negative effects to the species. Reduction of roads, as needed, in the Aravaipa Canyon, the San Francisco River, and Eagle Creek areas would mostly have beneficial effects on loach minnow and spikedace habitat, especially those roads through and adjacent to the habitat. Road reduction should improve aquatic habitat and associated riparian vegetation in most areas, depending on the closure technique, through a decrease in sediment entering any drainage. Increased sediment into drainages is possible from a road closure if that closure does not include sufficient soil stabilization efforts. Unmaintained roads can cause continual sedimentation problems. Sedimentation can kill eggs and larval fish and reduce suitability of the species' habitat,

specifically altering substrate type and embeddedness necessary for spawning. In addition, excessive sedimentation can decrease the amount, diversity, availability, and accessibility of prey species.

The FRMP does not describe how road closures will be implemented, but, considering the direction for managing wildlife habitat, riparian areas, and other resources, we anticipate that most increases in sediment will be short-term, with a long-term decrease of sediment load into most of the drainage systems. Reduction of open roads in and adjacent to habitat will reduce adverse effects to vegetation in those riparian areas and decrease the chance of killing loach minnow or spikedace. However, if loach minnow or spikedace are spawning at remaining vehicle crossings, eggs and young fry could potentially be injured or killed by vehicles.

No new road reconstructions are proposed in or adjacent to Aravaipa Canyon, Deer Creek, Turkey Creek, the San Francisco River, or Eagle Creek, and new roads are prohibited from being developed in the Aravaipa Canyon Wilderness.

Increasing access to BLM lands could result in both positive and negative effects to the species and their habitat. The BLM would seek legal access across private lands for the Aravaipa Canyon Wilderness trail from the west trailhead (at the administrative site) to the western boundary of the wilderness. The BLM would also seek legal access across private lands along the San Francisco River Road and Black River Road (Eagle Creek area). None of these actions would result in additional impacts to the loach minnow, spikedace, or their habitat because this trail and road already are being used by the public and this use is not expected to change from current levels. However, once acquired, the effects occurring on these acquired parcels would become effects of the proposed action (rather than cumulative effects). If the BLM maintains this existing trail and road, the result could be less sediment in drainages in the long-term. Short-term effects that may occur during the actual maintenance may include heavy equipment in drainages (only likely for road maintenance), destroying spawning beds and crushing egg masses and young fry (and at a lower likelihood, killing or injuring juveniles and adults), and water diverted from the work site resulting in direct mortality.

Increasing access by constructing new roads and trails could increase:

- Sediment in drainages, regardless of the proposed maintenance;
- The likelihood of human-caused fire.

Providing additional access through and adjacent to habitat would also result in impacts to loach minnow and spikedace as described in the previous paragraph. With direction for wildlife habitat, riparian areas, and other resources, we anticipate these types of impacts will be minimal.

Not all access that may impact these species or their habitat on Aravaipa Creek area or the San Francisco River is known because the FRMP is not specific on all possible locations for new access or maintenance of acquired and existing access. These actions will be addressed either through site-specific projects or through the District Transportation Plan.

Issue 2. Areas of Critical Environmental Concern and Other Types of Special Management

ACECs are designated for special management emphasis because of unique or sensitive resources. The Turkey Creek ACEC is designated along Turkey Creek, Oak Grove, and Maple canyons south of Aravaipa Canyon. It is unlikely that loach minnow or spikedace occur in this ACEC, but the management of this ACEC may have effects downstream to occupied habitat and on potential habitat, if present. This ACEC was established to protect and enhance the riparian values in the area. Management of this ACEC includes limiting vehicle use to existing roads and trails, closing portions of Turkey Creek and Oak Grove canyons to vehicle use, accelerating the recovery of riparian vegetation, acquiring adjacent riparian areas, and prohibiting home use woodcutting and gathering. Management of these areas requires the development and implementation of an ACEC management plan that directs special emphasis to maintain or improve the condition of the resources in these areas. Habitat quality for the loach minnow and spikedace is expected to maintain or improve downstream of the ACEC based on the emphasis of the ACEC direction.

Fourteen river segments (149 miles) are being studied for inclusion in the Wild & Scenic Rivers system. Segments in the San Francisco River, Aravaipa Creek, and Turkey Creek include occupied and/or potential habitat. Some other river segments may provide potential habitat for these species. These segments will be managed to protect their values until Congress acts to designate them or release them to management under provisions of the applicable Resource Management Plan. This management is expected to maintain or improve habitat for these species (in appropriate areas).

A coordinated management plan for the Aravaipa Creek watershed is in development. This plan is expected to provide direction that will result in the maintenance or improvement of occupied loach minnow and spikedace habitat. Specific effects will remain unknown until the plan is complete, but management for improving watershed conditions in this area is directed by the FRMP. This management includes monitoring, evaluating, and changing, if necessary, livestock management in the area, implementing a fire management plan, and stabilizing active erosion areas.

Issue 3. Off-highway Vehicles

All vehicle use is prohibited in the Aravaipa Wilderness and parts of Turkey Creek, which contain occupied loach minnow and spikedace habitat. This minimizes the effects of vehicle use on the species and their habitat by limiting sediment load from the surrounding lands into streams, and limiting the impacts to the species as described for Issue 1. Vehicle use on most of the BLM lands within the planning area, including BLM lands upstream and downstream of Aravaipa Wilderness, are restricted to roads and trails existing at the time of designation and any new roads approved for construction during the life of the FRMP. A four-wheel drive road exists along the San Francisco River from the RU Ranch to Clifton, which includes 8.7 miles of floodplain in the BLM's San Francisco grazing allotment. Within that length, there are 26 low-water ford crossings. Use of this road may result in a continual sediment release in the river. It may also result in direct mortality of eggs, fry, and possibly juveniles and adults, if loach minnow is able to maintain a reproducing population in this area. Restricting vehicle use

throughout most of the planning area to existing roads and trails will minimize the effects of off-route vehicle use of occupied and potential habitat by limiting sediment load from the surrounding lands into streams, and limiting the impacts to riparian vegetation and the species' habitat, as described in Issue 1.

Issue 4. Riparian Areas

Riparian areas in Aravaipa Canyon, the San Francisco River, and Eagle Creek areas contain occupied, potential, or critical loach minnow and/or spikedace habitat. These areas are anticipated, in general, to maintain current conditions, or possibly improve the physical and vegetation components of loach minnow and spikedace habitat, based on the direction for riparian areas including:

- Riparian areas on BLM land within the planning area will be managed to achieve good to excellent condition on 75 percent of the riparian zone (RMP states by 1997).
- Riparian objectives will be incorporated into existing and future activity plans.
- Riparian areas will be retained in public ownership unless disposal would be in the public interest, as determined by land-use planning.
- Grazing systems will be developed, and existing allotment management plans will be modified, as necessary, to best manage livestock use for improvement of riparian areas and reduce non-point source water pollution.

Management Concern 1. Wildlife Habitat

The loach minnow and spikedace are priority species under the FRMP, which directs the BLM to manage the species and their habitats to maintain or enhance population levels. Management actions will be implemented to accomplish this goal, including transplantation, prescribed burning, wildfire suppression, and development of habitat management plans within watersheds containing occupied and suitable loach minnow or spikedace habitat. All of these actions will likely have beneficial effects on loach minnow and spikedace, but it is possible for short-term negative effects to occur (such as with prescribed burning resulting in a temporary increase in erosion, but anticipated long-term increases in soil stabilization from increased herbaceous plant density). Specific effects are not known until specific actions are identified.

Management Concern 2. Lands and Realty

Designating the Aravaipa Canyon, San Francisco River, and Eagle Creek areas as LTMA's could benefit loach minnow and spikedace. The BLM will retain all BLM lands (surface and subsurface estate) within these areas. State and private lands within these LTMA's could be acquired, reducing the impacts of fragmented land ownership on loach minnow and spikedace. These lands would be intensively managed for their multiple resource values.

Land acquisition would benefit loach minnow and spikedace if habitat within those lands considered for acquisition were acquired and managed to protect and enhance habitat. The

consolidation of larger blocks of BLM lands (instead of the more checkerboard pattern in some areas) will allow the BLM to better manage the area as a whole. This will allow the BLM to implement actions that benefit loach minnow and spikedace habitat if present in these areas.

No specific land disposals are proposed in the San Francisco River or Aravaipa Canyon areas. However, unforeseen future land management concerns or public demand could necessitate the need for BLM land disposals in or near loach minnow or spikedace habitat, but such proposals would require a land use plan amendment and associated NEPA and Endangered Species Act compliance. Land disposal could adversely affect loach minnow or spikedace if potential/suitable habitat is involved or if disposal lands are within close proximity of habitat. Activities initiated on disposed lands, which contain or are adjacent to habitats on BLM land, could have direct or indirect effects to loach minnow or spikedace. These actions may include vegetation clearing, which would fragment habitats and change river channel and floodplain conditions where downstream erosion may affect habitat. Residential development adjacent to habitat on BLM lands may increase disturbance to habitat with increased recreational use, water withdrawal, and groundwater pumping. It is unlikely that the disposal of lands outside of these areas may result the loss of potential loach minnow or spikedace habitat because retention of riparian areas (Issue 4) and wilderness, and management to benefit listed species are emphasized. If lands are disposed of to individuals or groups that protect and enhance habitats this would be a benefit to loach minnow or spikedace. All land disposals would be reviewed under NEPA and section 7 consultations.

No major utility corridors have been designated in or near Aravaipa Canyon or the San Francisco River/Eagle Creek. Rights-of-way applications outside the designated corridors will be subject to NEPA and the Endangered Species Act processes, which will likely eliminate or minimize potential impacts. Excluding rights-of-way in the Aravaipa Canyon Wilderness will prevent potential impacts to loach minnow and spikedace occupied and potential habitat found there.

Management Concern 3. Outdoor Recreation and Visual Resource Management

The BLM will provide a diversity of recreational experiences in the planning area. Some of these actions could affect loach minnow or spikedace through road and trail use and recreational developments.

Existing and increasing road and trail use may directly affect the species. If loach minnow and spikedace are present in the vicinity of hiking and/or vehicle crossings through habitat, egg masses and young fry could potentially be injured or killed by vehicles. Juvenile and adult fish may also be killed or injured, but would likely be able to react quickly enough to swim away and avoid injury.

Additional parking areas, trailheads, restrooms, and other developments could potentially be provided in or near loach minnow or spikedace habitat. The installation, location, and use of some of these developments will result in recreational users trampling vegetation, stream banks, and stream beds, but effects are likely to be localized and minimal.

