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02-21-92-F-0070-R2
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June 10, 2004

Memorandum

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

From: Field Supervisor

Subject: Reinitiation of Consultation/Conference on the Gila Box Riparian National Conservation Area Interdisciplinary Activity Plan, Graham County, Arizona

This memorandum constitutes the second reinitiation of formal section 7 consultation/conference on the Gila Box Riparian National Conservation Area (RNCA) Interdisciplinary Activity Plan, pursuant to the Endangered Species Act of 1973 (16 U.S.C. 1531-1544), as amended (Act, 02-21-92-F-0070R2). Topics addressed in this reinitiation include effects of your proposed action on the threatened Chiricahua leopard frog (*Rana chiricahuensis*), the proposed endangered Gila chub (*Gila intermedia*) and its proposed critical habitat, and designated critical habitat of the loach minnow (*Tiaroga cobitis*) and spikedace (*Meda fulgida*). Your request was dated February 20, 2003, and received in this office on February 26, 2003.

Your request includes reinitiation of consultation/conference on effects of livestock grazing on eight allotments in the Gila Box RNCA. These allotments are covered by the Safford/Tucson programmatic grazing biological opinion (02-21-96-F-0160); this document will also be considered the seventh reinitiation of that biological opinion. That opinion was reinitiated in 2001 to address effects to spikedace and loach minnow critical habitat; however, potential effects of grazing activities on the Chiricahua leopard frog and Gila chub, and its critical habitat, will be addressed herein in regard to allotments in the Gila Box RNCA. Additional reinitiation may be needed to address effects of the Safford/Tucson grazing program in other allotments for these species.

CONSULTATION HISTORY

☛May 3, 1994. We issued a biological opinion on the Gila Box RNCA Interdisciplinary Activity Plan. We concluded that the proposed action was not likely to jeopardize the continued existence of the bald eagle (*Haliaeetus leucocephalus*), peregrine falcon (*Falco peregrinus*), or razorback sucker (*Xyrauchen texanus*), and was not likely to result in adverse modification or destruction of critical habitat designated for the razorback sucker. We also found that the

proposed action was not likely to jeopardize the continued existence of the proposed southwestern willow flycatcher. Consultation History prior to May 3, 1994, can be found in that biological opinion.

☛September 26, 1997. We issued a biological opinion on the Safford and Tucson Field Office's livestock grazing program. The opinion addressed 288 allotments and found that the proposed action was not likely to jeopardize 15 listed species nor result in destruction or adverse modification of designated critical habitat. Allotments covered in the opinion included all eight allotments in the Gila Box RNCA.

☛October 6, 1997. We received your request for concurrence with your determination that the Gila Box RNCA Management Plan may affect, but is not likely to adversely affect, the cactus ferruginous pygmy-owl (*Glaucidium brasilianum cactorum*) and the Arizona hedgehog cactus (*Echinocereus triglochiadatus* var. *arizonicus*).

☛October 7, 1997. We received from you the "draft Gila Box RNCA Management Plan".

☛November 6, 1997. We provided a conditional concurrence with your determination that the Gila Box RNCA Management Plan may affect, but is not likely to adversely affect, the cactus ferruginous pygmy-owl and the Arizona hedgehog cactus. This is considered the first reinitiation of the 1994 formal consultation.

☛January 30, 1998. The Gila Box Management Plan, Environmental Assessment, and Decision Record were finalized by your office.

☛April 12, 2000. We issued amendment/reinitiation #4 of the Safford/Tucson Field Offices' programmatic livestock grazing biological opinion. Among other issues addressed, the reinitiation found that proposed changes to the grazing action were not likely to jeopardize the continued existence of the razorback sucker, nor were they likely to result in destruction or adverse modification of the razorback sucker's critical habitat. We also found that take of razorback sucker was no longer anticipated. Allotments in the Gila Box were specifically addressed.

☛February 12, 2001. You requested reinitiation of the 1994 consultation due to designation of critical habitat for spikedace and loach minnow in the action area.

☛April 3, 2001. You again requested reinitiation of the 1994 consultation due to designation of critical habitat for spikedace and loach minnow in the action area.

☛December 4, 2001. We issued reinitiation/amendment #5 to the Safford/Tucson Field Offices' programmatic grazing biological opinion. In the opinion, we found that proposed livestock grazing activities, including those in the Gila Box RNCA, are not likely to adversely modify or destroy spikedace or loach minnow critical habitat.

☛July 2, 2003. You resubmitted your request for reinitiation on the Gila Box plan and asked that we consider effects of the proposed action on the threatened Chiricahua leopard frog, listed on June 13, 2002, and the proposed endangered Gila chub and its proposed critical habitat.

☛December 4, 2003. We issued the conference opinion and concurrences for the new Bull Gap Road section project in the Gila Box RNCA. We found that the Bullgap Road was neither likely to jeopardize the continued existence of the Gila chub, nor result in adverse modification or destruction of its proposed critical habitat. We also concurred with your determinations that the proposed action may affect, but is not likely to adversely affect, the razorback sucker, spikedace, and loach minnow, and critical habitat designated for those species.

☛December 4, 2003. We issued the conference opinion and concurrences for the new Bull Gap Road section project in the Gila Box RNCA. We found that the Bullgap Road was neither likely to jeopardize the continued existence of the Gila chub, nor result in adverse modification or destruction of its proposed critical habitat. We also concurred with your determinations that the proposed action may affect, but is not likely to adversely affect, the razorback sucker, spikedace, and loach minnow, and critical habitat designated for those species.

☛January 15, 2004. We transmitted a draft biological opinion on the Gila Box plan to your office.

☛May 27, 2004. We received your written comments on the draft biological opinion.

DESCRIPTION OF THE PROPOSED ACTION

The 1998 Gila Box RNCA Plan describes goals, objectives, management actions, rationale and monitoring for the Gila Box RNCA during 1998-2013. The actions found in the Management Plan were taken from the five alternatives analyzed in the 1993 Draft Plan/EA with some additions and modifications. The Plan addressed nine major resource issues and areas of concern.

Your October 16, 2001, memorandum to us described actions that have been completed under the 1998 Management Plan. Construction or development of these sites has already occurred, and therefore are no longer part of the proposed action; however, maintenance and use of these facilities are part of your proposed action. These actions include:

1. Picnic areas at the old Safford-Morenci Bridge, mouth of Bonita Creek, mouth of Spring Canyon, and at the mouth of Dry Canyon provide for day use of these areas.

2. Installation of a vault toilet at the picnic area at the mouth of Bonita Creek.

3. Overnight camping areas at Riverview and Owl Canyon campgrounds, and Riverview Group Use Area.

4. Interpretive site at Owl Canyon Campground.

5. Kearny Camp Road Entry Kiosk overlooking the Gila River.

6. Administrative camp/host site by the Kearny Camp monument.

7. Wildlife Viewing Area overlooking Bonita Creek near its confluence with the Gila River.

The 1998 Plan proposed actions for each of the nine major resource issues within the Gila Box RNCA. Project features and the Gila Box RNCA are portrayed in Figure 1. The proposed action was significantly revised in the 1998 Plan as compared to the preferred alternative in the 1993 Draft Plan/EA that was the subject of consultation in 1994. As a result, we present a full outline of the proposed action below. A complete description of the proposed action can be found in the 1998 Plan.

Riparian Area Management

The goal is to achieve healthy tree-sapling ratios and densities for cottonwood, willow, and sycamores within seven years following major flood events. Ratios and densities are defined for five segments of Bonita Creek and four segments of the Gila River. Ratios for tree-saplings vary from 1:1 to 1:7 (page 8 of the Plan). A healthy tree-sapling ratio and densities indicate continued recruitment of seedlings and saplings, which ensures a continual replacement of larger trees, and adequate densities of trees to ensure quality fish and wildlife habitat. These objectives will be met by collaborative management with agencies and individuals and deferring livestock grazing in the riparian areas of the RNCA for the life of the Plan. Monitoring would be conducted to track progress and management effectiveness.

Livestock grazing on the eight allotments in the RNCA (Bonita Creek - 4616, Bull Gap - 4617, Turtle Mountain - 4618, Twin C - 4021, County Line - 4022, Smuggler - 4010, Gila - 4014, and Morenci allotments - 4003) were addressed in our September 26, 1997, biological opinion for the Safford/Tucson Field Offices' programmatic biological opinion and subsequent amendments. Changes to the proposed action in the allotments from that analyzed in our opinion and subsequent reinitiations are as follows:

Bonita Creek - 4616

Livestock trailing along Bonita Creek to move cattle between pastures will be conducted so that:

1) The fewest number of cattle are present for the shortest possible period of time in the riparian/aquatic areas.

2) The shortest route across the river is taken.

3) Trailing across riparian areas is conducted as infrequently as possible.

4) Trailing is conducted when bankline soil moisture is relatively low, whenever possible.

5) Trailing is conducted in the winter months, whenever possible.

6) Trailing is limited to the shortest routes possible not to exceed 1.5 miles of the creek.

These six conditions on trailing for the Bonita Creek allotment are consistent with our conservation recommendations in the fourth reinitiation of the Safford/Tucson Field Offices' programmatic livestock grazing opinion (see Consultation History).

Smuggler Allotment - 4010

1) Trailing through the riparian areas will be limited to moving cattle across the Gila River between the Smuggler and Zorilla allotments no more than twice a year.

2) Trailing will be conducted similar to the procedures mentioned in the Bonita Creek Allotment above.

Changes to the proposed action for the Smuggler allotment are consistent with our conservation recommendations in the fourth reinitiation of the Safford/Tucson Field Offices' programmatic livestock grazing opinion (see Consultation History).

Recreation and Transportation System Management

Objectives include providing a mix of 15 to 35 low to moderately developed access points or recreational site developments, and achievement and maintenance of a desired social environment emphasizing a closer balance between motorized (roaded) and non-motorized (unroaded) recreational needs and opportunities to meet diverse visitor needs and expectations.

Actions proposed to implement or support these objectives include the following:

1) Phase in recreational user fees for specific management areas.

2) Operate and maintain an administrative site and campground host site on the level terrace southwest of Kearny Camp monument.

3) Develop user guides and brochures.

4) Develop Cooperative Agreements with the City of Safford, landowners, Phelps Dodge, and Graham and Greenlee counties regarding recreational use in the RNCA.

5) Establish a limit of five river outfitting companies to be permitted for special recreational use on the Gila River. In 1998, three outfitters were permitted. When daily boating use on the Gila River reaches 80 persons within the reach from the Old Safford Bridge to Bonita Creek, a permit allocation system will be implemented. A carrying capacity for the river will be established and will be split 50/50 between commercial and private boaters.

Boating in the three-mile reach from Bonita Creek to the takeout at Dry Creek will remain unrestricted.

6) Allow no motorized watercraft on the Gila River in the RNCA.

7) Manage the Gila River and Bonita Creek to protect their wild and scenic river characteristics until Congress acts on recommendations for wild and scenic river designations.

8) Operate and maintain a 10-unit campground on the bench above the Gila River near Owl Canyon. Facilities include tables, grills, a toilet, and information kiosk.

9) Operate and maintain the Riverview 15-unit campground 0.5 mile downstream of the Bonita Creek/Gila River confluence, which is primarily for tent and vehicle-based camping. Facilities include toilets, tables, grills, group areas, parking areas, and information kiosk.

10) Operate and maintain four existing picnic areas as day use areas, including:

    a) Dry Canyon - which is a small picnic area that includes tables, and upright grills, and signs,

    b) Spring Canyon - an existing picnic area with upright grills,

    c) Serna Cabin - includes a parking area with signs, tables, upright grills, and picnic area and

    d) Old Safford Road Bridge - an existing picnic area to which two more picnic tables added.

11) Retain boat launch/take out areas at the Old Safford Road Bridge and Dry Canyon. Restrict to day use only.

12) Maintain and mark the Old Safford-Morenci Trail from its west trailhead to Bonita Creek.

13) Develop a trailhead and parking area for the Camel Back trail and maintain the existing trail to the Gila River.

14) Operate and maintain a watchable wildlife viewing deck on the west rim above and north of the Serna Cabin Picnic Area for birdwatching and environmental education.

15) Upgrade the existing road to a developed overlook just above the Orange Cliff on the Gila River. Tables, benches, and a fence will be constructed at the overlook.

16) Develop a parking area just above the rocky rim of Bonita Creek on Goat Road. Provide tables and an informational kiosk.

17) Use the existing parking area at the bottom of the Lee Trail where hikers can leave their vehicles while hiking up Bonita Creek. Provide tables and an informational kiosk.

18) Develop the Red Knolls Parking Area on the bench above the last turn in the road before the bottom.

19) Provide and maintain an entry point informational kiosk at the Solomon Pass road entry point. Maintain the Kearny Camp road entry point. The latter site includes tables and construction of a fence.

20) Limit vehicular use to designated routes only (see Figure 1). Signing, cattleguards, and maintenance will be provided as needed. Note that the proposed rerouting of the Bullgap Road in lower Bonita Creek was addressed by our conference opinion and concurrences dated December 4, 2003 (see consultation history). That new route will not be addressed further, herein; however, this opinion addresses the remainder of that route in the RNCA.

21) Monitor visitor use via traffic and trail counters, permitting, and registration stations.

Cultural Resource Management

Management objectives include identifying and protecting the RNCA's cultural resources, and enhancing those resources' scientific and public use values by promoting research and developing interpretive sites. The following actions implement those objectives:

1) Monitor integrity of known cultural sites.

2) Architecturally stabilize the Old Lady Gay Cabin. The site will also be excavated and interpretive signs placed at the site.

3) Maintain the most important fragile sites at current levels of structural integrity.

4) Implement public interpretation at the Pueblo Devol cliff dwelling site.

5) Monitor public use at the Mimbres site near the River View Campground and fence or excavate the site if collecting and digging at the site may threaten the sites' eligibility for listing in the National Register of Historic Places.

6) Monitor and maintain the Serna Cabin at the mouth of Bonita Creek. An interpretive sign will be placed at the site. In the future it may be used as a visitor contact station or in another capacity.

7) Complete a cultural resources field inventory of the RNCA.

8) Provide public information and education about cultural resources in the RNCA.

9) Work with the City of Safford to manage and protect the plumed serpent pictograph site along Bonita Creek.

10) Work with Phelps Dodge to record and interpret the Eagle Creek Village site, on Phelps Dodge property.

11) Develop cooperative agreements with non-Federal landowners to foster partnerships in the collaborative management of cultural resources in the RNCA.

12) Promote scientific cultural resources research, including permitting, soliciting, funding, and conducting such activities.

13) Test-excavate the Old Lady Gay Cabin, Chinamen's Place, Moore Place, and AZ W:14:123 to investigate use by Chinese settlers.

14) Monitor research projects and number of sites developed for public interpretation.

Fish and Wildlife, and Threatened and Endangered Species Management

Objectives include maintenance and/or enhancement of populations of threatened, endangered, or other priority species. In regard to species in this consultation, target densities are identified for Gila chub. The following actions implement the management objectives:

1) Monitor populations and habitats of threatened and endangered, and other priority species. Monitoring will include:

   a. Breeding and migratory bird surveys at five locations. Data collected will allow assessment of changes in bird use relative to habitat changes and levels of human use.

   b. Inventory and monitor aquatic habitat to provide a baseline for future trends in bank stability and aquatic habitat diversity and quality.

   c. Monitor intensively Gila chub in lower Bonita Creek.

   d. Monitor fisheries trends in the RNCA twice over the life of the plan. Permanent monitoring stations will be established in representative (key) reaches.

   e. Monitor annually for presence of razorback suckers.

