FINAL ENVIRONMENTAL ASSESSMENT

for the

DESIGNATION OF CRITICAL HABITAT

for the

CHIRICAHUA LEOPARD FROG

Prepared by Mangi Environmental Group
For the
Department of Interior
U.S. Fish & Wildlife Service

FINAL ENVIRONMENTAL ASSESSMENT FOR THE DESIGNATION OF CRITICAL HABITAT FOR THE CHIRICAHUA LEOPARD FROG

March 2012

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Summary

The purpose of this environmental assessment (EA) is to identify and disclose the environmental consequences resulting from the Proposed Action of designating critical habitat for the Chiricahua leopard frog (*Lithobates chiricahuensis*), listed as threatened under the Endangered Species Act of 1973 (ESA), as amended. The need for the Proposed Action is to comply with the ESA and with a May 6, 2009 order from the Arizona District Court to designate critical habitat if the Secretary determined such a designation was prudent.

The physical and biological features of critical habitat in stream and riverine lotic (actively moving water) systems are contained within the riverine and riparian ecosystems formed by the wetted channel and adjacent floodplains within 328 lateral ft (100 lateral m) on either side of bankfull stage. The use of bankfull stage and 328 ft (100 m) on either side recognizes the naturally dynamic nature of riverine systems, recognizes that floodplains are an integral part of the stream ecosystem, and contains the features essential to the conservation of the species.

In ponds proposed as critical habitat, most of which are impoundments for watering cattle or other livestock, proposed critical habitat extends for 20 ft (6.1 m) beyond the high water line or to the boundary of the riparian and upland vegetation edge, whichever is greatest. The frogs are commonly found foraging and basking within 20 ft (6.1 m) of the shoreline of tanks. In addition, critical habitat extends upstream from ponds from the extent of the boundary for 328 ft (100 m) from the high water line.

Three alternatives were considered: the No Action Alternative, under which no critical habitat would be designated; Alternative A, Proposed Designation without exclusions; and Alternative B, Proposed Designation with exclusions.

Alternative A consists of 43 units as critical habitat for the Chiricahua leopard frog. All 43 units in Alternative A are within the species' geographical range, including areas occupied at the time of listing and areas not known to be occupied at the time of listing but identified as essential for the conservation of the species. The proposed critical habitat locations are distributed between six different watershed drainage areas within Arizona and New Mexico.

All proposed critical habitat units contain sufficient PCEs to support at least one life-history function. In addition, all but two proposed critical habitat units, units 13 and 17, are currently occupied by Chiricahua leopard frogs. Units 13 and 17 were occupied at the time of listing and currently contain sufficient PCEs to support life-history functions essential for the conservation of the species. These units are needed as future sites for frog colonization or reestablishment and could be restored (e.g., control of nonnative predators) to allow Chiricahua leopard frog persistence with a reasonable level of effort.

The proposed critical habitat designation includes lands under Federal (59%), state (4%), and private (37%) land ownership. Much of the Federal land is managed by the USDA Forest Service, in 5 National Forests: Apache Sitgreaves, Coconino, Coronado, Gila, and Tonto.

Alternative B includes the areas included in Alternative A, minus 1,647 ac (667 ha) of lands that meet the definition of critical habitat would be excluded under section 4(b)(2) of the Act from the final critical habitat rule. The areas that would be wholly or partially excluded are based on considerations outlined in section 4(b)(2) of the Act, and described below for each unit. The exclusions are associated with the following conservation programs: Arizona Game and Fish Department Safe Harbor Agreement; Malpai Borderlands Group Safe Harbor Agreement; Malpai Borderlands Group Habitat Conservation Plan; and established conservation easements.

The environmental issues identified by federal agencies and the public during the initial public comment period and during resource analysis were those raised by the types of actions taken by land management agencies in the region: fire management, water resource management, aquatic habitat restoration, recreation, livestock grazing, other land management and use.

The designation of critical habitat for the Chiricahua leopard frog would not have direct impacts on the environment; designation is not expected to impose land use restrictions or prohibit land use activities. However, the designation of critical habitat would (1) increase the number of additional section 7 consultations for proposed projects within designated critical habitat, (2) increase the number of re-initiated section 7 consultations for ongoing projects within designated critical habitat, (3) maintain Chiricahua leopard frog primary constitutent elements, (4) increase the likelihood of greater expenditures of time and federal funds of government agencies to develop measures to prevent both adverse effects to the species and adverse modification to critical habitat, and (5) indirectly increase the likelihood of greater expenditure of non-federal funds by project proponents to complete section 7 consultations and to develop reasonable and prudent alternatives (as a result of adverse modifications) that maintain critical habitat. Such an increase might occur if there was a federal nexus only to unoccupied units, or from the addition of adverse modification analysis to jeopardy consultations in occupied units.

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ACRONYMS

ADWR	Arizona Department of Water Resources
AGFD	Arizona Game and Fish Department
AMA	Active Management Area
AUM	Animal Unit Month
BLM	U.S. Bureau of Land Management
BMPs	Best Management Practices
BO	Biological Opinion
CAP	Central Arizona Project
CEQ	Council on Environmental Quality
CFR	Code of Federal Regulations
cm	Centimeter
ESA	Endangered Species Act
FEMA	Federal Emergency Management Agency
FHWA	Federal Highway Administration
FONSI	Finding of No Significant Impact
FR	Federal Register
HCP	Habitat Conservation Plan
in	Inch
MRA	Multiple Resource Area
NCA	National Conservation Area
NEPA	National Environmental Policy Act
NMDGF	New Mexico Department of Game and Fish
NRHP	National Register of Historic Places
NWR	National Wildlife Refuge
OHV	Off-highway vehicle
PBFs	Physical and Biological Features
PCEs	Primary Constituent Elements
RU	Recovery Unit
SESA	Southwest Endangered Species Act Team
SHA	Safe Harbor Agreement
TES	Threatened, Endangered, or Sensitive Species
USACE	U.S. Army Corps of Engineers
USDA	U.S. Department of Agriculture
USFS	U.S. Forest Service
USFWS	U.S. Fish & Wildlife Service
USDI	U.S. Department of Interior
USGS	United States Geological Survey
WUI	Wildlife-Urban-Interface

GLOSSARY

Animal Unit Month: Standardized measure of animals used in agricultural purposes. An Animal Unit Month is the amount of forage required by an animal unit for one month.

Bankfull Stage: Level of stream discharge reached just before flows spill out onto the adjacent floodplain.

Channelization: the 'straightening out' of a river or stream that limits its naturally winding course.

Chytridiomycete fungus: a type of aquatic fungus that can infect the skin of amphibans. This fungus is introduced into the United States and has contributed to world wide declines in amphibian species.

Cienegas: mid-elevation wetland communities often surrounded by arid environments. Similar to an oasis.

Effluent: discharge of water or waste into the water system.

Emergent vegetation: plants with roots under water but whose growth is above the water surface.

Ephemeral streams: streams that flow only in response to precipitation events.

Extirpated: locally extinct

Groundwater: water located beneath the earth's surface and often found in specific rock layers.

Habitat Conservation Plan (HCP): a planning document required as part of an application for an incidental take permit from the USFWS. It describes the anticipated effects of the proposed taking; how those impacts will be minimized, or mitigated; and how the HCP is to be funded. HCPs can apply to both listed and nonlisted species, including those that are candidates or have been proposed for listing.

Intermittent streams: streams that that flow seasonally or only in certain reaches (usually as a result of channel connection to groundwater)

Macrophyte: an aquatic plant that grows in or near water and is either emergent, submergent, or floating.

Metapopulation: a set of local populations that interact via individuals moving between local populations

Oviposition: the process of laying eggs

Perennial stream: stream that flows year-around.

Primary Constituent Elements (PCE): The elements of physical and biological features that, when laid out in the appropriate quantity and spatial arrangement to provide for a species' life-history processes, are essential to the conservation of the species.

Recharge: water that filters into the earth and replenishes groundwater supplies.

Riparian: at the interface between land and a river or stream.

Safe Harbor Agreement (SHA): a voluntary agreement involving private or other non-Federal property owners whose actions contribute to the recovery of species listed as threatened or endangered under the Endangered Species Act (ESA). The agreement is between cooperating non-Federal property owners and the U.S. Fish and Wildlife Service. In exchange for actions that contribute to the recovery of listed species on non-Federal lands, participating property owners receive formal assurances from the Service that if they fulfill the conditions of the SHA, the Service will not require any additional or different management activities by the participants without their consent. In addition, at the end of the agreement period, participants may return the enrolled property to the baseline conditions that existed at the beginning of the SHA.

Thermoregulation-an organism's process of maintaining a specific body temperature in a variety of external conditions.

Transitory Habitat: habitat that is not permanent

Trick Tanks: a water device for livestock or wildlife. The tank collects precipitation in a covered tank that helps to minimize evaporation and maintain adequate water quality

Tubercles: hard wart-like projections on the skin of the Chiricahua leopard frog

CHAPTER 1
PURPOSE OF AND NEED FOR ACTION

1.1 Introduction

The United States Department of the Interior (USDI), Fish and Wildlife Service (Service) has prepared this Environmental Assessment (EA) to analyze the potential effects on physical and biological resources and social and economic conditions that may result from the designation of critical habitat for the Chiricahua leopard frog (*Lithobates chiricahuensis*), listed as threatened under the Endangered Species Act of 1973 (ESA), as amended. The proposed rule to designate critical habitat for the Chiricahua Leopard Frog was published in the Federal Register on March 15, 2011 (76 FR 14126). This EA is used by the Service to decide whether critical habitat will be designated as proposed, if the proposed action requires refinement, or if further analyses are needed through preparation of an Environmental Impact Statement. If the proposed action is selected as described or with minimal changes and no further environmental analyses are needed, a Finding of No Significant Impact (FONSI) would be prepared. This EA has been prepared pursuant to the requirements of the National Environmental Policy Act of 1969 (NEPA) as implemented by the Council on Environmental Quality (CEQ) regulations 40 Code of Federal Regulations (CFR) Part 1500 et seq. and USDI NEPA procedures.

The Service published a proposed rule to list the Chiricahua leopard frog as threatened in the Federal Register on June 14, 2000 (65 FR 37343). The Service published a final rule listing the species as threatened on June 13, 2002 (67 FR 40790). Included in the final rule was a special rule (*see* 50 CFR 17.43(b)) to exempt operation and maintenance of livestock tanks on non-Federal lands from the section 9 take prohibitions of the Endangered Species Act of 1973, as amended (16 U.S.C. 1531 *et seq.*). In a May 6, 2009 order from the Arizona District Court, the Secretary of the Interior was required to publish a critical habitat prudency determination for the Chiricahua leopard frog and, if found prudent, a proposed rule to designate critical habitat by December 8,2010. Because of unforeseen delays related to species taxonomic issues, which required an inclusion of a threats analysis, the Service requested a 3-month extension to the court-ordered deadlines for both the proposed and final rules. On November 24, 2010, the extension was granted and new deadlines of March 8, 2011, for the proposed rule and March 8, 2012, for the final rule were established for submitting the critical habitat rules to the Federal Register. The proposed rule was published in accordance with the Arizona District Court's ruling.

1.2 Purpose and Need of the Action

Preservation of the habitat of an endangered species is a crucial element for the conservation of that species. A primary purpose of the ESA is to "provide a means whereby the ecosystems upon which endangered species and threatened species may be conserved" (section 2[b]). The purpose of critical habitat designation as specified in the ESA is to provide protection of habitat that is essential to the conservation of listed species. The purpose of this action is to designate critical habitat for the leopard frog, a species listed as endangered under the ESA. Critical habitat designation identifies geographic areas that are essential for conservation of the leopard frog and

that may also require special management. The designation also describes the physical and biological features that constitute critical habitat, known as the primary constituent elements (PCEs).

This action complies with the ESA and with a May 6, 2009 order from the Arizona District Court to designate critical habitat if the Secretary determined such a designation was prudent. Habitat protection and management is needed for the conservation of the leopard frog, as the species is now limited primarily to headwater streams and springs, and livestock tanks into which nonnative predators (e.g., sportfishes, American bullfrogs, crayfish, barred tiger salamanders) have not yet invaded or been introduced, or where the numbers of nonnative predators are low and habitats are complex.

1.3 Proposed Action

The Proposed Action consists of 43 units to be designated as critical habitat for the Chiricahua leopard frog. These critical habitat areas constitute the Service's current best assessment of areas that meet the definition of critical habitat for the species. All 43 units in the Proposed Action (Alternative A) are within the species' geographical range, including areas occupied at the time of listing and areas not known to be occupied at the time of listing but identified as essential for the conservation of the species. All proposed critical habitat units contain sufficient PCEs to support at least one life-history function. In addition, all but two proposed critical habitat units, units 13 and 17, are currently occupied by Chiricahua leopard frogs. Units 13 and 17 were occupied at the time of listing and currently contain sufficient PCEs to support life-history functions essential for the conservation of the species. These units are needed as future sites for frog colonization or reestablishment and could be restored (e.g., control of nonnative predators) to allow Chiricahua leopard frog persistence with a reasonable level of effort. The proposed units are described briefly in section 2.2, and incorporated here by reference to the proposed critical habitat rule (76 FR 14126).

1.4 Background

1.4.1 Critical Habitat

1.4.1.1 Provisions of the ESA

Section 4(a)(3) of the ESA states that critical habitat shall be designated to the maximum extent prudent and determinable and that such designation may be revised periodically as appropriate. Section 4(b)(2)of the ESA requires that critical habitat designation be based on the best scientific information available and that economic and other impacts must be considered. Areas may be excluded from critical habitat designation if it is determined that the benefits of exclusion outweigh the benefits of inclusion, unless failure to include the areas in critical habitat would result in the extinction of the species. In section 3(5)(A) of the ESA, critical habitat is defined as (i) the specific areas within the geographical area occupied by a species, at the time it is listed in accordance with the provisions of section 4 of the ESA, on which are found those physical or

biological features (1) essential to the conservation of the species and (2) which may require special management considerations or protection; and (ii) specific areas outside the geographical area occupied by a species at the time it is listed in accordance with the provisions of Section 4 of the Act, upon the determination by the Secretary of the Interior that such areas are essential for the conservation of the species. Section 3(5)(C) also states that critical habitat "shall not include the entire geographic area which can be occupied by the threatened or endangered species," except when the Secretary of the Interior determines that the areas are essential for the conservation of the species.

1.4.1.2 Section 4(b)(2) Exclusion Process

Section 4(b)(2) of the ESA allows the Secretary of the Interior to exclude any area from the critical habitat designation after considering the economic, national security, or other relevant impacts of designating the area or if the Secretary determines that the benefit of excluding the area exceeds the benefit of designating it as critical habitat, unless the exclusion would result in the extinction of the species. After reviewing public comment on the critical habitat proposal on this EA and on the draft economic analysis, and after reviewing the final versions of this EA and the economic analysis, the Secretary could determine to exclude areas other than those addressed in this EA. This is as provided for in ESA section 4(b)(2) and in implementing regulations at 50 CFR Part 424.19.

1.4.1.3 Section 7 Consultation Process

Section 7(a)(2) of the ESA requires federal agencies to consult with the Service to "insure that any action authorized, funded, or carried out by such agency is not likely to jeopardize the continued existence of any endangered species or threatened species or result in the destruction or adverse modification of habitat of such species which is determined to be critical." Each agency is required to use the best scientific and commercial data available. This consultation process is typically referred to as *section 7 consultation*. Section 7 of the ESA does not apply to state, local, or private land unless there is a federal nexus (i.e., federal funding, authorization, or permitting). Designation of critical habitat can help focus conservation efforts by identifying areas that are essential for the conservation of the species. Designation of critical habitat also serves to alert the public and land-managing agencies to the importance of an area for conservation of a listed species. As described above, critical habitat receives protection from destruction or adverse modification through required consultation under section 7 of the ESA. Aside from outcomes of consultation with the Service under section 7, the ESA does not automatically impose any restrictions on lands designated as critical habitat. The section 7 consultation process begins with a determination of the effects on a listed species and designated critical habitat by a federal action agency (Figure 1). If the federal action agency determines that there would be no effect on listed species or designated critical habitat, then the section 7 process concludes at that point. If the federal action agency determines that listed species or designated critical habitat may be affected, then consultation with the Service is initiated. Once it is determined that the proposed federal action may affect a listed species or critical habitat, the federal action agency and the Service typically enter into informal section 7 consultation. Informal consultation is an optional process for identifying affected species and critical habitat,

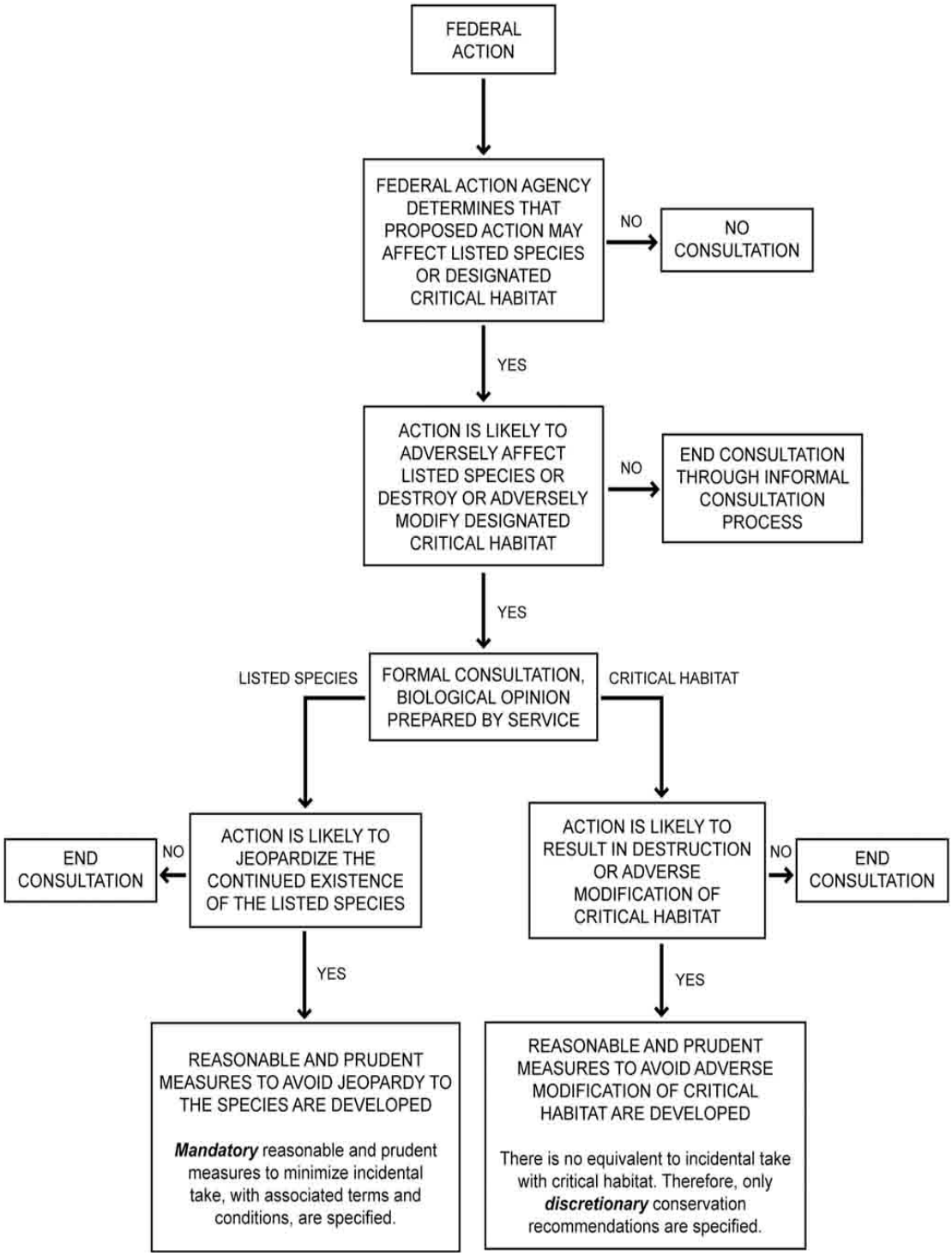

Figure 1. Simplifed Diagram of the ESA Section 7 Process

determining potential effects, and exploring ways to modify the action to remove or reduce adverse effects on listed species or critical habitat (50 CFR Part 402.13). During this process the Service may make suggestions concerning project modifications, which then can be adopted by

the action agency. If the action agency decides to further modify the project as suggested by the Service, the Service would then concur in writing or recommend formal consultation.