Aravaipa Canyon receives considerable use by hikers and backpackers. Spawning beds may be directly impacted by hikers walking through the beds. Loach minnow eggs laid under cobbles may be crushed by hikers. Spikedace eggs are demersal and develop in the sand and gravel where they were spawned (Propst et al. 1986). Some eggs and young fry may be killed from hikers traveling through these spawning beds. Loach minnow and spikedace spawning periods in late-winter to early spring coincide with cooler periods of the year, which typically experience higher hiker numbers. Overlap between loach minnow and spikedace occupied reaches and those heavily used by hikers is not specifically known, but likely limited because the majority of hikers enter Aravaipa Canyon from the west-end (lower reaches), whereas most loach minnow and spikedace during spring and fall surveys are found in the upper reaches of Aravaipa Creek. Due to the preponderance of loach minnow and spikedace captures in the upper reaches of Aravaipa Creek, hiking may have a minimal effect on these species.

Public use may increase the risk of human-caused fire, which can potentially result in direct impacts to loach minnow or spikedace through water quality degradation and indirect adverse effects to their habitat.

The BLM will incorporate various measures into their recreational management plans and other plans to manage for loach minnow, spikedace, and other listed species (when appropriate), including the riparian areas of Aravaipa Canyon/Deer Creek/Turkey Creek, San Francisco River, Eagle Creek, and other potential or recovery habitats of loach minnow and spikedace. The BLM manages Aravaipa Canyon Wilderness for least impacts to special status species. The FRMP designates the Aravaipa Canyon/Turkey Creek area as a Special Recreation Management Area. Recreation in the area is managed under the current Aravaipa Canyon Wilderness management plan, and will be addressed in the Aravaipa Ecosystem Management Plan that is currently in development.

While effects, including incidental take and degradation of habitat quality and quantity from the actions described above cannot be completely eliminated, the direction of the FRMP for listed species, riparian areas, and other areas of concern will minimize effects resulting from recreation.

Management Concern 4. Energy and Minerals

Mineral and energy development could affect these species or their habitat, but minerals and energy will be developed with the least damage to other resources in the area. These actions would also be subject to the NEPA and Endangered Species Act processes. Withdrawing the riparian areas in the Aravaipa Canyon and San Francisco River areas from mineral entry and prohibiting mineral sales will minimize potential impacts on the species and their habitat.

Management Concerns 5 (Cultural Resources), 9 (Air Quality), And 10 (Paleontological Resources)

It is unlikely that cultural, paleontological, or airshed resource management will affect loach minnow or spikedace, except possibly in relation to providing cultural or paleontological

interpretive development, or during excavation of cultural sites. Any possible impacts will be addressed at the project level.

Management Concern 6. Soil Erosion

Minimizing soil erosion, as proposed, will help maintain or enhance loach minnow and spikedace habitat. Managing upland vegetation can enhance the species' habitat by improving the watershed to decrease non-point source pollution. Rehabilitation efforts have the possibility of actually increasing soil erosion in the short-term (e.g., prescribed burning, structural improvements), but soil erosion is likely to decrease in most areas under the FRMP. A decrease in soil erosion will result in a decrease in sediment movement in occupied and potential loach minnow and spikedace habitats.

Management Concern 7. Vegetation

The BLM will manage upland vegetation on BLM lands within the planning area for livestock use, watershed protection, reduction of non-point source pollution, threatened and endangered species protection, priority wildlife habitat, firewood, and other incidental human uses. They will use best management practices and vegetation manipulation (including mechanical, chemical, and fire) to achieve desired plant community management objectives. Some of these uses could affect the loach minnow or spikedace.

Management practices that improve upland vegetation conditions and increase forage would benefit loach minnow and spikedace occupied and potential habitat by decreasing livestock dependency of grazing within riparian areas. With the exception of trailing of less than ten cattle per year in the Hell Hole allotment, and grazing on 0.2 mi of Aravaipa Creek in the Quintana and Brandenburg Mountain allotments, livestock activities are absent from BLM lands in Aravaipa Creek. The permittees on the San Francisco and Red Hickey Hills allotments attempt to limit livestock use in the riparian zone of the San Francisco River to prevent animals from moving along the river and out of the allotments. However, the grazing permits for these allotments do not prevent grazing in the riparian zone. BLM-administered portions of the San Francisco and Red Hickey Hills allotments include 1.5 and 0.1 miles of the San Francisco River, respectively. The effects of livestock grazing activities in these areas were evaluated in the Safford/Tucson Field Office's grazing biological opinion (U.S. Fish and Wildlife Service 1997).

The BLM will implement prescribed fires and manage wildland fires in various portions of the planning area. Wildfire would be suppressed as needed and prescribed fire would be applied to the landscape as needed to meet the objectives of the FRMP and the specific areas. These actions were addressed at the program level in our biological opinion on the BLM's Arizona Land Use Plan Amendment for Fire, Fuels and Air Quality Management (U.S. Fish and Wildlife Service 2004b).

We also anticipate that the BLM would build into their fire management plans standard measures to minimize potential effects to loach minnow, spikedace, and their habitat because BLM would manage fire with the objective of improving and protecting the resources in the planning area.

Chemicals for controlling noxious and invasive weeds would only include those herbicides approved for use on BLM lands. Noxious weeds documented in the plan area include Malta, yellow star thistle, and African rue. Invasive species considered for control include salt cedar, sweet resin bush, and buffelgrass. All herbicide use near riparian and aquatic resources will follow guidelines and restrictions described in BLM Manual H-9011-1 Chemical Pest Control. These guidelines reduce the likelihood of adverse effects to these species and their habitat.

The FRMP does not designate any firewood cutting areas in or near loach minnow or spokedace habitat, although other areas could be identified during plan implementation. Firewood collection by the public could help reduce invasions by woody species and work toward reestablishing grasslands and healthy watersheds.

With the emphasis that the FRMP directs for management of riparian, soil, watershed, and listed species habitats (among other issues and management concerns), it is likely that vegetation management will generally benefit the loach minnow and spokedace, though some specific actions may have negative effects. Grazing, fire, and other vegetation treatments will be addressed at more specific levels as part of projects or management plans.

Management Concern 8. Water Resources

The FRMP proposes to evaluate Aravaipa Creek, and possibly Deer Creek and Turkey Creek, as potential Unique Waters designations. If these waters are designated as unique waters, they will be managed to maintain or enhance water quality, which will increase the likelihood of maintaining water quality for loach minnow and spokedace. The San Francisco River, and possibly Deer Creek and Turkey Creek, would be evaluated to determine the quantities of in-stream flow water rights needed to meet resource management objectives. Once those instream flows are determined, the BLM would file with the State of Arizona to obtain those instream flow rights, which may increase the likelihood of maintaining water quantity for loach minnow and spokedace. Loach minnow and spokedace recovery may be advanced and habitat may be enhanced by the BLM seeking instream flow water rights and unique waters designations, implementing monitoring programs, initiating studies, controlling the availability and use of groundwater for the BLM's programs, purchasing water rights to protect resource values, and adopting best management practices for BLM-managed activities. These activities have the potential to not only maintain current water quality and quantity for loach minnow and spokedace, but possibly to improve habitats in the future. Specific effects will be addressed in future site-specific actions under the FRMP.

Conservation Measures

Conservation measures for all species would decrease the likelihood of adverse effects to loach minnow and spokedace, and contribute to the recovery of the species. A program-specific measure proposed for loach minnow and spokedace is that mining plans will have mitigation and stipulations to avoid undue or unnecessary degradation. This measure, while not eliminating any adverse effects, would help to minimize those effects to current and potential loach minnow and spokedace habitat.

Gila Chub

Because Gila chub occupied habitat and designated critical habitat are delineated in Bass, Hot Springs, and Redfield canyons, any discussion of occupied habitat in general and specifically in those areas applies to designated critical habitat. We focus our evaluation of effects on these four occupied areas, but Gila chub could potentially occur elsewhere in the action area or could be reestablished or colonize additional areas during the life of the FRMP.

Issue 1. Access.

The FRMP proposes reduction of roads as needed to manage visitors, protect resources, and to meet planning objectives. No specific road closures are proposed in Gila chub habitat or potential habitat. Closures would mostly have beneficial effects on Gila chub habitat, especially those roads through and adjacent to the habitat. Road reduction should improve aquatic habitat and associated riparian vegetation in most areas, depending on the closure technique, through a decrease in sediment entering any drainage. Increased sediment into drainages is possible from a road closure if that closure does not include sufficient soil stabilization efforts. Unmaintained roads can cause continual sedimentation problems. Sedimentation can kill eggs and larval fish and reduce suitability of the primary constituent elements of critical habitat that address specific substrate type and substrate embeddedness thresholds needed for spawning.

The FRMP does not describe how road closures will be implemented but considering the direction for managing wildlife habitat, riparian areas and other resources, we anticipate that most increases in sediment will be short-term and in the long-term sedimentation into most drainage systems is expected to decrease. Reduction of open roads in and adjacent to habitat would reduce the impacts to vegetation in those riparian areas and decrease the chance of killing Gila chub. However, if Gila chub are spawning at remaining vehicle crossings, eggs and young fry could potentially be injured or killed by vehicles.

Increasing access to BLM lands could result in both positive and negative effects to the species and its habitat. If the BLM maintains existing trails and roads, the result could be less sediment in any drainage in the long-term. Short-term impacts that may occur during the actual maintenance may include heavy equipment in the creek bed increasing sedimentation, destroying spawning beds, and crushing egg masses and young fry, and water diverted from the work site resulting in direct mortality. However, increasing access by constructing new roads and trails could increase:

- Sediment in drainages, regardless of the proposed maintenance;
- The likelihood of human-caused fire.

Providing additional access through and adjacent to habitat would also result in impacts to Gila chub and its critical habitat as described in the previous paragraph. With direction for wildlife habitat, riparian areas, and other resources, we anticipate that these types of impacts will be minimal. The FRMP proposes reconstruction of roads at five specific locations, acquisition of

legal trail access across non-BLM lands at five other sites, and acquisition of legal road access across non-BLM lands at 39 sites. None of the roads identified for reconstruction are located near known Gila chub locations or critical habitat. Four roads and one trail identified for acquisition of access are located in or near occupied Gila chub habitat (one trail and one road in the Bonita Creek area; three roads in the Redfield/Bass/Hot Springs canyons area). Existing use of the trail and the roads may change if legal access is acquired, but it is unlikely it will measurably increase over existing legal and illegal use. Other specific changes in access that may impact this species are unknown since the FRMP is not specific in regard to other locations. These actions will be addressed either through site-specific projects or through the District Transportation Plan.