2) Enhance wildlife habitat where natural processes have been slow or set back due to historical or ongoing activities.

   a. Plant 91 large dormant poles to enhance habitat for raptors.

   b. Plant native shrubs, trees, and vines to speed habitat recovery.

c. Consider placing nest boxes on the Gila River and Bonita Creek for cactus ferruginous pygmy-owl. Specific plans would be the subject of future consultation.

d. Control non-native plants where natural processes fail to remove them. Special emphasis will be placed on saltcedar.

3) Re-establish native fish and wildlife.

a. Control non-native wildlife where it interferes with natural processes.

b. Determine the suitability of existing aquatic habitat for the range extension, augmentation, or re-establishment of the razorback sucker, bonytail chub, Colorado squawfish, roundtail chub, flannelmouth sucker, woundfin minnow, spikedace, loach minnow, desert pupfish, and Gila topminnow.

c. Develop agreements with the Fish and Wildlife Service and the Arizona Game and Fish Department (AGFD) prior to any re-establishments or augmentations. Agreements will resolve conflicts prior to releases of any federally-listed species.

d. Monitor re-establishments and augmentations to evaluate success or failure and fine tune protocols.

4) Prepare a feasibility study to evaluate the potential for constructing a permanent fish barrier in Bonita Creek to prevent upstream migration by non-native fishes. If the results of the study are favorable and evaluated through the National Environmental Policy Act, construct the barrier.

5) Consider analyzing with the City of Safford development of a water system that will provide long-term security for fishes, leopard frogs, and other organisms.

6) Develop a public information program focused on the 15 native fish in the Gila River.

7) Encourage research on wildlife, habitat, and the effects of management strategies on species over time. Evaluate research proposals to ensure they are compatible with other objectives in the RNCA.

Water Quality Management

The objective is to ensure that water quality in the RNCA is not degraded. Specific proposed actions include the following:

1) Implement management actions for riparian and recreational values listed above.

2) Construct 110 percent spill containment structures for all diesel pump systems in the RNCA.

3) Store all gas and oil in the uplands; dispose of empty gas and oil containers properly.

4) Replace the Lee Trail septic system with a portable septic system. A long-term objective will be removing the cabin from the canyon bottom and moving the operations headquarters to the uplands.

5) Monitor macroinvertebrate samples at three sites on Bonita Creek and five sites on the Gila River.

Private Lands

The objective is to acquire private lands within the RNCA. As a part of this plan element, BLM would attempt to acquire, through exchange, purchase, or donation, private lands within Eagle Creek south of the Phelps Dodge pump station. A conservation easement could be an alternative to fee acquisition.

City of Safford Water System in Bonita Creek

The objective is to work cooperatively with City of Safford to provide for their management needs while reducing potential adverse effects to the resources of the RNCA. The associated management action is to work with the City to support the management goals of the RNCA along with the management needs of the City and the effective operation of the public water system.

Research and Education

The objective is to allow research and to provide public education. BLM would authorize appropriate research concerning the environmental, biological, hydrological, cultural, and other characteristics, resources, and values of the RNCA.

Fire Management

The objective is to improve and protect the resources of the RNCA by effectively managing both prescribed fire and wildfire. BLM would develop and implement a prescribed and natural fire plan for the RNCA commensurate with the Fire Management Plan for the Safford/Tucson Fire Management Zone. Prescribed fire that is conducted, in part or wholly, as part of the grazing program is covered by our Safford/Tucson grazing biological opinion and requires no further consultation unless criteria for reinitiation (50 CFR 402.16) are triggered.

SCOPE OF THE CONSULTATION

This consultation is at a plan level, in that the effects of implementing the Gila Box RNCA Plan are evaluated broadly over a range of programs and actions through the year 2013. However, this opinion is designed to maximize analysis to the project level, in order to evaluate all effects

of the action and to minimize the need for future consultation on projects in the Gila Box. The Plan proposes, and we address herein, many project-level activities such as specific campgrounds, picnic areas, road designations, informational kiosks at specific sites, and stabilization of specific cultural sites, among others. No future consultation is needed on these projects unless one or more of the reinitiation criteria, listed in the "REINITIATION STATEMENT" of this document, are triggered. For other projects or programs, not enough site-specific detail is provided to fully evaluate the effects of specific projects. For example, the following action is proposed under "*Fish and Wildlife, and Threatened and Endangered Species Management*": "Control non-native plants where natural processes fail to remove them. Special emphasis will be placed on saltcedar.." Mechanical or chemical control of saltcedar could have significant adverse effects to listed fishes, Chiricahua leopard frogs, or other species. However, without knowing precisely where and how saltcedar would be controlled, we cannot determine potential effects of such actions. Please note that saltcedar, depending on its structure and the size of the riparian patch in which it occurs, may be important breeding habitat for the endangered southwestern willow flycatcher, and could affect other listed/proposed species not evaluated herein that may occur in the area, such as bald eagles. We evaluate the effects of the action conceptually herein, but in regard to future specific actions to control saltcedar, the BLM has the responsibility under section 7(a)(2) of the Act and 50 CFR 402.14(a) to review those specific actions and to request reinitiation to address project-specific consultation if a listed species or critical habitat may be affected. In regard to some projects addressed herein for which we do not currently have enough information to address project-level effects, we also provide an alternative - which is for the BLM to prepare a mitigation or effects minimization plan to address and reduce effects to listed species and/or critical habitat. If we approve the minimization/mitigation plan, and it is consistent with the scope and extent of effects anticipated herein, that project-level action would be covered by this opinion and would require no further consultation. In the Effects of the Proposed Action, we indicate which actions are addressed to the project level (reinitiation only needed pursuant to reinitiation criteria in 50 CFR 402.16) and which would require further analysis (mitigation plan or reinitiation needed).

The proposed action for fire management in the Gila Box Plan does not include project-level actions, but rather proposes to develop and implement a fire management plan. We will consult on the objectives of that fire management plan, as stated in the Description of the Proposed Action; however, further consultation or analysis will be needed to address specific fuels or fire projects. As with saltcedar control, the BLM may wish to prepare mitigation plans for specific projects, which if we approve and they are consistent with the scope and extent of effects anticipated herein, would be covered by this opinion and would require no further consultation. We are currently in consultation with the BLM Arizona State Office on the Arizona Statewide Land Use Plan Amendment for Fire, Fuels, and Air Quality Management, which would amend the Safford RMP, among other such plans in Arizona, to incorporate adaptive fire management into planning processes and to provide a consistent approach to incorporate the 2000 National Fire Policy into the land use plans. We anticipate that the biological opinion that results from that consultation will provide further guidance and may supersede, in whole or in part, the conclusions herein regarding fire management planning for the Gila Box. Prescribed fire projects that are conducted wholly or in part for the purposes of livestock and range management

are covered by the Safford/Tucson grazing program biological opinion and will not be addressed further herein.

STATUS OF THE SPECIES

The status of the spikedace and loach minnow has changed substantially since our 1994 opinion, and the Gila chub and Chiricahua leopard frog have not been considered previously in consultation for the Gila Box. As a result, we present below revised status of the species in full for these four species.

Gila chub

The Gila chub was proposed as endangered in 2002 with critical habitat (U.S. Fish and Wildlife Service 2002a). The reasons for decline of this fish include past dewatering of rivers, springs and marshlands, water impoundment, stream channelization, water diversion, regulation of flow, land management practices that promote erosion and arroyo formation, and the introduction of predacious and competing non-native fishes (Miller 1961, Minckley 1985). Life history information can be found in the status review (Weedman 1996), the listing proposal (U.S. Fish and Wildlife Service 2002a), and references cited there.

The Gila chub is large minnow that grows as large as 7 to 8 inches long and occupies smaller streams and cienega-type habitats. It is a highly secretive fish and lives in deeper water or near cover (Griffith and Tiersch 1989). The Gila chub spends most daylight hours under cover such as cutbanks and thick overhanging or aquatic vegetation. Gila chub reach sexual maturity at age 1-3 years. Most populations breed primarily from late spring to summer, depending on conditions, but this species has also been known to breed from late winter through autumn. Gila chub are opportunistic omnivores, consuming terrestrial and aquatic insects, as well as smaller fish and filamentous algae. Although some studies indicate these fish are crepuscular (active mainly in twilight hours), others suggest most foraging occurs at night.

Historically, the Gila chub was found in most headwater streams of the Gila River drainage in Arizona and New Mexico, and within the Santa Cruz and San Pedro river systems of Arizona and Sonora, Mexico. Currently, it is thought to be extirpated from New Mexico. In Sonora, it was recently found in two cienegas near the headwaters of the San Pedro River. In Arizona, populations have been extirpated from Monkey Spring; Arnette, Cave, Fish, and Queen creeks; San Simon, San Pedro, and Santa Cruz rivers; and Post Canyon. Gila chub are found in fewer than 15 streams in central and southern Arizona and are abundant at no more than 10 of these locations (Griffith and Tiersch 1989). Only 2 of the 29 recently observed natural Gila chub populations are considered extant (Weedman *et al.* 1996). The status of the species is poor and declining.

Gila chub are highly vulnerable to adverse effects from non-native aquatic species (Dudley 1995). Predation and competition from non-native fishes have been a major factor in their decline and continue to be a major threat to the remaining populations (Minckley *et al.* 1977, The native fish fauna of the Gila basin and of the Colorado basin, overall, was naturally

depauperate and contained few fishes that were predatory on or competitive with Gila chub (Carlson and Muth 1989).

A total of 207.8 miles of stream and river reaches are proposed as critical habitat in Arizona and New Mexico. Proposed designations are primarily river tributaries, springs, and cienegas where the species still occurs. The primary constituent elements of proposed critical habitat determined necessary for survival and recovery of the Gila chub include, but are not limited to: 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 ranging from 68 to 79.7^0 F with sufficient dissolved oxygen, nutrients, and any other water-related characteristic needed, 3) water quality with reduced levels of contaminants or any other water quality characteristics, including excessive levels of sediments, adverse to Gila chub health, 4) a food base consisting of invertebrates, filamentous algae, and insects; 5) sufficient cover consisting of downed logs in the water channel, submerged large tree root wads, undercut banks with sufficient overhanging vegetation, and large rocks and boulders with overhangs; 6) habitat devoid of non-native aquatic species detrimental to Gila chub or habitat in which detrimental non-natives are kept at a level that allows Gila chub to continue to survive and reproduce (e.g. the Muleshoe Preserve and Sabino Canyon Gila chub populations are devoid of non-native aquatic species; however, the O'Donnell Canyon Gila chub population has continued to survive and reproduce despite presence of non-native aquatic species); and 7) streams that maintain a natural unregulated flow pattern, including periodic natural flooding; if flows are modified, then the stream should retain a natural flow pattern that demonstrates an ability to support Gila chub.

Spikedace

Spikedace was listed as a threatened species on July 1, 1986 (U.S. Fish and Wildlife Service 1986a). Critical habitat was designated on April 25, 2000 (U.S. Fish and Wildlife Service 2000a). Critical habitat includes portions of the Verde, middle Gila, San Pedro, San Francisco, Blue, and upper Gila rivers and Eagle, Bonita, Tonto, and Aravaipa creeks and several tributaries of those streams.

Spikedace are 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 reaches of the Gila Rivers, 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 occurs in the upper Verde River, but appears to be declining in numbers. It has not been documented in the Verde River since 1999 despite annual surveys, and additional survey work is needed to determine its current status. 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 spawn from March through May with some yearly and geographic variation (Barber *et al*. 1970, Anderson 1978, Propst *et al*. 1986). Actual spawning has not been observed in the wild, but spawning behavior and captive studies indicate eggs are laid over gravel and cobble where they adhere to the substrate. Spikedace live about two years with reproduction occurring primarily in one-year old fish (Barber *et al*. 1970, Anderson 1978, Propst *et al*. 1986). They feed primarily on aquatic and terrestrial insects (Schreiber 1978, Barber and Minckley 1983, Marsh *et al*. 1989).

The primary constituent elements for spikedace critical habitat include those habitat features required for the physiological, behavioral, and ecological needs of the species. These include permanent, flowing, unpolluted water; living areas for adult spikedace with slow to swift flow velocities in shallow water with 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 downstream riffle edges; living areas for juvenile spikedace with slow to moderate flow velocities in shallow water with moderate amounts of instream cover; living areas for larval spikedace with slow to moderate flow velocities in shallow water with abundant instream cover; sand, gravel, and cobble substrates with low to moderate amounts of fine sediment and substrate embeddedness; pool, riffle, run, and backwater components present in the aquatic habitat; low stream gradient; water temperatures in the approximate range of 35 to 65 degrees Fahrenheit; abundant aquatic insect food base; periodic natural flooding; a natural, unregulated hydrograph or, if the flows are modified or regulated, then a hydrograph that demonstrates an ability to support a native fish community, and; habitat devoid of non-native aquatic species detrimental to spikedace or habitat in which detrimental non-native species are at levels that allow the persistence of spikedace. The constituent elements are generalized descriptions and ranges of selected habitat factors that are critical for the survival and recovery of spikedace. 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 geomorphology, riparian vegetation, hydrological patterns, and overall aquatic faunal community structure.

Recent taxonomic and genetic work on spikedace indicate there are substantial differences in morphology and genetic makeup among remnant spikedace populations. Remnant populations occupy isolated fragments of the Gila basin and are isolated from each other. Anderson and Hendrickson (1994) found that spikedace from Aravaipa Creek are morphologically distinguishable from spikedace from the Verde River, while spikedace from the upper Gila River and Eagle Creek have intermediate measurements and partially overlap the Aravaipa and Verde populations. Mitochondrial DNA and allozyme analyses have found similar patterns of geographic variation within the species (Tibbets 1992, 1993).

The status of spikedace is declining rangewide. It is now restricted to approximately 289 miles of streams, and its present range is only 10 to 15 percent of its historical range. Within occupied areas, it is common to very rare, but is presently common only in Aravaipa Creek and some parts of the upper Gila River in New Mexico (U.S. Fish and Wildlife Service 2000a). Although it is currently listed as threatened, we have determined that reclassification of the species to endangered status is warranted. A reclassification proposal is pending; however, work on it is precluded by higher priority listing actions. For additional information on the spikedace please refer to the recovery plan.

Loach minnow

The loach minnow was listed as a threatened species on October 28, 1986 (U.S. Fish and Wildlife Service 1986b). Critical habitat was designated for loach minnow on April 25, 2000 (U.S. Fish and Wildlife Service 2000a). Critical habitat includes portions of the Verde, Black, middle Gila, San Pedro, San Francisco, Tularosa, Blue, and upper Gila rivers; Eagle, Bonita, Tonto, and Aravaipa creeks; and several tributaries of those systems.

The 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 non-native 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*. 1986, Propst *et al*. 1988, Marsh *et al*. 1990, Bagley *et al*. 1995, USBLM 1995, Bagley *et al*. 1996).

The 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 use 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 2-3 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).