The informal section 7 consultation process concludes in one of two ways: (1) the Service concurs in writing that the proposed action is not likely to adversely affect listed species or critical habitat or (2) the Service determines that adverse impacts are likely to occur. Formal consultation is initiated when it is determined that the proposed federal action is likely to adversely affect listed species or critical habitat (50 CFR Part 402.14). Formal consultation concludes with a biological opinion issued by the Service on whether the proposed federal action is likely to jeopardize the continued existence of a listed species or to destroy or adversely modify critical habitat (50 CFR Part 402.14[h]) (Figure 1 simplifies the end of the process by stating "End Consultation"; more precisely, consultations are formally concluded with the issuance of the Biological Opinion). Independent analyses are made under both the jeopardy and the adverse modification standards. The jeopardy analysis evaluates potential impacts on the species, while the adverse modifications analysis specifically evaluates potential impacts on designated critical habitat.

The Ninth Circuit Court recently determined that there is an additional difference between the two standards. In *Gifford Pinchot Task Force v. United States Fish and Wildlife Service*, 378 F.3d 1059 (9th Cir. 2004), the court held that while the jeopardy standard concerns the survival of a species or its risk of extinction, the adverse modification standard concerns the value of critical habitat for the recovery, or eventual delisting, of a species. As pointed out in the Ninth Circuit decision, survival of a species and recovery (or conservation) of a species are distinct concepts in the ESA. Implementation of the two standards, therefore, involves separate and distinct analyses based on these concepts. In light of the Gifford Pinchot decision, the Service no longer relies on the regulatory definition of "destruction of adverse modification" of critical habitat at 50 CFR 402.02. Instead, the Service relies on the statutory provisions of the ESA to complete the analysis with respect to critical habitat. The potential for destruction or adverse modification of critical habitat by a federal action is assessed by determining the effects of the proposed federal action on primary constituent elements (PCEs) of habitat qualities that are essential to the conservation of the species. These anticipated effects are then analyzed to determine how they will influence the function and conservation role of the affected critical habitat. This analysis provides the basis for determining the significance of anticipated effects of the proposed federal action on critical habitat. The threshold for destruction or adverse modification is evaluated in the context of whether the critical habitat would remain functional to serve the intended conservation role for the species.

Critical habitat is defined in section 3(5)(A) of the ESA as those areas that are essential for conservation of the species, and the definition of conservation includes species recovery.
An activity adversely affecting critical habitat must be of a severity or intensity that the PCEs are compromised to the extent that the critical habitat can no longer meet its intended conservation function before a destruction or adverse modification determination is reached. Within the context of the goals and purposes of the recovery strategy in the species' recovery plan, an activity that compromises the PCEs to the point that one or more of the recovery criteria could not be achieved or would be very difficult to achieve in one or more recovery units would

deteriorate the value of critical habitat to the point that its conservation function could not be met.

A “nonjeopardy” or “no adverse modification” opinion concludes consultation, and the proposed action may proceed under the ESA. The Service may prepare an incidental take statement with reasonable and prudent measures alternatives to minimize take and associated, mandatory terms and conditions that describe the methods for accomplishing the reasonable and prudent measures alternatives. Discretionary conservation recommendations may be included in a biological opinion based on the effects on the species. Conservation recommendations, whether they relate to the jeopardy or adverse modification standard, are discretionary actions recommended by the Service. These recommendations may address minimizing adverse effects on listed species or critical habitat, identifying studies or monitoring, or suggesting how action agencies can assist species under their own authorities and section 7(a)(1) of the ESA. There are no ESA section 9 prohibitions for critical habitat. Therefore, a biological opinion that concludes no destruction or adverse modification of critical habitat may contain conservation recommendations but would not include an incidental take statement, reasonable and prudent alternatives, or other terms and conditions. In a biological opinion that results in a jeopardy or adverse modification conclusion, the Service develops mandatory reasonable and prudent alternatives to the proposed action. Reasonable and prudent alternatives are actions that the federal agency can take to avoid jeopardizing the continued existence of the species or adversely modifying the critical habitat. Reasonable and prudent alternatives may vary from minimal project changes to extensive redesign or relocation of the project, depending on the situations involved. Reasonable and prudent alternatives must be consistent with the intended purpose of the proposed action, and they also must be consistent with the scope of the federal agency’s legal authority. Furthermore, the reasonable and prudent alternatives must be economically and technically feasible. A biological opinion that results in a jeopardy finding, based on effects on the species, may also include an incidental take statement, reasonable and prudent measures alternatives, terms and conditions, and conservation recommendations. A biological opinion that results in an adverse modification finding (but no jeopardy to the species) may include reasonable and prudent alternatives and conservation recommendations but no incidental take statement or associated reasonable and prudent measures alternatives and terms and conditions.

1.4.2 Chiricahua Leopard Frog

The following briefly summarizes key information about the physical and biological features (PBFs) of the Chiricahua leopard frog and primary constituent elements (PCEs) that determine its critical habitat. For more detail, and for a description of the species and information about its life history, habitat, and distribution, consult the final listing rule (67 FR 40790) and the proposed critical habitat designation (76 FR 14126), which are herein incorporated by reference.

Figure 2: Chiricahua Leopard Frog

1.4.2.1 Physical and Biological Features for the Chiricahua Leopard Frog

In determining which areas to propose as critical habitat within the geographical area occupied at the time of listing, the Service considered the physical and biological features (PBFs) essential to the conservation of the species that may require special management considerations or protection. The specific PBFs required for the Chiricahua leopard frog are derived from the studies of this species' habitat, ecology, and life history as described below. These needs are identified in the species' recovery plan (USFWS 2007a). These PBFs include, but are not limited to:

(1) Space for individual and population growth and for normal behavior;

(2) Food, water, air, light, minerals, or other nutritional or physiological requirements;

(3) Cover or shelter;

(4) Sites for breeding, reproduction, or or development of offspring; and

(5) Habitats that are protected from disturbance or are representative of the historical, geographical, and ecological distributions of a species.

1.4.2.2 Primary Constituent Elements for the Chiricahua Leopard Frog

Under the Act and its implementing regulations (50 CFR §424.12), the Service is required to identify the physical and biological features essential to the conservation of the Chiricahua leopard frog in areas occupied at the time of listing, focusing on the features' primary constituent elements (PCEs). The Service considers primary constituent elements to be the elements of

physical and biological features that, when laid out in the appropriate quantity and spatial arrangement to provide for a species' life-history processes, are essential to the conservation of the species.

Based on the above needs and the Service's current knowledge of the life history, biology, and ecology of the species, and the habitat requirements for sustaining the essential life-history functions of the species, the Service has determined that the PCEs essential to the conservation of the Chiricahua leopard frog are:

(1) Aquatic breeding habitat and immediately adjacent uplands

(2) Dispersal and non-breeding habitat, consisting of areas with ephemeral (water present for only a short time), intermittent, or perennial water that are generally not suitable for breeding, and associated upland or riparian habitat that provides corridors (overland movement or along wetted drainages) for frogs among breeding sites in a metapopulation

Specific descriptions of both aquatic breeding habitat and metapopulations are found in the final listing rule (67 FR 40790). With the exception of impoundments, livestock tanks, and other constructed waters, critical habitat does not include manmade structures (such as buildings, aqueducts, runways, roads, and other paved areas) and the land on which they are located existing within its legal boundaries.

Under Service regulations, we are required to identify the PCEs within the geographical area occupied by the Chiricahua leopard frog at the time of listing that are essential to the conservation of the species and which may require special management considerations or protections. The PCEs are laid out in a specific spatial arrangement and quantity determined to be essential to the conservation of the species. All proposed critical habitat units are within the species' historical geographical range in the United States and contain sufficient PCEs to support at least one life-history function. In addition, all but two proposed critical habitat units, units 13 and 17, are currently occupied by Chiricahua leopard frogs. Units 13 and 17 were occupied at the time of listing and currently contain sufficient PCEs to support life-history functions essential for the conservation of the species. These units are needed as future sites for frog colonization or reestablishment and could be restored (e.g., control of nonnative predators) to allow Chiricahua leopard frog persistence with a reasonable level of effort.

1.5 Permits Required for Implementation

No permits are required for critical habitat designation. Designation of critical habitat occurs through a rule-making process under the Administrative Procedures Act (5 U.S.C. §551–59, 701–06, 1305, 3105, 3344, 5372, 7521) and the ESA.

1.6 Related Laws, Authorizations, and Plans

Related provisions of the ESA require federal agencies to consult with the Service when there are potential effects to endangered or threatened species, independent of critical habitat. The ESA also prohibits any person from "taking" the species without a permit from the Service. Other federal laws address various aspects of conservations of fish and wildlife and their habitat,

which apply to the Chiricahua leopard frog. The Lacey Act (16 USC §3371 et seq.), as amended in 1982, prohibits the import, export, sale, receipt, acquisition, purchase, and engagement in interstate or foreign commerce of any species taken, possessed, or sold in violation of any law, treaty, or regulation of the United States, and Tribal law, or any law or regulation of any state. The Federal Land Policy Management Act of 1976 (43 USC §1701 et seq.) and the National Forest Management Act of 1976 (16 USC §1600 et seq.) direct federal agencies to prepare programmatic-level management plans to guide long-term resource management decisions. In addition, the Forest Service (USFS) is required to manage habitat to maintain viable populations of existing native and desired nonnative vertebrate species in planning areas (36 CFR §219.19). These regulations have resulted in the preparation of a variety of land management plans by the USFS and the Bureau of Land Management (BLM) that address management and resource protection of areas that support, or in the past supported, populations of Chiricahua leopard frogs. In addition, the Arizona Game and Fish Department (AGFD) consider these fish species as Wildlife of Special Concern in Arizona, and state regulations prohibit collection of or fishing for these fish in Arizona except under special permit.

1.7 Issues and Concerns from Public Comments

The following issues and concerns associated with the designation of critical habitat were identified through comments received during the public comment period (March 16, 2011 through May 16, 2011) on the proposed rule (76 FR 14126):

- Designation of critical habitat on private lands would impact private land uses. Specifically, concerns were expressed that the designation would:
    - Result in or impose limits to grazing on private ranchlands
    - Discourage ranchers from conducting voluntary activities that would support leopard frogs (this issue was raised generally as well as specifically for the Rosemont and North Tanks on the Magoffin Ranch)
    - Restrict the uses of land and water rights in ways that impact the ability of agricultural producers to earn a living
    - Reduce property values

- Designation of critical habitat at Peña Blanca Lake is incompatible with its recreational purpose. The role of the lake for recreational sportfishing, and the resulting stocking activities, are incompatible with the maintenance of PCEs; beyond that, the lake is not necessary for the conservation of the species.

- Designation will limit public access to areas throughout the designation

- Since frogs thrive in warmer temperatures, designation could limit stream restoration activities that lower water temperature on impaired waters (Clean Water Act, section 303(d))

- Concerns were raised on both sides of whether critical habitat unit 8 should be expanded to include areas where leopard frogs have historically occupied. This unit sits near to the proposed Rosemont copper mine, which the U.S. Forest Service is currently reviewing.

- Designation is currently insufficient and should be expanded in recognition of the scope and severity of threats on the landscape as well as provide for the conservation of the species into the future.

1.8 Topics Analyzed in Detail in this Environmental Assessment

Based on issues raised during the comment period for the proposed rule to designate critical habitat for the Chiricahua leopard frog, as well as during internal scoping within the Service, several resources were identified as potentially affected by the proposed designation. These resources, which are analyzed in Chapter 3.0 of this EA, are as follows:

- Water Resources (including water management projects and groundwater pumping)
- Wetlands and Floodplains
- Fish, Wildlife, and Plants (including other special-status species)
- Land Use and Management
- Fire Management
- Construction (roads, bridges, dam repairs)
- Recreation (including sport fishing)
- Socioeconomics
- Livestock Grazing

1.8.1 Mandatory Topics Dismissed from Detailed Analysis

Federal regulations (40 CFR §1500 et seq.) require that certain topics be addressed as part of a NEPA analysis. The Service reviewed the mandatory topics listed below and determined that the proposed action has no potential to affect them. These topics have been dismissed from detailed analysis in this document because designation of critical habitat for the leopard frog is likely to have no or, at most, negligible effect on them.

- *Energy requirements and conservation potential (1502.16)*. Additional section 7 consultations resulting from critical habitat designation of the leopard frog may require a very small increase in energy consumption in the form of fuel for vehicles used for fence construction and other conservation actions. Relative to energy requirements for the overall management of the affected federal, state, and county lands, this increase is anticipated to be negligible.
- *Natural or depletable resource requirements and conservation potential (1502.16).* No natural or depletable resources (e.g., oil, gas, coal, or other minerals) would be lost as a result of designating critical habitat for the leopard frog.
- *Urban quality and design of the built environment (1502.16)*. The proposed critical habitat segments are not located in urban or other built environments and would not affect the quality of such environments.
- *Prime and unique agricultural lands (1508.27)*. Prime agricultural land is defined (7 U.S.C. 4202(a)) as land that has the best combination of physical and chemical characteristics for producing food, feed, forage, fiber, and oilseed crops and is also available for these uses. Unique agricultural land is defined as land other than prime farmland that is used for the production of specific high-value food and fiber crops (e.g.,

citrus, tree nuts, olive, cranberries, fruits, and vegetables). Two proposed critical habitat units contain prime agricultural land: Unit 3, which is located at Buenos Aires NWR in Pima County, AZ; and Unit 15, in Hidalgo, NM, less than 5 miles (8 km) from the Mexican border. As part of the NWR, the lands contained within Unit 3 are not currently farmed, and would remain conservation lands for listed species with habitats within. Unit 15 is less than 0.5 acres (0.2 ha) of private farmland currently occupied by a robust but isolated frog population, and designated for critical habitat because of an elevated concrete tank. Actions to restore or replace this tank would not convert farmland. Further, regulations for the Farmland Protection Policy Act (7 CFR 658.2) exclude Federal permitting and licensing activities ("program activities") on private lands, so consultations triggered by critical habitat designation would have no impact on this prime agricultural land. For these reasons, this topic is dismissed from further consideration.

- *Important scientific, archeological, and other cultural resources, including historic properties listed in or eligible for the National Register of Historic Places (NRHP) (1508.27).* The proposed designation would not result in any ground-disturbing activities that have the potential to affect archeological or other cultural resources. There are several NRHP-listed historical sites within, or within close range of, critical habitat units:
    1. Mimbres Valley Multiple Resource Area (MRA): Portions of this MRA are within 500 m of designated stream reaches within Unit 40. This site contains historic structures built from 1869-1937.
    2. Silver Peak Lookout Complex (Unit 17). This is a national forest fires lookout complex for the Southwestern Region TR.
    3. Portal Ranger Station (Unit 17)--a Depression-Era USDA Forest Service Administrative Complexes
    4. Atascosa Lookout House (Unit 5)--also in Coronado National Forest

  While these sites are each no more than 1.5 miles (2.4 km) from the nearest critical habitat boundary, potential conservations measures or project modifications to protect critical habitat PCEs also would not modify or pose risk of harm to any historic properties listed in or eligible for the National Register of Historic Places.
- *Ecologically critical areas, Wild and Scenic Rivers, or other unique natural resources (1508.27).* The closest Wild and Scenic River is about 7.5 miles (12.1 km) southwest of the Buckskin Hills Spring and Doren's Defeat Tank in Unit 23, therefore designation of critical habitat for the Chriciahua leopard frog would not affect the resource values of the Verde River. Additionally, the designation of critical habitat for the leopard frog would not affect the eligibility of other streams for Wild and Scenic River status.
- *Public health and safety (1508.27).* These topics are not analyzed in detail in this EA because the potential for effects from designation of critical habitat are very small. Nonetheless a slight possibility exists that public safety issues may arise with effects on fire management, and construction or modification of roads, bridges, and dams.
- *Climate change.* The Chiricahua leopard frog Recovery Plan describes the anticipated effects of climate change on the Chiricahua leopard frog (USFWS 2007a). While climate models are not certain about the specific regional impacts of climate change, precipitation in the American Southwest, the habitat of the Chiricahua leopard frog, is expected to decrease. A decrease in water resources is also expected to occur based on a predicted decrease of snowpacks and subsequent runoff in the mountains that surround critical habitat units. This variability in snowpack resulting in a decreased net runoff onto

leopard frog critical habitat would be expected to reduce groundwater recharge and therefore spring discharge, which is essential leopard frog habitat. While there have not been any obvious trends in rainfall during the summer months in the affected area, there has been a regional and severe multi-year drought within the region which seems to be related to La Niña events. Chiricahua leopard frog populations have likely been affected by these droughts.

Anthropogenic water supplies such as stock tanks would also be affected. With an increasing drought frequency, the stock tanks dry up for long periods during the summer. This is the period that is important in breeding and dispersal of the species and the period when at least half of the precipitation within the range of the leopard frog occurs. Chiricahua leopard frogs can withstand somewhat prolonged drying periods due to their evolutionary history in the American Southwest. If the drying period were to increase, leopard frog populations may be forced to migrate to areas with more consistent wet-dry cycles, including areas not designated as critical habitat;potentially endangering future populations. Shifts in occupied habitat may also increase detrimental effects by forcing the leopard frog to compete with additional aquatic species. Further discussion of the impact of climate change on leopard frog habitat can be found in the final rule designating critical habitat.

Federal mandates on Climate Change

The Council on Environmental Quality (CEQ) released draft guidance in 2010 that explains climate change impact analysis from proposed actions that create greenhouse gases (CEQ 2010). A threshold of 25,000 metric tons of carbon dioxide equivalent emissions from a action was proposed as the trigger to further quantitative analysis. A designation of critical habitat units does not create or develop projects that produce emissions, and therefore would not be subject to quantitative analysis.

The US Department of the Interior (USDOI) released Secretarial Order 3289 in 2010 which details two additional departmental actions to mitigate climate change: (1) DOI Carbon Storage and (2) DOI Carbon Footprint (DOI 2010). The DOI Carbon Storage project was created to develop methodologies for geologic and biologic carbon sequestration. The US Geological Survey (USGS) is the lead agency for research while additional agencies within the department are cooperating agencies. The DOI Carbon Footprint project has the goal of developing a unified greenhouse gas emission reduction program to mitigate climate change activities. DOI has created Climate Change Response Centers to conduct impact analysis and data collection for the program. Specific Landscape Conservation Cooperatives would work with the Centers by supplying the on-the-ground data derived from each specific locale.

In addition to these two projects, Secretarial Order 3289 also states that avoidance of climate change and mitigation of its effects should also be addressed by prioritizing the development of renewable energy (DOI 2010). BLM has separately published programmatic EISs for solar and wind energy development on its managed lands (BLM 2005; BLM 2011a). While currently there are no plans for solar or wind energy

development that overlap with proposed critical habitat units, future projects could spur section 7 consultations if they had the potential to adversely affect critical habitat.

The Forest Service issued a document titled "Climate Change Considerations in Project Level NEPA Analysis" in 2009, to guide the analysis of climate change for future projects (USFS 2009). It discusses the two types of effects of climate change: (1) the effect of the proposed action on climate change. As stated above, the designation of critical habitat units would not impact climate change as it would not initiate or implement projects that produce greenhouse gas emissions; (2) the effect of climate change on the proposed action. Expected shifts in rainfall patterns are an example of such an effect, and would have the potential to affect Chiricahua leopard frog critical habitat units. The Forest Service would conduct its own NEPA climate change analysis of its proposed actions, as appropriate.