Issue 2. Areas of Critical Environmental Concern and Other Types of Special Management

ACECs are designated for special management emphasis because of unique or sensitive resources. The Gila Box RNCA includes Gila chub habitat in Bonita Creek. A plan has been completed for the Gila Box RNCA, and formal conferencing was completed for the effects of that plan on Gila chub. The plan and resulting formal conference provides measures and actions that will limit impacts to individuals and habitat, and provide for the improvement of habitat conditions for the species. The Swamp Springs–Hot Springs Watershed ACEC includes portions of Hot Springs, Redfield, and Bass canyons. No plan has been completed for this ACEC specifically, but the ACEC is included in the Muleshoe Ecosystem Management Plan (discussed below). Special Management Provisions (Appendix 2 in the RMP) will result in the maintenance and improvement of habitat for the Gila chub through accelerating the recovery of riparian and upland vegetation, excluding livestock, prohibiting woodcutting and gathering for home use, and limiting vehicles to existing roads and trails.

Fourteen river segments (149 miles) will be studied for inclusion in the Statewide Wild & Scenic Rivers system. Segments in the Hot Springs Canyon and Bonita Creek areas have occupied habitat. Some other river segments may provide potential habitat for this species. These segments will be managed to protect their values until Congress acts to designate them or release them to management under provisions of the applicable Resource Management Plan. This management is expected to maintain or improve physical and vegetation components of habitat for this species (in appropriate areas).

The Muleshoe Ecosystem Management Plan has been completed and is being implemented. The plan, while not specifically addressing this species, manages the area to maintain and improve riparian and upland vegetation conditions, improve biological diversity, and re-establish extirpated native fish (including the Gila chub). Planning and conferencing is presently proceeding to re-establish Gila chub and other native fish into some of the systems within the Muleshoe Ecosystem Management area.

Issue 3. Off-Highway Vehicles.

The 140-acre riparian area of Hot Springs Canyon is closed to all vehicular use. In the Gila Box RNCA, vehicles are limited to designated routes only. Elsewhere in Gila chub habitat or potential habitat, vehicle use is restricted to existing roads and trails at the time of designation as

well as any new roads approved for construction during the life of the FRMP. The closure in Hot Springs Canyon will eliminate effects of authorized vehicular use in that area. The effects of vehicle use, including routes and stream crossings, in Bonita Creek (Gila Box RNCA), were evaluated in the Gila Box RNCA BO. Restricting vehicle use elsewhere in the planning area to existing roads and trails will reduce the effects of off-route vehicle use of the habitat by limiting sediment load from the surrounding lands into streams, and limiting the impacts to riparian vegetation and the species in the habitat, as described in Issue 1.

Issue 4. Riparian Areas.

Riparian areas in Bonita Creek, Bass Canyon, Hot Springs Canyon, and Redfield Canyon contain occupied Gila chub habitat. These areas are anticipated, in general, to maintain their current condition, or possibly improve, based on the direction for riparian areas including:

- Riparian areas on BLM land within the planning area will be managed to achieve good to excellent condition on 75 percent of the riparian zone (FRMP states by 1997).
- Riparian objectives will be incorporated into existing and future activity plans.
- Riparian areas will be retained in public ownership unless disposal would be in the public interest, as determined by land-use planning.
- Grazing systems will be developed and existing allotment management plans will be modified, as necessary, to best manage livestock use for improvement of riparian areas and reduce non-point source water pollution.

For this issue, no specific actions were identified in the FRMP for areas known to be occupied by Gila chub.

Management Concern 1. Wildlife Habitat

The Gila chub is a priority species under the FRMP, which directs the BLM to manage the species and its habitats to maintain or enhance population levels. Management actions will be implemented to accomplish this goal, including reestablishments, prescribed burning, wildfire suppression, and development of habitat management plans. The BLM proposes to develop a Habitat Management Plan for the Gila Box. This plan is expected to provide management direction for recovering Gila chub in this area. All of the actions under this management concern will likely have beneficial effects on Gila chub, but it is possible for short-term negative effects to occur (such as with prescribed burning resulting in a temporary increase in erosion, but such action would eventually result in increased soil stabilization from the increase in herbaceous plant density). Specific effects are not known until specific actions are identified.

Management Concern 2. Lands And Realty

Designating the Muleshoe area and the Gila Box area as LTMA's could benefit Gila chub because these areas include known populations and critical habitat has been designated in the Muleshoe area. Other identified LTMA's with potential habitat would benefit Gila chub if they become occupied in the future. The BLM will retain all BLM lands within these areas. State

and private lands within these LTMAAs could be acquired, reducing the impacts of fragmented land ownership on Gila chub. These lands would be intensively managed for their multiple resource values. The consolidation of larger blocks of BLM lands (instead of the more checkerboard pattern in some areas) will allow the BLM to better manage the area as a whole. This will allow the BLM to implement actions that benefit Gila chub habitat if present in these areas.

Land disposal could adversely affect Gila chub if potential/suitable habitat is involved or if disposal lands are within close proximity to habitat. Gila chub are not known to occur in or within close proximity to any of the lands identified for disposal. If chub were found in these areas, consultation and NEPA evaluation, as appropriate, would be conducted prior disposal. Disposal of other lands would require a land-use plan amendment with subsequent NEPA and consultation. Activities initiated on disposed lands that may contain or are adjacent to habitats, could have direct or indirect effects to Gila chub. These actions may include vegetation clearing, which would fragment habitats and change river channel and floodplain conditions where downstream erosion may affect habitat. Residential development adjacent to habitat on BLM lands may increase disturbance to habitat with increased recreational use, water withdrawal, and groundwater pumping. It is unlikely that disposal of other lands would result in loss of potential Gila chub habitat, because retention of riparian areas (Issue 4) and management to benefit listed species are emphasized. If lands are disposed of to individuals or groups that protect and enhance habitats, this would be a benefit to Gila chub. All land disposals would be reviewed under NEPA and section 7 consultations.

The Gila Box RNCA is designated as a right-of-way exclusion area, which would eliminate any possible future effects of utility development on the Gila chub in Bonita Creek. The Muleshoe Ranch is designated a right-of-way avoidance area, in which every attempt would be made to avoid locating utilities in this area. The FRMP proposes no utility corridors, communication sites, or atmospheric deposition monitoring sites in or near Gila chub habitat.

Management Concern 3. Outdoor Recreation and Visual Resource Management

The BLM will provide a diversity of recreational experiences in the planning area. Some of these actions could affect Gila chub through development and use of roads, trails, and other recreational developments. The Gila Box area, including Bonita Creek, is designated a Special Recreation Management Area, for which a Recreation Area Management Plan would be developed and implemented. This plan would determine which sites within the Gila Box would be developed for interpretation and education, and where signs would be placed. These activities have been addressed in part in the Gila Box RNCA Plan and the Gila Box RNCA BO.

The FRMP proposes evaluating new road construction to enhance recreational experiences. Existing and increasing road and trail use may facilitate effects directly to the species. If Gila chub are present in the vicinity of vehicle crossings through occupied habitat, eggs and young fry could potentially be injured or killed by vehicles. Adult fish would probably swim away and avoid injury.

Parking areas, trailheads, restrooms, and other developments will likely be provided in some areas in or near Gila chub habitat. The installation, location, and use of some of these developments will result in recreational users trampling vegetation, stream banks, and streambeds.

Public use may increase the risk of human-caused fire, which can potentially result in direct impacts to Gila chub through water quality degradation and indirect adverse effects to their habitat. However, directing public use to managed areas, such as campgrounds and picnic areas, which would occur under some of the recreational planning, is much less risky than more dispersed recreational use.

BLM will likely incorporate various measures in their recreational management plans and other plans (ACECs, wilderness management plans, etc.) to manage for Gila chub and its critical habitat and other listed species (when appropriate). While possible increases in mortality and decreases in habitat quality and quantity from the actions described may occur, the direction of the FRMP for listed species, riparian areas, and other areas of concern will minimize recreational impacts.

Management Concern 4. Energy and Minerals

Mineral and energy development could affect this species or its habitat, but minerals and energy will be developed with the least damage to other resources in the area. Closing riparian areas (in Bonita Creek, Bass Canyon, Hot Springs Canyon, and Redfield Canyon that contain occupied Gila chub habitat) and the Gila Box RNCA to mineral sales and stipulating no surface occupancy in these areas will minimize potential impacts on the species and its habitat. Mineral sales and surface occupancy for mineral leasing would be allowed in Bass, Hot Springs, and Redfield canyons in the Muleshoe area. The potential for mineral extraction in these areas is unknown. However, mining in these areas would be subject to NEPA and the Endangered Species Act processes, through which effects of mineral leasing and development would be reduced.

Management Concerns 5 (Cultural Resources), 9 (Air Quality), and 10 (Paleontological Resources)

It is unlikely that cultural, paleontological, or airshed resource management will impact Gila chub, except possibly in relation to providing cultural or paleontological interpretive development, or during excavation of cultural sites. Any possible impacts will be addressed at the project level.

Management Concern 6. Soil Erosion.

Minimizing soil erosion will help maintain or enhance Gila chub habitat. Managing upland vegetation can enhance the species' habitat by improving the watershed to decrease non-point source pollution. Rehabilitation efforts have the possibility of actually increasing soil erosion in the short-term (e.g., prescribed burning, structural improvements), but soil erosion is likely to decrease in the long term in most areas under the FRMP. A decrease in soil erosion would result

in a decrease in sediment movement in occupied, potentially occupied, and Gila chub critical habitat. No specific erosion control projects are proposed in or near Gila chub habitat.

Management Concern 7. Vegetation.

The BLM will manage upland vegetation on BLM lands within the planning area for livestock use, watershed protection, reduction of non-point source pollution, threatened and endangered species protection, priority wildlife habitat, firewood, and other incidental human uses. They will use best management practices and vegetation manipulation (including mechanical, chemical, and fire) to achieve desired plant community management objectives. Some of these uses could affect the Gila chub. No specific vegetation projects are proposed in or near Gila chub habitat. Some types of vegetation management are addressed to the project level in the Safford/Tucson Grazing BO and the Gila Box RNCA BO. The FRMP designated no firewood cutting areas in or near Gila chub habitat, although firewood collection is not prohibited in the Gila Box or the Muleshoe areas.

Management practices that improve upland vegetation conditions and increase forage would benefit Gila chub critical habitat by decreasing livestock dependency of grazing within riparian areas. With the exception of limited trailing, livestock are excluded from potential habitat within Bonita Creek and the Gila River in the Gila Box RNCA. Increased production of key forage species would increase upland sustainability and reduce the need to graze riparian pastures.

The BLM will implement prescribed fires and manage wild land fires in various portions of the planning area. Wildfire would be suppressed as needed and prescribed fire would be applied to the landscape as needed to meet the objectives of the FRMP and the specific areas. These actions are addressed at the program level in the BLM LUP Amendment BO. Because BLM would manage fire with the objective of improving and protecting the resources in the planning area, we assume BLM would build into their fire management plans standard measures to minimize potential effects to Gila chub and its habitat.