The final rule lists constituent elements of critical habitat for loach minnow. These elements include permanent, flowing, unpolluted water; living areas for loach minnow adults, juveniles,

and larvae with appropriate flow regimes and substrates; spawning areas; low amounts of fine sediment and substrate embeddedness; riffle, run, and backwater components; low to moderate stream gradients; appropriate water temperatures; periodic natural flooding; an unregulated hydrograph, or, if flows are modified, a hydrograph that demonstrates an ability to support a native fish community; and, habitat devoid of non-native aquatic species detrimental to loach minnow, or habitat where such non-native species are at levels that allow persistence of loach minnow. These constituent elements are generalized descriptions and ranges of selected habitat factors that are critical for the survival and recovery of loach minnow.

As noted under spikedace, 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 geomorphology, riparian vegetation, hydrological patterns, and overall aquatic faunal community structure.

Recent biochemical genetic work on loach minnow indicate there are substantial differences in genetic makeup among remnant loach minnow populations (Tibbets 1993). Remnant populations occupy isolated fragments of the Gila River basin and are isolated from each other. Tibbets (1992, 1993) recommended that the genetically distinctive units of loach minnow be managed as separate units to preserve the existing genetic variation.

The status of loach minnow is declining rangewide. As noted in the final rule designating critical habitat, loach minnow are restricted to 419 miles of streams, and their current range represents only 15 to 20 percent of their historical range. In occupied areas, loach minnow may be common to very rare. Loach minnow 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 2000a). Although it is currently listed as threatened, we have found that reclassification of the species to endangered status is warranted. A reclassification proposal is pending, however, work on it is precluded by higher priority listing actions. For additional information on the loach minnow please refer to the recovery plan.

Chiricahua leopard frog

The Chiricahua leopard frog (*Rana chiricahuensi*s) was listed as a threatened species without critical habitat in a Federal Register notice dated June 13, 2002. Included was a special rule to exempt operation and maintenance of livestock tanks on non-Federal lands from the section 9 take prohibitions of the Act. The frog is distinguished from other members of the *Rana pipiens* complex by a combination of characters, including a distinctive pattern on the rear of the thigh consisting of small, raised, cream-colored spots or tubercles on a dark background; dorsolateral folds that are interrupted and deflected medially; stocky body proportions; relatively rough skin on the back and sides; and often green coloration on the head and back (Platz and Mecham

1979). The species also has a distinctive call consisting of a relatively long snore of 1 to 2 seconds in duration (Davidson 1996, Platz and Mecham 1979). Snout-vent lengths of adults range from approximately 2.1 to 5.4 inches (Stebbins 2003, Platz and Mecham 1979). The Ramsey Canyon leopard frog *(Rana subaquavocali*s) is similar in appearance to the Chiricahua leopard frog, but it reportedly grows to a larger size and has a distinct call that is typically given under water (Platz 1993). Recent genetic work suggests *R. subaquavocalis* and *R. chiricahuensis* may be conspecific (Goldberg *et al.* in review).

The Chiricahua leopard frog is an inhabitant of cienegas, pools, livestock tanks, lakes, reservoirs, streams, and rivers at elevations of 3,281 to 8,890 feet (feet) in central and southeastern Arizona; west-central and southwestern New Mexico; and in Mexico, northern Sonora, and the Sierra Madre Occidental of Chihuahua, and northern Durango (Platz and Mecham 1984, Degenhardt *et al.* 1996, Sredl *et al.* 1997, Sredl and Jennings *in press*). Reports of the species from the State of Aguascalientes (Diaz and Diaz 1997) are questionable; however, the distribution of the species in Mexico 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 Chiricahua leopard frog. In New Mexico, of sites occupied by Chiricahua leopard frogs from 1994-1999, 67 percent were creeks or rivers, 17 percent were springs or spring runs, and 12 percent were stock tanks (Painter 2000). In Arizona, slightly more than half of all known historical localities are natural lotic systems, a little less than half are stock tanks, and the remainder 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 Chiricahua leopard frog 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 supports describing the northern populations as a distinct species (Platz and Grudzien 1999, Benedict and Quinn 1999).

Die-offs of Chiricahua leopard frogs 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 Chiricahua leopard frogs 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 Chiricahua leopard frog 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 Chiricahua leopard frog 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 species has been extirpated from about 75 percent of its historical localities in Arizona and New Mexico. The status of the species in Mexico is unknown.

The species is still extant in all the major drainages in Arizona and New Mexico where it occurred historically, with the exception of the Little Colorado River drainage in Arizona (Painter 2000, Sredl *et al.* 1997, Service files). However, it has not been found recently in many

rivers, valleys, and mountains ranges within some of these major drainages, 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. Only one or two small populations are currently extant in each of the Dragoon, Galiuro, and Chiricahua mountains, areas that supported many populations before the mid 1990s. Moreover, the species is now absent from all but one of the southeastern Arizona valley bottom cienega complexes. In many of these regions Chiricahua leopard frogs were not found for a decade or more despite repeated surveys. Recent surveys suggest the species may have recently disappeared from some major drainages in New Mexico (C. Painter, pers. comm. 2000).

The species 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). Threats to this species include predation by non-native organisms, especially bullfrogs, fish, and crayfish; 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. Loss of Chiricahua leopard frog 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).

Disruption of metapopulation dynamics is likely an important factor in regional loss of populations (Sredl *et al.* 1997, Sredl and Howland 1994). Chiricahua leopard frog 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 extirpated due to drought, disease, or other causes, extirpated sites could be recolonized via immigration from nearby populations. However, 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.

An understanding of the dispersal abilities of Chiricahua leopard frogs is key to determining the likelihood that suitable habitats will be colonized from a nearby extant population of frogs and that groups of populations will act as functional metapopulations. Dispersal may occur via active movement of frogs or passive movement of tadpoles along streamcourses. 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 East Turkey Creek in the Chiricahua Mountains. In August 1996, Rosen and Schwalbe (1998) found up to 25 young adult and subadult Chiricahua leopard frogs 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. Movements away from water do not appear to be random. Streams are important dispersal corridors for young

northern leopard frogs (Seburn *et al.* 1997). Displaced northern leopard frogs will home, and apparently use olfactory and auditory cues, and possibly celestial orientation, as guides (Dole 1968, 1972). 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).

Fire frequency and intensity in Southwestern forests are much altered from historical conditions (Dahms and Geils 1997). Fire regimes are now dominated by intense crown fires, which were rare historically (Danzer *et al.* 1997, Swetnam and Baisan 1996). Absence of vegetation and forest litter following intense crown fires exposes soils to surface and rill erosion during storms, often causing high peak flows, sedimentation, and erosion in downstream drainages (DeBano and Neary 1996). Leopard frogs were historically known from many localities in the Huachuca Mountains; however, natural pool and pond habitat is largely absent now, and the only breeding leopard frog populations occur in man-made tanks and ponds. Crown fires followed by scouring floods are a likely cause of this absence of natural leopard frog habitats. Bowers and McLaughlin (1994) list six riparian plant species they believed might have been eliminated from the Huachuca Mountains as a result of floods and debris flow following destructive fires.

Recent evidence suggests a chytridiomycete skin fungus is responsible for global declines of frogs, toads, and salamanders, including the Chiricahua leopard frog (Speare and Berger 2000, Longcore *et al.* 1999, Berger *et al.* 1998, Hale 2001, Bradley *et al.* 2002). In Arizona, chytrid infections have been reported from four populations of Chiricahua leopard frogs (M. Sredl, pers. comm. 2000, Service files). 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. 2000).

The fungus does not have an airborne spore, so it must spread via other means. Free-ranging introduced healthy bullfrogs with low-level chytriodiomycosis 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 non-native frogs may serve as disease vectors or reservoirs of infection, as well (Bradley *et al.* 2002). Chytrids could also be spread by tourists or fieldworkers sampling aquatic habitats (Halliday 1998). The fungus can exist in water or mud and thus 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 are employing preventative measures to ensure the disease is not spread by aquatic sampling.

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

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 from which to assess the effects of the action now under consultation.

Action Area

The "action area" means all areas to be affected directly or indirectly by the Federal action and not merely the immediate area involved in the action. In this case the action area is the Gila Box RNCA (Figure 1) and the Gila River downstream of the RNCA that may be affected by changes in watershed condition in the RNCA. Effects downstream of the RNCA attenuate with distance and are largely masked by farming, ground water pumping, diversions, burning and clearing of riparian vegetation, and other human activities in the Safford Valley.

Affected Environment

Information about the RNCA's soil resources, upland and riparian vegetation, water resources, surface and ground water quality, in-stream flow water rights, wildlife and fisheries resources, and cultural resources can be found in "Description of the Project Area" in our 1994 biological opinion, and U.S. Bureau of Land Management (1993, 1998).

Factors Affecting the Species Within the Action Area

Please refer to the section "Past Actions" in our 1994 opinion regarding factors affecting listed species and their habitats in the action area. Since that opinion was written, changes have occurred to livestock grazing (see our September 27, 1997, biological opinion for the Safford and Tucson Field Offices' livestock grazing program and its reinitiations and amendments - the effects of livestock grazing in the RNCA are detailed in the biological opinion). Additional changes are proposed in the current proposed action for the Gila Box Plan. A Cooperative Agreement is now in place between the City of Safford and the BLM on managing the resources in Bonita Creek. The City of Safford is responsible for maintenance of the 1.5 miles of road into Bonita Creek to access their water pump station. The City's water supply system has been in place for 50 plus years, and they still maintain it. Water withdrawals reduce water available in Bonita Creek for fish and wildlife resources. Recreational use in the form of river rafting and camping/picnicking is increasingly popular in the RNCA, particularly near the confluence of the Gila River and Bonita Creek. Visitor use has increased in recent years to over 20,000 visitor use days per year, with associated impacts to natural resources. Recreational rafting occurs throughout the year. Off-highway vehicle use is another popular recreational use in the RNCA, which under the proposed action is restricted to designated routes. In the past, off-road vehicle use was popular along the Gila River corridor through the Gila Box.

The Consultation History herein, in the first reinitiation, and in the original opinion, list biological opinions and informal consultations that have occurred in the action area. These consultations provide additional information about how listed species and their habitats are affected by various activities in the action area.

Status of Species in the Action Area

Gila chub

In the action area, Gila chub occurs only in Bonita Creek. Within the RNCA, the only proposed critical habitat is on Bonita Creek from the City of Safford's withdrawal pipeline upstream to the San Carlos Apache Indian Reservation boundary, a distance of about 11 miles. This is 5.3 percent of critical habitat proposed for the species.

Bonita Creek's aquatic system is maintained by a seasonal combination of flash floods and low spring and fall flows. Low flows for perennial reaches vary, but generally exceed five cubic feet per second (cfs; U.S. Bureau of Land Management 1998). Median annual flow from 1982-1990 was 4,970 acre-feet (Arizona Department of Water Resources 2002). Above the Narrows in Bonita Creek, only native fish are found; whereas below the Narrows, non-native fishes have invaded from the Gila River. The two reaches are separated by an ephemeral reach that likely inhibits invasion of the upper reach by non-natives. Periodic floods also tend to flush non-native fishes out of Bonita Creek to a greater degree than the native fishes. As a result, the upper reach of Bonita Creek is more important habitat for Gila chub, although they can be found throughout the creek in the RNCA.

Non-native species in the lower reach include yellow bullhead, fathead minnow, carp, channel catfish, and mosquitofish (Weedman 1996). The lower reach experiences oxygen deficits in summer, with concentrations below that recommended for fish (Minckley and Sommerfeld 1979). Chubs are rare in the first four miles above the confluence, are typically solitary and have exhibited heavy parasite loads and skin infections. In the upper reach, above the Narrows, Gila chub occur with longfin dace, speckled dace, and Sonora sucker (Weedman 1996).

In the past, cattle commonly grazed the creek bottom and roads crossed the creek more than 30 times in the RNCA. The proposed action would limit these activities. City of Safford Municipal Utilities maintains an infiltration gallery about four miles above the mouth of Bonita Creek. The gallery consists of perforated pipes 17 feet below the surface of the creek bottom. An average of 3.1 million gallons of water flow into the gallery and through a 24-mile long pipeline to storage tanks in Safford, Solomon, and Thatcher.

Spikedace

Spikedace is currently not known to occur in the action area; however, critical habitat is designated on the Gila River through the RNCA and on Bonita Creek from the Gila confluence to the San Carlos Apache Indian Reservation boundary. The Gila River within the RNCA is dominated by predatory non-native fishes such as flathead and channel catfish, red shiners,

mosquitofish, and fathead minnows. These species likely preclude occupancy by spikedace and other native fishes. Until recently, livestock grazing and off-road vehicle use commonly occurred along and in the riparian areas of the Gila River and Bonita Creek. Recent changes have eliminated much of these uses, and the proposed action would further restrict these activities. The best habitats for spikedace in the RNCA are probably in Eagle and Bonita creeks.

Loach minnow

In the action area, critical habitat is designated for loach minnow in the same reaches as for spikedace. As with the spikedace, there have been no recent sightings of loach minnow within the action area. However, the species occurs nearby in the San Francisco River. The distribution of the loach minnow in the San Francisco River in Arizona is poorly studied. 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). Downstream of the Forest/Bureau boundary loach minnow distribution 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 (in Bureau 1996) reported loach minnow in the San Francisco River above Clifton. Substantial amounts of apparently suitable habitat exists for several miles below the Forest/Bureau boundary. The downstream distribution of the loach minnow in the San Francisco River probably fluctuates over time depending upon water and sediment levels, flooding, and other factors. Non-native fishes probably preclude occurrence of loach minnow on the Gila River in the RNCA, and have likely eliminated or severely limited numbers of loach minnow on the lower San Francisco River. Livestock grazing and recreation have degraded riparian habitat in the RNCA, but recent changes and the proposed action would minimize these effects. The best habitats for loach minnow in the RNCA may be in Bonita and Eagle creeks.

Chiricahua leopard frog

The Chiricahua leopard frog inhabits rivers and creeks, stock tanks, and springs, such as occur in the RNCA. However, it has never been observed in the RNCA. The nearest localities are in tributaries of the San Francisco River near the New Mexico border on the Apache-Sitgreaves National Forest approximately 15 miles northeast of the RNCA. These populations are still extant. The species also occurred historically (1980s) on the San Carlos Apache Reservation at and near Ash Creek, north and west of the headwaters of Bonita Creek. The status of the species at these latter locations is unknown. The RNCA is in an area between the range of the northern and southern populations of the frog; however, it is closest to the northern populations. The nearby Apache-Sitgreaves populations are at the lowest known elevations (~4,000 feet) of the northern populations. The lowest elevation populations known are in southern Arizona at

approximately 3,280 feet. The highest elevations in the RNCA are in the upper reaches of Bonita Creek. The elevation in Bonita Creek at the San Carlos Apache Reservation boundary is 3,943 feet. At its upstream end on the RNCA, the Gila River is under 3,600 feet. Thus, elevations in the RNCA are low for the species, particularly for northern populations. Non-native fishes and bullfrogs likely preclude populations of Chiricahua leopard frogs on the Gila River and lower Bonita Creek. The most likely places for the frog to occur in the RNCA are upper Bonita Creek and associated perennial or nearly perennial creeks, springs, and stock tanks.