Therefore, while it is anticipated that climate change will continue to affect leopard frog critical habitat though alteration of rainfall cycles and increased frequency and duration of drought, the designation of critical habitat itself will neither create impacts to climate change (since it does not initiate or implement projects that create emissions) nor contribute to the expected adverse impacts of climate change on critical habitat (since it would not contribute to the changes in temperature or hydrologic cycles). To the extent that designation of habitat contributes to the maintenance of PCEs, it may produce beneficial impacts by improving the resilience of PCEs to the adverse impacts of climate change.

1.9 Decision to be Made

Critical habitat is designated in a federal rule-making process that includes publication of notices for the draft and final rule in the *Federal Register*. The draft rule notice solicits public comment. The final rule notice include responses to comments received. The decision to be made by the Assistant Secretary of the Department of the Interior is whether to designate critical habitat for the Chiricahua leopard frog and, if so, according to which of the alternatives described in Chapter 2.

CHAPTER 2
ALTERNATIVES, INCLUDING THE NO ACTION ALTERNATIVE

This section describes the alternatives for critical habitat designation for the Chiricahua leopard frog. For the purposes of this EA, alternatives provide a clear basis for choice by the decision-maker and the public for critical habitat designation, as described in Chapter One, which can be summarized as providing protection of habitat that is essential to the conservation of *Lithobates chiricahuensis.*

2.1 Development of Alternatives

In developing the action alternatives, the Service based their decisions on the best scientific and commercial data available in determining areas within the geographical area occupied at the time of listing that contain the features essential to the conservation of the Chiricahua leopard frog, and areas outside of the geographical area occupied at the time of listing that are essential for the conservation of the species. In addition, the Service consulted the report by the Southwest Endangered Species Act Team, entitled "Considerations for Making Effects Determinations and Recommendations for Reducing and Avoiding Adverse Effects" (SESA 2008). The Service also considered all comments received from agencies and the public on the proposed rule for designating critical habitat for the leopard frog.

Critical habitat units are proposed for designation based on sufficient PCEs being present to support the Chiricahua leopard frog's life processes. Some units contain both PCEs 1 and 2 and support multiple life processes. Some units contain one of the PCEs or only the potential to develop PCEs necessary to support the Chiricahua leopard frog's particular use of that habitat. In most cases, aquatic sites within metapopulations contain both PCEs 1 and 2. Isolated aquatic sites contain only PCE 1, and dispersal corridors only contain PCE 2, or a reasonable potential to develop those PCEs.

Based on the above criteria, the Service developed three alternatives for impact analysis:

- No Action Alternative
- Alternative A, Critical habitat designation with no exclusions
- Alternative B, Critical habitat designation with Exclusion Areas (Preferred Alternative)

The Service also considered additional alternatives that were considered but not carried forward for further analysis. Rationale for why these alternatives were removed from further consideration is provided in in section 2.5 of this EA.

2.2 No Action Alternative

The No Action Alternative would be no designation of critical habitat for the leopard frog. An analysis of a No Action Alternative is required by NEPA, and provides a baseline for analyzing

effects of the action alternatives. However, if no critical habitat were designated for this species, the Service would not be meeting the requirements of the ESA and would be operating counter to the May 6, 2009, order of the U.S. District Court for Arizona. Analysis of this alternative describes the existing environment and consequences that are anticipated as a result of the proposed listing status of the species, without the designation of critical habitat from the 2011 proposed rule (76 FR 14126). Therefore, this alternative would have no substantial impacts beyond those already incurred from the listing of the leopard frog as threatened on June 13, 2002 (67 FR 40790).

2.3 Alternative A—Critical Habitat Designation with no exclusions

Alternative A consists of 43 units as critical habitat for the Chiricahua leopard frog. The proposed critical habitat areas constitute the Service's current best assessment of areas that meet the definition of critical habitat for the species. All 43 units in Alternative A are within the species' geographical range, including areas occupied at the time of listing and areas not known to be occupied at the time of listing but identified as essential for the conservation of the species (Platz and Mecham 1984, p. 347.1). All proposed critical habitat units contain sufficient PCEs to support at least one life-history function. In addition, all but two proposed critical habitat units, units 13 and 17, are currently occupied by Chiricahua leopard frogs. Units 13 and 17 were occupied at the time of listing and currently contain sufficient PCEs to support life-history functions essential for the conservation of the species. These units are needed as future sites for frog colonization or reestablishment and could be restored (e.g., control of nonnative predators) to allow Chiricahua leopard frog persistence with a reasonable level of effort.

The occupancy and approximate area of each critical habitat unit are shown in Table 1. The 43 areas proposed as critical habitat in Alternative A are summarized here by recovery unit. Full descriptions and maps of each unit are available in the proposed critical habitat rule, published on March 15, 2011 (76 FR 14126) and the Notice of Availability for this Environmental Assessment, which contains minor revisions (76 FR 58441), and incorporated here by reference.

Generally, the physical and biological features of critical habitat in lotic (stream and riverine) systems are contained within the 100 year floodplain and adjacent habitat within 328 lateral ft (100 lateral m) on either side of bankfull stage.

Ephemeral drainages (containing water for only brief periods) proposed as critical habitat are important dispersal corridors among breeding sites in metapopulations. Although less visually distinctive, ephemeral drainages will still be defined by wetland plant species, denser or taller specimens of upland species, channel characteristics such as sandy or gravelly soils that contrast with upland soils, the presence of cut banks, or some combination of these. Where dispersal corridors cross uplands, proposed critical habitat is 328 ft (100 m) wide, the centerline of which is the line delineated on the critical habitat maps and legal descriptions.

In ponds proposed as critical habitat, most of which are stock tanks (impoundments) for watering cattle or other livestock, proposed critical habitat extends for 20 ft (6.1 m) beyond the high water line or to the boundary of the riparian and upland vegetation edge, whichever is greatest. The frogs are commonly found foraging and basking within 20 feet of the shoreline of tanks. In addition, proposed critical habitat extends upstream from ponds from the extent of the boundary

for 328 ft (100 m) from the high water line. The proposed critical habitat extends to 328 ft (100 m) upstream because there is often a riparian drainage coming into the tank, and the frogs are likely moving along those drainages. Also, the high water line is defined as that water level which, if exceeded, results in overflow of the pond. In most cases, this is the elevation of the spillway in livestock impoundments.

TABLE 1. Proposed critical habitat units for the Chiricahua leopard frog

[Area estimates reflect all land within critical habitat unit boundaries. Note that grazing allotments are not considered in private ownership.]

Critical Habitat Unit	Land Ownership by Type Acres (Hectares)			Size of Unit in Acres (Hectares)	Currently Occupied?
	Federal	State	Private		
(1) Twin Tanks and Ox Frame Tank	0	1.3 (0.5)	0.4 (0.2)	1.7 (0.7)	Yes
(2) Garcia Tank	0.7 (0.3)	0	0	0.7 (0.3)	Yes
(3) Buenos Aires NWR Central Tanks	1,720 (696)	0	0	1,720 (696)	Yes
(4) Bonita, Upper Turner, and Mojonera Tanks	201 (81)	0	0	201 (81)	Yes
(5) Sycamore Canyon	262 (106)	0	7 (3)	268 (108)	Yes
(6) Peña Blanca Lake and Spring and Associated Tanks	202 (82)	0	0	202 (82)	Yes
(7) Florida Canyon	4 (2)	0	0	4 (2)	Yes
(8) Eastern Slope of the Santa Rita Mountains	172 (70)	0	14 (6)	186 (75)	Yes
(9) Las Cienegas National Conservation Area	1,235 (500)	186 (75)	0	1,420 (575)	Yes
(10) Pasture 9 Tank	0	0	0.5 (0.2)	0.5 (0.2)	Yes
(11) Scotia Canyon	70 (29)	0	0	70 (29)	Yes
(12) Beatty's Guest Ranch	0	0	10 (4)	10 (4)	Yes
(13) Carr Barn Pond	0.6 (0.3)	0	0	0.6 (0.3)	No
(14) Ramsey and Brown Canyons	58 (24)	0	65 (26)	123 (50)	Yes

(15) High Lonesome Well	0	0	0.4 (0.2)	0.4 (0.2)	Yes
(16) Peloncillo Mountains	366 (148)	0	289 (117)	655 (265)	Yes
(17) Cave Creek	234 (95)	0	92 (37)	326 (132)	No
(18) Leslie Creek	26 (11)	0	0	26 (11)	Yes
(19) Rosewood and North Tanks	0	78 (31)	19 (8)	97 (39)	Yes
(20) Deer Creek	17 (7)	69 (28)	34 (14)	120 (48)	Yes
(21) Oak Spring and Oak Creek	27 (11)	0	0	27 (11)	Yes
(22) Dragoon Mountains	74 (30)	0	0	74 (30)	Yes
(23) Buckskin Hills	232 (94)	0	0	232 (94)	Yes
(24) Crouch, Gentry, and Cherry Creeks, and Parallel Canyon	334 (135)	64 (26)	6 (3)	404 (163)	Yes
(25) Ellison and Lewis Creeks	83 (34)	0	15 (6)	99 (40)	Yes
(26) Concho Bill and Deer Creek	17 (7)	0	0	17 (7)	Yes
(27) Campbell Blue and Coleman Creeks	174 (70)	0	0	174 (70)	Yes
(28) Tularosa River	335 (135)	0	1,575 (637)	1,910 (772)	Yes
(29) Deep Creek Divide Area	408 (165)	0	102 (41)	510 (206)	Yes
(30) Main Diamond Creek	14 (6)	0	40 (16)	54 (22)	Yes
(31) Beaver Creek	132 (54)	0	25 (10)	157 (64)	Yes
(32) Left Prong of Dix Creek	13 (5)	0	0	13 (5)	Yes
(33) Rattlesnake Pasture Tank and Associated Tanks	59 (24)	0	0	59 (24)	Yes
(34) Coal Creek	7 (3)	0	0	7 (3)	Yes
(35) Blue Creek	24 (10)	0	12 (5)	37 (15)	Yes
(36) Seco Creek	66 (27)	0	610 (247)	676 (273)	Yes
(37) Alamosa Warm Springs	0.2 (0.1)	25 (10)	54 (22)	79 (32)	Yes
(38) Cuchillo Negro Warm Springs and Creek	3 (1)	3 (1)	23 (9)	28 (12)	Yes

(39) Ash and Bolton Springs	0	0	49 (20)	49 (20)	Yes
(40) Mimbres River	0	0	1,097 (444)	1,097 (444)	Yes
(41) Kerr Canyon	19 (8)	0	6 (2)	25 (10)	Uncertain
(42) West Fork Gila River	177 (72)	0	0	177(72)	Yes
(43) South Fork Palomas Creek	23 (9)	0	106 (43)	129 (52)	Yes
Total	**6,790 (2,750)**	**426 (173)**	**4,251 (1,721)**	**11,466 (4,644)**	

Note: Area sizes may not sum due to rounding.

2.4 Alternative B—Critical Habitat Designation with Exclusion Areas

Alternative B includes the areas identified in Alternative A, minus the areas identified in Table 2 that would be wholly or partially excluded based on considerations outlined in section 4(b)(2) of the Act, as described for each unit. The exclusions are associated with the following conservation programs:

- Arizona Game and Fish Department Safe Harbor Agreement
- Malpai Borderlands Group Safe Harbor Agreement
- Malpai Borderlands Group Habitat Conservation Plan
- Established conservation easements

Table 2 below provides approximate areas (1,647 ac (667 ha)) of lands that meet the definition of critical habitat but for which the Service is considering possible exclusions under section 4(b)(2) of the Act from the final critical habitat rule. Detailed descriptions of the reasons for proposed exclusion for each unit are found in the proposed designation (76 FR 14126) and in the the Final Rule.

TABLE 2. Exemptions and areas considered for exclusion by critical habitat unit, based on section 4(b)(2) of the Endangered Species Act

Unit	Specific Area to be Considered for Exclusion	Area Meeting the Definition of Critical Habitat in the Unit (Acres (Hectares))	Possible Exclusion in Acres (Hectares)
10	Pasture 9 Tank	0.5 (0.2)	0.5 (0.2)
12	Beatty's Guest Ranch	10 (4)	10 (4)
14	Ramsey Canyon Preserve	123 (50)	16 (6)
16	Canoncito Ranch	655 (265)	289 (117)
17	Southwest Research Station	326 (132)	92 (37)
19	Magoffin Ranch	97 (39)	97 (39)
36	Ladder Ranch	676 (274)	610 (247)
38	Ladder Ranch	29 (11)	23 (9)
40	Mimbres River Preserve	1,097 (444)	510 (206)
43	Ladder Ranch	129 (52)	106 (43)
Totals		**3,037 (1,229)**	**1,753 (710)**

2.5 Alternatives Considered but Dismissed from Further Analysis

2.5.1 Development of Conservation Agreements

The development of conservation agreements with agencies and private landowners to gain similar protection to that afforded by designation of critical habitat would preclude the need to designate critical habitat. Such conservation agreements would have to be negotiated with numerous federal and state agencies, local governments, Native American Tribes, and private landowners in two states, and conservation efforts would have to be implemented or in progress. The development of a multistate, multiagency, multi-watershed conservation agreement(s) involving a large number of private landowners would be difficult to develop, costly to implement, and subject to litigation. No such efforts were underway during the 2011 proposed rule development nor are any proposed in the foreseeable future. It is unlikely that such a

conservation agreement could be developed or implemented before the statutory time frame for completing the designation process or completing the NEPA process. Therefore, this alternative was rejected, because it is deemed to be impractical.

2.5.2 Land Acquisition or Conservation Easements

The time required and the cost of acquiring lands in fee title or obtaining conservation easements for approximately 11,467 acres (4,644 ha) of habitat protection would exceed the time and current funding available for this action. Therefore, this alternative was rejected, because it is deemed to be impractical.

2.6 Comparison of Potential Impacts of Chiricahua Leopard Frog Proposed Critical Habitat Designation

TABLE 3. Comparison of Potential Impacts of Chiricahua Leopard Frog Proposed Critical Habitat Designation

Resource	No Action	Alternative A—Proposed Rule with no exclusions	Alternative B—Proposed Rule with Exclusion Areas
Water Resources	No impact beyond those conservation measures resulting from the listing of the C. leopard frog and associated requirements of section 7, ESA	• Compared with No Action Alternative, a small increase in new and reinitiated section 7 consultations, including USFS lands in the unoccupied Carr Barn Pond unit • Addition of adverse mod analyses to section 7 consultations that would be undertaken for the species • Minor impacts from delays, increased costs, or project alterations resulting from additional section 7 consultations, including species monitoring, mapping,	• Minor impacts similar to Alternative A, but fewer consultations because of fewer units of CH • Beneficial impacts roughly equivalent to Alternative A, owing to conservation easements or agreements on excluded units

		surveying • Minor beneficial impacts on water resources due to increased conservation measures to help conserve PCEs and natural stream hydrology and geomorphology	
Wetlands and Floodplains	No impact beyond those conservation measures resulting from the listing of the C. leopard frog and associated requirements of section 7, ESA	• Compared with No Action Alternative, a small increase in new and reinitiated section 7 consultations, including USFS lands in the unoccupied Carr Barn Pond unit Addition of adverse mod analyses to section 7 consultations that would be undertaken for the species • Minor impacts from delays, increased costs, or project alterations resulting from additional section 7 consultations, including species monitoring, mapping, surveying • Minor beneficial impacts on wetlands and floodplains due to increased conservation measures to help conserve PCEs and integrity of riparian ecosystems, including wetlands and floodplain resources	• Minor impacts similar to Alternative A, but fewer consultations because of fewer units of CH • • Beneficial impacts roughly equivalent to Alternative A, owing to conservation easements or agreements on excluded units

Natural Resources: Fish, Wildlife, Plants, Biological Communities	No impact beyond those conservation measures resulting from the listing of the C. leopard frog and associated requirements of section 7, ESA.	• Compared with No Action Alternative, a small increase in new and reinitiated section 7 consultations, including USFS lands in the unoccupied Carr Barn Pond unit • Addition of adverse mod analyses to section 7 consultations that would be undertaken for the species • Likely beneficial impacts on wildlife that use riparian habitats and especially C. leopard frog, from proposed project modifications to conserve frog habitat	• Minor impacts similar to Alternative A, but fewer consultations because of fewer units of CH • • Beneficial impacts roughly equivalent to Alternative A, owing to conservation easements or agreements on excluded units
Land Use & Management	No impact beyond those conservation measures resulting from the listing of the C. leopard frog and associated requirements of section 7, ESA.	• Compared with No Action Alternative, a small increase in new and reinitiated section 7 consultations, including USFS lands in the unoccupied Carr Barn Pond unit Addition of adverse mod analyses to section 7 consultations that would be undertaken for the species • Minor impacts from delays, increased costs, or project alterations resulting from additional section 7 consultations,	• Minor impacts similar to Alternative A, but fewer consultations because of fewer units of CH • • Beneficial impacts roughly equivalent to Alternative A, owing to conservation easements or agreements on excluded units

		including species monitoring, mapping, surveying • Likely beneficial impacts on C. leopard frog, from proposed project modifications to conserve frog habitat	
Fire Management	No impact beyond those conservation measures resulting from the listing of the C. leopard frog and associated requirements of section 7, ESA.	• Compared with No Action Alternative, a small increase in new and reinitiated section 7 consultations, including USFS lands in the unoccupied Carr Barn Pond unit Addition of adverse mod analyses to section 7 consultations that would be undertaken for the species • Minor impacts from delays, increased costs, or project alterations resulting from additional section 7 consultations, including species monitoring, mapping, surveying	• Minor impacts similar to Alternative A, but fewer consultations because of fewer units of CH • Beneficial impacts roughly equivalent to Alternative A, owing to conservation easements or agreements on excluded units
Construction/Development	No impact beyond those conservation measures resulting from the listing of the C. leopard frog and associated requirements of section 7,	• Compared with No Action Alternative, a small increase in new and reinitiated section 7 consultations, including USFS lands in the unoccupied Carr Barn Pond unit Addition of adverse mod analyses to section 7 consultations that would be	• Minor impacts similar to Alternative A, but fewer consultations because of fewer units of CH • • Beneficial impacts roughly equivalent to Alternative A.

	ESA.	undertaken for the species • Minor impacts from delays, increased costs, or project alterations resulting from additional section 7 consultations, including limiting use on trails, relocated whole or parts of construction projects, and changing the time and/or duration of a construction project.	
Recreation	No impact beyond those conservation measures resulting from the listing of the C. leopard frog and associated requirements of section 7, ESA	• Minor impacts from project alterations or potential limitations on recreational access resulting from additional section 7 consultations	• Minor impacts from project alterations or potential limitations on recreational access resulting from additional section 7 consultations, less than Alternative A
Socioeconomics	No impact beyond those conservation measures resulting from the listing of the C. leopard frog and associated requirements of section 7, ESA	• Minor impacts from delays, increased costs, or project alterations resulting from additional section 7 consultations o Incremental consultation costs of $1.3M, or $115K/yr o Minor costs to small entities	• Minor impacts from delays, increased costs, or project alterations resulting from additional section 7 consultations, less than Alternative A o Incremental consultation costs of $1.06 M, or $93.3K/yr o Minor costs to small entities
Livestock Grazing	No impact beyond those conservation measures	• Compared with No Action Alternative, a small increase in new	• Minor impacts similar to Alternative A, but fewer consultations

	resulting from the listing of the C. leopard frog and associated requirements of section 7, ESA.	and reinitiated section 7 consultations, including USFS lands in the unoccupied Carr Barn Pond unit Addition of adverse mod analyses to section 7 consultations that would be undertaken for the species • Minor impacts from delays, increased costs, or project alterations resulting from additional section 7 consultations, including permanent or temporary fencing, and maintenance of stream bank stability. • Likely beneficial impacts on C. leopard frog, from proposed project modifications to conserve and create the frog's habitat.	because of fewer units of CH • Beneficial impacts roughly equivalent to Alternative A.

CHAPTER 3
AFFECTED ENVIRONMENT AND ENVIRONMENTAL CONSEQUENCES

3.1 Introduction

This chapter is organized by resource categories that may potentially be affected by designating critical habitat for the Chiricahua leopard frog. These resource categories were selected based on issues and concerns identified by the Service in the June, 2000 final rule listing the species (65 FR 37343) and in the March 2011 proposed critical habitat rule (76 FR 14126). Within each resource category, a description of the existing condition and threats is followed by an evaluation of potential environmental consequences resulting from the designation of critical habitat. Potential effects are evaluated for each alternative described in Chapter 2, including the No Action Alternative.