Chemical treatments proposed for noxious and invasive weeds in the action area would only use those herbicides approved for use on BLM lands. All herbicide use near riparian and aquatic resources will follow guidelines and restrictions described in BLM Manual H-9011-1 Chemical Pest Control. These guidelines reduce the likelihood of adverse effects to the chub or its habitat.

With the emphasis that the FRMP directs for management of riparian, soil, watershed, and listed species habitats (among other issues and management concerns), it is likely that vegetation management will generally benefit the Gila chub, though some specific actions may have negative effects. Grazing, fire, and other vegetation treatments will be addressed at more specific levels as part of projects or management plans.

Management Concern 8. Water Resources.

The FRMP proposes to evaluate Redfield, Hot Springs, and Bass canyons for Unique Waters designations. If these waters are designated as unique waters, they will be managed to maintain or enhance water quality, which may increase the likelihood of maintaining water quality for

Gila chub. These canyons and Bonita Creek would also be evaluated to determine quantities of instream flow needed to meet resource objectives. Once those instream flows are determined, the BLM would file with the State to obtain those instream flow rights, which may increase the likelihood of maintaining water quantity for Gila chub. Implementing monitoring programs, initiating studies, controlling the availability and use of groundwater for the BLM's programs, purchasing water rights to protect resource values, and adopting best management practices for BLM-managed activities are also expected to benefit Gila chub and its habitat. These activities have the potential to not only maintain current water quality and quantity for Gila chub, but possibly to improve habitats in the future. Specific effects will be addressed in future site-specific actions under the FRMP.

Conservation Measures

Conservation measures for all species would decrease the likelihood of adverse effects to Gila chub, and contribute to the recovery of the species. These measures include contributing to the conservation of the species, not jeopardizing the continued existence of the species, and complying with section 7 of the ESA.

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 biological opinion. Future Federal actions that are unrelated to the proposed action are not considered in this section because they require separate consultation pursuant to section 7 of the Act. Effects of past Federal and private actions are considered in the Environmental Baseline.

Southwestern Willow Flycatcher

Further economic development of private lands near the Gila and San Pedro rivers will, in some cases, occur in the absence of Federal permitting. This increased development would lead to more public use of the rivers and shoreline areas. Increases or changes in cowbird foraging areas (corrals, domestic stock, and bird feeders) and habitat fragmentation may increase the parasitism rate and decrease flycatcher productivity. Continued and future conversion of floodplains and near-shore lands would eliminate opportunities to restore floodplains for flycatcher habitats. Increased recreation, camping, off-road vehicle use, or river trips, may harass and disturb breeding birds or impact nesting habitats. This increased recreation also increases wildfire potential in these areas. As these areas develop, demands will increase for groundwater pumping. The water budgets of the middle Gila and San Pedro valleys are already in deficit; increased pumping would accelerate loss of river flow and increase associated loss of riparian habitats along those rivers. Fire, often associated with agricultural operations in the middle Gila Valley, continues to degrade flycatcher habitat there. Yearlong livestock grazing on private and State lands in these areas may be negatively affecting regeneration of native species used for nesting.

Proposals are being considered for phreatophyte control in the Safford area of the Gila River, and projects authorized in the 2004 Arizona Water Settlement will likely affect flows in the Gila

River through the action area. Although the specifics are not yet known, these projects may affect flycatchers and their habitats. Proponents of these projects are also unknown, but we believe most will be Federal agencies or will have a Federal nexus, resulting in section 7 consultations. Some projects may not have a Federal nexus; the effects of those projects would be cumulative effects.

Huachuca Water Umbel

The water budget of the upper San Pedro River Subwatershed is in deficit. Continued water withdrawals in excess of recharge threatens the baseflow of the river and the critical habitat of the umbel. The Upper San Pedro Partnership is developing plans and projects to balance the water budget, and hopefully preserve the flow in the river. The San Pedro River is a popular travel corridor for undocumented aliens and smugglers. These individuals have started fires in the riparian area, leave trash, and probably trample water umbel as they travel through the river corridor. Response to these illegal activities is being addressed in part through consultation with the Tucson Sector of the Border Patrol. We know of no other cumulative effects that may affect Huachuca water umbel in the action area. Surrounding State and private lands in the action area do not support habitat for this species.

New Mexico Ridge-nosed Rattlesnake

The FS and BLM manage the majority of lands in the action area within the subspecies' range. Thus, most of the activities that would affect the snake in the future are Federal actions, the effects of which are not cumulative. Small, privately-owned lands are intermixed with Federally-administered lands in the lower elevations. Habitat and snake disturbance, snake injury or mortality, and habitat fragmentation, degradation, or destruction from various activities on these small, privately-owned parcels could affect the small, disjunct populations of NMRRs within the action area. Conversely, fuel reduction and fire management activities on these private lands conducted in similar ways to this proposed action could contribute longer-term positive effects by reducing the potential for catastrophic wildfires, particularly in those situations where a fire spreads from private to Federal lands. Fuel reduction and fire management projects may adversely affect the snake in the short-term, or could eliminate the subspecies from habitat patches that are altered beyond suitability. The snake's habitat in the Peloncillo Mountains is increasingly traversed by undocumented aliens and smugglers who create vehicle routes and trails, trample vegetation, leave trash, and start fires. If these individuals encounter a NMRR or other rattlesnake, they may kill it. Response to these illegal activities is being addressed in part through consultation with the Tucson Sector of the Border Patrol.

Chiricahua Leopard Frog

The action area includes both blocks of BLM land and a checkerboard-type pattern of land ownership involving other Federal, State, and private landholders. The majority of the species' habitat is on Federal lands. Thus, most of the activities that would affect the frog in the future are Federal actions, the effects of which are not cumulative. CLF have been and will continue to be affected by activities on State and private lands that have cumulatively contributed to its decline.

Many of these activities, such as livestock grazing, human population expansion and associated infrastructure development, and recreation (including OHV use), are expected to continue on State and private lands within the range of the species. Some of these activities could continue to contribute to the introduction of nonnative species, such as bullfrogs, crayfish, and fish that would prey on or compete with the CLF, and spread of chytrid fungus that could harm the species. These activities could also continue to contribute to fragmentation, degradation, loss, and pollution of CLF's wetland habitats.

CLF habitats near the border have been affected by illegal activities by undocumented aliens and smugglers, as discussed above for other species.

Razorback Sucker

Many activities outside of the Federal nexus occur and are expected to continue in potential and critical razorback sucker habitat. Critical habitat through the middle Gila Valley downstream of the Gila Box is mostly non-Federal land. Cumulative effects in this area are described for the flycatcher above. Human development or recreational site encroachment and changes in land-use pattern around occupied reaches and designated critical habitat that further fragment, modify, or destroy upland or riparian vegetation negatively affect water quality and quantity and the primary constituent elements of critical habitat. Increased development, agriculture, and livestock grazing practices may result in the drainage, development, or diversions of wetland and aquatic habitats that reduce water quantity and quality, and destroy spawning and critical habitats. Non-native fish introduction resulting from fishing and recreation in occupied reaches and critical habitat would increase resource competition and direct mortality from predation.

Loach Minnow and Spikedace

Human development, recreational site encroachment, and changes in land-use patterns on non-Federal lands around occupied and potentially-occupied reaches of the San Francisco River and Aravaipa Creek that further fragment, modify, or destroy upland or riparian vegetation negatively affect water quality and quantity. Increased development, and continuation of agricultural and livestock grazing practices may result in the drainage, development, or diversions of wetland and aquatic habitats that reduce water quantity and quality, and destroy spawning and other important habitats. Non-native fish introduction resulting from fishing and recreation in occupied reaches would increase resource competition and direct mortality from predation.

Because most of the stream bottom in Aravaipa Creek below the wilderness is privately owned, a potential exists for increasing residential or commercial use of the area. Increasing recreational, residential, or commercial use of the private lands along the creek would likely result in increased cumulative adverse effects to the loach minnow and spikedace through increased water use, increased pollution, and increased alteration of the streambanks through riparian vegetation suppression, bank trampling, and erosion. An increase in human structures in the area would likely lead to more bank stabilization and channelization, changing the availability and quantity of suitable loach minnow and spikedace habitat.

Within the action area, lands along the San Francisco River are a mix of BLM, State, and private lands. Upstream of the action area, most of the river is administered by the Apache-Sitgreaves National Forest. Non-Federal activities such as grazing and road construction and maintenance occur on the State and private lands. Recreation in the area is light and, with the exception of vehicles and the road through the river bottom, in general has a minor impact on the river. Private lands along the San Francisco River are used almost entirely for livestock grazing, which is managed in conjunction with grazing on Federal allotments.

Within the action area, critical habitat along Eagle Creek is a mix of state and private lands. Upstream of the action area, most of the river is administered by the Apache-Sitgreaves National Forest and the San Carlos Apache Nation. Non-Federal activities such as grazing and road construction and maintenance occur on the State and private lands. Lands along the creek are used almost entirely for livestock grazing and dispersed recreation.

Gila Chub

Extensive private lands occur along Bonita Creek in the Gila Box RNCA. The BLM, in their Gila Box Plan, proposes to acquire some of these lands. We are not aware of activities that affect the Gila chub and its critical habitat on these lands other than recreation, livestock grazing, and the City of Safford's infiltration gallery and water system (Bonita Creek). The general effects of these activities are described above and in our biological and conference opinion for the Gila Box Plan. Also of importance are activities occurring upstream of the reach of Bonita Creek on the RNCA that affect Gila chub and its habitat. Tributaries leading into Bonita Creek from the east and west drain primarily BLM lands (effects of activities on these lands are not cumulative effects). The most important upstream cumulative effects likely occur on the San Carlos Apache Tribal lands. Occasional trespass cattle from the reservation are found in upper Bonita Creek; however, the BLM has been working with the tribe to minimize this.

Occupied habitat in the Muleshoe area is primarily owned by BLM; additional lands are owned and managed by The Nature Conservancy. TNC management is consistent with conservation of the Gila chub.

CONCLUSION

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.