EFFECTS OF THE PROPOSED ACTION

Gila chub and its proposed critical habitat

Proposed actions in the Bonita Creek portion of the RNCA may affect the proposed Gila chub and its proposed critical habitat. Effects are expected to be both direct and indirect, and include beneficial, neutral, and adverse effects. We evaluate effects by plan element:

Riparian Area Management

The Gila Box Plan sets target tree:sapling ratios for five segments of Bonita Creek, which are 1:1 except from the upstream end of the Narrows to just below Christianson Road, which has a target tree:sapling ratio of 1:2 (page 8 of the Plan). Target densities are also set for trees and saplings in each segment. Target ratios and densities are for stands of trees seven years after a major flood event. The BLM believes these tree:sapling ratio and densities are needed for continued recruitment of seedlings and saplings, to ensure a continual replacement of larger trees, and adequate densities of trees to ensure quality fish and wildlife habitat.

Structure and composition of Southwestern riparian tree communities are dynamic. Cottonwoods and willows, in particular, can germinate in large numbers after natural flooding events and grow very rapidly under good conditions. Post-flood ratios of trees to saplings will vary considerably. Severe flooding events will topple and wash out mature trees but may provide an excellent seed bed for germination and tree saplings. Smaller floods would likely result in fewer mature trees being washed out, but may produce fewer young trees. As a result, the utility of using tree:sapling ratios as an indicator of replacement of trees or the quality of fish and wildlife habitat is questionable. However, maintaining a ratio of at least 50 percent saplings is likely to ensure at least some replacement of older trees. Restoring natural hydrological processes and maintaining healthy watersheds and riparian zones are probably the best ways to ensure riparian habitat is maximized for fish and wildlife values.

The Bonita Creek, Johnny Creek, and Bullgap allotments border Bonita Creek, or in the case of the Bonita Creek allotment, includes Bonita Creek and portions of its watershed on the RNCA. As of 1996, all three were in predominantly late seral (good) range condition. Bonita Creek and Johnny Creek were in an upward trend, while Bullgap was static. These data suggest good watershed condition that is static or improving. We have no information on the condition of the Bonita Creek watershed on the San Carlos Apache Reservation; however, the BLM (1993) reported that waters in Bonita Creek are relatively low in turbidity, suggesting minimal erosion

from the watershed. We have no other more recent information suggesting these conditions have changed. Under the Gila Box RNCA Plan, grazing in Bonita Creek would be limited to trailing once or twice per year to move cattle between pastures on the Bonita Creek allotment. Trailing across the creek would occur twice one year and then once the next. Movement of cattle from west to east across Bonita Creek would occur from Lee Trail to Christiansen's Place in upper Bonita Creek. Movements from east to west would occur from Jones Road to Lee Trail where the road runs through Bonita Creek (Figure 1). The BLM has adopted the conservation recommendations from our fourth reinitiation of the Safford/Tucson Field Offices' programmatic livestock grazing opinion. Following from the analysis in the reinitiation, these measures will minimize effects to streambanks, riparian vegetation, and native fishes, including Gila chub, that occur in the stream. The BLM provided information supporting this conclusion in their February 12, 2001, memorandum to us. In that memorandum, they report that monitoring after trailing revealed no impacts to riparian vegetation or stream banks. Any damage that does occur would be localized and infrequent.

Gila chub are likely to be present during annual or biannual crossings of Bonita Creek by cattle. Most fish will swim away from cattle, avoiding significant impacts. However, fish fry and any eggs that may be present could be trampled. Detecting take of this type would be very difficult as dead or injured fish or eggs would be very small and difficult to see in the turbid waters created by cattle crossing the stream. Relatively few fish would be affected because of the localized and infrequent nature of the impact. Loss of these few fish would represent an insignificant impact to the population. Larger fish, which are critical to the breeding population, would probably escape injury.

Recreation and Transportation System Management

BLM proposes a number of specific projects and activities that have the effect of limiting or directing recreational uses to specific areas that provide for quality recreational experiences while minimizing effects to threatened and endangered species, their habitat, and other resources. Activities that affect Bonita Creek are relevant to discussions of effects to the Gila chub.

BLM would reduce roads through the bottom of Bonita Creek from 15 miles (the entire reach of Bonita Creek in the RNCA) to about two miles, including a short segment of the Red Knolls Canyon/Hackberry Spring Road below the Narrows, and a little less than two miles of the City Pipeline Road near the confluence with the Gila River. Other roads provide access to but not through Bonita Creek. Vehicular use in the creek bottom inhibits riparian plant growth, breaks down banks, causes erosion, sedimentation, and increased turbidity in the stream, particularly where vehicles drive through the stream and immediately downstream of the vehicular activity. These effects are likely to result in wider and shallower stream channels (Armour 1977, Platts and Nelson 1985, Platts 1990, Meehan 1991). This causes progressive adjustments in other variables of hydraulic geometry and results in changes to the configuration of pools, runs, riffles, and backwaters; levels of fine sediments and substrate embeddedness; availability of instream cover; and other fish habitat factors in the vicinity of the vehicle crossings (Bovee 1982, Rosgen 1994). It also changes the way in which flood flows interact with the stream channel and may

exacerbate flood damage to banks, channel bottoms, and riparian vegetation. The breaking down of stream banks by vehicles would reduce undercut banks and overhanging vegetation that chub use as cover. Adverse effects of stream sedimentation to fish and fish habitat have been extensively documented (Murphy *et al.* 1981, Wood *et al.* 1990, Newcombe and MacDonald 1991, Barrett 1992, Megahan *et al.* 1992). Excessive sedimentation may cause channel changes that are adverse to the Gila chub. Excessive sediment may fill backwaters and deep pools used by Gila chub, and sediment deposition in the main channel may cause a tendency toward stream braiding, thus reducing adult chub habitat, as well. Excessive sediment may smother invertebrates, reducing chub food production and availability, and related turbidity may reduce the chub's ability to see and capture food. Fish fry and eggs could also be killed or injured if vehicles are driven through stream segments where these life stages occur. Vehicles driven rapidly through the stream could splash young fish or eggs onto the bank where they may dessicate. Larger fish are likely to swim away and avoid death or injury.

Gila chub have persisted in Bonita Creek despite the 15 miles of road through the creek bottom that have existed prior to the current proposal. The Gila Box RNCA Plan would reduce roads through the creek to two miles. A proportional reduction in adverse effects to Gila chub and its proposed critical habitat is expected from this action. Habitats should improve and the likelihood of long-term persistence of the chub in this system should increase. However, there would still be localized impacts, as described above, including some take of Gila chub, where roads follow or cross Bonita Creek.

Parking areas and trailheads would be provided at the end of the Solomon Pass/Lee Trail Road (the existing parking area would be used, and tables and an information kiosk would be placed there), on the opposite bank from the end of the Jones Road, and on the west bank of where the Red Knolls Canyon/Hackberry Spring Road crosses Bonita Creek (this parking area would be developed on a bench above the creek). A parking area would also be provided at the end of Christiansen Road near the San Carlos Apache Tribal boundary. Visitors would likely use the Christiansen parking area to access and view the Pueblo Devol cliff dwelling. At the mouth of Bonita Creek, the Serna Cabin parking area and picnic area, with signs, tables, upright grills, and a toilet would be developed. A wildlife viewing area would be maintained and accessed by the public near Serna Cabin. User fees would be phased in, vehicular use would be limited to designated routes only, and brochures, signs, and interpretive kiosks would inform the public of the importance of natural resources and requirements to protect them and follow regulations in the RNCA. All of these proposed activities act to limit and direct recreational activities. Parking and picnic areas and trails along Bonita Creek will be areas of concentrated public use. Some trampling of vegetation and banks is expected, but should be localized and minimal. Parking and picnic areas will be located out of the floodplain and will not affect Gila chub or its habitat directly. With the limitation of recreational use to specific areas, environmental damage at former informal camps, parking, off-road vehicle, and other use areas will recover.

Public use is often associated with an elevated risk of human-caused fire. This risk will still exist, but would be directed to picnic and camping areas where the opportunity for escape of fire into wildlands is much reduced. Directing public use to these relatively fire-safe areas is much less risky than the previous policy whereby people would camp and picnic anywhere along the

15 miles of routes in Bonita Creek. The risk of wildfire associated with public use is also mitigated by the Fire Management element of the Gila Box Plan.

The effects of all proposed Recreation and Transportation System Management activities on the Gila chub are addressed herein to the project level and require no further consultation unless one of the reinitiation criteria at 50 CFR 402.16 are triggered (see REINITIATION STATEMENT, herein).

Cultural Resource Management

Cultural resource management should affect the Gila chub and its proposed critical habitat minimally. Some important cultural sites occur along Bonita Creek, including the Serna Cabin at the mouth of Bonita Creek, the Old Lady Gay Cabin, the plumed serpent pictograph, and the Pueblo Devol cliff dwelling complex. BLM proposes to monitor and maintain the Serna Cabin. Excavation of part of the Old Lady Gay Cabin is proposed and interpretive signs would be placed. As both these structures and activities are outside of the floodplain, no effects to Gila chub or its proposed critical habitat are anticipated. In regard to the cliff dwellings, BLM proposes to implement public interpretation. For the plumed serpent pictograph, BLM would work with City of Safford to protect and manage the site. We do not know precisely what that would entail, but may include interpretive signing or structures to prevent access to the pictograph. We do not anticipate any effects from cultural resource activities to Gila chub or its habitat beyond placement of signs or posts near or along Bonita Creek and occasional foot traffic or vehicle access on designated routes. Activities other than that may require reinitiation of consultation (see REINITIATION STATEMENT, herein).

Fish and Wildlife, and Threatened and Endangered Species Management

This plan element would include monitoring of Gila chub and other plants and animals, re-establishment of native fish and wildlife, development of agreements to resolve conflicts prior to releases of any listed species, a feasibility study to evaluate the potential for constructing a permanent fish barrier in Bonita Creek, working with City of Safford to develop a water system that provides for long-term security of fishes and other organisms, public information about native fishes, and encouraging research.

The specifics of these activities are lacking; however, the underlying objective is to maintain and/or enhance populations of listed and other priority species. Thus, the net effect should be neutral or beneficial to the Gila chub. Monitoring or research of Gila chub that involves capture or other forms of take, as defined in section 3(18) of the ESA, will require a permit from us. Effects of permit issuance are addressed in an associated intra-service section 7 consultation. Thus, project-level consultation, including anticipating incidental take from these activities, will occur during permit processing. We note that re-establishments or augmentations are proposed for razorback sucker, woundfin minnow, desert pupfish, Gila topminnow, bonytail chub, Colorado pikeminnow, and other native species, many of which are listed, but are not addressed herein (and in some cases not in the previous reinitiation or the original opinion on the Gila Box RNCA Plan). These re-establishments or augmentations, where they require a permit from us,

again will be addressed at the project level in intra-service consultation on issuance of the permit; however, we expect their net effect to listed species will be neutral or beneficial.

In regard to habitat enhancement, BLM proposes to plant trees, native shrubs, and vines. Saltcedar and other non-native plants would be controlled where natural processes fail to remove them, and nest boxes would be considered for cactus ferruginous pygmy-owls. Planting of native plants may involve minor disturbance caused by foot or vehicle traffic and planting, but the effects would be short-term, and plantings, if successful, would enhance streamside cover for Gila chub. BLM proposes to consult separately on placement of nest boxes; however, we anticipate no significant adverse effects from this activity (only occasional foot and vehicle traffic). The effects of non-native plant control will depend on the extent of control efforts and the mechanism of control. Small numbers of herbaceous weeds may be pulled by hand with little or no effect to Gila chub or its habitat. However, saltcedar removal may involve chemical treatment and chainsaw removal, with temporary disturbance along Bonita Creek and opening of the riparian canopy. As with other activities under this planning category, the underlying objective is to maintain and/or enhance populations of listed and other priority species. However, we do not have enough project-specific information to fully evaluate chemical and mechanical control of non-native plants. We recommend that either BLM consult, as needed, on project-level plant control activities or develop a mitigation plan for such projects that would minimize effects to Gila chub and its habitat. If this office agrees that the plan minimizes effects, and the project and its effects are consistent with the description of the proposed action and the scope and extent of effects anticipated herein, the project would be covered by this opinion and would require no further consultation unless one or more of the four criteria for reinitiation (see REINITIATION STATEMENT, herein) are triggered.

The Gila Box RNCA Plan includes preparation of a feasibility study to evaluate the potential for constructing a permanent fish barrier in Bonita Creek to prevent upstream migration by non-native fishes. This typically involves constructing a weir that downstream fishes cannot negotiate. The feasibility study itself would have no effect on Gila chub or its proposed critical habitat. Bureau of Reclamation has the lead for the fish barrier and we understand the feasibility study is close to completion. Construction of the fish barrier is a component of our Central Arizona Project biological opinion to Bureau of Reclamation. Its construction is covered by that opinion and would not require project-specific consultation with the BLM.

Similarly, analyzing the City of Safford's development of a water system to provide long-term security for fishes, leopard frogs, and other organisms, would have no effect on Gila chub or its habitat. If actions were proposed in Bonita Creek in support of this concept, the BLM should evaluate potential effects of the action and consult with us as needed on project-level effects (50 CFR 402.14).

Water Quality Management

Proposed activities under this Plan element include management actions previously analyzed under riparian and recreational management, 110 percent spill containment structures for diesel pumps, storage of gas and oil containers in the uplands, proper disposal of such containers, replacement of the Lee Trail septic system with a portable system and eventual movement of the Lee Trail cabin and septic system out of the canyon bottom, and monitoring of macroinvertebrates at three sites on Bonita Creek. All of these activities act to minimize the potential for water-quality impacts to Gila chub and its habitat. A portable septic system at the Lee Trail cabin would allow the system to be moved out of the floodplain in the event of an anticipated flood in Bonita Creek.

Private Lands

The BLM proposes to acquire all privately-owned lands in the RNCA. These include extensive City of Safford and other lands along Bonita Creek. Such acquisition would allow those lands to be managed under the objectives of the Plan. Specific management actions are not proposed for these new acquisitions; however, management consistent with the rest of Bonita Creek (including minimization of routes through the creek bottom, minimization of livestock grazing in Bonita Creek, and directing recreational use to certain areas that will result in minimal resource damage) should be beneficial to Gila chub and its proposed critical habitat. We recommend that if such acquisitions are made, the BLM present us with a management proposal for those lands, and if we find that the net effects are beneficial and otherwise consistent with the findings and conclusions herein, we would consider that management covered under this opinion and no further consultation would be needed.

City of Safford Water System in Bonita Creek

BLM proposes to work cooperatively with City of Safford to provide for their management needs while reducing potential adverse effects to the resources of the RNCA. BLM hopes to work with the City to support the management goals of the RNCA along with the management needs of the City and the effective operation of the public water system. As we described in the Environmental Baseline, the City's infiltration gallery and pipeline are private, not BLM, actions. The infiltration gallery occurs on City of Safford lands. If BLM is able to work with the City to support the management goals of the RNCA in regard to the City's facilities, it would be beneficial to the Gila chub and its proposed critical habitat. The infiltration gallery currently diverts water from Bonita Creek that could otherwise be used by Gila chub. However, the ephemeral or intermittent reach of Bonita Creek associated with the infitration gallery may help to impede the movement of non-native fishes from the lower creek into the upper creek where chub are more abundant and proposed critical habitat exists. Any specific projects that the BLM proposes with City of Safford to support the management goals of the RNCA should be evaluated by the BLM pursuant to 50 CFR 402.14. Project-level consultation should occur on these projects as needed.