Under the No Action Alternative, no critical habitat would be designated for the Chiricahua leopard frog.

Alternative A is described in the 2011 proposed rule and in Chapter 2.1.2 above. It includes the units being considered for exclusion. Under Alternative A, approximately 11,136 acres (4,510 hectares) are proposed as critical habitat in 40 units.

Alternative B is described in Chapter 2.1.3 above. It excludes parts or all of the nine units under consideration for exclusion, as described in the proposed rule. These excluded areas total 1,647 acres (667 hectares), bringing the total designation in Alternative B to 9,488 acres (3,841 hectares).

3.1.1 Methodology

Descriptions of the affected environment presented in Sections 3.2 through 3.10 of this document are based on a number of sources. These include:

- Published literature
- Available state and federal agency reports and management plans
- Final listing rule for the Chiricahua leopard frog (65 FR 37343)
- Current proposed rule for designating critical habitat for the Chiricahua leopard frog (76 FR 14126)
- Biological opinions issued by the Service relative to potential impacts on the Chiricahua leopard frog
- Formal section 7 consultations conducted since the species was listed
- Service-issued biological opinions for other species with multispecies consultations that included the Chiricahua leopard

- The 2011 final economic analysis for the proposed designation of critical habitat (IEc 2011).

The designation of critical habitat imposes no universal rules or restrictions on land use, nor does it automatically prohibit or alter any land use or water development activity. With respect to critical habitat, the purpose of section 7 consultation is to ensure that federal actions of federal agencies do not adversely modify critical habitat. The Service is working to update the regulatory definition of adverse modification since it was invalidated by a prior court ruling. In the meantime, the working definition is that provided by the Director's December 9, 2004 Memorandum, *Application of the "Destruction or Adverse Modification" Standard under Section 7(a)(2) of the Endangered Species Act.* This memo explains that the goal of a section 7 analysis of a Federal action is to determine if the "critical habitat would remain functional (or retain the current ability for the primary constituent elements to be functionally established) to serve the intended conservation role of the species…" (p.3).

Individuals, organizations, local governments, states, and other nonfederal entities are potentially affected by the designation of critical habitat only if their actions have a connection to federal actions—a nexus—that is, only if those actions occur on federal lands, require a federal permit or license, or involve federal funding.

Critical habitat designation generally increases the potential for more Section7 consultations, both reinitiated and new, with their associated costs and outcomes. Designating critical habitat is likely to result in formal consultations over and above those required for a listed species with no designated critical habitat. Federal action agencies may consult on project activities they otherwise would not have consulted on because the affected habitat was thought to be unoccupied by or unsuitable for the listed species. Likewise, project proponents that are not involved with recovery efforts for the species have not requested consultations for actions that may affect the species, but may do so after critical habitat is designated due to increased awareness of the species presence in an area based on delineation of critical habitat. For the leopard frog, discussion with several action agencies (U.S. Forest Service, BLM, Army Corps of Engineers, and the Rural Utilities Service) has suggested that no new consultations are likely in occupied areas, because these agencies are already aware of the presence of the leopard frog, and the agencies already account for dispersal habitat when they consult for jeopardy (IEc, 2011).

In addition, activities proposed in Units 13 & 17, which are currently unoccupied by the leopard frog, will now require consultation due to the designation of critical habitat. These two areas include the Cave Creek area and Carr Barn Pond, both in Cochise County, Arizona. Private lands in the Cave Creek area are being considered for exclusion because they are enrolled in a Safe Harbor Agreement. Federal lands in the Cave Creek area and all of Carr Barn Pond are managed by the USDA Forest Service and will now require consultation for proposed actions related to fire management, fire suppression, and habitat restoration. These additional consultations are impacts from the designation of critical habitat.

One of these unoccupied sites, Unit 17 (Cave Creek), is located within the critical habitat for the Mexican spotted owl. This means that future consultations for the spotted owl will also need to consider adverse modification for leopard frog PCEs.

Also, reinitiation of previously conducted consultations may result from new information, guidance, or clarification provided in the critical habitat proposal. The following is a list of representative types of consultations that might be reinitiated. These include, but would not be limited to, the following:

- USDA Forest Service—
    - Forest plans and travel management plans
    - Grazing allotment Management Plans
    - Fire Management Plans
- Bureau of Reclamation—Water deliveries to the Gila River Basin in AZ and NM
- Bureau of Land Management
    - Programmatic Livestock Grazing Program
    - Aquatic species conservation
    - Wildland Fire Use Management Areas
    - Resource Management Plans
    - Land Use Plan Amendments for Fire, Fuels and Air Quality Management
- Natural Resource Conservation Service—Altar Valley Fire Management Plan
- US Fish & Wildlife Service
    - Incidental Take Permits for 3 Safe Harbor Agreements
    - Enhancement of Survival Permits to AZ and NM Game & Fish Departments
    - NWR plans:
        - Buenos Aires NWR Habitat Management & Fire Management Plans
        - Implementation of Fire Management Plan
        - Wildlife and Sportfish Restoration Program
        - Statewide sportfish consultations for AZ and NM
- Department of Homeland Security
    - Tower projects—multiple Areas of Operation

Examples of Federal actions that may affect the Chiricahua leopard frog include dredge-and-fill activities, grazing programs, construction and maintenance of stock tanks, logging and other vegetation removal activities, management of recreation, road construction, fish stocking, issuance of rights-of-way, prescribed fire and fire suppression, and discretionary actions authorizing mining.

The Service cannot predict with certainty or detail what the effects of new, expanded, or reinitiated section7 consultations would be. However, the record of past conservation measures and consultations provides some basis for predicting what kinds of actions would be subject to consultation and the outcome of those consultations. Since 2002, 59 formal consultations that addressed adverse effects to the Chiricahua leopard frog have been conducted in Arizona, and 11 in New Mexico (many of which also addressed effects to other listed species). It is assumed that future consultations would be near the same magnitude as past consultations, with a potential increase in consultations in the limited areas not currently occupied by the leopard frog. No consultation for the Chiricahua leopard frog has ever resulted in a determination of jeopardy.

The evaluation of impacts in this chapter focuses on costs and outcomes of the potential increase in section 7 consultations resulting from the designation of critical habitat for the leopard frog. Impacts of increased consultations may include the following:

- Additional expenditures of time and money by federal agencies, including the Service, and nonfederal proponents to complete the consultations.
- Additional time and costs to implement the reasonable and prudent alternatives and (possibly) discretionary conservation recommendations specified in biological opinions in which adverse modification was concluded.
- Additional time and costs to implement conservation measures to minimize effects that are part of an agency's proposed action or implement possible reasonable and prudent measures if incidental take is anticipated.
- A greater probability that the PBFs identified in section 1.4 would be maintained. The requirement to consult on activities that may adversely modify designated critical habitat may cause action agencies and project proponents to alter their proposals to reduce, minimize, or avoid impacts on PBFs. Such alterations may obviate the need for consultation. If a consultation is initiated, then the outcome of critical habitat designation could be the modification of the proposal to limit the impacts on PBFs or the imposition of reasonable and prudent alternatives that would reduce impacts on PBFs.

For the purposes of this evaluation, it is assumed that designation of critical habitat protects PBFs for the Chiricahua leopard frog (e.g., aquatic breeding habitat, adequate water quality, vegetative cover, nonnative predator control, dispersal habitat) as a result of section 7 consultation or of project modifications made in anticipation of or to avoid section 7 consultation. Benefits of these protections extend indirectly to other components of interconnected ecosystems. Critical habitat exclusion areas (e.g., covered by other conservation agreements) may also be protective of PBFs. In some cases the resource discussion generally applies to all of the proposed units; in other cases, more specificity may be warranted and the discussion and impact assessment is specifically tied to proposed units.

3.1.2 Economic Analysis

A separate analysis was conducted by Industrial Economics Incorporated (IEc 2011) to assess the potential economic effects of measures to protect the spikedace and loach minnow and their habitat in the proposed critical habitat areas. Dollar estimates of future economic impacts take into account all of the conservation activities related to the Chiricahua leopard frog predicted to occur in the proposed critical habitat areas over the next 20 years, not just those attributable to designation of critical habitat. This EA addresses only those impacts that are directly or indirectly attributable to the designation of critical habitat and does not predict impacts associated with future economic impacts. Where appropriate, information from the economic analysis was incorporated into this EA.

3.2 Water Resources

3.2.1 Existing Conditions

The Chiricahua leopard frog's range of habitats includes many natural and man-made water bodies, ranging in elevation from 3,281 and 8,890 feet (1000-2710 meters). These include rivers, streams, intermittent streams that feature permanent pools, wetlands in the region (known as cienegas), springs, livestock talks, wells, and ponds. Critical habitat designation is proposed because the life cycle of these frogs is heavily reliant on the habitat in which they live and breed. The eggs and larvae exist only in aquatic environments and adults are primarily aquatic, relying on aquatic vegetation for egg deposition, thermoregulation, and foraging sites (DOD 2009).

Watersheds (surface and groundwater)

The proposed critical habitat locations are distributed between 6 different watershed drainage areas (Figure 3) within Arizona and New Mexico. Each of the watershed drainage areas has specific characteristics unique to that particular location. Surface water features are illustrated in the unit maps, contained in the Appendix.

Critical Habitat units 2-5, 16, 18, and 19 are located in the Sonora watershed. The Sonora watershed, also known as the Rio Bavispe, occurs mainly in Mexico although its northern reaches cross the border into Arizona and New Mexico. In total it drains about 10,042 square miles of land (26,008 km^2) (ADWR 2010a).

Critical habitat units 1, 6-14, and 20-22 are located in the Middle Gila watershed, which drains an area of approximately 5,425 square miles (14,051 km^2) of land. Its largest river and the single largest tributary to the Gila River in this area, the San Pedro River has its headwaters near Cananea Mexico (ADWR No Date[a]). The Middle Gila is designated as the portion of the Gila River below the Coolidge Dam. The State of Arizona's Department of Water Resources (ADWR) has two planning areas within the Middle Gila region that monitor and record water sourcing and usage. Units 1-6 are located in the Santa Cruz Active Management Area (AMA). Water demands here have increased mainly due to population increases. From 2001-2005, agricultural water withdrawals accounted for 58 percent of the total water demand while municipal and industrial withdrawals accounted for 35 percent and 7 percent respectively (groundwater and surface water withdrawal monitoring are combined in the Santa Cruz AMA, thus separate figures are not available). There are two large (500 acre-feet capacity and greater) reservoirs located within the Santa Cruz AMA. Patagonia Reservoir is located on the Sonoita Creek and much of the area is protected as the Sonoita Creek State Natural Area. The second major reservoir is the Peña Blanca. It is located on the Peña Blanca River, also within Santa Cruz County (ADWR 2010b).

Although units 7-14 and 20-22 are located in the Middle Gila watershed, they are incorporated into the Southeastern Arizona Planning Area. Eight counties are included in this planning area, but only 6 contain proposed critical habitat areas. Annually 515,100 acre-feet of water are used here for agricultural, industrial, and municipal services. About 84 percent of the water harvested is groundwater, and the majority of it is used for agricultural purposes. Units 11-14 are concentrated along the upper portion of the San Pedro River drainage area. Groundwater levels

here have declined in recent years and this region has the highest population concentration in Cochise County (ADWR 2010b; ADWR 2010c).

River water diversions occur in this watershed mainly for agricultural purposes. In addition, however, the Cananea copper mine in Sonora, Mexico extracts significant quantities of groundwater for its operations and then pumps it into the Rio Sonora River Basin, likely contributing to the decline in groundwater levels (CEC 1999; Harris et al. 2001). The Gila and the San Pedro waters are diverted based on the season and availability of flow. When river flow is not sufficient, groundwater withdrawals increase to fill the shortfall. Surface waters in the Middle Gila watershed are fully appropriated and subject to adjudication.

Units 17, 27-35, 41, and 41 are located in the Upper Gila River Basin. This basin drains approximately 12,890 square miles (33,385 km^2) in southeast Arizona and southwest New Mexico. The Upper Gila is considered to be the segment of the Gila River that sits above the Coolidge Dam at the San Carlos Reservoir and contains a total of about 1/5 of the total Gila watershed. The Upper Gila River Basin located within Arizona is considered to be a part of the Southeastern Arizona Planning Area as described above (ADWR No Date[b]). Units 28-31, 35, 41 and 42 are located in New Mexico, thus are not part of the Arizona planning area. The Gila River in New Mexico is the only river in the state that is not dammed. During summer months withdrawals for irrigation cause periodic drying episodes along the river (TNC 2008).

Unit 15, as well as units 36, 38-40, and 43 are located in the Rio Grande-Mimbres watershed. This drainage area is a part of the larger Rio Grande drainage system. The Mimbres sub-division drains about 5,140 square miles (13,313 km^2) of land compared to the total Rio Grande watershed which drains 182,200 square miles (471,896 km^2). The Mimbres River is the largest stream with its headwaters in the Mimbres Mountains, in the northern region of the basin (NMWRRI 2010).

One Unit, 37, is located in the Rio Grande-Elephant Butte watershed. This drainage area occurs over 12,900 square miles (33,411 km^2) of land. The Middle Rio Grande Conservancy District was established here to monitor aquifer withdrawals in the region (USGS 2002).

Units 28-31, 41, and 42 are located in Catron County New Mexico, the largest county in the state. The total surface and groundwater withdrawal was about 21,000 acre-feet in 1990, most of it for irrigation. Approximately 87 percent of the water used was sourced as surface water. The major sources of surface water are the San Francisco, Gila, and Tularosa Rivers (USGS 1996).

In general, groundwater withdrawals in southwestern New Mexico greatly exceed recharge rates. The majority of the withdrawals are for agricultural purposes and it is estimated that one year of groundwater pumping removes 240 years of accumulated recharge (Trauger and Doty No Date).

Critical habitat units 23-25 are located entirely in the Salt River Basin. The headwaters of this basin are located at the confluence of the Salt River Basin and the Gila River. The watershed drains approximately 5,980 (15,488 km^2) square miles of land, and is the largest tributary region to the Gila River. This region is managed by the ADWR and is considered a part of the greater Phoenix Management Area. There are four dams on the Salt River that impound water for agricultural, municipal, and industrial use. The Roosevelt is the largest, with a storage capacity of 1,336,700 acre-feet. This is followed by the Apache at 245,000 acre-feet and the Saguaro

containing 69,800 acre-feet. The smallest of the four dams is the Canyon, which holds 57, 900 acre-feet of water. These dams are operated by the Salt River Project (ADWR No Date[c]).

Recent Consultations

Since 2000, there have been a total of about 75 section 7 consultations involving the leopard frog that resulted in a Biological Opinion in Arizona and New Mexico, each of which resulted in a *no jeopardy* determination. A recent reinitiation of a consultation specifically addressing the leopard frog and water resources by the Service occurred in 2011 and resulted in a Biological Opinions (BO) of no jeopardy. A BO for the reinitiation of section 7 consultation for the Buenos Aires National Wildlife Refuge Fire Management Plan 2005-2008 for the 2011 season resulted in no jeopardy. Conservation measures to reduce impacts at the sole site of potential leopard frog populations, short-term impacts from ash/sediment flows, and leopard frog reproductive potential were all determined to be sufficient practices/mitigations for any impact on the population in the area.

USFS completed a consultation in 2010 that also resulted in a no-jeopardy BO for the Apache-Trout Enhancement Project. This project proposed use of a pesticide within the stream to target and eliminate non-native species. It was determined after a survey that no frogs, tadpoles, and/or eggs were present in the treatment area since the project began in 2002.

The USACE completed a section 7 consultation for a section 404 permit to restore the Gila River at Apache Grove. A BO of no jeopardy was concluded based on the low likelihood of leopard frog encounters during the construction period as well as proposed conservation measures that would be used in the project area.

The FHWA consulted the Service in 2011 seeking a BO for the Control Road Bridge Replacements in Gila County, AZ. No jeopardy was determined for the leopard frog because of conservation measures such as scheduling construction around the monsoon season, which lessened the likelihood larvae or frogs disersing into the action area. In addition, the FHWA agreed to monitor the population at the construction site to determine the likelihood of dispersal.

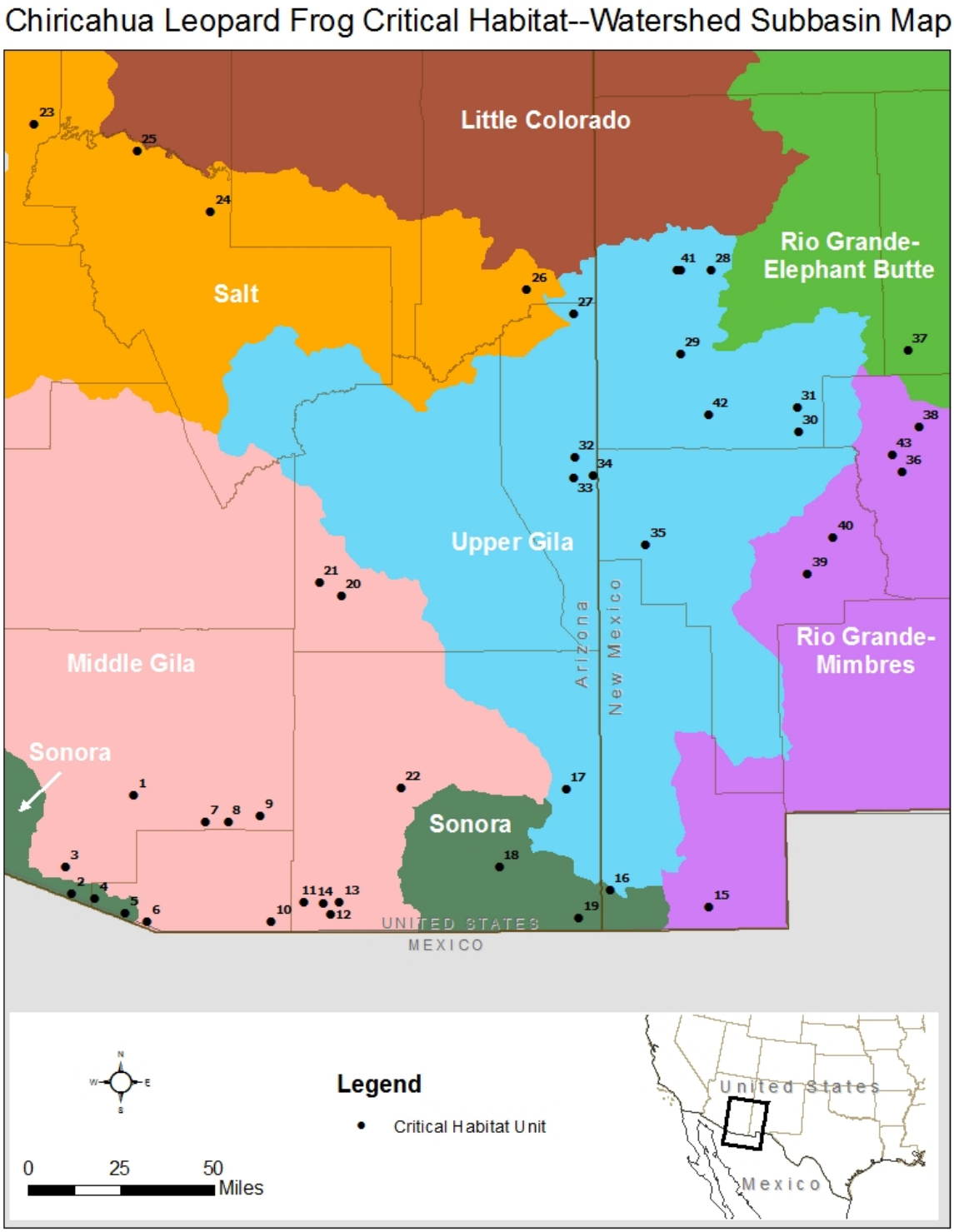

Figure 3. Watershed Subbasins with Proposed Critical Habitat Units

Water Rights

Water rights in Arizona are based on the doctrine of prior appropriation, meaning "first in time, first in right." The ADWR is responsible for ensuring appropriate supplies are available to the public for all uses. The four categories of water in Arizona include Colorado River water, all other surface waters outside of the Colorado River, groundwater, and effluent. To control the overdraft of groundwater supplies, the Arizona Ground Water Management Code (Code) was passed in 1980. In addition to controlling overdraft, the Code also allocates groundwater resources and increases water supply development. Surface water rights are attached to the landowner and any changes in use must be approved by the ADWR (BLM 2001a).