Southwestern Willow Flycatcher

After reviewing the current status of the flycatcher and its critical habitat, the environmental baseline for the action area, the effects of the proposed action, and the cumulative effects, it is our biological opinion that the action, as proposed, is neither likely to jeopardize the continued existence of the flycatcher, nor likely to adversely modify or destroy its critical habitat. We base our conclusions on the following:

1. Most of the proposed actions in the FRMP will generally maintain or improve the habitat for flycatcher.
2. Actions that may have negative effects on flycatcher habitat generally will include measures to eliminate or minimize the effects.
3. The BLM will analyze all projects and plans completed under this FRMP for effects to listed species, including the flycatcher, and request consultation if necessary.
4. The Geronimo-Fort Thomas survey sites on the Middle Gila, downstream of Safford, are the only sites possibly on BLM lands that are known to have had breeding willow flycatchers in recent years (Table 1).
5. The BLM will survey for flycatchers in appropriate habitat as part of project analyses.
6. The BLM proposes a number of conservation measures that act together to reduce or eliminate potential adverse effects from the FRMP.

Huachuca Water Umbel

After reviewing the current status of Huachuca water umbel and its critical habitat, the environmental baseline for the action area, the effects of the proposed action and the cumulative effects, it is our biological opinion that the proposed action is neither likely to jeopardize the continued existence of Huachuca water umbel, nor likely to destroy or adversely modify its critical habitat. We base our conclusions on the following:

1. Cumulative effects due to water withdrawals and development in the Sierra Vista Subwatershed are being addressed through the Upper San Pedro Partnership. We are working with Border Patrol through section 7 consultation to address cumulative effects of illegal immigration and smuggling.
2. Proposed BLM management for the SPRNCA is consistent with conservation of water umbel populations and constituent elements of critical habitat. Any effects to plants and critical habitat from BLM activities are expected to be localized and minimal. A few plants may be affected by some actions, but the overall density of Huachuca water umbel in the action area should not be greatly reduced by the proposed action. The effects to critical habitat should be temporary in nature and localized.
3. The BLM has proposed a number of conservation measures for the Huachuca water umbel that would reduce adverse effects of proposed actions implemented under the FRMP.

4. The BLM will analyze all projects and plans completed under this FRMP for effects to listed species, including CLF on and off BLM lands. Based on these analyses, BLM will request consultation if necessary.

New Mexico Ridge-nosed Rattlesnake

After reviewing the current status of the NMRR, the environmental baseline for the action area, the effects of the proposed action, and the cumulative effects, it is our biological opinion that the action, as proposed, is neither likely to jeopardize the continued existence of the NMRR, nor likely to destroy or adversely modify designated critical habitat. We base our conclusions on the following:

1. The identified NMRR potential core habitats (Holycross and Smith 2001) on BLM land are a small portion of the core habitats within the Peloncillo Mountains.
2. No NMRRs have been located on BLM lands in the action area.
3. Short-term effects are expected to be minimized through implementing the direction of the FRMP in managing for listed species.
4. Long-term effects are expected to aid in improving NMRR habitat.
5. No critical habitat is designated in the action area.
6. The BLM will analyze all projects and plans completed under this FRMP for effects to listed species, including NMRRs on and off BLM lands. Based on these analyses, BLM will request consultation if necessary.

Chiricahua Leopard Frog

After reviewing the current status of the CLF, the environmental baseline for the action area, the effects of the proposed action, and the cumulative effects, it is our biological opinion that the action, as proposed, is not likely to jeopardize the continued existence of the CLF. No critical habitat has been designated for this species; therefore, none will be affected. We base our conclusion on the following:

1. Most of the proposed actions in the FRMP will generally maintain or improve the physical and vegetation components of CLF habitat.
2. Actions that may have negative effects on known and possible CLF populations and habitats

in the action area generally will include measures to eliminate or minimize the effects.

3. No extant populations of CLF are known on BLM lands within the action area. Only one population is currently known in the action area and it occurs on a National Wildlife Refuge where it is protected from many activities.
4. The BLM will analyze all projects and plans completed under this FRMP for effects to listed species, including CLF on and off BLM lands. Based on these analyses, BLM will request consultation if necessary.

Razorback Sucker

After reviewing the current status of the razorback sucker and its critical habitat, the environmental baseline for the action area, the effects of the proposed action, and the cumulative effects, it is our biological opinion that the action, as proposed, is neither likely to jeopardize the continued existence of the razorback sucker, nor likely to result in destruction or adverse modification of designated critical habitat. We base our conclusions on the following:

1. Most of the proposed actions in the FRMP will generally maintain or improve the physical and vegetation components of razorback sucker habitat.
2. Actions that may have negative effects on razorback sucker habitat generally will include measures to eliminate or minimize those effects.
3. The BLM will analyze all projects and plans completed under this FRMP for effects to listed species, including razorback sucker, and request consultation if necessary.
4. Razorback suckers are likely very rare and localized in the action area (middle Gila River and its major tributaries). The most recent surveys (2004, 2005) failed to find any razorback suckers.
5. Livestock grazing and vehicle use are excluded from most critical habitat and potential habitats of the razorback sucker.

Loach Minnow

After reviewing the current status of the loach minnow and its proposed critical habitat, the environmental baseline for the action area, the effects of the proposed action, and the cumulative effects, it is our biological and conference opinion that the action, as proposed, is not likely to

jeopardize the continued existence of the loach minnow, nor likely to result in destruction or adverse modification of proposed critical habitat. We base our conclusions on the following:

1. Most of the proposed actions in the FRMP will generally maintain or improve the physical and vegetation components of loach minnow habitat and proposed critical habitat.
2. Actions that may have negative effects to loach minnow habitat generally will include measures to eliminate or minimize the effects.
3. BLM will analyze all projects and plans completed under this FRMP to determine the effects to listed species, including loach minnow, and request consultation if necessary.
4. Loach minnow continuously occupy only one site, Aravaipa Canyon, on BLM-administered lands in the action area. The Aravaipa Canyon Wilderness is 19,400 acres, 7,000 of which are deeded to The Nature Conservancy (TNC) as part of their preserve program. This area is actively managed to protect riparian and aquatic resources, including exclusion of livestock from most of the creek.
5. TNC, the University of Arizona, and the BLM census native fish within Aravaipa Creek twice a year; loach minnow populations are well-monitored. Monitoring demonstrates that loach minnow persist in the Aravaipa Creek area, and that the population is likely stable.
6. The San Francisco River will be evaluated to determine the quantities of in-stream flow water rights needed to meet resource management objectives. The BLM will file with the State of Arizona for quantities needed to meet those objectives.

Spikedace

After reviewing the current status of the spikedace and its proposed critical habitat, the environmental baseline for the action area, the effects of the proposed action, and the cumulative effects, it is our biological and conference opinion that the action, as proposed, is not likely to jeopardize the continued existence of the spikedace, nor likely to result in destruction or adverse modification of proposed critical habitat. We base our conclusions on the following:

1. Most of the proposed actions in the FRMP will generally maintain or improve the physical and vegetation components of spikedace habitat and proposed critical habitat.
2. Actions that may have negative effects to spikedace habitat generally will include measures to eliminate or minimize the effects.

3. The BLM will analyze all projects and plans completed under this FRMP to determine the effects to listed species, including spikedace, and request consultation if necessary.
4. Spikedace continuously occupy only one site, Aravaipa Canyon, on BLM-administered lands in the action area. The Aravaipa Canyon Wilderness is 19,400 acres, 7,000 of which are deeded to The Nature Conservancy (TNC) as part of their preserve program. This area is actively managed to protect riparian and aquatic resources, including exclusion of livestock from most of the creek.
5. TNC, the University of Arizona, and the BLM census native fish within Aravaipa Creek twice a year; spikedace populations are well-monitored. Monitoring demonstrates that spikedace persist in the Aravaipa Creek area, and that the population is likely stable.

Gila Chub

After reviewing the current status of the Gila chub and its critical habitat, the environmental baseline for the action area, the effects of the proposed action, and the cumulative effects, it is our biological opinion that the action, as proposed, is neither likely to jeopardize the continued existence of the Gila chub, nor likely to result in destruction or adverse modification of critical habitat. We base our conclusions on the following:

1. Most of the proposed actions in the FRMP will generally maintain or improve the physical and vegetation components of Gila chub critical habitat.
2. Actions that may have negative effects on Gila chub critical habitat generally will include measures to eliminate or minimize those effects.
3. The BLM will analyze all projects and plans completed under this FRMP for effects to listed species, including Gila chub, and request consultation if necessary.
4. Gila chub occupy only two areas within the action area – Bonita Creek and the Muleshoe area. Proposed management in these areas emphasizes management to protect riparian and aquatic resources, including Gila chub critical habitat.
5. With implementation of the proposed Federal action, critical habitat would remain functional (or retain the current ability for the primary constituent elements to be functionally established) to serve the intended conservation role for the species.

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 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.

The measures described below are non-discretionary, and must be undertaken by the BLM so that they become binding conditions of any grant or permit issued to an applicant, as appropriate, for the exemption in section 7(o)(2) to apply. Three previous biological opinions that analyze the effects of component parts of the FRMP, including the Gila Box RNCA BO, the Safford/Tucson Grazing BO, and the BLM LUP Amendment BO provide incidental take statements for those activities. Those take statements are included here by reference. The take statements provided below address other aspects of the FRMP. We provide specific amounts and forms of take anticipated below which are based on the best information available to us at this time. However, we are conservative with anticipated take because we do not know many locations and other specific details of proposed actions under the FRMP, how those projects may result in incidental take, and we are not able to anticipate where new locations of listed species may be discovered in the future. As program or project-level plans are developed and the BLM comes to us for consultation on those plans, and as surveys are conducted in areas that are not documented as occupied by listed species, we will likely have better information at that time to predict incidental take. Based on those plans, our analysis in consultation, and new documented locations of listed species, reinitiation of this consultation (which could be addressed through those program or project-level consultations) may be necessary to adjust anticipated take herein (50 CFR 402.16a).

The BLM has a continuing duty to regulate the activity covered by this incidental take statement. If the BLM (1) fails to assume and implement the terms and conditions or (2) fails 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 BLM must report the progress of the action and its impact on the species to the FWS 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

The Fish and Wildlife Service 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.

Southwestern Willow Flycatcher

Although our effects analysis found that some activities proposed could potentially result in incidental take, the likelihood of incidental take is low because of conservation measures and the direction of the FRMP to generally improve conditions in riparian areas and promote recovery of listed species. As a result, we do not anticipate incidental take of the flycatcher from actions associated with the FRMP, except for incidental take already identified in previous Biological Opinions (See Safford/Tucson Grazing BO and BLM LUP Amendment BO regarding incidental take anticipated due to livestock grazing and fire and fuels management projects). Future actions as part of implementing the FRMP may result in incidental take if flycatchers become established on other BLM lands, but this is unknown at this time and will require consideration and section 7 consultation as appropriate (see the Reinitiation Notice).