Research and Education

The objective of this plan element is to allow research and provide public education. Many of these research and educational projects are described above under the Recreation and Transportation System Management; Fish and Wildlife, and Threatened and Endangered Species Management; and Cultural Resource Management elements. Other environmental, biological, cultural, and other research projects could be authorized, as well. Only projects in the Bonita Creek watershed have any potential to affect Gila chub. Most interpretive kiosks, signing, brochures, and other public education would have no effect on Gila chub and its proposed critical habitat. In regard to project effects, we anticipate no more than occasional sign and post placement, as well as associated foot and vehicle traffic along Bonita Creek. Effects from research involving Gila chub and other animals and plants is addressed in Fish and Wildlife, and Threatened and Endangered Species Management above. Effects of cultural resource research is addressed in Cultural Resource Management, above. Other projects not specifically addressed herein should be evaluated by BLM and if needed, project-specific consultation should be conducted.

Fire Management

BLM would develop and implement a prescribed and natural fire plan for the RNCA that would have the objective of improving and protecting the resources of the RNCA. Wildfire would be suppressed as needed and prescribed fire would be applied to the landscape as needed to meet the objectives of the Gila Box Plan.

Degradation of watershed condition immediately after fires can result in dramatically increased runoff, sedimentation, and debris flow that can scour aquatic habitats in canyon bottoms or bury them in debris (DeBano and Neary 1996). In degraded watersheds, less precipitation is captured and stored, thus perennial aquatic systems downstream may become ephemeral during dry seasons or drought (Rinne and Neary 1996). In salmonid fish, ash and slurry flow into streams can be toxic, and populations of macroinvertebrates (Gila chub prey species) can be drastically reduced after a fire (Rinne 1996), at least temporarily (Roby and Azuma 1995). Smoke diffusion into water and ash flow can result in high levels of phosphorus and nitrogen (Spencer and Hauer 1991) with potentially toxic effects to Gila chub. These effects may be minor with light burns but can reach dramatic levels during or after catastrophic fire (Neary *et al.* 2003). Direct effects of fires on Gila chub would be few; most effects are indirect and result from ash flow, increased peak flows and runoff, sedimentation, and changes in channel morphology (Rinne and Neary 1996, Neary *et al.* 2003).

Suppression of wildfire, as needed, would help prevent these effects from occurring. Prescribed fire should help prevent catastrophic wildfire and severe damage to watersheds and riparian systems by reducing fuel loads in a controlled situation. Short-term adverse effects may occur during fire suppression or as indirect effects after prescribed or natural fire. Effects may include take of Gila chub due to post-fire ash flow and sedimentation. Incidental take may also occur due to post-fire high flows that flush fish downstream to where they would be subject to predation by non-native fishes. Fire suppression activities or activities during prescribed fires

can also affect Gila chub or its habitat, including impacts of placing crew camps and equipment staging areas in or near Bonita Creek, use of heavy equipment in Bonita Creek or the watershed of Bonita Creek, and decisions made during fire suppression that affect the direction or intensity of wildfire and whether areas on or near Bonita Creek burn, and if they burn intensely. Fire retardants and foam suppressants are typically quite toxic to aquatic organisms, including fish. If used in aquatic systems, they can result in dramatic significant kills (Oregon Department of Fish and Wildlife 2002).

BLM has proposed to manage fire with the objective of improving and protecting the resources of the RNCA. This objective could be met by including specific measures to protect the chub and its habitat in fire-management planning; however, no such measures were proposed. The prescribed and natural fire plan will require further analysis to fully evaluate potential effects on the Gila chub and its proposed critical habitat; however, the objective of the plan, to improve and protect resources in the RNCA, indicates that the net effect on the Gila chub and its proposed critical habitat would be positive or neutral.

Cumulative Effects

Cumulative effects include the effects of future State, tribal, or local private actions that are reasonably certain to occur in the action area. 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.

Most lands and activities in the RNCA are federally authorized and thus would be the subject of section 7 consultation. The effects of these activities are not considered cumulative. However, extensive private lands occur along Bonita Creek and at the confluence of Eagle Creek. A parcel of private lands also occurs along the Gila River downstream of the Old Safford Bridge (Figure 1). We are not aware of activities that affect the Gila chub and its proposed 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. 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 (again, 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. The condition of the watershed upstream on the reservation is unknown; however, water quality is good in Bonita Creek (U.S. Bureau of Land Management 1993) and Gila chub are persisting in the upper reaches, suggesting watersheds are at least in adequate condition to support downstream habitat. No other activities are known on the San Carlos Apache reservation that may affect Gila chub or its habitat.

CONCLUSION

After reviewing the status of the Gila chub, the environmental baseline for the action area, the cumulative effects, and the anticipated effects of the Gila Box RNCA plan, it is our biological opinion that the proposed action is neither likely to jeopardize the continued existence of the Gila chub, nor result in the destruction or adverse modification of proposed critical habitat.

We present these conclusions based on the following:

1. With the exception of limited trailing, BLM would exclude livestock grazing from Bonita Creek. Upland range conditions and trends along Bonita Creek and water quality in Bonita Creek do not suggest that the Bonita Creek watershed is significantly deteriorated due to grazing or other activities.

2. BLM proposes to reduce roads through Bonita Creek from 15 to about two miles, and vehicles would be limited to designated routes only.

3. BLM proposes to direct potentially damaging recreational activity out of the riparian zone of Bonita Creek.

4. A fire management element to the Gila Box RNCA Plan is proposed that would have the objective of improving and protecting the resources of the RNCA.

5. The BLM has proposed public outreach and education, riparian habitat improvement, land acquisitions in Bonita Creek, working cooperatively with City of Safford to provide for their management needs while reducing potential adverse effects to the resources of Bonita Creek, and other actions that should improve habitat conditions for Gila chub in Bonita Creek.

INCIDENTAL TAKE STATEMENT

Section 9 of the Act and Federal regulation pursuant to section 4(d) of the Act prohibit the take of endangered and threatened species without special exemption. Take is defined as harass, harm, pursue, hunt, shoot, wound, kill, trap, capture, collect, or 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 behavior patterns, including breeding, feeding, or sheltering. "Harass" is defined (50 CFR 17.3) in the same regulation 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 that include, but are not limited to, breeding, feeding, or sheltering. "Incidental take" is defined as take of a listed animal species that is incidental to, and not the purpose of, the carrying out of an otherwise lawful activity conducted by the Federal agency or the applicant. Under the terms of sections 7(b)(4) and 7(o)(2) of the Act, 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.

If this conference opinion is adopted as a biological opinion following listing, these measures, with their implementing terms and conditions, will be nondiscretionary, and must be undertaken by you so that they become binding conditions of any grant or permit issued to any applicants, as appropriate, for the exemption in section 7(o)(2) to apply. You have a continuing duty to regulate the activity covered by this incidental take statement. If you (1) fail to assume and implement the terms and conditions or (2) fails to require any applicants 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. To monitor the impact of incidental take, you must report the progress of the action and its impact on the species to us as specified in the incidental take statement [50 CFR §402.14(i)(3)]

AMOUNT OR EXTENT OF TAKE

Incidental take of Gila chub is anticipated from three elements of the Gila Box RNCA Plan, as described here. Incidental take could occur on BLM lands in the RNCA, including any currently private lands that BLM may acquire during the term of the Plan (through 2013).

Riparian Area Management

Gila chub are likely to be present during annual or biannual crossings of Bonita Creek by cattle. Most fish will swim away from cattle, avoiding significant impacts. However, fish fry and any eggs that may be present at the cattle crossings are anticipated to be trampled and killed or injured. Detecting take of this type would be very difficult as dead or injured fish or eggs would be very small and difficult to see in the turbid waters created by cattle crossing the stream. Numbers of fish and eggs incidentally taken are anticipated to be small. We anticipate that direct take of Gila chub will occur at a level that will result in no more than 20 dead or dying fish of any species being observable near the cattle crossings, or within 600 yards downstream of the activity, during crossings or within three hours following crossings. Finding more than 20 dead or dying fish of any species in the vicinity and during or within three hours after a cattle crossing will indicate effects to Gila chub over and above that anticipated herein, unless such mortality is attributable to other causes.

Recreation and Transportation System Management

Fish fry and eggs are anticipated to be killed or injured when vehicles drive the approximately two miles of roads through Bonita Creek. Detecting fish taken in this manner would be difficult. Larger fish are likely to swim away and avoid death or injury. The number of fish or eggs affected would probably depend on the speed of the vehicle, the number of vehicles, if in a caravan, and water conditions. Very low water would reduce options for Gila chub to escape impact. Relatively small numbers of fish are likely to be affected during any one vehicle crossing of the stream. We anticipate that direct incidental take of Gila chub will occur at a level that will result in no more than 10 dead or dying fish of any species being observable near a vehicle crossing, or within 600 yards downstream of a crossing, during crossings or within three hours following crossings. Finding more than 10 dead or dying fish of any species in the

vicinity of and during or within three hours after a vehicle crossing will indicate effects to Gila chub over and above that anticipated herein, unless such mortality is attributable to other causes.

Fire Management

Decisions made during wildfire suppression and application of prescribed fire could result in fire in the watershed of Bonita Creek that could result in death or injury of Gila chub due to post-fire ash flow, sedimentation, and flushing of fish downstream during post-fire high flows where the fish would be subject to predation by non-native fishes. BLM's fire management element has an objective of improving and protecting the resources of the RNCA, so we assume that a fish kill due to fire suppression or prescribed fire activities would be a rare event. We anticipate such a fish kill involving Gila chub, but not extirpating the species from Bonita Creek, once during the life of the plan (through 2013).

EFFECT OF THE TAKE

In this biological opinion, we find the anticipated level of incidental take is not likely to result in jeopardy to the Gila chub for the reasons described in the "Conclusion" above.

REASONABLE AND PRUDENT MEASURES AND TERMS AND CONDITIONS

The prohibitions against taking Gila chub found in section 9 of the ESA do not apply until the species is listed. However, we advise you to consider implementing the following reasonable and prudent measures with their terms and conditions. If this conference opinion is adopted as a biological opinion following listing, these measures with their terms and conditions will become nondiscretionary.

Reasonable and Prudent Measure #1. The BLM has adopted our conservation recommendations from amendment #4 of the Safford/Tucson grazing program biological opinion. We are not aware of further reasonable and prudent measures and terms and conditions to minimize incidental take associated with cattle crossings of Bonita Creek. However, the BLM shall monitor incidental take associated with such crossings.

Term and Condition. During and within three hours after an annual or biannual trailing of cattle in 2004-2006, where Gila chub are abundant, the BLM shall survey the vicinity of the crossing and 600 yards downstream of the crossing for dead or dying fish. The results of the survey shall be included in that year's annual monitoring report for the Safford/Tucson grazing program biological opinion.

Reasonable and Prudent Measure #2. The BLM has proposed reducing miles of road through Bonita Creek from 15 to two miles, which minimizes incidental take associated with vehicle use in the creek bottom. However, the BLM shall monitor incidental take associated with such use.

Term and Condition. During and within three hours after a crossing by a caravan of three or more vehicles where Gila chub are abundant, the BLM shall survey the vicinity of the crossing

and 600 yards downstream of the crossing for dead or dying fish. If dead or dying fish are found, the likely cause(s) of death or morbidity shall be assessed. The BLM shall accomplish this monitoring for a single caravan crossing during 2004-2006. The results of the survey shall be summarized in a letter to us within 120 days of the monitoring.

Reasonable and Prudent Measure #3. The BLM shall include in the prescribed and natural fire plan for the RNCA measures to minimize incidental take of Gila chub resulting from fire suppression and prescribed fire activities.

Term and Condition #1. Regarding fire management activities in the Bonita Creek watershed, the BLM shall, at a minimum, include the following measures in the Gila Box fire plan. Before the fire plan is developed, these measures shall be applied to any fire suppression and prescribed fire in the Bonita Creek watershed. These measures shall be implemented to the degree that they do not compromise human safety or result in loss of property:

1. All personnel on the fire shall be briefed about protecting Gila chub and its habitat in Bonita Creek.

2. On wildfires, Resource Advisors shall be designated to coordinate listed species and other resource concerns and serve as an advisor to the Incident Commander. Resource Advisors shall monitor fire suppression activities to ensure that protective measures endorsed by the Incident Commander are implemented. The Resource Advisor shall also perform other duties as necessary to ensure adverse effects to Gila chub and its habitat are minimized. Resource Advisors shall be on call 24 hours during the fire season.

3. Off-road vehicle activity shall be kept to a minimum. Vehicles will be parked as close to roads as possible, and vehicles shall use wide spots in roads to turn around. Whenever possible, local fire-fighting units shall go off-road first because of their prior knowledge of the area.

1.4 To the degree possible, crew camps, equipment staging areas, and aircraft landing and refueling areas shall be located outside of Gila chub habitat, or in locations that are previously disturbed. If such sites are located in Gila chub habitat, measures shall be taken to limit habitat disturbance and to locate sites in areas with minimal effects to the fish and its habitat.

5. Use of tracked vehicles shall be restricted to activities that, in the judgement of the Incident Commander and in consultation with the Resource Advisor, might save a large area or important resources from fire.

6. Fire crews shall, to the extent possible, obliterate vehicle tracks made during the fire where presence of tracks is likely to encourage off-road travel by recreationists.

7. The Resource Advisor shall consult with the Incident Commander to ensure that no fire retardants or suppressants toxic to fish shall be used over Bonita Creek, tributary drainages, or on the watershed where these chemicals are likely to enter Bonita Creek.

8. Rehabilitation of the burned areas shall be considered, including seeding, planting of native perennial species, etc.

9. Recovery of vegetation shall be monitored by the assigned Resource Advisor.

10. The effectiveness of suppression/prescribed fire activities and these measures shall be evaluated after a fire. Procedures shall be revised as needed.

11. After any fire suppression or prescribed fire event in the watershed of Bonita Creek, the BLM shall, within 120 days, deliver to us a brief summary in letter format of the fire activities, including size, dates, location of the fire, coordination with this office, and implementation and effectiveness of the above 10 components of term and condition #1.

Term and Condition #2. Planning for prescribed fire in the watershed of Bonita Creek shall be coordinated with us. The BLM, with input from the Service, will develop and implement a mitigation plan for each prescribed fire project that will minimize the likelihood of incidental take of Gila chub. If this office agrees that the plan minimizes effects, and the project and its effects are consistent with the description of the proposed action and the scope and extent of effects anticipated herein, the project would be covered by this opinion and would require no further consultation unless one or more of the four criteria for reinitiation (see REINITIATION STATEMENT, herein) are triggered.

CONSERVATION RECOMMENDATIONS

Section 2(c) and 7(a)(1) of the Act direct Federal agencies to utilize their authorities to further the purposes of the Act by carrying out conservation programs for the benefit of listed species. Conservation recommendations are discretionary agency activities to minimize or avoid effects of a proposed action on listed species or critical habitat, to help implement recovery plans, or to develop information on listed species. The recommendations provided here do not necessarily represent complete fulfillment of the agency's section 2(c) or 7(a)(1) responsibilities for the Gila chub. In furtherance of the purposes of the Act, we recommend implementing the following actions:

1. The BLM should attempt to work with the San Carlos Apache Tribe on a watershed-level conservation plan for Bonita Creek with the objective of protecting the watershed and preventing introductions of non-native fishes and other organisms.