New Mexico follows the same doctrine of prior appropriation with regards to water rights. Surface and groundwater appropriation and distribution are controlled by the State Engineer, who is appointed by the Governor. Any changes to water rights must be approved by the State Engineer (BLM 2001b).

The Central Arizona Project (CAP) delivers water to three counties, one of which (Pima) contains proposed critical habitat units 1-3 and 7-9. The water is derived from the Colorado River, and also aids in the fulfillment of the Arizona Water Settlements Act, which increased tribal allocations of Arizona water. According to the Bureau of Reclamation (BLM 2011), CAP "provides water for irrigation, municipal and industrial use, hydropower, flood control, recreation, environmental enhancement, and sediment control." Authorization for this project was based on the Colorado River Basin Project Act of 1968. This is an agreement between the federal government and non-federal entities which entitles the federal government to 24.3 percent of the power generated from the Navajo Generating Station.

3.2.2 Environmental Consequences

Activities that occur on critical habitat units that affect water resources include: channel alteration; prescribed fires; alterations of watersheds and floodplains; release of chemical or biological pollutants; release of effluents into the surface or groundwater at a point-source or non-point source; livestock waste pollution; aerial pesticide application; fire retardant application. Actions that would alter the water quality or permanence of a breeding site or dispersal corridor may also affect critical habitat for the Chiricahua leopard frog, thus triggering a section 7 consultation. These activities include: water diversions; groundwater pumping; construction, operation, or destruction of dams or impoundments; 'improvements' at a spring such as channelization, or dredging; road and bridge construction; and destruction of riparian or wetland vegetation.

3.2.2.1 No Action

Under the No Action Alternative, no critical habitat would be designated for the Chiricahua leopard frog. The section 7 consultation process would continue as presently conducted. The special rule for the exemption of Section 9 take prohibitions of the ESA as related to the operation and maintenance of livestock tanks on non-Federal lands would continue to be implemented.

section 7 consultations would be initiated only for *may affect* determinations of impacts to the leopard frog. These consultations would analyze relevant land, resource, and fire management plans proposed for federal lands occupied by the Chiricahua leopard frog. As they relate to water resources, such consultations would likely include:

- U.S. Fish and Wildlife Service—for permits for habitat restoration, conservation of aquatic habitats; fire management plans; Sportfish Restoration Program sportfish stocking; and permits for Habitat Conservation Plans and Safe Harbor Agreements.
- U.S. Army Corps of Engineers--for 404 permits for river restorations, dam/levee construction or demolition, water divergence structures, dredging and fill, canal development, effluent discharge, and bridge or other water crossing structure construction.
- U.S. Bureau of Land Management—for aquatic habitat restoration and conservation; fire management plans; livestock grazing permits; and wetland restoration and conservation plans.

Therefore, this alternative would not have any impacts on water resource management beyond any conservation measures or project modifications resulting from the listing of the Chiricahua leopard frog and associated requirements of section 7 of the ESA.

3.2.2.2 Alternative A

Most proposed critical habitat areas are occupied by the Chiricahua leopard frog; therefore, actions that include water resources in those areas would be subject to section 7 consultations irrespective of the area's status as critical habitat. However, compared to the No Action Alternative, Alternative A (all proposed units, no exclusions) would result in (1) a small but unknown increase in the number of additional new and reinitiated section 7 consultations for water resource actions based solely on the presence of designated critical habitat; and (2) the addition of an analysis of adverse modification of critical habitat to future section 7 consultations on the Chiricahua leopard frog in critical habitat. All proposed actions that may trigger section 7 consultation are required to also take into consideration habitat (both riparian and aquatic) protection measures that would ensure compliance with the Clean Water Act (CWA).

New and Reinitiated Consultations

Because the PCEs that make up each critical habitat units are closely tied to adverse effects to the species, activities that would require consultation for critical habitat are primarily the same activities that currently require consultation for the species.

As it relates to water resources, the designation of critical habitat may extend beyond formerly analyzed locations. For example, with respect to ponds, critical habitat extends 20 feet (6.1 meters) beyond the high water line or to the boundary of riparian vegetation as well as 328 feet (100.0 meters) upstream. In the case of perennial, ephemeral, and intermittent streams, critical habitat includes the bankwidth of the stream plus 328 feet (100.0 meters) on either side unless it is bounded by canyon walls.

The designation of critical habitat raises awareness of the species presence in an area, and therefore project proponents who have not requested consultations for actions that may affect the

species may decide to do so. Based on previous activity with designated units, such project proponents could include the Rural Utilities Service and the U.S. Army Corps of Engineers, although specific locations of these types of projects in critical habitat are unknown at this time.

In addition, activities proposed in the two units of critical habitat where the frog is currently not extant will now require consultation due to designation of critical habitat. These two sites include the Cave Creek area (Unit 17) and Carr Barn Pond (Unit 13), both in Cochise County, AZ. Federal lands in these areas are managed by the Forest Service and will require consultation for proposed actions relating to fire management, fire suppression, and habitat restoration.

Reinitiated consultations are consultations that have been completed for impacts to the species, but which might need to be re-opened to consider the likelihood of destruction or adverse modification to critical habitat. As it relates to water resource management, such consultations could include, but are not limited to:

- Fire Management plans which include retardants and potential for increased sedimentation—BLM, USFWS
- Pesticide use projects to control certain species populations—USFS
- River restoration projects, water diversion/crossing construction, water diversion/crossing demolition—USACE, FHWA

Addition of Adverse Modification Analysis to Future Consultations

The consultation analyses for effects on a listed species and effects on critical habitat are similar in many respects and are parallel processes because the health of a species cannot be disassociated from the health of its habitat. The analyses are distinct, however, in that the standard for determining jeopardy concerns only survival of the species, while the standard for determining adverse modification must also take into account habitat values essential for the recovery of the species. The outcomes of these future consultations would depend on the details of project proposals and the analysis of effects, which are unknown at this time. The additional consultations, and the additional time required to complete consultations that would only have considered effects on the species, would increase administrative costs to the Service and to the action agencies. Implementing conservation measures resulting from those additional consultations would also increase costs for action agencies. Outcomes of consultations for critical habitat could also include reasonable and prudent alternative alternatives and other conservation measures designed to maintain leopard frog PCEs. These outcomes cannot be predicted precisely; however, based on past consultations, types of additional management actions that may be required include, but are not limited to:

- Revising resource management plans
- Mapping, surveying, and monitoring leopard frog habitat and preparing survey and monitoring reports
- Collecting eggs, tadpoles, and frogs from the action area for off-site holding
- Limiting uses of fire retardants or suppressants toxic to fish or amphibians in occupied frog habitats or in watersheds where these chemicals are likely to enter occupied frog habitats
- Avoid high severity fire affects upstream from any occupied habitat

- Prohibiting water diversion or pumping from a site occupied by leopard frogs
- Establishing burn buffers along riparian corridors and around aquatic habitats
- If extensive erosion is possible, sediment traps should be placed above occupied habitat to reduce potential take of this species

In summary, the effects of critical habitat designation on water resource management activities are expected to be minor. The Chiricahua leopard frog has been listed since 2002 thus federal activities that have the potential to impact water resource management activities have considered the leopard frog since its listing. Any constraints regarding the conservation of critical habitat would likely be similar in nature to those imposed from consultations for listed species.

3.2.2.3 Alternative B

For Alternative B (proposed units minus exclusions), the impacts associated with the designation of critical habitat would be similar to those identified for Alternative A. However, the exclusions are primarily private lands associated with existing Safe Harbor Agreements and/or conservation easements. If these areas are included, designation of critical habitat affects them only to the extent that activities that affect critical habitat may require a federal license, permit or funding; also, enrollment in a Safe Harbor Agreement provides regulatory protection should conservation activities on the land result in incidental take of leopard frogs. Therefore, these exclusions could reduce the economic impacts of designation on water resource management activities in these areas overall, by requiring fewer consultations overall. This would reduce administrative costs as well for the Service. The overall impacts water resource management would still be characterized as minor.

3.3 Wetlands and Floodplains

3.3.1 Existing Conditions

Proposed Chiricahua leopard frog critical habitat areas may include wetlands and floodplains close to specific units. Wetlands are often located along buffer zones of perennial and intermittent surface water bodies. Critical habitat designations around ponds include an extension of 20 feet (6 meters) beyond the pre-determined high water mark to the boundary of the riparian vegetation edge. When pond levels decrease, emergent vegetation can take hold in the buffer area between the low pond level and the extended riparian buffer zone. In the case of perennial, ephemeral and intermittent streams, critical habitat would be considered to be “bankwidth” full of the stream plus an additional 328 feet (99.97 meters) on either side of the water body. For the same reasons as stated regarding pond levels, stream fluctuations can create the opportunity for riverine wetland development.

The Chiricuaha leopard frog is completely reliant upon the existing habitat conditions to live and breed. The quality of wetland and floodplain habitat is linked to the species survival. The leopard frog may rely on zones of wetland and emergent vegetation for land migrations which determine the viability of the metapopulation. The shallow waters of wetlands and their vegetation types provide locations for egg deposition, thermoregulation sites, as well as foraging sites (DOD 2009). In addition, wetlands (especially riparian) intrinsically form a buffer around

surface water bodies and act as filters eliminating pollutants and contaminants that may affect certain life stages of the leopard frog. In addition, they control sediment loads by preventing erosion and regulate flooding. Floodplains distribute minerals and nutrients during flood events that work to restore the natural state of rivers and streams. It is this element of water quality within critical habitat that positively affects the breeding and early life stages of the Chiricahua leopard frog.

While there are wetland areas distributed throughout the region, of the 43 units proposed as critical habitat there is only one that contains a delineated wetland: Unit 42, Turkey Feather Spring, has an emergent wetland of approximately 49 square feet (4.55 square meters) in size. Emergent wetlands are defined by the U.S. Geological Survey (USGS) as being characterized by erect, rooted, water-loving plants that are present for most of the growing season during most years. Perennial plants dominate this type of wetland (USGS 2006).

It can be assumed that floodplains exist along all river and stream miles that travel through areas of proposed critical habitat. According to data from the Federal Emergency Management Agency (FEMA), major floodplains occur adjacent to the major rivers in the area. These include along the Gila River (near units 30, 31, 35, 42), San Francisco River (near units 28, 29, 32-34, and 41), and the Verde River and Cherry Creek (near units 23-25). Flood control in Arizona is managed by the Arizona Floodplain Management Association which designates flood control districts by county. In New Mexico, floodplains are managed by the New Mexico Floodplain Managers Association. Flood control programs exist throughout the counties in which proposed critical habitat units occur. The purpose of floodplain management is to mitigate flood hazards while balancing the need to preserve floodplains for their intended use.

Recent Consultations

There have been a total of about 75 section 7 consultations involving the leopard frog that resulted in a Biological Opinion since 2000 in Arizona and New Mexico, each of which resulted in a *no jeopardy* determination. There have not been any consultations directly relating to wetlands and floodplains, but many of the actions requiring consultation may result in impacts to wetlands and floodplains. . A recent reinitiation of a consultation specifically addressing the leopard frog and wetlands and floodplains by the Service occurred in 2011 and resulted in a Biological Opinion (BO) of no jeopardy. A BO for the reinitiation of section 7 consultation for the Buenos Aires National Wildlife Refuge Fire Management Plan 2005-2008 for the 2011 season resulted in no jeopardy. Conservation measures to reduce impacts at the sole site of potential leopard frog populations, short-term impacts from ash/sediment flows, and leopard frog reproductive potential were all determined to be sufficient practices/mitigations for any impact on the population in the area.

The USACE consulted the Service on the Rehabilitation of Nelson Dam in AZ. The Biological Opinion found no jeopardy because no major frog populations nor important breeding or foraging sites would be affected by construction. The ratio of stream bed that would be de-watered to total habitat area available was also determined to be negligible.

The Service issued a BO for the USFS on the Wildbunch Allotment Management Plan in 2008. No jeopardy was determined, but a reasonable and prudent measure stipulated that the protected wetlands within the allotment should be surveyed every three years. If the leopard frog is found in the area, a complete survey would be completed within three years of the finding. The no jeopardy finding was based on the fact that the new plan would improve the overall dispersal of livestock, reducing heavy livestock use at stock ponds and tanks. Also, the ecological condition of the area should be either maintained or improved during the 10-year life of the plan.

3.3.2 Environmental Consequences

Activities that occur on critical habitat units that affect wetlands and floodplains include channel alteration; prescribed fires; alterations of watersheds and floodplains; release of chemical or biological pollutants; livestock waste pollution; livestock grazing; aerial pesticide application; and fire retardant application. Actions that would alter the existence of wetlands or floodplain zones which affect a dispersal corridor may also affect critical habitat for the Chiricahua leopard frog thus triggering a section 7 consultation. These activities include water diversions; groundwater pumping; construction, or destruction of dams or impoundments; 'improvements' at a spring such as channelization, or dredging; road and bridge construction; and destruction of riparian or wetland vegetation.

3.3.2.1 No Action

Under the No Action Alternative, no critical habitat would be designated for the Chiricahua leopard frog. The section 7 consultation process would continue as presently conducted, but without consideration of PCEs. The special rule for the exemption of section 9 take prohibitions of the ESA as related to the operation and maintenance of livestock tanks on non-Federal lands would continue to be implemented.

Section 7 consultations would be initiated only for *may affect* determinations of impacts to the leopard frog. These consultations would analyze relevant land, resource, and fire management plans proposed for federal lands occupied by the Chiricahua leopard frog. As they relate to wetlands and floodplains, such consultations would likely include, but not be limited to:

- U.S. Fish and Wildlife Service—for permits for habitat restoration, conservation of aquatic habitats; fire management plans; and permits for Habitat Conservation Plans and Safe Harbor Agreements.
- U.S. Army Corps of Engineers--for 404 permits for river restorations, dam/levee construction or demolition, water divergence structures, dredging and fill, canal development, effluent discharge, and bridge or other water crossing structure construction; and permits for wetland restoration and mitigation.
- U.S. Bureau of Land Management—for aquatic habitat restoration and conservation; fire management plans; livestock grazing permits; and wetland restoration and conservation plans.

Therefore, this alternative would not have any impacts on wetlands and floodplains beyond any conservation measures or project modifications resulting from the listing of the Chiricahua leopard frog and associated requirements of section 7 of the ESA.

3.3.2.2 Alternative A

Most proposed critical habitat areas are occupied by the Chiricahua leopard frog; therefore, actions that include water resources in those areas would be subject to Section 7 consultations irrespective of the area's status as critical habitat. However, compared to the No Action Alternative, Alternative A (all proposed units, no exclusions) would result in (1) a small but unknown increase in the number of additional new and reinitiated section 7 consultations due to the potential of alterations to wetlands and floodplain based solely on the presence of designated critical habitat; and (2) the addition of an analysis of adverse modification of critical habitat to future section 7 consultations on the Chiricahua leopard frog in critical habitat. All proposed actions that may trigger section 7 consultation are required to also take into consideration habitat (both wetland, riparian and aquatic) protection measures that would ensure compliance with the Clean Water Act.

New and Reinitiated Consultations

Because the PCEs that make up each critical habitat units are closely tied to adverse effects to the species, activities that would require consultation for critical habitat are primarily the same activities that currently require consultation for the species.

As it relates to wetlands and floodplains, the designation of critical habitat may extend beyond formerly analyzed locations. For example, with respect to perennial, ephemeral, and intermittent streams, critical habitat includes the bankwidth of the stream plus 328 feet (100.0 meters) on either side unless it is bounded by canyon walls.

The designation of critical habitat raises awareness of the species presence in an area, and therefore project proponents who have not requested consultations for actions that may affect the species may decide to do so. Based on previous activity with designated units, such project proponents could include the Rural Utilities Service and the USACE, although specific locations of these types of projects in critical habitat are unknown at this time.

In addition, activities proposed in the two units of critical habitat where the frog is currently not extant will now require consultation due to designation of critical habitat. These two sites include the Cave Creek area (Unit 17) and Carr Barn Pond (Unit 13), both in Cochise County, AZ. These units are not proximal to any wetlands or floodplains, thus additional analysis for critical habitat based on these resources would not be necessary.

Reinitiated consultations are consultations that have been completed for impacts to the species, but which might need to be re-opened to consider the likelihood of destruction or adverse modification to critical habitat. As it relates to wetlands and floodplains, such consultations could include:

- Fire Management plans which include removal of vegetation and potential for increased bank erosion—BLM, USFS

- River restoration projects, wetland restoration projects, water diversion/crossing construction/demolition—USACE, USFS

Addition of Adverse Modification Analysis to Future Consultations

The additional consultations for adverse modification, and the additional time required to complete consultations that would only have considered effects on the species, would increase administrative costs to the Service and to the action agencies. Implementing conservation measures resulting from those additional consultations would also increase costs for action agencies. Outcomes of consultations for critical habitat could also include reasonable and prudent alternative alternatives and other conservation measures designed to maintain leopard frog PCEs. These outcomes cannot be predicted precisely; however, based on past consultations types of additional management actions that may be required include, but are not limited to:

- Revising resource management plans
- Mapping, surveying, and monitoring leopard frog habitat and preparing survey and monitoring reports
- Limiting uses of fire retardants or suppressants toxic to fish or amphibians in occupied frog habitats or in watersheds where these chemicals are likely to enter occupied frog habitats
- Avoid high severity fire affects upstream from any occupied habitat
- Prohibiting water diversion or pumping from a site occupied by leopard frogs
- Establishing burn buffers along riparian corridors and around aquatic habitats
- If extensive erosion is possible, sediment traps should be placed above occupied habitat to reduce potential take of this species

In summary, the effects of critical habitat designation on floodplain management activities are expected to be minor. The Chiricahua leopard frog has been listed since 2002; thus federal activities that have the potential to impact floodplain management activities have considered the leopard frog since its listing. Any constraints regarding the conservation of critical habitat would likely be similar in nature to those imposed from consultations for listed species.

3.3.2.3 Alternative B

For Alternative B (proposed units minus exclusions), the impacts associated with the designation of critical habitat would be similar to those identified for Alternative A. However, the exclusions are primarily private lands associated with existing Safe Harbor Agreements and/or conservation easements. If these areas are included, designation of critical habitat affects them only to the extent that activities that affect critical habitat may require a federal license, permit or funding; also, enrollment in a Safe Harbor Agreement provides regulatory protection should conservation activities on the land result in incidental take of leopard frogs. Therefore, these exclusions could reduce the economic impacts of designation on wetland and floodplain activities in these areas overall, by requiring fewer consultations overall. This would reduce administrative costs as well for the Service. The overall impacts wetlands and floodplains would still be characterized as minor.

3.4 Natural Resources: Fish, Wildlife, Plants, Trust Species

3.4.1 Existing Conditions

Several hundred species of fish, wildlife, and plants, including threatened, endangered, and sensitive (TES) species occupy the aquatic and terrestrial biological communities within the proposed critical habitat area (NMDGF 2006; AZGFD 2006). This is evidenced by the disproportionately large number of species that utilize riparian habitat for all or part of their life history requirements compared to the area of other habitats (Hubbard 1977). Proposed critical habitat areas include one or more of the PCEs for Chiricahua leopard frogs that are described in section 1.4 or can be restored to provide those elements. The presence of these elements and the potential to restore them indicate the proposed areas contain a relatively intact riparian habitat that is of great importance to wildlife species. The occurrence of any given species, whether fish, wildlife, or plant within the proposed critical habitat varies widely and depends on local and regional environmental conditions such as elevation, climate, stream type, water management activities, proximity to land development or other human disturbances, and grazing practices.