New Mexico Ridge-nosed Rattlesnake

We anticipate that implementation of the proposed actions of the FRMP may result in incidental take through harm and direct mortality to NMRRs. Activities associated with the implementation of this plan may kill or injure NMRRs through the use of heavy equipment and fire effects from back burns and prescribed burns (direct mortality). These activities may also contribute to an increase in snake predation due to loss of ground cover, potentially reduce prey species numbers, and alter suitable habitat so as to significantly disrupt normal behavior patterns including, but not limited to, breeding, feeding, or sheltering (harm).

We anticipate incidental take of NMRRs will be difficult to detect for the following reasons: the species has small body size and cryptic coloration, and several actions (e.g., prescribed fires) will take place on such a large scale that the ability to detect a dead or injured individual is highly diminished. The level of anticipated take is quantified differently depending upon the action. Take will be quantified by number of killed or injured individuals (in case such individuals are observed), but also by destruction of potential core habitats ranked by Holycross and Smith (2001) as “habitats probably or likely supporting a deme of *C. w. obscurus*” (habitats 3 and 4). Effects to potential core habitats are used as a surrogate for incidental take caused by fire projects (prescribed or wildland fire), in which detection of individuals is extremely unlikely.

We anticipate the following incidental take for the NMRR:

1. One NMRR is killed or injured; or
2. Up to 20 percent of delineated core habitat ranked as 3 or 4 (Holycross and Smith 2001) in the action area is affected by high intensity fire during the life of this Plan.

Additional incidental take is anticipated due to livestock grazing activities (refer to the Safford/Tucson Grazing BO).

Chiricahua Leopard Frog

We anticipate incidental take of the CLF as described in the BLM LUP Amendment BO. That BO identifies take only from fire suppression actions, and is addressed statewide. We do not anticipate that other actions proposed will result in incidental take of CLF because individuals are not currently known in the action area, except for the population on the Leslie Canyon National Wildlife Refuge, Cochise County. Based on information available to us at this time, expected effects of actions implemented nearby or upstream of the population (such as land disposals, riparian improvements, livestock grazing, or prescribed fire) are not anticipated to result in incidental take. Specific actions near the Leslie Canyon population may require section 7 consultation to determine if there would be incidental take. Discovery of additional populations in the action area would require reanalysis of effects and, through reinitiation of consultation (if needed) or subsequent consultation on specific actions, could expand anticipated incidental take to actions other than fire suppression.

Razorback Sucker

We do not anticipate that the proposed actions of the FRMP will result in incidental take of the razorback sucker because individuals are likely rare and localized in the action area.

Loach Minnow

We anticipate that the proposed actions of the FRMP may result in the incidental take of the loach minnow. However, at the broad scale of this consultation, we are unable to anticipate all possible circumstances that may involve the take of loach minnow due to actions implemented under the FRMP.

The only FRMP action reasonably certain to result in incidental take, not already identified in previously cited biological opinions (U. S. Fish and Wildlife Service 1997, 2004b), is recreational activity in Aravaipa Creek. The only occupied loach minnow sites documented consistently in the planning area are in Aravaipa Canyon. Recreation in the form of backpacking and hiking is authorized by the BLM. Incidental take may be in the form of harm, injury, or death resulting from the loss or disturbance of a spawning bed; i.e. in the form of temporary disturbance as hikers travel through occupied river reaches. Loach minnow spawn in late winter to early spring; though they could spawn in the fall (see Status of the Species). We anticipate incidental take of loach minnow will be difficult to detect or determine for the following reasons:

dead fish, destroyed eggs, and fry are difficult to find, occupied habitats are located within remote wilderness, cause of death may be difficult to determine, and losses may be masked by seasonal fluctuations. Based upon intensive surveys, loach minnow populations persist and appear to be stable within Aravaipa Canyon. As a result, the take associated with the use of up to 50 hiking permits/day does not appear to be affecting loach minnow populations in the long term. If the BLM begins to issue more than 50 hiking permits per day through Aravaipa Canyon, the amount of anticipated incidental take will be considered to have been exceeded.

Spikedace

We anticipate that the proposed actions of the FRMP may result in the incidental take of the spikedace. At the broad scale of this consultation, we are unable to anticipate all possible circumstances that may involve the take of spikedace due to actions implemented under the FRMP.

The only FRMP action reasonably certain to result in incidental take, not already identified in previously cited biological opinions (U. S. Fish and Wildlife Service 1997, 2004b), is recreational activity in Aravaipa Creek. The only spikedace occupied sites documented consistently in the planning area are in Aravaipa Canyon. Recreation in the form of backpacking and hiking is authorized by the BLM. Incidental take may be in the form of harm, injury, or death resulting from the loss or disturbance of a spawning bed; i.e. in the form of temporary disturbance as hikers travel through occupied river reaches. Spikedace spawn in late winter to early spring (see Status of the Species). We anticipate incidental take of spikedace will be difficult to detect or determine for the following reasons: dead fish, destroyed eggs, and fry are difficult to find, occupied habitats are located within remote wilderness, cause of death may be difficult to determine, and losses may be masked by seasonal fluctuations. Based upon intensive surveys, spikedace populations persist and appear to be stable within Aravaipa Canyon. As a result, the take associated with the use of up to 50 hiking permits/day does not appear to be affecting spikedace populations in the long term. If the BLM begins to issue more than 50 hiking permits per day through Aravaipa Canyon, the amount of anticipated incidental take will be considered to have been exceeded.

Gila Chub

We anticipate that the proposed actions of the FRMP may result in the incidental take of the Gila chub. However, at the broad scale of this consultation, we are unable to anticipate all possible circumstances that may involve the take of Gila chub due to actions implemented under the FRMP.

See the Safford/Tucson Grazing BO and the BLM LUP Amendment BO regarding anticipated incidental take due to livestock grazing and fire and fuels management projects, respectively. Incidental take from all activities under the FRMP that occur in the Bonita Creek area was addressed in the Gila Box RNCA BO. In the Muleshoe area (Bass, Redfield, and Hot Springs canyons), we do not anticipate that additional incidental take of Gila chub will result from the proposed action. Several types of actions are possible in this area under the FRMP that have some potential to result in incidental take (e.g. road construction through occupied habitat,

rights-of-way projects, recreation, etc.); however, the FRMP provides no specific actions upon which we can reasonably conclude that incidental take (beyond that defined in previous opinions) is likely in the Muleshoe area. Further analysis of the likelihood of incidental take from these actions will occur during consultation on site-specific projects.

EFFECT OF THE TAKE

In this biological opinion, we determined that this level of anticipated take is not likely to result in jeopardy to the southwestern willow flycatcher, New Mexico ridge-nosed rattlesnake, Chiricahua leopard frog, razorback sucker, loach minnow, spikedace, or Gila chub, or destruction or adverse modification of any critical habitat or proposed critical habitat. The implementation of the proposed actions of the FRMP, along with the conservation measures, will ensure that, while incidental take may still occur, it is minimized to the extent that habitat quality and quantity will be maintained in the planning area and species will be conserved.

REASONABLE AND PRUDENT MEASURES AND TERMS AND CONDITIONS

In order to be exempt from the prohibitions of section 9 of the Act, the BLM must comply with the terms and conditions of the following reasonable and prudent measures, and report implementation of these terms and conditions to us. These terms and conditions are non-discretionary. The reasonable and prudent measures, with the implementing terms and conditions are designed to minimize or avoid the impact of incidental take that might otherwise result from the proposed action. If, during the course of the action, the level of incidental take is exceeded, such incidental take represents new information requiring reinitiation of consultation and review of the reasonable and prudent measures provided.

New Mexico Ridge-nosed Rattlesnake

We believe that the following reasonable and prudent measure is necessary and appropriate to minimize take of the NMRR:

Protect and improve habitat conditions within areas that are reasonably certain to be occupied by NMRR populations.

The following Terms and Conditions will implement the Reasonable and Prudent Measure:

1. Pre-treat NMRR habitat, when necessary, to avoid canopy loss before suppression actions (e.g., back burning) and wildfire are applied.
2. Areas mapped as level 3 or 4 NMRR habitat (Holycross and Smith 2001) will be treated with low-intensity fire that minimizes oak and/or pine canopy removal.
3. No prescribed fire ignitions will be allowed from July 15 through October 31 in delineated level 3 or 4 NMRR habitat (Holycross and Smith 2001).

4. In high-quality NMRR habitat and riparian areas, night-time or cool season burning to reduce fire intensity may be necessary under the following conditions: 1) fires that burn in the months following a dry winter with less than 3 inches of rainfall, and 2) whenever live fuel moistures in the oak types are less than 75 percent.
5. All personnel participating in fire suppression or prescribed fire will be briefed regarding NMRRs, their habitat requirements, these conservation measures, and the reasonable and prudent measures to minimize incidental take.
6. Fire intensities will be maintained at such a level that not more than ten percent of delineated NMRR habitat (level 3 and 4 habitat) (Holycross and Smith 2001) is affected by high-intensity (stand-replacing) fire. A high-intensity fire is defined as one where 90-100 percent of the wooded canopy is burned off within any area greater than 5 acres (the minimum mapping unit).
7. Fire intensities will be maintained at such a level that no more than 20 percent of delineated NMRR habitat is affected by high-intensity fire.
8. The ten- and twenty-percent thresholds of high-quality NMRR habitat that can be modified by high-intensity burns are applicable for the 10-year life of this Plan.
9. Annual fire effects monitoring in NMRR habitat will be conducted by you and members of the NMRR advisory team. The monitoring will consist of mapping the fire perimeter and delineating areas affected by fire intensity. Reports will be submitted to us for review. If monitoring indicates that the ten or twenty percent thresholds have been exceeded, you will reinitiate section 7 consultation on this Plan.
10. To the extent possible, minimize surface-disturbing activities from fire suppression and fuels treatment activities within NMRR habitat on BLM lands in the southern Peloncillo Mountains, particularly during active periods for snakes (July through October).
11. All fires that occur outside of prescriptions that will not result in low intensity, low severity burns will be fully suppressed within or near suitable NMRR habitat.

Additional reasonable and prudent measures and terms and conditions are provided in the Safford/Tucson grazing BO and are included herein by reference.

Chiricahua Leopard Frog

The reasonable and prudent measures and terms and conditions necessary and appropriate to minimize take are listed in the BLM LUP Amendment BO (Page 225).

Loach Minnow and Spikedace

Refer to the Safford/Tucson Grazing BO for applicable reasonable and prudent measures and terms and conditions associated with livestock grazing.

Regarding incidental take associated with hiking in Aravaipa Canyon: Because the proposed action, along with the relevant conservation measures that are described in the Description of the Proposed Action section that are part of the proposed action, provides the reasonable direction to limit adverse effects and generally improve habitat, no additional reasonable or prudent measures are necessary or warranted to minimize incidental take.