2. If the Gila chub is listed, BLM should work with us on developing and implementing a recovery plan.

In order that we be kept informed of actions minimizing or avoiding adverse effects or benefitting listed species or their habitats, we request notification of the implementation of any conservation recommendation.

Spikedace and Loach Minnow Critical Habitat

Our May 3, 1994, biological opinion concluded that the spikedace and loach minnow were extirpated from the project area and thus would not be affected by the Gila Box Management Plan. This is likely still the case; however, recent detections of loach minnow on the San Francisco River near Clifton suggest that occasional loach minnow could potentially reach the Gila River confluence. However, presence of an abundance of non-native fishes on the Gila River currently precludes potential for a loach minnow population in the RNCA (see Environmental Baseline). Our conclusion in the 1994 opinion is still valid for the species; we include the analysis from that opinion here by reference. Herein we address effects to critical habitat in the RNCA, which includes the entire reaches of the Gila River and Bonita Creek within the RNCA. We address critical habitat for both species below because of the similarity of habitat needs and constituent elements of the two species.

Riparian Area Management

As described in the Description of the Proposed Action, the Gila Box RNCA Plan sets target tree-sapling ratios ranging from 1:1 to 1:2 for five segments of Bonita Creek and four segments of the Gila River. As we discussed for the Gila chub, structure and composition of Southwestern riparian tree communities are dynamic, and we question the utility of defining such ratios and densities. However, maintaining a ratio of at least 50 percent saplings is likely to ensure at least some replacement of older trees. Healthy riparian woodlands influence the abundance of instream cover, habitat complexity, and channel morphology, which are constituent elements or components thereof, of spikedace and loach minnow critical habitat.

Effects from livestock grazing in the RNCA to spikedace and loach minnow critical habitat were addressed in our December 4, 2000, amendment #4 to the Safford/Tucson field offices' livestock grazing program biological opinion. Herein, we will only evaluate effects of changes from the proposed action evaluated in that amendment. Those changes only affect livestock trailing across the Gila River on the Smuggler allotment and livestock trailing across Bonita Creek on the Bonita Creek allotment. The proposed changes reduce effects of trailing and livestock grazing on spikedace and loach minnow critical habitat from what we evaluated in amendment #4 of the Safford/Tucson grazing opinion. This is because the BLM adopted our conservation measures as their proposed changes to how trailing would be conducted through the Gila River and Bonita Creek. Based on the analysis in amendment #4, these measures will minimize the effects of trailing on streambanks and riparian vegetation.

Recreation and Transportation System Management

Bonita Creek

We discussed above effects of recreational, interpretive, and vehicular regulations and developments for the Gila chub and its habitat on Bonita Creek. That analysis of effects to habitat applies to spikedace and loach minnow critical habitat, as well. To summarize, BLM proposes a number of specific projects and activities on Bonita Creek that have the effect of limiting or directing recreational uses to specific areas that provide for quality recreational experiences while minimizing effects to threatened and endangered species, their habitat, and other resources. These include reducing roads through the bottom of Bonita Creek from 15 to about two miles, designation or construction and use of parking areas, a wildlife viewing area, and trailheads; and development of the Serna Cabin parking area and picnic area. User fees would be phased in, vehicular use would be limited to designated routes only; and brochures, signs, and interpretive kiosks would inform the public of the importance of natural resources and requirements to protect them, as well as the importance of following regulations in the RNCA. All of these proposed activities act to limit and direct recreational activities.

Parking and picnic areas and trails along Bonita Creek will be areas of concentrated public use. Some trampling of vegetation and banks is anticipated in these areas, but effects are expected to be localized and minimal. Effects to banklines, the stream channel, turbidity, and riparian plants will still occur along the approximately two miles of roads through the bottom of Bonita Creek, as described for the Gila chub. However, with the limitation of recreational use to specific areas, environmental damage at former vehicle routes, informal camps, parking, and other use areas will recover.

Gila River

The Plan prohibits motorized vehicles in the river corridor, effectively closing 23 miles of routes through the riparian zone. In the past, the Gila River through the Gila Box was an off-road vehicle corridor where severe effects to riparian vegetation and banklines occurred. Motorized access and hikers will be concentrated at the downstream and upstream ends of the RNCA on the Gila River (see Figure 1). From the Bonita Creek confluence to the downstream end of the RNCA, public use will be most evident at the River View Campground and associated parking areas, the picnic areas at Serna Cabin, Spring Canyon, and Dry Canyon, and at the boating takeout point at Dry Canyon. At the upstream end, public use will be concentrated at the Owl Canyon Campground, the Old Safford Bridge picnic area, and the put-in for boaters. Between these areas limited hiking (such as on the trail to Camelback) and vehicular access (Black Canyon and Deadman Canyon roads, and an overlook off of Bull Gap Road) opportunities will exist. Public use areas will be impacted by roads, camping and picnic areas, and trampling.

Most recreation in the middle portion of the Gila River will be via rafts, canoes, and kayaks. The Plan places a limit of five new river outfitter companies doing business in the RNCA (currently there are three). However, no restriction on numbers of commercial or non-commercial boats on the river would be implemented until monitoring shows more than 80 persons on the Gila River between the put-in at the Old Safford Bridge and Bonita Creek. Current use is unknown. At that time, a permit and fee system would be instituted (permits and fees could be put in place prior to use reaching 80 persons if resource damage is occurring). Also at that time, a carrying capacity for the river will be determined and permits would be split 50/50 between commercial and non-commercial permittees. BLM does not say how a carrying capacity would be set.

Boaters typically take two days or more to traverse the Gila Box. They camp along the way on sand bars and informal camps. Sand bars sustain little impact from boating-based campers. Camps further from the river may be in riparian areas which could be impacted by trampling. Campfires could potentially escape and burn into riparian areas and uplands, with impacts to fish habitat described above for the Gila chub under the "Fire Management" element. Human waste buried in sand bars or nearby riparian zones could degrade water quality if enough boaters are present.

Recreational boating is likely to have few significant adverse impacts to spikedace and loach minnow critical habitat. Areas of riparian vegetation affected by campers will be small and localized. BLM's Fire Management element mitigates the likelihood of catastrophic fire damage along the Gila River. The BLM also can close the Gila Box to public use if fire danger is very high. For example, the Gila Box was closed to public use during the summer of 2002.

The effects on spikedace and loach minnow critical habitat from instituting a permit and fee system, and, in particular, setting a carrying capacity of boating use when use exceeds 80 persons, cannot be fully evaluated herein due to a lack of detail. We assume these policies would be consistent with riparian area management objectives, and the objective to maintain or enhance populations of threatened, endangered, and other priority species; however, effects should be evaluated when the permit and fee system and carrying capacity are proposed. Such evaluation should be reviewed in the context of our above-stated assumptions. The BLM can then determine whether further section 7 review is appropriate and should be requested. The effects of all other proposed Recreation and Transportation System Management activities on spikedace and loach minnow critical habitat are addressed herein to the project level and require no further consultation unless one of the reinitiation criteria at 50 CFR 402.16 are triggered (see REINITIATION STATEMENT, herein).

Cultural Resource Management

Cultural resource management should affect spikedace and loach minnow critical habitat minimally. As discussed for the Gila chub, the Gila Box RNCA contains at least 54 known cultural resource sites, including some significant sites along Bonita Creek (U.S. Bureau of Land

Management 1993). The exact location of General Kearney's camp is unknown, but there is a monument to the campsite near the Gila River/Bonita Creek confluence. On the Gila River, the historical Old Safford Bridge is located near the eastern end of the RNCA.

On Bonita Creek, BLM proposes to monitor and maintain the Serna Cabin. Excavation of part of the Old Lady Gay Cabin is proposed, and interpretive signs would be placed. As these structures and activities are outside of the floodplain, no effects to spikedace and loach minnow critical habitat are anticipated. In regard to the cliff dwellings, BLM proposes to implement public interpretation. For the plumed serpent pictograph, BLM would work with City of Safford to protect and manage the site. We do not know precisely what that would entail, but it may include interpretive signing or fencing/structures to prevent access to the pictograph. On the Gila River, interpretive information is proposed for the Old Safford Bridge, which would be placed in the information kiosk at the Owl Canyon Campground.. We do not anticipate any effects from cultural resource activities to critical habitat beyond placement of signs or posts near Bonita Creek and occasional foot traffic or vehicle access on designated routes. Activities other than that may require reinitiation (see REINITIATION STATEMENT, herein).

Fish and Wildlife, and Threatened and Endangered Species Management

This plan element would include monitoring of plants and animals; evaluation of re-establishment of native fish (including spikedace and loach minnow) and wildlife; planting of trees, shrubs, and vines to speed habitat recovery; development of agreements to resolve conflict prior to releases of any listed species; a feasibility study to evaluate construction of a fish barrier in Bonita Creek; working with City of Safford to develop a water system that provides for long-term security of fishes and other organisms, public information about native fishes; consideration of nest box placement for pygmy-owls; and encouraging research.

The specifics of these activities are lacking; however, the underlying objective is to maintain and/or enhance populations of listed and other priority species. Thus, the net effect should be neutral or beneficial to spikedace and loach minnow critical habitat. Monitoring and research in or near Bonita Creek and the Gila River would likely involve water quality/quantity monitoring, fisheries and aquatic invertebrate surveys, riparian vegetation inventory and monitoring, and other activities that we anticipate would have few impacts to critical habitat. In the long term, these research projects should be beneficial because the information provided should allow for better management in the future. If spikedace or loach minnow were re-established or reinvaded the Gila Box at some point in the future, some activities could affect the fish as well as critical habitat. Reinitiation would be necessary to evaluate those effects. The effects of re-establishing a native fish community should be beneficial to spikedace and loach minnow critical habitat. Re-establishment would probably require control of most non-native fishes prior to re-establishment. Specific proposals to re-establish fishes would require a section 10(a)(1)(A) permit from us, with associated intra-service consultation to address issuance of the permit. Thus, project-level section 7 review will occur during permit processing.

Planting of native plants may involve minor disturbance caused by foot or vehicle traffic and planting of plants, but the effects would be short-term, and plantings, if successful, would enhance streamside cover. BLM proposes to consult separately on placement of nest boxes for cactus ferruginous pygmy-owls; however, we anticipate no significant adverse effects from this activity. The effects of non-native plant control will depend on the extent of control efforts and the mechanism of control. Small numbers of herbaceous weeds may be pulled by hand with little or no effect to spikedace and loach minnow critical habitat. However, saltcedar grows to be small trees and their removal may involve chemical treatment and chainsaw removal, with temporary disturbance to water quality and the stream or river channel, and would result in opening of the riparian canopy. As with other activities under this plan element, the underlying objective is to maintain and/or enhance populations of listed and other priority species. However, beyond hand removal of plants, we do not have enough project-specific information to fully evaluate chemical and mechanical control of non-native plants. We recommend that either BLM consult, as needed, on project-level activities or develop a mitigation plan for such projects that would minimize effects to spikedace and loach minnow critical habitat. If this office agrees that the plan minimizes effects, and the project and its effects are consistent with the description of the proposed action and the scope and extent of effects anticipated herein, the project would be covered by this opinion and would require no further consultation unless one or more of the four criteria for reinitiation (see REINITIATION STATEMENT, herein) are triggered.

As described in the Description of the Proposed Action, BLM proposes to prepare a feasibility study to evaluate the potential for constructing a permanent fish barrier in Bonita Creek to prevent upstream migration by non-native fishes. The feasibility study itself would have no effect on spikedace and loach minnow critical habitat. Bureau of Reclamation has the lead for the fish barrier. The feasibility study is close to completion. Construction of the fish barrier is a component of our Central Arizona Project biological opinion to Bureau of Reclamation. If Reclamation proposes to build the fish barrier, such construction would be covered under that opinion and would not require project-specific consultation with the BLM.

Similarly, analyzing with the City of Safford development of a water system to provide long-term security for fishes, leopard frogs, and other organisms, would have no effect on critical habitat. If actions are proposed in Bonita Creek in support of this concept, the BLM should evaluate potential effects of the action and consult with us as needed on project-level effects (50 CFR 402.14).

Water Quality Management

Proposed activities under this Plan element include management actions previously analyzed under riparian and recreational management, 110 percent spill containment structures for diesel pumps, storage of gas and oil containers in the uplands, proper disposal of such containers, replacement of the Lee Trail septic system with a portable system and eventual movement of the Lee Trail Cabin and septic system out of the canyon bottom, and monitoring of

macroinvertebrates at three sites on Bonita Creek. All of these activities act to minimize the potential for water quality impacts to spikedace and loach minnow critical habitat. A portable septic system at the Lee Trail Cabin would allow the system to be moved out of the floodplain in the event of an anticipated flood in Bonita Creek.

Private Lands

The BLM proposes to acquire all privately-owned lands within the RNCA. These include extensive inholdings along Bonita Creek, lands at the confluence of Eagle Creek and the Gila River, and lands on the Gila River about 1.5 miles east of the Old Safford Bridge. Such acquisition would allow those lands to be managed under the objectives of the Plan. The Plan also proposes to acquire private lands outside of the RNCA on Eagle Creek downstream of the Phelps Dodge pump station. If such acquisition occurred, the RNCA would be expanded and those acquired lands would also be managed in accordance with the Plan. Specific management actions are not proposed for acquired lands; however, management consistent with the remainder of the RNCA (including minimization of routes and livestock grazing in aquatic systems and riparian areas, and directing recreational use to certain areas that will result in minimal resource damage) should be beneficial to spikedace and loach minnow critical habitat. We recommend that if such acquisitions are made, the BLM present us with a management proposal for those lands, and if we find that the effects are beneficial and otherwise consistent with the findings and conclusions herein, we would consider that management covered under this opinion and no further consultation would be needed.

City of Safford Water System in Bonita Creek

BLM proposes to work cooperatively with City of Safford to provide for their management needs while reducing potential adverse effects to the resources of the RNCA. BLM hopes to work with the City to support the management goals of the RNCA along with the management needs of the City and the effective operation of the public water system. Further information about the water system was presented in the Environmental Baseline and the Effects of the Proposed Action for the Gila chub. If BLM is able to work with the City to support the management goals of the RNCA in regard to the City's facilities, it would be beneficial to critical habitat. The infiltration gallery currently diverts water from Bonita Creek that could otherwise provide habitat for spikedace and loach minnow. However, the ephemeral or intermittent reach of Bonita Creek associated with the infitration gallery may help impede the movement of non-native fishes from the lower creek into the upper creek. The fish barrier, discussed above, if constructed would further impede or stop movement of non-native fishes. Any specific projects that the BLM proposes with City of Safford to support the management goals of the RNCA should be evaluated by the BLM pursuant to 50 CFR 402.14. Project-level consultation should occur on these projects as needed.