The proposed critical habitat locations are found within the Salt, Upper Gila, Rio Grande-Elephant Butte, Rio Grande - Mimbres, Middle Gila, and Sonora river basins (see section 3.2 for more information on water resources). Most of this area falls within the Sonoran and Chihuahuan deserts, which are characterized by high desert scrub/shrub vegetation. Riparian areas, including man-made structures such as stock tanks, are an important part of the ecology of these desert ecosystems. The environments represented in Recovery Unit (RU) 1 include oak woodland, oak and mesquite savannas, semi-desert grassland, cienega, and, marginally, Sonoran Desert scrub (USFWS 2007a). In RU 2, RU 3, RU 6, and RU 8, vegetation communities range from Chihuahuan Desert scrub along the San Pedro and Gila Rivers in lower elevations to mixed conifer and aspen at the highest elevations. RU 4 vegetation communities are highly diverse, ranging from semi-desert and plains grasslands at the lower elevations to the high elevation subalpine conifer forests in the Pinaleno Mountains, characterized by Engelmann spruce, corkbark fir, Douglas fir, white fir, and aspen. The vegetation communities of RU 5 and RU 6 are primarily ponderosa and mixed conifer forest, and pinyon-juniper at the lower elevations (USFWS 2007a).

3.4.1.1 Fish

The fish community (both native and nonnative) is an important component of the biological environment of these critical habitat areas. Native species in the proposed designation range include include gila trout (*Oncorhynchus gilae gilae*), Apache trout (*Oncorhynchus apache)* topminnows (*Poeciliopsis spp*), spikedace (*Meda fulgida*), loach minnow (*Tiaroga cobitis*), sucker fish (*Pantosteus* [*Catostomus*] *spp*), roundtail chub (*Gila robusta*), speckled dace (*Rhinichthys osculus*), and longfin dace (*Agosia chrysogaster*). Native fishes such as longfin dace and topminnows appear most compatible with leopard frogs, whereas more predatory types like chubs seem much less compatible. The abundance of these fish is likely important in determining their effects on leopard frogs. All fish species, including more compatible ones such as the longfin dace and topminnow, can affect recruitment through competition and food web pathways, and the Chiricahua leopard frog seems to be more in ponds and springs with no fish

(USFWS 2007a). See Section 3.4.1.4 in this document for a description of threatened and endangered fish species that occur in the proposed critical habitat areas.

Numerous nonnative aquatic species also occur within the proposed critical habitat areas, notably fish in the family Centrarchidae, which includes bluegill (*Lepomis macrochirus*), green sunfish (*Lepomis cyanellus*), and a species of bass (*Micropterus* spp.). Other nonnative fish include the red shiner (*Cyprinella lutrensis*), flathead catfish (*Pylodictis olivaris*), channel catfish (*Ictalurus punctatus*), rainbow trout (*Oncorhynchus mykiss*), yellow bullhead (*Ameiurus natalis*), and black bullhead (*Ictalurus melas*) (NMDGF 2006; AZGFD 2006). Most nonnative fish species were introduced into Arizona and New Mexico streams as sport fish, but one particularly invasive species, mosquitofish (*Gambusia affinis*), was widely introduced to control mosquitoes (USFWS 2007). Several of these species predate directly on larval and adult stages of the Chiricahua leopard frog and can be the determining factor on whether or not the Chiricahua leopard frog is present. Introduced crayfish (*Orconectes* spp.) and bullfrogs (*Rana catesbeiana*) may also be found in proposed critical habitat areas and have a profound adverse impact on Chiricahua leopard frog populations (USFWS 2007a; USFWS 2011a). Several of the proposed critical habitat sites are tanks or springs that are disconnected from any river system. As such, many of the species mentioned here are not likely found in the proposed stock tanks and springs critical habitat units. However, these sites are at risk for unauthorized introduction of nonnative fish, crayfish, and bullfrogs without proper enforcement (USFWS 2011a).

3.4.1.2 Wildlife

Hundreds of species of mammals, birds, amphibians, reptiles, and invertebrates depend on riparian and aquatic habitats that are likely to occur in the proposed critical habitat areas (NMDGF 2006; AZGFD 2006). Wildlife species commonly found in southwestern riparian habitats are listed in the Arizona and New Mexico State Wildlife Action Plans (NMDGF 2006; AZGFD 2006). These species include small rodents; furbearers such as beaver (*Castor canadensis*) and muskrats (*Ondatra zibethicus*); small carnivores such as raccoon (*Procyon lotor*), otter (*Lontra canadensis*), and bobcat (*Lynx rufus*), and larger carnivores such as mountain lion (*Felis concolor*), black bear (*Ursus americanus*), and coyote (*Canis latrans*); and wide-ranging mammals such as deer (*Odocoileus* spp.) and javelina (*Pecari tajacu*). Migratory and resident birds such as gray hawk (*Asturina nitida*), common black-hawk (*Buteogallus anthracinus*), marsh wren (*Cistothorus palustris*), summer tanager (*Piranga rubra*), and turkey (*Meleagris* spp.) also depend on riparian habitats. Amphibians such as treefrogs (*Pternohyla* spp.) and mole salamanders (*Ambystoma* spp.) and reptiles such as garter-snakes (*Thamnophis* spp.), Sonoran mud turtle (*Kinosternon sonoriense sonoriense*), and other leopard frogs (*Lithobates* spp.) depend on riparian and aquatic habitats for all or most of their life cycles. Hundreds of species of invertebrates also utilize southwestern riparian and aquatic habitats or depend on these habitats for all or most of their life cycles (NMDGF 2006; AZGFD 2006). See Section 3.4.1.4 of this document for a description of threatened and endangered wildlife species that are likely to occur in the critical habitat areas.

3.4.1.3 Plants

Riparian vegetation around the proposed critical habitat tanks, ponds, and streams are primarily cottonwood (*Populus fremontii, P. angustifolia*) and willow (*Salix* sp.). At higher elevations there is also extensive alder (*Alnus oblongifolia*) and box elder (*Acer negundo*). At middle elevations sycamore (*Platanus wrightii*), velvet ash (*Fraxinus pennsylvanica*), and walnut (*Juglans major*) are common riparian species, and at lower elevations mesquite (*Prosopis juliflora*), seepwillow (*Baccharis* sp.), and hackberry (*Celtis reticulata*) are prominent (NMDGF 2006; AZGFD 2006). These riparian areas also contain rooted aquatic vegetation (e.g., *Polygonum*, *Potamogeton*, *Ranunculus*, *Rorippa*, Cyperaceae, Gramíneae) used by female Chiricahua leopard frogs to deposit egg masses.

3.4.1.4 Threatened and Endangered Wildlife Species

There are a number of other endangered and threatened species in the proposed critical habitat for the Chiricahua leopard frog. Table 4 lists the federally endangered, threatened, sensitive, and candidate species likely found in the proposed Chiricahua leopard frog Recovery Units. Of those species listed, only critical habitat units for Gila chub (*Gila intermedia*) and Mexican spotted owl (*Strix occidentalis lucida*) overlap with some of the proposed critical habitat units for the Chiricahua leopard frog (USFWS 2011b). One of the unoccupied sites, Unit 17 (Cave Creek), is located within the critical habitat for the Mexican spotted owl. The other unoccupied site, Unit 13 (Carr Barn Pond) is about 1.1 miles (1.77 km) west of Mexican spotted owl critical habitat.

Gila chub are a small-finned minnow with a deep and chubby body averaging 6 to 8 inches (15.2-20.3 cm). They are found in pools in smaller streams, ciengas and artificial ponds ranging in elevation from 1998-5498 ft. (609-1,676 meters) (USFWS 2011c). Threats to this species are similar to that of the Chiricahua leopard frog and include predation by nonnative species and habitat degradation (mostly due to erosion).

The Mexican spotted owl is a medium sized owl with ashy-chestnut brown feathers and white and brown spots on their abdomen, back and head (USFWS 2011d). These owls are commonly found in old-growth or mature forests and commonly found near water and therefore may frequent some of the proposed critical habitat units for the Chiricahua leopard frog.

TABLE 4. Federally Endangered, Threatened, and Candidate Wildlife Species within the proposed Recovery Units for the Chiricahua leopard Frog

Species	Status	Recovery Units
AMPHIBIANS		
Sonora tiger salamander *Ambystoma tigrinum stebbinsi*	Endangered	1, 2, 3, 4
Arizona treefrog *Hyla wrightorum*	Candidate	1, 2, 3, 4
BIRDS		

Yellow-billed cuckoo *Coccyzus americanus*	Candidate	1, 2, 3, 4, 5, 6, 7, 8
Mexican spotted owl *Strix occidentalis lucida*	Threatened	1, 2, 3, 4, 5, 6, 7, 8
Piping Plover *Charadrius melodus*	Threatened	8
Southwestern willow flycatcher *Empidonax trailii extimus*	Endangered	1, 2, 3, 4, 5,6, 7, 8
Sprague's pipt *Anthus spragueii*	Candidate	1, 2, 3, 4, 8
Yuma clapper rail *Rallus longirostris yumanensis*	Endangered	5
Masked bobwhite (quail) *Colinus virginianus ridgewayi*	Endangered	1, 2
Least tern *Sterna antillarum*	Endangered	1, 2, 6, 8
MAMMALS		
Grey wolf *Canis lupis*	Experimental non-essential population	3, 5, 6, 7, 8
Sonoran pronghorn *Antilocapra Americana sonoriensis*	Endangered	1, 2
Jaguar *Panthera onca*	Endangered	1, 2, 3, 4
Ocelot *Leopardus pardalis*	Endangered	1, 2, 3, 4
Lesser long-nosed bat *Leptonycteris curasoae yerbabuenae*	Endangered	1, 2, 3, 4, 5, 6, 7
Mexican long-nosed bat *Leptonycteris nivalis*	Endangered	3
Black footed ferret *Mustela nigripes*	Endangered	5, 6
Mount Graham red squirrel *Tamiasciurus hudsonicus grahamensis*	Endangered	4
New Mexico meadow jumping mouse *Zapus hudsonius luteus*	Candidate	6, 7, 8
REPTILES		
New Mexican ridge-nosed rattlesnake *Crotalus willardi obscures*	Threatened	1, 2, 3, 4
Desert Tortoise *Goperus morafkai* **(=** *agassizii***)**	Candidate	1, 2, 3, 4, 5
Northern Mexican Gartersnake *Thamnophis eques megalops*	Candidate	1, 2, 3, 4, 5, 6
Sonoyta mud turtle *Kinsternon sonoriense longifemorale*	Candidate	1, 2
Tucson shovel-nosed snake *Chionactis occipitalis klauberi*	Candidate	1, 2
INVERTEBRATES		
Alamosa springsnail *Tryonia alamosae*	Endangered	8
Chupadera springsnail *Pyrgulopsis chupaderae*	Candidate	8
Stephan's Riffle Beetle *Heterelmis stephani*	Candidate	1, 2
Gila springsnail	Candidate	6, 8

Pyrgulopsis gilae		
Huachuca springsnail *Pyrgulopsis thompsoni*	Candidate	3, 4
New Mexico sprinsnail *Pyrgulosps thermalis*	Candodate	7, 8
Page springsnail *Pyrgulopsis morrisoni*	Candidate	5
Rosemont talussnail *Sonorella rosemontensis*	Candidate	1, 2
San Bernardino springsnail *Pyrgulopsis thompsoni*	Proposed Endangered	1, 2, 3, 4
Socorro isopod *Thermospaheroma thermophils*	Endangered	8
Socorro springsnail *Pyrgulopsis neomexicana*	Endangered	8
Three forks springsnail *Pyrgulopsis trivialis*	Proposed Endangered	6
FISH		
Apache trout *Oncorhynchus apache*	Threatened	4,5, 6, 7
Chiricahua chub *Gila bigrescens*	Threatened	7, 8
Gila trout *Oncorhynchus gilae*	Threatened	6, 7, 8
Gila topminnow *Poeciliopsis occidentalis*	Endangered	1, 2, 3, 4, 5, 6, 7, 8
Sonora chub *Gila ditaenia*	Threatened	1, 2
Gila chub *Gila intermedia*	Endangered	1, 2, 3, 4, 5, 6, 7, 8
Roundtail chub *Gila robusta*	Candidate	4, 5, 6, 7
Headwater chub *Gila nigra*	Candidate	4, 5
Razorback sucker *Xyrauchen texanus*	Endangered	4, 5, 6, 7
Desert pupfish *Cyprinodon macularius*	Endangered	1, 2, 3, 4, 5
Yaqui catfish *Ictalurus pricei*	Threatened	2, 3, 4
Yaqui chub *Gila purpurea*	Endangered	2, 3, 4
Loachminnow *Tiaroga cobitis*	Threatened	2, 3, 4, 5, 6, 7, 8
Beautiful shiner *Cyprinella Formosa*	Threatened	2, 3, 4, 7, 8
Spikedace *Meda fulgida*	Threatened	2, 3, 4, 5, 6, 7, 8
Little Colorado spinedace *Lepidomeda vittata*	Threatened	6
Zuni bluehead Sucker *Catostomus discobolus yarroki*	Candidate	6
Colorado pikeminnow *Ptychocheilus lucius*	Experimental non-essential population	5

Rio Grande cutthroat trout *Oncorhynchus clarki virginalis*	Candidate	8
Rio Grande silvery minnow *Hybognathus amarus*	Endangered	8

Source: USFWS 2011e; USFWS 2003; NatureServe 2011

3.4.2 Environmental Consequences

3.4.2.1 No Action Alternative

Under the No Action Alternative, critical habitat for the Chiricahua leopard frog would not be designated under the ESA. The section 7 consultation process would continue as presently conducted without consideration of PCEs. Section 7 would be initiated only for *may affect* determinations of impacts on the Chiricahua leopard frog. Such consultations would analyze relevant Land Management Plans, Grazing Management Plans, Fire Management Plans, and include both site-specific and programmatic projects within the proposed area. As they relate to wildlife, such consultations would likely include:

- U.S. Army Corps of Engineers--stream restoration
- U.S. Bureau of Land Management--for aquatic habitat restoration, fire suppression, fuel reduction treatments, resource management plans, livestock grazing and management, mining permits, native fish and frog reestablishment, renewable energy development
- U.S. Fish & Wild Service—for issuance of ESA section 10 permits for enhancement of survival, Habitat Conservation Plans, and Safe Harbor Agreements; for national wildlife refuge planning; for Partners for Fish and Wildlife programs benefiting the leopard frog; and for Wildlife and Sportfish Restoration Program sportfish stocking
- U.S. Forest Service—for aquatic habitat restoration, fire management plans, fire suppression, fuels reduction treatments, forest plans, livestock grazing allotment management plans, mining permits, native fish and frog reestablishment, and travel management plans

Consequently, this alternative would have no impact on fish, wildlife, and plants, including candidate, proposed, or listed species, beyond those conservation measures resulting from the listing of the Chiricahua leopard frog (65 FR 24328-24372) and associated requirements of section 7 of the ESA.

3.4.2.2 Alternative A

Compared to No Action Alternative, the Alternative A would result in (1) a small but unknown increase in the number of additional new and reinitiated section 7 consultations based solely on the presence of designated critical habitat and (2) the addition of an adverse modification of critical habitat analysis to section 7 consultations for the Chiricahua leopard frog in critical habitat. As almost all proposed critical habitat units contain populations of Chiricahua leopard frogs, federal actions in those areas would be subject to Section 7 consultation irrespective of the

critical habitat designation. The presence of Gila chub and Mexican spotted owl critical habitat in several units would require adverse modification analysis regardless of the presence of Chiricahua leopard frog critical habitat, and all of the species depend on healthy riparian ecosystems (USFWS 2007a; USFWS 2011c; USFWS 2011d).

New and Reinitiated Consultations

Because the PCEs that make up each critical habitat units are closely tied to adverse effects to the species, activities that would require consultation for critical habitat are primarily the same activities that currently require consultation for the species. The designation of critical habitat raises awareness of the species presence in an area, and therefore project proponents who have not requested consultations for actions that may affect the species may decide to do so.

In addition, activities proposed in the two units of critical habitat where the frog is currently not extant will now require consultation due to designation of critical habitat. These two sites include the Cave Creek area and Carr Barn Pond, both in Cochise County, AZ. Since only Unit 13 (Carr Barn Pond) is both unoccupied and is not located within critical habitat for another listed species this is the only location that would warrant consultation based solely on designation of Chiricahua leopard frog critical habitat.

Reinitiated consultations may include fire management, land management, conservation management plans and livestock management plans.

Addition of Adverse Modification Analysis to Future Consultations

The additional consultations from the addition of adverse modification analysis, and the additional time required to complete consultations that would only have considered effects on the species, would increase administrative costs to the Service and to the action agencies. Implementing conservation measures resulting from those additional consultations would also increase costs for action agencies. Outcomes of consultations for critical habitat could also include reasonable and prudent alternative alternatives and other conservation measures designed to maintain leopard frog PCEs. These outcomes cannot be predicted precisely; however, based on past consultations types of additional management actions that may be required include, but are not limited to:

- Revising resource management plans
- Mapping, surveying, and monitoring leopard frog habitat and preparing survey and monitoring reports
- Limiting uses of fire retardants or suppressants toxic to fish or amphibians in occupied frog habitats or in watersheds where these chemicals are likely to enter occupied frog habitats
- Avoid high severity fire affects upstream from any occupied habitat
- Prohibiting water diversion or pumping from a site occupied by leopard frogs
- Establishing burn buffers along riparian corridors and around aquatic habitats
- If extensive erosion is possible, sediment traps should be placed above occupied habitat to reduce potential take of this species

In summary, the effects of critical habitat designation with regards to wildlife are expected to be minor because (1) few projects would be subject to new consultations based solely on the presence of designated critical habitat, because most of the proposed units are occupied by the leopard frog; (2) any reasonable and prudent alternatives developed under jeopardy analysis would not likely be changed substantially with the addition of adverse modification analysis; (3) very few if any additional conservation measures would be proposed to address critical habitat, beyond those already proposed in jeopardy consultations.

A potential outcome of section 7 consultations for critical habitat would be increased efforts to maintain and restore the Chiricahua leopard frog PCEs through conservation measures within designated critical habitat. This would serve to maintain water quality, natural stream flow characteristics, and stream geomorphology, as well as other PCEs that sustain aquatic and riparian ecosystem integrity. As a result, all native fish, wildlife, and plants, including candidate, proposed, or listed species would benefit. The species most likely to benefit are aquatic species such as roundtail chub, headwater chub, desert sucker, Sonora sucker, speckled dace, longfin dace, leopard frogs and other amphibians, snails and other aquatic invertebrates, and aquatic mammals and plants. Riparian vegetation would benefit through measures to ensure natural stream flow patterns, as well as measures to anchor soils and reduce erosion and excessive sedimentation into critical habitat stream segments. Maintenance of riparian vegetation would benefit all wildlife dependent on riparian habitats. The beneficial effects of Alternative A on fish, wildlife, and plants are expected to be minor because the outcomes of consultations for critical habitat are not likely to substantially change management practices, proposed and existing projects, or various uses of proposed critical habitat segments.

Nonnative species, such as crayfish, that are considered harmful to the Chiricahua leopard frog may be adversely affected if managers implement a program to remove them from critical habitat. Such a program may be instituted prior to reintroducing the Chiricahua leopard frog into extirpated critical habitat areas. The adverse impacts on nonnative fish populations throughout the Chiricahua leopard frog critical habitat units would be negligible because of their large numbers and, since the species are invasive in the proposed critical habitat areas, removing individuals would not affect the natural populations.

3.4.2.3 Alternative B

Impacts associated with Alternative B (proposed units minus exclusions) would be similar to those identified for Alternative A, but with fewer section 7 consultations. The potential exclusions are primarily located on private land with existing Safe Harbor Agreements or conservation easements. Only projects requiring a federal license, permit, or funding would be required to consult with the Service on these locations. Therefore, these exclusions could reduce the economic impacts of designation on land management activities in these areas overall, by requiring fewer consultations overall. This would reduce administrative costs as well for the Service. By including more riparian areas there would be a negligible increase in the beneficial impacts to wildlife and vegetation as described in Alternative A due to the management of riparian habitat for healthy ecosystems. Impacts to wildlife from this alternative would be expected to be minor.