Gila Chub

The reasonable and prudent measures and terms and conditions necessary and appropriate to minimize take are listed in the Safford/Tucson Grazing BO, Gila Box RNCA BO, and BLM LUP Amendment BO.

Review requirement: The reasonable and prudent measures, with their implementing terms and conditions, are designed to minimize incidental take that might otherwise result from the proposed action. If, during the course of the action, the level of incidental take is exceeded, such incidental take would represent new information requiring review of the reasonable and prudent measures provided. The BLM must immediately provide an explanation of the causes of the taking and review with us the need for possible modification of the reasonable and prudent measures.

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. The recommendations provided here do not necessarily represent complete fulfillment of the BLM's section 2(c) or 7(a)(1) responsibility for these species. In furtherance of the purposes of the Act, we recommend implementing these discretionary actions.

Southwestern Willow Flycatcher

We recommend that you:

1. Continue to support inventories and monitoring of flycatchers and their habitats.
2. Implement the flycatcher recovery plan, by considering the recommendations in that plan in all program and project-level activities under the FRMP.
3. Not implement saltcedar control in riparian patches that are suitable flycatcher habitat without careful evaluation and coordination with our office and the Arizona Game and Fish Department.

Huachuca Water Umbel

We recommend that you:

1. Monitor the effects of fire suppression activities on all populations of water umbel on the San Pedro River.
2. Monitor the effects of fire suppression activities on the spread of non-native species within the action area.
3. Actively participate in the recovery of, and recovery plan development for, the water umbel.
4. Fund, aid, or establish research or study projects regarding fire ecology and conservation of the water umbel on BLM lands.
5. Educate employees and your public users about conservation needs of the water umbel.
6. Work with the Border Patrol to reduce impacts of undocumented immigrants and smugglers on the San Pedro RNCA.
7. Continue to work with the Upper San Pedro Partnership to develop and implement projects that help bring the water budget for the subwatershed into balance.
8. Determine effects of the recently reestablished beaver population on the water umbel and its critical habitat.

New Mexico Ridge-nosed Rattlesnake

We recommend that you:

1. Actively participate in the recovery of and any future recovery planning for this subspecies.
2. Fund, aid, or establish research or study projects for this subspecies.
3. Educate employees and your public users about this subspecies.

Chiricahua Leopard Frog

We recommend that you:

1. Cooperate with adjacent landowners and managers, and with the Arizona Game and Fish Department, in managing the watersheds of occupied and suitable habitats, including preventing introductions of and controlling non-native fishes, bullfrogs, crayfish, and other non-native organisms.
2. Continue to work with us on implementing emergency interim measures to protect frogs during plan preparation, and help us implement the recovery plan after it is completed.
3. Work with us and the Arizona Game and Fish Department to re-establish CLFs at suitable sites within the planning area if deemed appropriate by the recovery team.
4. Develop and implement conservation measures for fire management projects other than fire suppression to minimize adverse effects to CLFs and their potential habitats in the action area. These measures would be similar to those outlined in reasonable and prudent measure number 3, term and condition number 1, for prescribed fire and natural fire plans as they affect CLF, as described in our June 10, 2004, biological and conference opinion on the Gila Box Riparian National Conservation Area Interdisciplinary Activity Plan (U. S. Fish and Wildlife Service 2004a).

Razorback Sucker

We recommend that you:

1. Continue to support inventories and monitoring of occupied or potential razorback sucker habitats. This could include unsurveyed and partly surveyed sites.
2. Collect flow data to apply for instream flow rights with the Arizona Department of Water Resources in occupied or potential razorback sucker habitats and designated critical habitats if such rights have not been previously obtained.
3. Work with us to implement the recovery plan for this species.
4. Coordinate with the Arizona Game and Fish Department and us to begin an aggressive program to control non-native aquatic species on BLM lands.

Loach Minnow

We recommend that you:

1. Continue to support inventories and monitoring of occupied loach minnow habitats. This could include un-surveyed and incompletely surveyed sites.
2. Collect flow data to apply for instream flow rights with the Arizona Department of Water Resources in occupied loach minnow and un-occupied suitable loach minnow habitats if such rights have not been previously obtained.
3. Work with us to implement the recovery plan for this species.
4. Close or stabilize the San Francisco River Road and work with private landowners to remove livestock grazing from the San Francisco River below the Forest boundary.
5. Coordinate with the Arizona Game and Fish Department and us to begin an aggressive program to control non-native aquatic species on BLM lands.

Spikedace

We recommend that you:

1. Continue to support inventories and monitoring of occupied spikedace habitats. This could include un-surveyed and incompletely surveyed sites.
2. Collect flow data to apply for instream flow rights with the Arizona Department of Water Resources in occupied spikedace and un-occupied suitable spikedace habitats if such rights have not been previously obtained.
3. Work with us to implement the recovery plan for this species.
4. Coordinate with the Arizona Game and Fish Department and us to begin an aggressive program to control non-native aquatic species on BLM lands.

Gila Chub

We recommend that you:

1. Coordinate with us in development and implementation of a recovery plan for the Gila chub.
2. Coordinate with the Arizona Game and Fish Department and us to translocate Gila chub into suitable habitat.
3. Conduct, fund, or otherwise support comprehensive surveys for the Gila chub in all potential or suitable habitats on BLM lands.
4. Coordinate with the Arizona Game and Fish Department and us to begin an aggressive program to control non-native aquatic species on BLM lands.

5. Continue working with the San Carlos Apache Tribe to minimize trespass livestock in Bonita Creek.
6. Acquire and manage, in accordance with the Gila Box Plan, private lands along Bonita Creek.

REINITIATION NOTICE

This concludes reinitiation of consultation and conferencing for the FRMP. You may ask us to confirm the conference opinion as a biological opinion issued through formal consultation if loach minnow or spikedace 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 FRMP and no further section 7 consultation will be necessary.

This concludes formal consultation on the action of the FRMP as described in the requests. As provided in 50 CFR §402.16, reinitiation of formal consultation is required where discretionary Federal agency involvement or control over the action has been retained (or is authorized by law) and if: (1) the amount or extent of incidental take is exceeded; (2) new information reveals effects of the agency action that may affect listed species or critical habitat in a manner or to an extent not considered in this opinion; (3) the agency action is subsequently modified in a manner that causes an effect to the listed species or critical habitat not considered in this opinion; or (4) a new species is listed or critical habitat designated that may be affected by the action. In instances where the amount or extent of incidental take is exceeded, any operations causing such take must cease pending reinitiation. As discussed in the incidental take statement, specific project plans or programmatic plans developed under the FRMP may provide new information indicating the amount or extent of incidental take anticipated may be different than indicated herein. Reinitiation of consultation would be required in that scenario (50 CFR 402.16a). We suggest that reinitiation of this plan-level consultation could be batched with the consultation document(s) for these project or program-level consultations.

We appreciate your efforts to identify and minimize effects to listed species from this project. For further information please contact Mark Crites (520) 670-6150 (x229) or Jim Rorabaugh (602) 242-0210 (x238). Please refer to the consultation number 02-21-05-F-0086 in future correspondence concerning this project.

/s/ Steven L. Spangle
Field Supervisor

cc: Assistant Field Supervisor, Fish and Wildlife Service, Tucson, AZ

State Director, Bureau of Land Management, Phoenix, AZ

Habitat Branch Chief, Bob Broscheid, Arizona Game and Fish Department, Phoenix, AZ

Regional Supervisor, Arizona Game and Fish Department, Tucson, AZ

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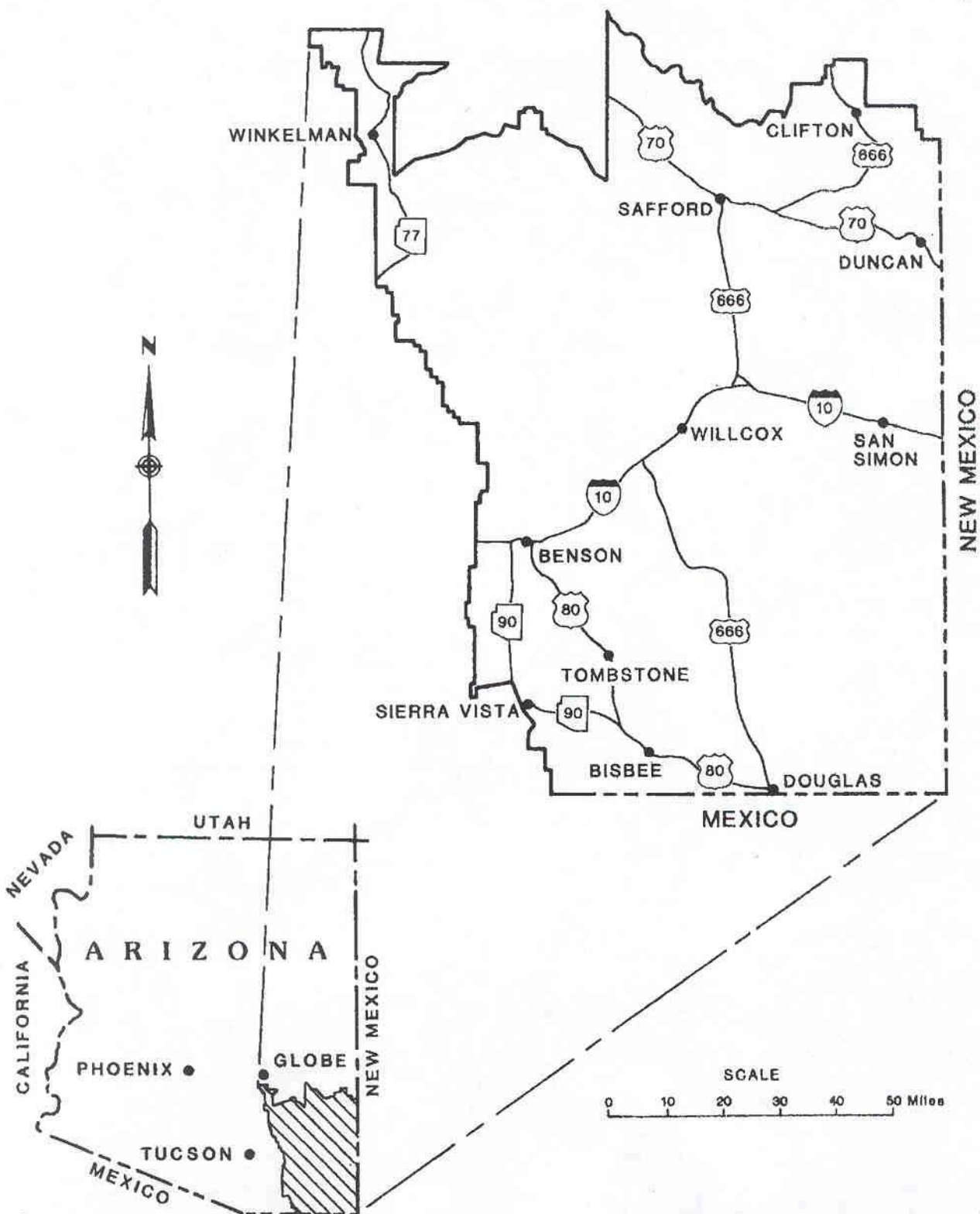
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TABLES AND FIGURES

Figure 1. Project Area Map

Figure 1.