Research and Education

The objective for this plan element is to allow research and provide public education. Many of these research and educational projects are described above under the Recreation and Transportation System Management; Fish and Wildlife, and Threatened and Endangered Species Management; and Cultural Resource Management elements. Other environmental, biological, cultural, and other research projects could be authorized, as well. Most interpretive kiosks, signing, brochures, and other public education would have few or no effect on spikedace and loach minnow critical habitat. We anticipate no more than occasional sign placement, posts, and foot traffic along Bonita Creek and the Gila River associated with such projects. Effects from research on fishes, riparian ecology, or other biological aspects are addressed in Fish and Wildlife, and Threatened and Endangered Species Management above. Effects of cultural resource research is addressed in Cultural Resource Management, above. We expect only minor impacts associated with these activities. The information provided by the projects should allow for better management in the future, and thus should have long-term benefits. Other projects not specifically addressed herein should be evaluated by BLM and if needed, project-specific consultation should be conducted.

Fire Management

BLM would develop and implement a prescribed and natural fire plan for the RNCA that would have the objective of improving and protecting the resources of the RNCA. As described for the Gila chub, fire can have many adverse effects on fish and their habitat. Thus, use of prescribed fire must attempt to minimize short-term impacts while preventing or greatly reducing the likelihood of catastrophic fire that can have much more devastating effects on watersheds and aquatic habitats. Wildfire suppression can be used to further reduce the likelihood of catastrophic fire, but if suppression is the only tool, fuel loads will increase until catastrophic fire becomes nearly inevitable. Thus, a balance between prescribed or natural low-to-moderate intensity natural fires and suppression is needed to protect fish habitat and hopefully restore a natural fire cycle.

In addition to fire itself, activities during fire suppression and prescribed fires can affect spikedace and loach minnow critical habitat. Placing crew camps and equipment staging areas in or near Bonita Creek or the Gila River, use of heavy equipment in Bonita Creek, the Gila River, or watersheds thereof, and decisions made during fire suppression that affect the direction or intensity of wildfire and whether areas on or near Bonita Creek or the Gila River burn, and if they burn intensely, can all dramatically affect spikedace and loach minnow critical habitat.

BLM has proposed to manage fire with the objective of improving and protecting the resources of the RNCA. This objective could be met by including specific measures to protect spikedace and loach minnow critical habitat in fire-management planning; however, no such measures were proposed. The fire management plan will require further analysis to fully evaluate potential effects on critical habitat; however, the objective of the plan, to improve and protect resources in the RNCA, indicates that the net effect on spikedace and loach minnow critical

habitat should be positive or neutral. Short-term adverse effects may occur during fire suppression or as indirect effects after prescribed or natural fire.

Cumulative Effects

Most lands, and thus most activities in the RNCA are Federal and thus would be the subject of section 7 consultation. The effects of these activities are not considered cumulative. However, extensive private lands occur along Bonita Creek and at the confluence of Eagle Creek. A parcel of private lands also occurs along the Gila River downstream of the Old Safford Bridge. Cumulative effects occurring on and upstream of the reach of Bonita Creek in the RNCA that affect aquatic habitats are discussed in the "Cumulative Effects" for the Gila chub, and also apply to spikedace and loach minnow critical habitat. On privately-owned lands on the Gila River, we are not aware of ongoing or planned activities that are damaging to critical habitat other than recreation and livestock grazing. The general effects of these activities are described above. Livestock are often present on private lands at the confluence of Eagle Creek and the Gila River, and upstream on Eagle Creek. Livestock in the creek bottom likely causes increased turbidity and sediment inflow into the Gila River reach of critical habitat (see our December 4, 2000, amendment #4 to the Safford/Tucson field offices' livestock grazing program biological opinion regarding mechanisms of livestock impacts on spikedace and loach minnow critical habitat.) Cumulative effects to spikedace and loach minnow critical habitat in the RNCA do not appear to be at a level that would significantly degrade recovery potential for spikedace and loach minnow in the RNCA.

CONCLUSION

Changes made in the Gila Box RNCA plan, including changes in grazing management, do not change our previous determinations that the Gila Box RNCA plan and the Safford/Tucson grazing program are not likely to jeopardize the continued existence of the spikedace and loach minnow. In regard to the Safford/Tucson grazing program, changes in grazing management within the RNCA also do not change our previous determination that the grazing program is not likely to result in the destruction or adverse modification of spikedace and loach minnow critical habitat. After reviewing the status of spikedace and loach minnow, the environmental baseline for the action area, the cumulative effects, and the anticipated effects of the Gila Box RNCA plan, it is also our biological opinion that the Gila Box RNCA plan is not likely to result in the destruction or adverse modification of critical habitat.

We present these conclusions based on our analysis in the Safford/Tucson grazing program biological opinion and its reinitiations and amendments, and the following:

1. With the exception of limited trailing, BLM would exclude livestock grazing from the floodplains of Bonita Creek and the Gila River in the RNCA.

2. BLM proposes to reduce roads through Bonita Creek from 15 to about two miles, roads would be eliminated along the Gila River, and elsewhere in the RNCA vehicles would be limited to designated routes only.

3. BLM proposes to direct potentially damaging recreational activity out of the riparian zone of Bonita Creek and the Gila River.

4. A fire management element to the Gila Box RNCA Plan is proposed that would have the objective of improving and protecting the resources of the RNCA.

5. The BLM has proposed public outreach and education, riparian habitat improvement, land acquisitions, and other actions that should improve habitat conditions for spikedace and loach minnow on the Gila River and Bonita Creek.

INCIDENTAL TAKE STATEMENT

Section 9 of the Act and Federal regulation pursuant to section 4(d) of the Act prohibit the take of endangered and threatened species without special exemption. Take is defined as harass, harm, pursue, hunt, shoot, wound, kill, trap, capture, collect, or 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 behavior patterns, including breeding, feeding, or sheltering. "Harass" is defined (50 CFR 17.3) in the same regulation 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 that include, but are not limited to, breeding, feeding, or sheltering. "Incidental take" is defined as take of a listed animal species that is incidental to, and not the purpose of, the carrying out of an otherwise lawful activity conducted by the Federal agency or the applicant. Under the terms of sections 7(b)(4) and 7(o)(2) of the Act, 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.

AMOUNT OR EXTENT OF TAKE

As no spikedace or loach minnow are known from the action area, and the presence of loach minnow on the Gila River is likely precluded by non-native predaceous fishes, no incidental take of these species as a result of the Gila Box RNCA plan is anticipated. Please refer to our September 27, 1997, biological opinion for the Safford/Tucson grazing program in regard to incidental take anticipated for that program and associated reasonable and prudent measures and terms and conditions.

CONSERVATION RECOMMENDATIONS

Section 2(c) and 7(a)(1) of the Act direct Federal agencies to utilize their authorities to further the purposes of the Act by carrying out conservation programs for the benefit of listed species. Conservation recommendations are discretionary agency activities to minimize or avoid effects of a proposed action on listed species or critical habitat, to help implement recovery plans, or to develop information on listed species. The recommendation provided here does not necessarily represent complete fulfillment of the agency's section 2(c) or 7(a)(1) responsibilities for the

loach minnow. In furtherance of the purposes of the Act, we recommend implementing the following action:

1) The BLM should work with us to implement the recovery plans for spikedace and loach minnow.

2) BLM should develop and implement conservation measures for fire management projects to minimize adverse effects to spikedace and loach minnow critical habitat. These measures would be similar to those outlined in reasonable and prudent measure number 3, term and condition number 1 for the Gila chub, herein.

Chiricahua Leopard Frog

As discussed in the Environmental Baseline, the most likely places for the frog to occur in the RNCA are upper Bonita Creek and associated perennial or nearly perennial creeks, springs, and stock tanks. Specifically, Chiricahua leopard frogs may occur above the City of Safford's infiltration gallery (on Bonita Creek about four miles above the Gila confluence) where non-native fishes are rare or absent and the elevation is within the range of Chiricahua leopard frog sites elsewhere in Arizona and New Mexico. We do not anticipate Chiricahua leopard frogs occur or would be affected by the Gila Box RNCA plan outside of upper Bonita Creek and associated wetlands in its watershed in the RNCA. We assess potential impacts by plan element:

Riparian Area Management

The Gila Box Plan sets target tree-sapling ratios for five segments of Bonita Creek. As we discussed for the Gila chub, maintaining a ratio of at least 50 percent saplings is likely to ensure at least some replacement of older trees. The Chiricahua leopard frog is found in a variety of habitat in regard to riparian vegetation communities; and if present, would likely be unaffected by the structure or composition of the riparian forest. Rather, the frog is dependent on pool habitats, absence of aquatic non-native predators, and other factors.

Adverse effects to the Chiricahua leopard frog and its habitat as a result of livestock grazing and management actions may occur under certain circumstances. These effects are similar to those described for listed fish and include: facilitating dispersal of non-native predators; trampling 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 2002b, Belsky *et al.* 1999, Bartelt 1998**,** Ohmart 1995, Hendrickson and Minckley 1984, Arizona State University 1979, Jancovich *et al.* 1997).

The Bonita Creek, Johnny Creek, and Bullgap allotments border, or in the case of Bonita Creek allotment, includes Bonita Creek and portions of its watershed on the RNCA. As described in the Effects of the Action for the Gila chub, range condition and trends on these allotments

suggest good watershed condition with static or improving trends. The BLM (1993) reported that waters in Bonita Creek are relatively low in turbidity, suggesting minimal erosion from the watershed. We have no other more recent information suggesting these conditions have changed. Under the Gila Box Management Plan, grazing in Bonita Creek would be limited to trailing once or twice per year to move cattle between pastures on the Bonita Creek allotment. Trailing across the creek would occur twice one year and then once the next. The BLM has adopted the conservation recommendations from our fourth reinitiation of the Safford/Tucson Field Offices' programmatic livestock grazing opinion. We believe these measures will minimize effects to streambanks and riparian vegetation. As discussed for the Gila chub, BLM reported in their February 12, 2001, memorandum to us that monitoring after trailing revealed no impacts to riparian vegetation or stream banks. Thus, effects to potential frog habitats in Bonita Creek and its watershed due to livestock grazing are probably relatively minor. We have no information about the condition of habitats at stock tanks or other aquatic sites in the watershed of Bonita Creek, but because grazing is not excluded from these sites, habitat may be degraded at some sites.

Maintenance of viable populations of Chiricahua leopard frog is thought to be compatible with well-managed livestock grazing. Throughout the range of the frog, grazing occurs in most of the frog's habitats. For instance, one large and healthy population of Chiricahua leopard frogs coexists with cattle and horses on the Tularosa River in New Mexico (Randy Jennings, Western New Mexico University, pers. comm. 1995). Throughout their range, Chiricahua leopard frog are often found living in earthen livestock tanks. These tanks are often heavily used by livestock, yet Chiricahua leopard frogs 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.

Sixty-three percent of extant Chiricahua leopard frog localities in Arizona are 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 Chiricahua leopard frogs are present in stock tanks on the Bonita Creek allotments, 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 the frogs 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. As the tank was drying up, several Chiricahua leopard frogs were excavated out of cracks around Walt's Tank on the Coconino National Forest in September 2002. If backhoes or other equipment had been brought in to dredge out the tank at that time, these frogs would have certainly perished.

Vehicle use associated with or facilitated by the grazing program at or near habitats of the frog could result in animals being run over. For instance, a Chiricahua leopard frog was found in September 2002 on Ruby Road in the Pajarito Mountains, Coronado National Forest, Arizona. Frogs were also found at the same time in a pool within 10 feet of the road. (J. Rorabaugh, pers. comm.). Ruby Road is the primary access route for ranchers and others in the mountain range. Frogs on the road could be killed by vehicles. In some populations of leopard frogs, road mortality can significantly reduce populations (Carr and Fahrig 2001).

Chiricahua leopard frogs, 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 bottom of ponds (Harding 1997), where they may be subject to trampling during the winter months.

Chiricahua leopard frogs 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 Chiricahua leopard frogs 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 2002b). 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 (Schuytema 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 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 Chiricahua leopard frog. 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). Any introduced non-native predators would likely prey upon and may eliminate Chiricahua leopard frogs from the site to which the water was hauled.

Recreation and Transportation System Management

BLM proposes a number of specific projects and activities that have the effect of limiting or directing recreational uses to specific areas. Activities that affect upper Bonita Creek are relevant to discussions of potential effects to the Chiricahua leopard frog.

BLM would reduce roads through the bottom of Bonita Creek from 15 miles (the entire reach of Bonita Creek in the RNCA) to about two miles. The majority of these two miles are in lower Bonita Creek, thus Chiricahua leopard frogs and their habitat would only be potentially affected on a short segment of the Red Knolls Canyon/Hackberry Spring Road below the Narrows. Other roads provide access to but not through upper Bonita Creek. This should improve aquatic habitat and associated riparian vegetation in upper Bonita Creek. However, if frogs were 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 the frogs could be on the bottom of pools, which if traversed by a vehicle, could result in death or injury.

Parking areas and trailheads would be provided at the end of the Solomon Pass/Lee Trail Road (the existing parking area would be used, and tables and an information kiosk would be placed there), on the opposite bank from the end of the Jones Road, and on the west bank of where the Red Knolls Canyon/Hackberry Spring Road crosses Bonita Creek (this parking area would be developed on a bench above the creek). A parking area would also be provided at the end of Christiansen Road near the San Carlos Apache Tribal boundary. Visitors would likely use the Christiansen parking area to access and view the Pueblo Devol cliff dwelling. User fees would be phased in, vehicular use would be limited to designated routes only, and brochures, signs, and interpretive kiosks would inform the public of the importance of natural resources and requirements to protect them and follow regulations in the RNCA. All of these proposed activities act to limit and direct recreational activities and would potentially affect Chiricahua leopard frogs and their habitats similarly to the Gila chub and its habitats (see Effects of the Action for the chub).

Hikers and vehicles that pass through Bonita Creek could potentially introduce chytridiomycosis. Chytrid-positive frogs have not been found in the RNCA, but recreationists coming from other parts of the state where chytrids are present could spread the disease to Bonita Creek via mud on vehicle tires, boots, or other means. On the other hand, chytrids could already be present in Bonita Creek, but have yet to be detected.

The risk of human-caused fire associated with public use would be directed to picnic and camping areas where the opportunity for escape of fire into wildlands is low. Fire can potentially result in direct impacts to frogs and indirect adverse effects to their habitat (see Fire Management below). However, directing public use to these relatively fire-safe areas is much less risky than the previous policy whereby people would camp and picnic anywhere along upper Bonita Creek. The risk of wildfire associated with public use is also mitigated by the Fire Management element of the Gila Box Plan.

The effects of all proposed Recreation and Transportation System Management activities on the Chiricahua leopard frog are addressed herein to the project level and require no further consultation unless one of the reinitiation criteria at 50 CFR 402.16 are triggered (see REINITIATION STATEMENT, herein). In particular, if Chiricahua leopard frogs are located within the RNCA, we recommend that reinitiation of consultation be considered.

Cultural Resource Management

Some important cultural sites occur along upper Bonita Creek, including the plumed serpent pictograph and the Pueblo Devol cliff dwelling complex. In regard to the cliff dwellings, BLM proposes to implement public interpretation. For the plumed serpent pictograph, BLM would work with City of Safford to protect and manage the site. We do not know precisely what that would entail, but may include interpretive signing or structures to prevent access to the pictograph. We do not anticipate any effects from cultural resource activities to Chiricahua leopard frogs or their potential habitats beyond placement of signs or posts near Bonita Creek and occasional foot traffic or vehicle access on designated routes. These activities are addressed herein to the project level.