3.5 Land Use and Management

3.5.1 Existing Conditions

The proposed critical habitat designation includes lands under Federal (59%), state (4%), and private (37%) land ownership. Much of the Federal land is managed by the USDA Forest Service, in 5 National Forests: Apache Sitgreaves, Coconino, Coronado, Gila, and Tonto (see Figure 4). Federal lands are managed according to the pertinent management plan for each Forest Service district office and BLM field office. There are no critical habitat units on tribal lands.

Table 5 summarizes the land ownership status for the 43 designated critical habitat units.

TABLE 5. Approximate Proposed Critical Habitat Acres (ha) by Land Ownership and State

Land Owner	Arizona acres (ha)	New Mexico acres (ha)	Total acres (ha)
Federal	5,222 (2117)	1,567 (635)	6,790 (2752)
State	398 (161)	28 (11)	436 (172)
Tribal	0	0	0
Private	262 (107)	3,988 (1613)	4,251 (1721)
Total	**5,884 (2385)**	**5,583 (2259)**	**11,467 (4,644)**

There is a variety of land uses in designated critical habitat units. Forest Service lands dominate the Federal holdings, comprising approximately 55% of the Federal lands, with the two National Wildlife Refuges (Buenos Aires, Leslie Canyon) comprising another quarter and BLM lands almost 20%.

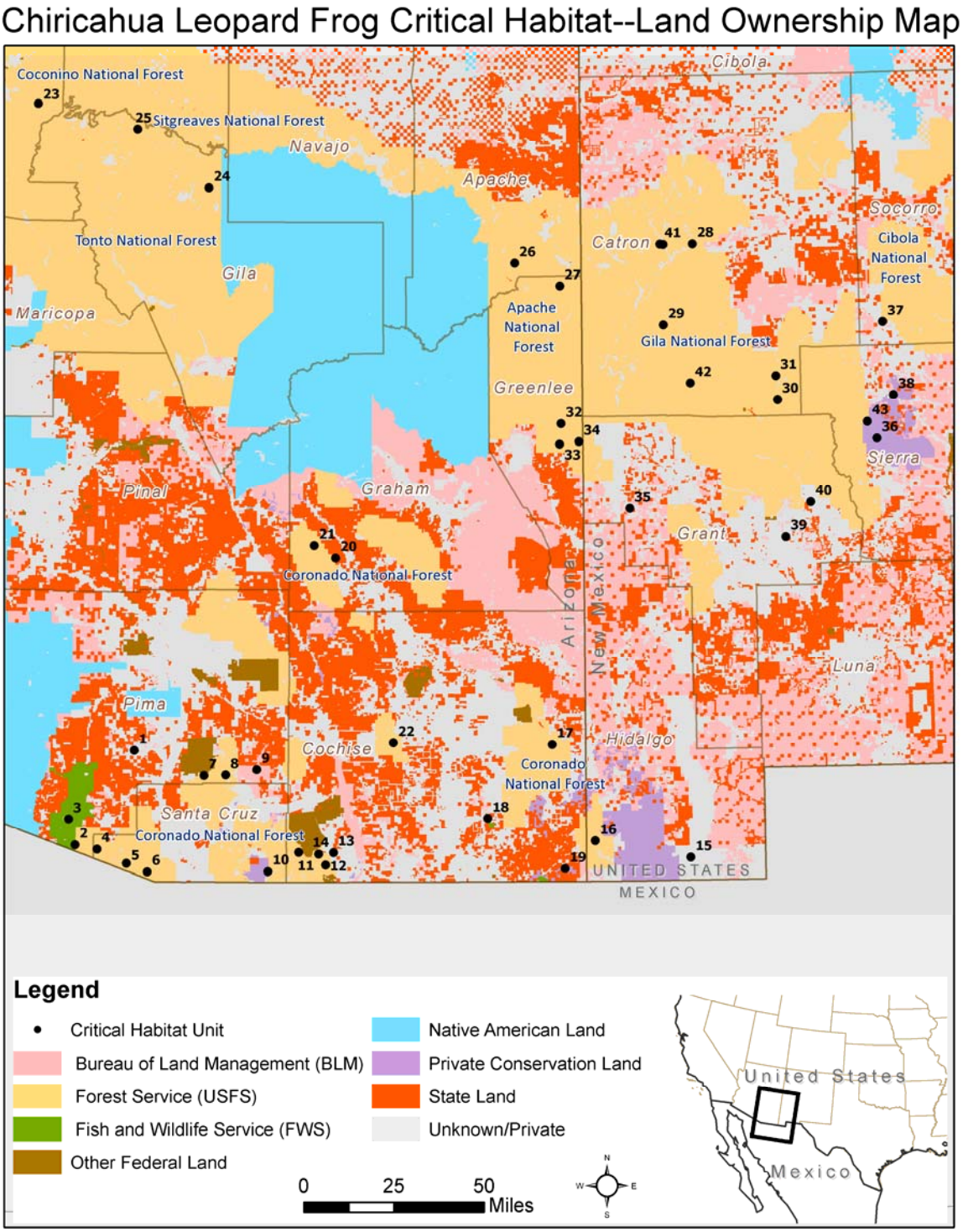

Figure 4. Land Ownership of Proposed Critical Habitat Units

On Forest Service lands, the principal land management activities affecting critical habitat units include fire and fuels management, livestock grazing, habitat restoration, road maintenance and construction, sportfish stocking, and vegetation management. These activities and their impacts are discussed in the individual resource sections of this chapter.

Bureau of Land Management lands include two National Conservation Areas (NCAs): San Pedro Riparian NCA and Las Cienegas NCA in Arizona. These areas are managed under the principles of multiple-use and ecosystem management for future generations. The filing of new mining claims and mineral leasing is not permitted. Off-highway vehicle use is limited to designated roads. Other BLM lands include smaller parcels in Sierra, Socorro, and Grant counties, New Mexico. These lands are managed for multiple use, including habitat restoration, fire management, grazing, and recreation. There were no fuels treatment sites in 2009 or 2010 in the BLM parcels of Units 35, 37 & 38.

There are two National Wildlife Refuges (NWRs) within proposed critical habitat: the Buenos Aires NWR, in Pima County, AZ, which includes former cattle tanks and other waters used as breeding and dispersal sites plus intervening and connecting drainages and uplands; and Leslie Canyon NWR, in Cochise County, AZ, which includes a stream system with intermittent pools and two small impoundments.

The proposed designation includes 4,251 acres (1721 ha) of private land, which supports a variety of land uses:

- Conservation land—lands managed by The Nature Conservancy, including Ramsey Canyon Preserve (unit 14), managed for preservation of natural features and species, and the Mimbres River Preserve (unit 40), managed for the benefit of the Chihuahua chub, Chiricahua leopard frog, and other riparian and aquatic resources: watershed management and conservation ranching.
- Lands enrolled in Safe Harbor Agreements or with conservation easements—these lands are typically managed for recreation and/or ranching, with occupied ranch tanks, and have been enrolled in one of several Safe Harbor agreements. These include lands in Units 10, 12, 14 (Ramsey Canyon Preserve, soon to be enrolled), 16, 17 (private lands owned by the American Museum of Natural History), and 19 (Magoffin Ranch).
- In-holdings and adjacent areas to Gila NF—over 2300 acres (931 ha) are in private hands, as in-holdings or adjacent areas to Gila NF. Over 630 acres (255 ha) are part of the Ladder Ranch (Units 36 & 38), owned by Turner Enterprises and are managed for their biodiversity. Land uses on the Ranch include nature conservation, rangeland/pastureland, and hunting.
- Mining lands—Units 1and 39:
    - At Unit 1, the Twin Tanks area is less than 0.5 mi (0.8 km) upslope of active mining at Freeport McMoRan's Sierrita Copper Mine. Sierrita Copper Mine is an open-pit metals mine and concentrator, with molybdenum by-products. In addition to copper and molybdenum, the mine produces rhenium, a rare and highly valued metal (Sierrita, 2011).
    - Unit 39 includes 49 acres (20 ha) of lands are owned by Freeport-McMoRan Copper and Gold Subsidiaries as part of the Chino Copper Mine, which is based in nearby Santa Rita and Hurley. In December 2008, Freeport-McMoRan

announced plans to suspend mining and milling activities at Chino. The majority of the work force was laid off in 2009. To the Service's knowledge, no current plans exist to expand the mine into the area proposed for critical habitat

3.5.2 Environmental Consequences

Land management activities on critical habitat units include groundwater pumping and surface water diversion; livestock management; fire suppression and prescribed fire; surface disturbance construction activities including road construction and maintenance, mining, timber harvest and thinning, and flood control; native fish and aquatic habitat recovery including use of piscicides; and recreation developments and activities including off-road vehicle use and sportfish stocking.

3.5.2.1 No Action

Under the No Action Alternative, no critical habitat would be designated for the Chiricahua leopard frog. The section 7 consultation process would continue as presently conducted without consideration of PCEs. For example, conservation efforts made by ranchers to maintain their livestock tanks on non-Federal lands would still be protected, under the special section 4(d) listing rule, from the section 9 take prohibition, and the benefits of these activities would outweigh any adverse effects to critical habitat and thus would not constitute adverse modification.

Section 7 consultations would be initiated only for *may affect* determinations of impacts to the leopard frog. Such consultations would analyze relevant land, resource and fire management plans on federal lands currently occupied by the species. As they relate to land use and management, such consultations would likely include:

- U.S. Bureau of Land Management--for aquatic habitat restoration, fire suppression, fuel reduction treatments, resource management plans, livestock grazing and management, mining permits, native fish and frog reestablishment, renewable energy development

- U.S. Fish & Wild Service—for issuance of ESA section 10 permits for enhancement of survival, Habitat Conservation Plans, and Safe Harbor Agreements; for national wildlife refuge planning; for Partners for Fish and Wildlife programs benefiting the leopard frog; and for Wildlife and Sportfish Restoration Program sportfish stocking

- U.S. Forest Service—for aquatic habitat restoration, fire management plans, fire suppression, fuels reduction treatments, forest plans, livestock grazing allotment management plans, mining permits, native fish and frog reestablishment, and travel management plans

Therefore, this alternative would not have any impacts on land use and management beyond any conservation measures or project modifications resulting from the listing of the Chiricahua leopard frog and associated requirements of section 7 of the ESA.

3.5.2.2 Alternative A

Most proposed critical habitat areas are occupied by the Chiricahua leopard frog; therefore, land management actions in those areas would be subject to section 7 consultations irrespective of the area's status as critical habitat. However, compared to the No Action Alternative, Alternative A (all proposed units, no exclusions) would result in (1) a small but unknown increase in the number of additional new and reinitiated section 7 consultations for land management actions based solely on the presence of designated critical habitat; and (2) the addition of an analysis of adverse modification of critical habitat to future section 7 consultations on the Chiricahua leopard frog in critical habitat.

New and Reinitiated Consultations

Because modifications to the PCEs of critical habitat are closely tied to adverse effects to the species, activities that would require consultation for critical habitat are primarily the same activities that currently require consultation for the species. The designation of critical habitat raises awareness of the species presence in an area, and therefore project proponents who have not requested consultations for actions that may affect the species may decide to do so. Based on previous activity with designated units, such project proponents could include the Rural Utilities Service and the U.S. Army Corps of Engineers, although specific locations of these types of projects in critical habitat are unknown at this time.

In addition, activities proposed in the two units of critical habitat where the frog is currently not extant will now require consultation due to designation of critical habitat. These two sites include the Cave Creek area and Carr Barn Pond, both in Cochise County, AZ. Federal lands in these areas are managed by the Forest Service and will require consultation for proposed actions relating to fire management, fire suppression, and habitat restoration.

Reinitiated consultations are consultations that have been completed for impacts to the species, but which might need to be re-opened to consider the likelihood of destruction or adverse modification to critical habitat. As it relates to land use and management, such consultations could include:

- Grazing Allotment Management—BLM, USFS, NRCS
- Fire Management Plans—BLM, USFS
- Fuels Reduction—BLM, USFS
- Actions on Recreation Lands—BLM, USFS

Addition of Adverse Modification Analysis to Future Consultations

The consultation analyses for effects on a listed species and effects on critical habitat are similar in many respects and are parallel processes because the health of a species cannot be disassociated from the health of its habitat. The outcomes of these future consultations would depend on the details of project proposals and the analysis of effects, which are unknown at this time.

The additional consultations, and the additional time required to complete consultations that would only have considered effects on the species, would increase administrative costs to the Service and to the action agencies. Implementing conservation measures resulting from those

additional consultations would also increase costs for action agencies. Outcomes of consultations for critical habitat could also include reasonable and prudent alternatives and other conservation measures designed to maintain leopard frog PCEs. These outcomes cannot be predicted precisely; however, based on past consultations, types of additional management actions that may be required include, but are not limited to:

- Revising resource management plans
- Mapping, surveying, and monitoring leopard frog habitat and preparing survey and monitoring reports
- Limiting uses of fire retardants or suppressants toxic to fish or amphibians in occupied frog habitats or in watersheds where these chemicals are likely to enter occupied frog habitats
- Avoid high severity fire affects upstream from any occupied habitat
- Prohibiting water diversion or pumping from a site occupied by leopard frogs
- Establishing burn buffers along riparian corridors and around aquatic habitats
- If extensive erosion is possible, sediment traps should be placed above occupied habitat to reduce potential take of this species

In summary, the effects of critical habitat designation on land use and management are expected to be minor because (1) few projects would be subject to new consultations based solely on the presence of designated critical habitat, because most of the the proposed units are occupied by the leopard frog; (2) any reasonable and prudent alternatives developed under jeopardy analysis would not likely be changed substantially with the addition of adverse modification analysis; and (3) very few if any additional conservation measures would be proposed to address critical habitat, beyond those already proposed in jeopardy consultations.

3.5.2.3 Alternative B

For Alternative B (proposed units minus exclusions), the impacts associated with the designation of critical habitat would be similar to those identified for Alternative A. However, the exclusions are primarily private lands associated with existing Safe Harbor Agreements and/or conservation easements. If these areas are included, designation of critical habitat affects them only to the extent that activities that have effects on critical habitat may require a federal license, permit or funding; also, enrollment in a Safe Harbor Agreement provides regulatory protection should conservation activities on the land result in incidental take of leopard frongs. Therefore, these exclusions could reduce the economic impacts of designation on land management activities in these areas overall, by requiring fewer consultations. This would reduce administrative costs as well for the Service. The overall impacts on land management would be less than those in Alternative A, and still characterized as minor.

3.6 Fire Management

3.6.1 Existing Conditions

Wildland fires and fire management activities can significantly affect southwest riparian areas in general and the Chiricahua leopard frog habitat in particular (USFWS 2007a). Native riparian vegetation is not generally fire adapted, and evidence suggests that, historically, fire has not been a major disturbance in the vegetation communities that border southwestern streams. Wildland fire, however, is becoming a more common form of disturbance in riparian habitats throughout the Southwest. The increased prevalence of fire disturbance is attributed to increased fuel loading resulting from control of floods that historically swept away dead vegetation, litter, and woody debris; replacement of native vegetation by exotic species, many of which are highly flammable (e.g., tamarisk); river dewatering; and increased ignitions associated with increased human activity (USFWS 2003; USFWS 2004a) .

Current federal fire management practices conform to the National Fire Plan, which was developed by federal agencies in 2001 to address the causes of changing fire regimes and to guide wildland fire management (FY 2001 Interior and Related Agencies Appropriations Act [Public Law 106–291]). The implementation plan for this collaborative effort, called the 10-year Comprehensive Strategy, outlines a comprehensive approach to the management of wildland fire, hazardous fuels, and ecosystem restoration and rehabilitation on federal and adjacent state, Tribal, and private forest and range lands in the United States. The four primary goals of this strategy are to (1) improve prevention and suppression, (2) reduce hazardous fuels, (3) restore fire-adapted ecosystems, and (4) promote community assistance. Possible fire management actions depend on specific circumstances and may include:

- reduction of hazardous fuel loads by mechanical, chemical, or biological means;
- reduction of hazardous fuel loads or habitat restoration with prescribed fire, which is any fire ignited by management actions to meet specific objectives;
- wildland fire use, which is the management of naturally ignited wildland fires to accomplish specific restated resource management objectives in predefined geographic areas; and
- wildland fire suppression.

These actions could result in potential impacts such as increased water temperatures, fire-induced changes in pH, and increased ammonium and phosphate levels leached from smoke and ash. Post-fire effects include increased runoff and heavy sediment loads due to loss of groundcover and subsequent erosion in the watershed; loss of streamside vegetation that provides nutrients, shade, bank stabilization, and habitat among roots; altered channel morphology; degraded water quality; and altered food web. These adverse effects of high-intensity wildfire are well documented (SESA, 2008).

Consistent with national policy, the focus of fire management has increasingly been on the wildland-urban interface (WUI), which comprises areas where flammable wildland fuels meet or intermingle with structures and other human development. Because the designation includes rural areas, very little of the proposed critical habitat for the Chiricahua leopard frog overlaps WUI areas. WUI areas are closer to developed areas and may be more vulnerable to human

caused fires and consequent fire suppression efforts. In general, however, riparian habitats, areas occupied by federally protected species, and designated or proposed critical habitat are primarily managed to protect their resource values.

Section 7 consultations regarding fire management are often programmatic in nature, covering broad-based fire management plans and programs, but consultations may be required for individual burn and rehabilitation plans. Emergency section 7 consultations for wildland fire suppression are typically conducted after the fact. Since listing the Chiricahua leopard frog on the endangered species list in 2002, 6 consultations have been completed for actions involving fire management planning (including 3 consultations regarding revision of a single plan) and 5 consultations have been completed for fuels reduction and wildland fire suppression (see Table 6). None of these consultations have resulted in a finding of jeopardy.

TABLE 6. Fire-related section 7 consultations involving the Chiricahua leopard frog

Name	Year	Agency/Entity	Activity Type
Meown Wildlfire Suppression Activities, Wildlerness Ranger District, Grant county, New Mexico	2004	Forest Service	Wildland Fire Suppression
Ryan Fire	2004	Forest Service	Wildland Fire Suppression
Tonto National Forest's Verde Analysis Area Wildland Urban Interface Fuels Treatment	2004	Forest Service	Fuel Reduction
BLM Arizona Statewide Land Use Plan Amendment for Fire, Fuels, and Air Quality Management	2004	Bureau of Land Management	Fire Management Plan
Fork Fire Management Activities	2006	Forest Service	Wildland Fire Suppression
Fire Management Plan at San Bernardino and Leslie Canyon National Wildlife Refuges	2006	Fish and Wildlife Service	Fire Management Plan
Nutrioso Wildland Urban Interface Fuels Reduction Project	2006	Forest Service	Fuel Reduction
Four Proposed Wildland Use Management Areas within the BLM Safford Field Office Management Area	2007	Bureau of Land Management	Fire Management Plan
Buenos Aires National Wildlife Refuge fire Management Plan 2005-2008	2011 2010 2005	Fish and Wildlife Service	Fire Management Plan

Conservation measures listed in the Biological and Conference Opinion for the BLM Arizona Statewide Land Use Plan Amendment for Fire, Fuels, and Air Quality Management (USFWS 2004a) exemplify the kinds of conservation measures that might be expected for future section 7 consultations for the Chiricahua leopard frog. These measures are designed to minimize adverse effects of all fire management activities on federally protected species and their habitat. Several measures are specifically designed to protect and enhance the ecological values and functions of riparian areas. Conservation efforts for protecting sensitive species and habitat generally include:

- Using Minimum Impact Suppression Tactics in sensitive habitats;
- Excluding fire retardant and wildland fire use fires from riparian and wetland areas; and

- Incorporating consideration of sensitive species and habitat into all fire management and rehabilitation plans, programs, and implementation efforts.