SAFFORD DISTRICT RMP/EIS AREA



APPENDIX A

The appendix contains our concurrences with your determinations that the proposed action may affect, but is not likely to adversely affect, the jaguar (*Panthera onca*), and Mexican spotted owl (*Strix occidentalis lucida*). These concurrences are based on the full implementation of the proposed action as described in the Description of the Proposed Action section of the Biological Opinion, including the conservation measures proposed by the BLM.

Jaguar

The jaguar was listed as endangered in the United States in 1997 (62 FR 39147), without critical habitat. Non-United States populations were listed as endangered in March 1972 (37 FR 6476).

Most of the information presented regarding the status of the species is presented by the Jaguar Conservation Team (http://azgfd.gov/w_c/jaguar_management.shtml). Refer to that internet site for additional information.

The jaguar currently is found from southern South America north into southern Arizona. The historical range in the United States included all of the Southwest as far north as the Grand Canyon. Individual jaguars have been seen and photographed infrequently in southern Arizona during the last few decades, including within the action area, and possibly within or near BLM lands. The recent documented locations in the action area include a jaguar photographed in the Peloncillo Mountains in 1996, and a jaguar killed illegally in the Dos Cabezas Mountains in 1986. Most jaguar use has been documented in mountainous areas in southern Arizona. Recent camera surveys have not detected any jaguars in the action area. The most recent sightings (including 2004) have been two or three individuals in the Pajarito Mountains, approximately 50 miles west of the action area. These jaguars are likely transient males moving back and forth from Mexico into Arizona, with most of their home range in Mexico. No females have been documented in Arizona since the early 1900's. Reproduction is not expected to be occurring in Arizona due to a lack of recent documentation of females and the infrequent sightings of any jaguar.

The jaguar is generally associated with swamps and rainforests in most of their range but occur in drier climates in the northern and southern parts. In Arizona, they have been generally found in oak woodland and riparian areas in the sky island mountain ranges in southeastern Arizona, though they have been documented from desert grasslands to montane forests. Known prey species for the jaguar throughout its range includes over 80 species. In Arizona, larger prey, such as deer and javelina, are the key prey species. These species are widely present in southeastern Arizona, and are unlikely to be limiting factors at this time.

The main effect on the jaguar in Arizona, and likely the main reason for the decline in numbers over the last 100 years, has been legal and illegal killing. Most of the documented individuals since the 1800's have been killed as part of legal and illegal hunting, predator control, or trade. The jaguar killed in the Dos Cabezas Mountains in 1986 was killed by a member of the family that held a BLM grazing permit in that mountain range (Brown 1997). The jaguar photographed in the Peloncillo Mountains was being pursued by a lion hunter who called off the hunt after realizing it was a jaguar (Glenn 1996). The listing of the species in the United States, and

throughout its range, has likely decreased this effect, but illegal killing (particularly outside of the U.S.) may continue. Habitat changes in southern Arizona may also have an effect on jaguar use and presence. Altering woodland and riparian areas in the sky island mountain canyons may reduce cover for the jaguar and alter prey availability. With increasing human activities, including illegal border traffic and the resulting law enforcement activities, more interactions between humans and jaguars that may travel to southern Arizona may occur, and possibly change jaguar use patterns. Changes in main prey habitat, though possible, are unlikely to be measurably affecting deer and javelina populations, but any decrease in cover may reduce jaguar hiding opportunities for hunting, and thus prey availability.

Jaguars may travel in and through the action area during the remaining life of the FRMP, mainly in the southern areas. Based on two sightings in the action area over the last 20 years and multiple sightings in the last year to the west of the action area in the Pajarito Mountains, a project life of at least several years, and because certainly more jaguars occur in Arizona than are reflected by observations, we believe there is a reasonable likelihood of a jaguar occurrence in the action area during the life of the action. However, any jaguars that may use the action area would likely be transients from Mexico and only present for a short period of time.

Determination of Effects

The proposed actions are not likely to directly affect jaguar due to their mobility. Actions implemented under the FRMP could indirectly affect jaguars, if present, by altering their travel and foraging cover. These actions include vegetation treatments, livestock management, and recreation activities. Access provided by trails and roads on BLM lands may allow human use in otherwise remote areas where jaguars and people may come into contact, possibly altering their use of areas. A localized change in prey (mainly deer) patterns on the landscape may occur as burning, livestock grazing, and other vegetation management actions impact prey forage. Any changes to prey habitat are likely to be localized dependent on the actions, and not expected to significantly change prey availability throughout the areas that jaguars may occur. These effects on jaguar travel and foraging cover, and on prey habitat, are expected to be small, not measurable, and insignificant.

Predator control actions may affect a jaguar, if present during the control actions. Both the Safford/Tucson Grazing BO and the biological opinion addressing the predator control by Wildlife Services (U. S. Fish and Wildlife Service 1999) provide measures to minimize possible effects on jaguars from predator control activities. We believe the listing of the jaguar in the U.S. in 1997 combined with recent heightened awareness of the plight of the jaguar and the cooperative conservation efforts of the Jaguar Conservation Team, which includes ranchers and other stakeholders, make it unlikely that a jaguar will be illegally killed in Arizona. The BLM LUP Amendment BO addressed the effects of fire management activities on the jaguar, and also includes measures to minimize possible effects to jaguars. This concurrence incorporates the measures from those three BOs.

Actions under the FRMP may affect the jaguar, but effects to individuals would be few during the remaining life of the FRMP. We base this on the lack of recent sightings (recent sighting are found west of the action area) and that any individual will infrequently use southern Arizona as

part of its home range, the majority of which is likely in Mexico. Any effects to habitat that jaguars may use in the future will be small and not measurable. If the status of the jaguar in the action area changes (such as presence of a female, evidence of reproduction, consistent documentation of a jaguar over a short period of time, or documented poaching of a jaguar) in the future, then reinitiation of section 7 consultation may be required.

Conclusion

We concur that the proposed action of the CNM FMP is not likely to adversely affect the jaguar. Our concurrence is based on:

1. No jaguar has been documented in the action area recently.
2. Jaguars are currently a wide-ranging, transient species in Arizona, and are found infrequently within the project area.
3. It is unlikely that an action implemented under the FRMP will directly affect a jaguar or its movement patterns.
4. It is unlikely that an action implemented under the FRMP will measurably affect cover or prey habitat that will affect habitat use by a jaguar.

Mexican spotted owl

We listed the Mexican spotted owl (MSO) as a threatened species in 1993 (U. S. Fish and Wildlife Service 1993) and designated critical habitat in 2004 (U. S. Fish and Wildlife Service 2004). The primary threats to the species were cited as even-aged timber harvest and the threat of catastrophic wildfire, although grazing, recreation, and other land uses were also mentioned as possible factors influencing the MSO population. We appointed the Mexican Spotted Owl Recovery Team in 1993, which produced the Recovery Plan for the Mexican Spotted Owl (RP) in 1995 (U. S. Fish and Wildlife Service 1995).

Most habitats in the action area that meet the RP definition are located on the sky island mountain ranges administered by the U. S. Forest Service. These areas have numerous Protected Activity Centers (PACs) that were determined by the presence of MSO. Other areas within the action area may also contain potential MSO habitat. No MSO have been located on BLM lands in the action area. There is one known MSO location in the Muleshoe area on private land, which is near BLM lands.

Habitat characteristics for the MSO, as defined by the RP, are very limited within the planning area on BLM lands. There are some canyons that may provide some habitat characteristics for the MSO (e.g., Aravaipa Canyon, Guadalupe Canyon), but there are no protected or restricted habitats on BLM lands in the planning area as defined by the RP. Occasional protocol and non-protocol surveys have not detected any MSO in these or other areas. Considering the limited habitat for the MSO, and that no owls have been documented on BLM lands within the action area, it is unlikely that breeding MSO occur on BLM lands within the planning area.

Determination of Effects

Areas with some habitat characteristics for the MSO on and near BLM lands may be affected by various proposed actions in the FRMP, including prescribed fire and livestock management. These habitats are not anticipated to be significantly or measurably affected by fire or livestock management because they generally are rocky, cool canyons with riparian areas, and are relatively difficult for livestock to access. While recreation, livestock, and other management may result in some disturbance to any MSO in the action area, or may disturb any MSO that move into these areas during the remaining life of the FRMP, this disturbance is anticipated to be temporary and minimal in intensity, and not result in changes in behavior or survival.

One small parcel (approximately 35 acres) is within the boundaries of Critical Habitat Unit BRW-18. This parcel is located near the Paradise area on the east side of the Chiricahua Mountains. This parcel is mainly a juniper vegetation type, with some scattered pinyon pine (Doug Powers, pers. comm., March 10, 2005). The area is surrounded by private land. The parcel does not provide the constituent elements for forest structure, and likely provides limited prey habitat (few fallen trees or other woody debris; few number of tree or plant species; low levels of residual plant cover to maintain fruits, seeds, and allow plant regeneration). This parcel has been identified as available for disposal, but a more specific analysis will be conducted on this parcel, including going through the NEPA process and section 7 consultation, before it would be disposed. There are no other actions planned for this parcel, and considering how small it is and that it is surrounded by private land, no other actions are expected. There is no critical habitat identified on BLM lands anywhere else within the action area.

Conclusion

We concur with your determination that the proposed actions of the FRMP may affect, but are not likely to adversely affect, the MSO or its critical habitat. Our concurrence is based on the following:

1. The proposed actions of the FRMP, including the conservation measures presented in the BO, provide direction to minimize effects.
2. No MSO are known on BLM lands in the action area.
3. Potential habitat is limited on BLM lands in the action area.
4. Impacts to potential habitat on and near BLM lands will be insignificant and not measurable.
5. Disturbance to the MSO that may occur near BLM lands, and MSO that move onto BLM lands during the remaining life of the FRMP, is anticipated to be temporary and minimal in intensity, and not result in changes in behavior or survival.
6. There is one small 35-acre parcel of BLM land within the boundaries of a critical habitat unit, but this parcel includes no constituent elements for forest structure and limited prey habitat.

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