Fish and Wildlife, and Threatened and Endangered Species Management

As described in the Description of the Proposed Action, herein, this plan element would include a variety of monitoring and research activities, public outreach, and working with partners to promote the objectives of the RNCA Plan. The specifics of these activities are lacking; however, the underlying objective is to maintain and/or enhance populations of listed and other priority species. Thus, the net effect should be neutral or beneficial to the Chiricahua leopard frog. Monitoring or research of listed species that involves capture or other forms of take, as defined in section 3(18) of the ESA, will require a permit from us. Issuance of a permit is accompanied by intra-service section 7 review on the issuance of that permit. Thus, project-level consultation, including any anticipating incidental take from these activities, will occur during permit processing.

In regard to habitat enhancement, BLM proposes to plant trees, native shrubs, and vines. Saltcedar and other non-native plants would be controlled where natural processes fail to remove it, and nest boxes would be considered for cactus ferruginous pygmy-owls. Planting of native plants may involve minor disturbance caused by foot or vehicle traffic. The plantings themselves would probably have little or no affect on Chiricahua leopard frogs or their potential habitat. BLM proposes to consult separately on placement of nest boxes; however, we anticipate no significant adverse effects from this activity. The effects of non-native plant control will depend on the extent of infestations and the mechanism of control. Saltcedar removal may involve chemical treatment and chainsaw removal, with temporary disturbance along Bonita Creek and opening of the riparian canopy. Ranid frogs are particularly sensitive to a variety of chemicals (Sparling 2003), and may suffer mortality or other adverse effects from chemical controls. If Chiricahua leopard frogs are found in Bonita Creek, we recommend that BLM consult, as needed, on project-level non-native plant control proposed in the occupied habitat of the frog or immediately downstream of occupied habitat (if frogs are subsequently found in Bonita Creek). Alternatively, BLM could develop a mitigation plan for such projects that would minimize effects to the Chiricahua leopard frog. If this office agrees that the plan minimizes effects, and the project and its effects are consistent with the description of the proposed action and the scope and extent of effects anticipated herein, the project would be covered by this opinion and would require no further consultation unless one or more of the four criteria for reinitiation (see REINITIATION STATEMENT, herein) are triggered.

The feasibility study regarding construction of a fish barrier on Bonita Creek would have no effect on the Chiricahua leopard frog. As discussed for the Gila chub, Bureau of Reclamation has the lead for the fish barrier and the feasibility study is close to completion. Construction of the fish barrier is covered by our Central Arizona Project biological opinion to Bureau of Reclamation and its construction would not require project-specific consultation with the BLM.

Similarly, analyzing with the City of Safford development of a water system to provide long-term security for fishes, leopard frogs, and other organisms, would have no effect on the Chiricahua leopard frog. If actions were proposed in Bonita Creek in support of this concept, and Chiricahua leopard frogs were found in the vicinity of Safford's water system, the BLM should evaluate potential effects of the action and consult with us as needed on project-level effects (50 CFR 402.14).

Water Quality Management

Proposed activities under this Plan element include a variety of management actions to improve and protect water quality on Bonita Creek. All of these activities act to minimize the potential for water quality impacts to potential Chiricahua leopard frog habitat.

Private Lands

The BLM proposes to acquire all privately-owned lands in the RNCA, including City of Safford and other lands along Bonita Creek. Such acquisition would allow those lands to be managed under the objectives of the Plan. Specific management actions are not proposed for acquired

lands; however, management consistent with the rest of Bonita Creek should be beneficial to Chiricahua leopard frogs and their potential habitats. If Chiricahua leopard frogs are found on or in the vicinity of lands targeted for acquisition and BLM acquires those lands, we recommend the BLM present us with a management proposal for those lands, and if we find that the effects are beneficial and otherwise consistent with the findings and conclusions herein, we would consider that management covered under this opinion and no further consultation would be needed.

City of Safford Water System in Bonita Creek

BLM proposes to work cooperatively with City of Safford to provide for their management needs while reducing potential adverse effects to the resources of the RNCA. If BLM is able to work with the City to support the management goals of the RNCA in regard to the City's facilities, the effects of supporting actions would be neutral or beneficial to the Chiricahua leopard frog. The frog probably does not occur below the City's facilities due to presence of non-native fishes. The ephemeral or intermittent reach of Bonita Creek associated with the infitration gallery may impede the movement of non-native fishes from the lower creek into the upper creek. If a fish barrier is constructed, it would serve the same purpose. If Chiricahua leopard frogs are found at or near Safford's infiltration gallery, any specific projects that the BLM proposes with City of Safford to support the management goals of the RNCA should be evaluated by the BLM pursuant to 50 CFR 402.14. Project-level consultation on the frog should occur on these projects as needed.

Research and Education

The objective is to allow research and provide public education. Only projects in upper Bonita Creek or its watershed have any potential to affect Chiricahua leopard frogs. Most would have no effect on the frog, if it is present. We anticipate no more than occasional sign placement, posts, and foot traffic along Bonita Creek associated with proposed interpretive kiosks, signing, brochures, and other public education such projects. Effects from fisheries or other biological research is addressed in Fish and Wildlife, and Threatened and Endangered Species Management above. Effects of cultural resource research is addressed in Cultural Resource Management, above. Other projects not specifically addressed herein should be evaluated by BLM and if needed, project-specific consultation should be conducted.

Fire Management

BLM would develop and implement a prescribed and natural fire plan for the RNCA that would have the objective of improving and protecting the resources of the RNCA. Wildfire would be suppressed as needed, and prescribed fire would be applied to the landscape as needed to meet the objectives of the Gila Box Plan.

As discussed for the Gila chub, fire and subsequent degradation of watershed condition immediately after fires can result in dramatically increased runoff, sedimentation, debris flow that can scour aquatic habitats in canyon bottoms or bury them in debris, and ash flow that can

create toxic conditions. Amphibian communities, including leopard frog populations, can be significantly altered following prescribed fires, and recovery may take 12 or more years post-fire for southern leopard frog (*Rana sphenocephala*) populations (Schurbon and Fauth 2003). Following the 1994 Rattlesnake fire in the Chiricahua Mountains, Arizona, a debris flow filled in Rucker Lake, an historical Chiricahua leopard frog locality. Leopard frogs (either Chiricahua or Ramsey Canyon leopard frogs) apparently disappeared from Miller Canyon in the Huachuca Mountains, Arizona, after a 1977 crown fire in the upper canyon and subsequent erosion and scouring of the canyon during storm events (Tom Beatty, Miller Canyon, pers. comm. 2000). Leopard frogs were historically known from many localities in the Huachuca Mountains; however, natural pool and pond habitat is largely absent now and the only breeding leopard frog populations occur in artificial tanks and ponds. Crown fires followed by scouring floods are a likely cause of this absence of natural leopard frog habitats. In Romero Canyon, Catalina Mountains, Pima County, Arizona, lowland leopard frogs (*Rana yavapaiensis*) and their habitat were severely reduced or eliminated due to runoff and sedimentation following the Aspen Fire in 2003. Loss of occupied habitat also occurred in Buehman Canyon and probably other localities in the Catalina Mountains due to recent catastrophic fires (Wallace 2003). At Saguaro National Park East, similar loss of lowland leopard frog habitat has also occurred due to post-fire sedimentation and ash flow (Don Swann, pers. comm. 2002). Smoke diffusion into water and ash flow can result in high levels of phosphorus and nitrogen (Spencer and Hauer 1991) with potentially toxic effects to frogs.

Suppression of wildfire, as needed, would help prevent these effects from occurring. Prescribed fire should help prevent catastrophic wildfire and subsequent severe damage to watersheds and riparian systems by reducing fuel loads in a controlled situation. However, fire suppression activities or activities during prescribed fires can also affect any frogs in the area, including impacts of placing crew camps and equipment staging areas in or near frog habitats, use of heavy equipment in frog habitats, and decisions made during fire suppression that affect the direction or intensity of wildfire and whether areas on or upstream of frog habitats burn, and if they burn intensely. Fire retardants and foam suppressants used during fire suppression are typically quite toxic to aquatic organisms, including leopard frogs (Calfee and Little 2003).

BLM would manage fire with the objective of improving and protecting the resources of the RNCA. This objective could be met by including specific measures to protect Chiricahua leopard frogs and their potential habitats into fire management planning; however, no such measures were proposed. If Chiricahua leopard frogs are found in Bonita Creek or its watershed, the prescribed and natural fire plan will require further analysis and consultation to fully evaluate potential effects on the frog.

Cumulative Effects

Cumulative effects in the Bonita Creek area were described for the Gila chub and are included here by reference. The majority of lands, and thus most activities in upper Bonita Creek and its watershed are Federal and thus would be the subject of section 7 consultation. The effects of these activities are not considered cumulative. However, extensive private lands occur along upper Bonita Creek. We are not aware of activities that potentially affect Chiricahua leopard

frogs on these lands other than recreation, livestock grazing, and the City of Safford's infiltration gallery and water system. Similar activities upstream on the San Carlos Apache Reservation could also affect frogs in upper Bonita Creek.

CONCLUSION

After reviewing the status of the Chiricahua leopard frog, the environmental baseline for the action area, the cumulative effects, and the anticipated effects of the Gila Box RNCA plan, it is our biological opinion that the proposed action is not likely to jeopardize the continued existence of the Chiricahua leopard frog. No critical habitat has been designated, thus none will be affected. We come to the same conclusions regarding livestock grazing in the RNCA under the Safford/Tucson grazing program.

We present these conclusions based on the following:

6. With the exception of limited trailing, BLM would exclude livestock grazing from Bonita Creek. Upland range conditions and trends along Bonita Creek and water quality in Bonita Creek do not suggest that the Bonita Creek watershed is significantly deteriorated due to grazing or other activities.

7. BLM proposes to nearly eliminate roads and vehicular use through upper Bonita Creek. Elsewhere, vehicles would be limited to designated routes only.

8. BLM proposes to direct potentially damaging recreational activity out of the riparian zone of Bonita Creek.

9. A fire management element to the Gila Box RNCA Plan is proposed that would have the objective of improving and protecting the resources of the RNCA.

10. The BLM has proposed public outreach and education, riparian habitat improvement, land acquisitions in Bonita Creek, working cooperatively with City of Safford to provide for their management needs while reducing potential adverse effects to the resources of Bonita Creek, and other actions that should improve habitat conditions for Chiricahua leopard frogs in Bonita Creek.

INCIDENTAL TAKE STATEMENT

Section 9 of the Act and Federal regulation pursuant to section 4(d) of the Act prohibit the take of endangered and threatened species without special exemption. Take is defined as harass, harm, pursue, hunt, shoot, wound, kill, trap, capture, collect, or 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 behavior patterns, including breeding, feeding, or sheltering. "Harass" is defined (50 CFR 17.3) in the same regulation 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 that include,

but are not limited to, breeding, feeding, or sheltering. "Incidental take" is defined as take of a listed animal species that is incidental to, and not the purpose of, the carrying out of an otherwise lawful activity conducted by the Federal agency or the applicant. Under the terms of sections 7(b)(4) and 7(o)(2) of the Act, 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.

AMOUNT OR EXTENT OF TAKE

Because Chiricahua leopard frogs are currently not known to occur in the RNCA, no incidental take of Chiricahua leopard frogs is anticipated.

CONSERVATION RECOMMENDATIONS

Section 2(c) and 7(a)(1) of the Act direct Federal agencies to utilize their authorities to further the purposes of the Act by carrying out conservation programs for the benefit of listed species. Conservation recommendations are discretionary agency activities to minimize or avoid effects of a proposed action on listed species or critical habitat, to help implement recovery plans, or to develop information on listed species. The recommendations provided here do not necessarily represent complete fulfillment of the agency's section 2(c) or 7(a)(1) responsibilities for the Chiricahua leopard frog. In furtherance of the purposes of the Act, we recommend implementing the following actions:

1. The BLM should attempt to work with the San Carlos Apache Tribe on a watershed-level conservation plan for Bonita Creek with the objective of protecting the watershed and preventing introductions of and controlling non-native fishes, bullfrogs, crayfish, and other exotic organisms.

2. BLM should continue to work with us on developing a recovery plan for the Chiricahua leopard frog, implement emergency interim measures to protect frogs during plan preparation, and help us implement the recovery plan after it is completed.

3. If deemed appropriate by the recovery team, BLM should work with us to re-establish Chiricahua leopard frogs at suitable sites within the RNCA.

4. BLM should develop and implement conservation measures for fire management projects to minimize adverse effects to Chiricahua leopard frogs and their potential habitats on Bonita Creek. These measures would be similar to those outlined in reasonable and prudent measure number 3, term and condition number 1 for the Gila chub, herein.

In order that we be kept informed of actions minimizing or avoiding adverse effects or benefitting listed species or their habitats, we request notification of the implementation of any conservation recommendation.

Deposition of Dead or Injured Listed Animals

Upon finding a dead or injured threatened or endangered animal, initial notification must be made to the Service's Division of Law Enforcement, 2450 W. Broadway Road Suite 113, Mesa, Arizona 85202 (480/835-8289) 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, and any other pertinent information. Care must be taken in handling injured animals to ensure effective treatment and care, and in handling dead specimens to preserve biological material in the best possible condition. If feasible, the remains of intact specimens of listed animal species shall be submitted as soon as possible to the nearest Service or AGFD office, educational, or research institutions (e.g., University of Arizona in Tucson) holding appropriate State and Federal permits.

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

REINITIATION-CLOSING STATEMENT

This concludes formal consultation and conferencing on the proposed Gila Box RNCA plan. 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 maintained (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 that was not considered in this opinion; or (4) a new species is listed or critical habitat designated that may be affected by the action. In instances where the amount or extent of incidental take is exceeded, any operations causing such take must cease pending reinitiation. We recommend reinitiation of consultation if Chiricahua leopard frogs, spikedace, or loach minnow are found within the RNCA, and for some specific projects implemented as part of the plan, as outlined in the Effects of the Proposed Action for each species herein.

In regard to conferencing for the Gila chub, you may ask us to confirm the conference opinion as a biological opinion issued through formal consultation if the chub is listed. The request must be in writing. If we review the proposed action and find that 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 on the project and no further section 7 consultation will be necessary. After listing of the chub and any subsequent adoption of this conference opinion, you are required to request reinitiation of consultation if any of the reinitiation criteria listed above are met.

The incidental take statement for the Gila chub provided herein does not become effective until the species is listed and the conference opinion is adopted as the biological opinion issued

through formal consultation. At that time, the project will be reviewed to determine whether any take of the Gila chub has occurred. Modifications of the opinion and incidental take statement may be appropriate to reflect that take. No take of the Gila chub may occur between the listing of the species and the adoption of the conference opinion through formal consultation, or the completion of a subsequent formal consultation.

We appreciate your interest in furthering the conservation of these species. If we can be of further assistance, please contact Jim Rorabaugh (x238) or Sherry Barrett (520) 670-6150 (x223) of my staff.

/s/ Steven L. Spangle

cc: Regional Director, U.S. Fish and Wildlife Service, Albuquerque, NM (ARD-ES)
Assistant Field Supervisor, Fish and Wildlife Service, Tucson, AZ
State Director, Bureau of Land Management, Phoenix, AZ

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

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