High-intensity wildfire in and near riparian habitat can result in severe adverse impacts on aquatic species. As discussed in the Biological Opinion of the Meown Wildfire Suppression Activities leopard frogs disappeared from Miller Canyon in the Huachuca Mountains of Arizona after a 1977 crown fire in the upper canyon and subsequent erosion and scouring of the canyon during storm events (USFWS 2004b). Suppression of this Meown fire included dropping of fire retardant and construction of a fire line close to a channel. No tadpole or adult frog mortalities were observed, although the Service concluded some loss was likely. However, despite the potential adverse effects of these two activities the potential effect from not suppressing the fire could have resulted in a significant adverse impact to the species. Since suppression activities were warranted and resulted in decreased potential harm the Biological Opinion concluded with a No Jeopardy finding (USFWS 2004b).

3.6.2 Environmental Consequences

3.6.2.1 No Action Alternative

Under the No Action Alternative, Chiricahua leopard frog critical habitat would not be designated under the ESA. The section 7 consultation process would continue as presently conducted without consideration of PCEs. Section 7 would be initiated only for *may affect* determinations of impacts on the Chiricahua leopard frog. Consequently, this alternative would have no impact on wildfire management beyond those conservation measures resulting from the listing of the Chiricahua leopard frog (65 FR 24328-24372) and associated requirements of section 7 of the ESA.

Section 7 consultations would be initiated only for *may affect* determinations of impacts to the leopard frog. Such consultations would analyze relevant land, resource and fire management plans on federal lands currently occupied by the species. As they relate to fire management, such consultations would likely include:

- U.S. Bureau of Land Management-- fire suppression, fuel reduction treatments,
- U.S. Fish & Wild Service—fire management plans
- U.S. Forest Service—fire management plans, fire suppression, fuels reduction treatments,

Therefore, this alternative would not have any impacts on fire management beyond any conservation measures or project modifications resulting from the listing of the Chiricahua leopard frog and associated requirements of section 7 of the ESA.

3.6.2.2 Alternative A

Compared to No Action Alternative, Alternative A would result in (1) a small but unknown increase in the number of additional new and reinitiated section 7 consultations for fire management actions based solely on the presence of designated critical habitat and (2) the

addition of an adverse modification of critical habitat analysis to section 7 consultations for the Chiricahua leopard frog in critical habitat. Most fire management plans are programmatic in nature and these plans may be required to reinitiation consultation. The additional new section 7 consultations would most likely be for specific hazardous fuels reduction treatments or for after-the-fact (emergency) consultations for wildland fire suppression and rehabilitation activities in those areas. The primary impact of the additional consultations would be increased administrative costs to the Service and action agencies.

New and Reinitiated Consultations

Because the PCEs that make up each critical habitat unit are closely tied to adverse effects to the species, activities that would require consultation for critical habitat are primarily the same activities that currently require consultation for the species. The designation of critical habitat raises awareness of the species presence in an area, and therefore project proponents who have not requested consultations for actions that may affect the species may decide to do so. Based on previous activity with designated units, such project proponents could include the Forest Service and Bureau of Land Management, although specific locations of these types of projects in critical habitat are unknown at this time.

In addition, activities proposed in the two units of critical habitat where the frog is currently not extant will now require consultation due to designation of critical habitat. These two sites include the Cave Creek area and Carr Barn Pond, both in Cochise County, AZ. Federal lands in these areas are managed by the Forest Service and will require consultation for proposed actions relating to fire management and fire suppression. Since only Unit 13 (Carr Barn Pond) is both unoccupied and is not located within critical habitat for another listed species this is the only location that would warrant consultation based solely on designation of Chiricahua leopard frog critical habitat. Projects within or affecting Unit 17 are already generating consultations for the Mexican spotted owl. However, there are still incremental administrative costs from including leopard frog analysis into those Unit 17 consultations.

Reinitiated consultations are consultations that have been completed for impacts to the species, but which might need to be re-opened to consider the likelihood of destruction or adverse modification to critical habitat. As it relates to fire management, such consultations could include:

- Fire Management Plans—BLM, USFS
- Fuels Reduction—BLM, USFS
- Fire Suppression—BLM, USFS

These reinitiated consultations would include after-the-fact consultations precipitated by emergency fire response activities.

Addition of Adverse Modification Analysis to Future Consultations

The consultation analyses for effects on a listed species and effects on critical habitat are similar in many respects and are parallel processes because the health of a species cannot be disassociated from the health of its habitat. The outcomes of these future consultations would

depend on the details of project proposals and the analysis of effects, which are unknown at this time.

The additional consultations, and the additional time required to complete consultations that would only have considered effects on the species, would increase administrative costs to the Service and to the action agencies. Implementing conservation measures resulting from those additional consultations would also increase costs for action agencies. Outcomes of consultations for critical habitat could also include reasonable and prudent alternative alternatives and other conservation measures designed to maintain leopard frog PCEs. These outcomes cannot be predicted precisely; however, based on past consultations, types of additional management actions that may be required include, but are not limited to:

- Mapping, surveying, and monitoring leopard frog habitat and preparing survey and monitoring reports
- Limiting uses of fire retardants or suppressants toxic to fish or amphibians in occupied frog habitats or in watersheds where these chemicals are likely to enter occupied frog habitats
- Avoid high severity fire affects upstream from any occupied habitat
- Prohibiting water diversion or pumping from a site occupied by leopard frogs
- Establishing burn buffers along riparian corridors and around aquatic habitats
- If extensive erosion is possible, sediment traps should be placed above occupied habitat to reduce potential take of this species

In summary, the effects of critical habitat designation on fire management activities are expected to be minor because (1) few projects would be subject to new consultations based solely on the presence of designated critical habitat, because most of the proposed units are occupied by the leopard frog; (2) any reasonable and prudent alternatives developed under jeopardy analysis would not likely be changed substantially with the addition of adverse modification analysis; (3) very few if any additional conservation measures would be proposed to address critical habitat, beyond those already proposed in jeopardy consultations.

Consultations for critical habitat may also result in the establishment of reasonable and prudent alternatives and other conservation measures designed to maintain the Chiricahua leopard frog PCEs. The Chiricahua leopard frog CMED (SESA 2008) recommends the following fire management guidelines for reducing impacts to the Chiricahua leopard frog:

1. No fire retardants or suppressants toxic to fish or amphibians will be used over habitats occupied by Chiricahua leopard frogs, tributary drainages, or on the watershed where these chemicals are likely to enter occupied frog habitats.
2. No burning will occur within 300 feet (91 meters) of any aquatic habitats, and no-burn buffers will be established along riparian corridors with variable widths determined by hydrologist
3. Water shall not be pumped or diverted from a site occupied by Chiricahua leopard frogs
4. To avoid the transfer of chytridiomycosis, water hauled to the occupied sites should originate from sources either within the same drainage as the target site, or preferable from ground water or domestic/treated sources.

3.6.2.3 Alternative B

Compared to the No Action Alternative, impacts associated with the designation of critical habitat would be similar to those identified for Alternative A. However, the exclusions are primarily private lands associated with existing Safe Harbor Agreements and/or conservation easements. If these areas are included, designation of critical habitat only affects them to the extent that activities that have effects on critical habitat may require a federal license, permit or funding; also, enrollment in a Safe Harbor Agreement provides regulatory protection should conservation activities on the land result in incidental take of leopard frogs. In some cases private lands adjacent to federal lands are encompassed in programmatic fire management plans (USFWS 2004a). Therefore, these exclusions could reduce the economic impacts of designation on fire management activities in these areas overall, by requiring fewer consultations. This would reduce administrative costs as well for the Service. The overall impacts on fire management would be less than those of Alternative A, and still be characterized as minor.

3.7 Construction/Development—Roads, Bridges, Dams

3.7.1 Existing Conditions

The proposed rule lists construction and maintenance of roads as a threat to Chiricahua leopard frog critical habitat. Construction and maintenance of bridges and dams have similar effects to the proposed habitat. The proposed rule states that critical habitat does not include any manmade structures already in place at the time of listing (such as buildings, aqueducts, runways, roads, and other paved areas) and the land on which they are located, with the exclusion of impoundments, livestock tanks, and other constructed waters (USFWS 2011a).

Many road, bridge, and dam construction and maintenance actions in areas occupied by Chiricahua leopard frogs are typically restricted to a defined area and may not have watershed-level impacts to water permanence. Exceptions to this may include construction of roads, bridges, or dams that either divert and/or alter natural drainage patterns, or severely impact the function of floodplains and channel characteristics (SESA 2008).

Formal consultations to analyze the effects on Chiricahua leopard frog from road, bridge, and dam construction or maintenance have previously been conducted by the U.S. Army Corps of Engineers (USACE), U.S. Forest Service (USFS), and the Federal Highway Administration (FHWA). For example, the USACE addressed the Chiricahua leopard frog during consultations for the rehabilitation of Nelson Dam in 2009. The biological opinion found that although suitable habitat would be eliminated, there were no major frog populations or important breeding or foraging sites at the site. The available habitat that would be affected was a very small portion of the area being dewatered. Conservation measures taken by the USACE included erosion and siltation controls for habitat found further downstream of the dam (USFWS 2009d).

In 2011, the FHWA addressed the Chiricahua leopard frog in consultation for the Control Road Bridge Replacement on the Tonto National Forest. FHWA developed several conservation measures to address the effects to the frog and its habitat. These measures included:

- Conducting leopard frog surveys;

- Training on-site personnel on identifying the leopard frog
- Informing the Service of any leopard frogs observed;
- Returning each site, as near as practicable, to pre-construction contours upon completion of construction;
- Stabilizing and, where appropriate, revegetating all disturbed soils;
- Implementing appropriate best management practices during construction to minimize the potential for erosion and offsite transport of sediments;
- Returning each site, as practicable, to pre-construction contours upon completion of construction;
- Stabilizing and, when appropriate, revegetating all disturbed soil (USFWS 2011f).

3.7.2 Environmental Consequences

Construction and maintenance of road, bridge, and dams could include clearing vegetation; roadside use of salt and herbicides; increasing pervious surfaces; and compacting soils. Adverse effects of road, bridge, and dam construction on the Chiricahua leopard frog could result from:

- Increasing contamination of aquatic sites with petroleum, herbicide, pesticide, residue from cement trucks, or dust;
- Increasing the spread of non-native predators and *Bd*;
- Barriers to frog movement and dispersal (crushing frogs on paved surfaces or causing the frogs to be reluctant to move across disturbed soils).
- Increase in sediment deposition;
- Alteration of water chemistry;
- Introduction of non-native predators
- Removal or blocking access to riparian vegetation
- Pedestrian and construction traffic on roads near frog-occupied sites, resulting in direct mortality of dispersing frogs

In addition, the creation and use of unpaved roads can also contribute to soil erosion and increase sediment loads to aquatic sites (SESA 2008).

Beneficial effects of road construction include creation of small pools of water that has the potential to provide temporary habitat for dispersing frogs (SESA 2008).

3.7.2.1 No Action

Under the No Action Alternative, no critical habitat would be designated for the Chiricahua leopard frog. The section 7 consultation process would continue as presently conducted without consideration of PCEs. Conservation measures to protect the frog from incidental take during road construction would still be excluded from the section 9 take prohibition, and the benefits of these activities would outweigh any adverse effects to critical habitat and thus would not constitute adverse modification. For example, proposed trail, bridge, and dam projects may be relocated or redesigned if the Chiricahua leopard frog or egg masses are found in the proposed site of one of these projects.

Section 7 consultations would be initiated only for *may affect* determinations of impacts to the leopard frog. Such consultations would analyze relevant travel management plans, and management plans on federal lands currently occupied by the species. As they relate to road, bride, and dam construction and maintenance, such consultations would likely include:

- Bureau of Land Management – Safford Resource Management Plan
- U.S. Forest Service –Travel and forest management plans on the Apache-Sitgreaves, Coconino, Coronado, Gila, and Tonto National Forests
- U.S. Department of Transportation – Highway and bridge construction and maintenance
- U.S. Army Corps of Engineers – Bridge projects, urban development
- U.S. Fish and Wildlife Service – Management plans
- U.S. Department of Homeland Security – Border security infrastructure and operations

Therefore, this alternative would not have any impacts on road, bridge, and dam construction beyond any conservation measures or project modifications resulting from the listing of the Chiricahua leopard frog and associated requirements of section 7 of the ESA.

3.7.2.2 Alternative A

Most proposed critical habitat areas are occupied by the Chiricahua leopard frog; therefore, road, bridge, and dam construction in those areas would be subject to section 7 consultations irrespective of the area's status as critical habitat. However, compared to the No Action Alternative, Alternative A (all proposed units, no exclusions) would result in (1) a small but unknown increase in the number of additional new and reinitiated section 7 consultations for livestock grazing based solely on the presence of designated critical habitat; and (2) the addition of an analysis of adverse modification of critical habitat to future section 7 consultations on the Chiricahua leopard frog in critical habitat.

New and Reinitiated Consultations

Because the PCEs that make up each critical habitat units are closely tied to adverse effects to the species, activities that would require consultation for critical habitat are primarily the same activities that currently require consultation for the species. The designation of critical habitat raises awareness of the species presence in an area, and therefore project proponents who have not requested consultations for actions that may affect the species may decide to do so.

In addition, construction and maintenance on federal land proposed in the two units of critical habitat where the frog is currently not extant will now require consultation due to designation of critical habitat. These two sites include the Cave Creek area and Carr Barn Pond, both in Cochise County, AZ. Federal lands in these areas are managed by the Forest Service and will require consultation for proposed actions relating to road, bridge, and dam construction. The additional consultations would increase administrative costs to the Service, the action agencies, and any project proponent involved in the consultation process.

Reinitiated consultations for road, bridge, and dam construction and maintenance could include:

- Plans for Land Use, Recreation, Fire Management—BLM, USFS, NRCS
- Travel Management Plans – USFS

- Operations Plans - USDHS

Addition of Adverse Modification Analysis to Future Consultations

The consultation analyses for effects on a listed species and effects on critical habitat are similar in many respects and are parallel processes because the health of a species cannot be disassociated from the health of its habitat. The analyses are distinct, however, in that the standard for determining jeopardy concerns only survival of the species, while the standard for determining adverse modification must also take into account habitat values essential for the recovery of the species. The outcomes of these future consultations would depend on the details of project proposals and the analysis of effects, which are unknown at this time.

The additional consultations, and the additional time required to complete consultations that would only have considered effects on the species, would increase administrative costs to the Service and to the action agencies. Implementing conservation measures resulting from those additional consultations would also increase costs for action agencies. Outcomes of consultations for critical habitat could also include reasonable and prudent alternative alternatives and other conservation measures designed to maintain leopard frog PCEs. These outcomes cannot be predicted precisely; however, based on past consultations types of additional management actions that may be required include:

- Relocating the trail away from known Chiricahua leopard frog sites;
- Designating trail uses as non-motorized use only;
- Measures to minimize the amount of disturbance within the stream channels and the amount of vegetation cleared;
- Implementing appropriate best management practices during construction to minimize the potential for erosion and offsite transport of sediments;
- Limiting placement and amount of interpretive signs;
- Excluding signs along highways;
- Including information on the Chiricahua leopard frog on interpretive signs;
- Implementing control measures for erosion and siltation;
- Changing the extent, duration, and timing of construction and maintenance activities (USFWS 2011a; USFWS 2009d; USFWS 2005a).

In summary, the effects of critical habitat designation on livestock grazing are expected to be minor because (1) few projects would be subject to new consultations based solely on the presence of designated critical habitat, because most of the proposed units are occupied by the leopard frog; (2) any reasonable and prudent alternatives developed under jeopardy analysis would not likely be changed substantially with the addition of adverse modification analysis; (3) very few if any additional conservation measures would be proposed to address critical habitat, beyond those already proposed in jeopardy consultations.

3.7.2.3 Alternative B

For Alternative B (proposed units minus exclusions), the impacts associated with the designation of critical habitat would be similar to those identified for Alternative A. However, the exclusions are primarily private lands associated with existing Safe Harbor Agreements and/or

conservation easements. If these areas are included, designation of critical habitat affects them only to the extent that activities that have effects on critical habitat may require a federal license, permit or funding; also, enrollment in a Safe Harbor Agreement provides regulatory protection should conservation activities on the land result in incidental take of leopard frogs. Therefore, these exclusions could reduce the economic impacts of designation on land management activities in these areas overall, by requiring fewer consultations overall. This would reduce administrative costs as well for the Service. The overall impacts on road, bridge, and dam construction would still be characterized as minor.

3.8 Recreation

3.8.1 Existing Conditions

Several types of recreational activities take place in or near proposed critical habitat areas for the Chiricahua leopard frog. Recreational opportunities include hiking, wading, boating, swimming, birding, wildlife viewing, photography, angling, hunting, camping, horseback riding, and off-highway vehicle (OHV) use. Level of use and type of activity vary by site characteristics, landownership, management policy, and accessibility.

Table 7 below lists critical habitat units that are at least partly within or adjacent to Federal recreational sites. The largest recreational area within the proposed designation is the Santa Rita Backcountry Tour area, 172 acres (70 ha) within Coronado NF.

TABLE 7. Critical Habitat Units within or adjacent to Federal recreation sites

Federal Property	Critical Habitat Unit	Recreational Area within or adjacent to this unit (name, area size)
Coronado NF	5	Sycamore Canyon Hiking Trail and Border Hiking Trail--9 miles (15 km)
Coronado NF	6	White Rock Family Campground (15 campsites), Peña Blanca Lake
Coronado NF	7,8	Santa Rita Backcountry Tour Area--172 acres (70 ha)
Coronado NF	11	Sunnyside Canyon Hiking Trail--5 miles (8 km)
Coronado NF	12	Miller Canyon Hiking Trail--4 miles (6.4 km)
Coronado NF	14	Brown Canyon Hiking Trail--5 miles (8 km)
Coronado NF	17	Cave Creek Canyon (includes 5 campgrounds and Summerhomes)
Coronado NF	22	Middle March Hiking Trail--2 miles (3.2 km)
Apache NF	34	Coal Creek Campground (5 campsites)
Buenos Aires NWR	3	Refuge area (2 campsites)
Leslie Canyon NWR	18	Refuge area (hiking ,wildlife viewing)

In addition, Bureau of Land Management lands include two National Conservation Areas (NCA): San Pedro Riparian NCA and Las Cienegas NCA in Arizona. These areas are managed under the principles of multiple-use and ecosystem management for future generations. Popular recreational activities include hunting, off-highway driving, birding, camping and picnicking, and sightseeing. Recreational uses of the NCA will likely increase due to human population growth in southern Arizona. The filing of new mining claims and mineral leasing is not permitted. Off-highway vehicle use is limited to designated roads. Other BLM lands with recreational access include smaller parcels in Sierra, Socorro, and Grant Counties, New Mexico.

Most of the proposed habitat segments receive only low-level recreational use because of their remoteness, difficult terrain, or landownership status. The activities most likely to be impacted by the designation of critical habitat are Off-Highway Vehicle (OHV) use and sportfishing.

OHVs

OHV use is authorized on certain roads open to all vehicles that pass near to (within ~½ mile of) proposed critical habitat in Coronado National Forest, specifically in units 4, 5, 6, 8, 11, 16, 20, 21, and 22—all areas occupied by the leopard frog. In addition, a small authorized road segment passes within ½ mile of unit 17, an unoccupied area. Many of these roads are used primarily to access dispersed camping (USFS 2011a).

There have been no previous consultations on Travel Management Plan actions involving the C. leopard frog in any of the five national forests containing proposed critical habitat, although changes to these plans are among actions that could trigger future consultations, regardless of whether critical habitat is designated. The Forest Service actively manages for the C. leopard frog, and its designation of roads and trails is done within the context of its efforts to protect sensitive aquatic habitat.

OHV use is not authorized in Coal Creek Campground in Apache NF, where unit 34 is located.

Sportfishing

Peña Blanca Lake in Santa Cruz County, Arizona, is a popular fishing site, and the largest sportfishing site within the proposed critical habitat designation. It lies within Coronado NF (unit 6), but the Lake and associated fish-stocking activities are managed by Arizona Game and Fish Department. A CERCLA-required mercury remediation effort in 2008 eliminated the warmwater fish community present in the Lake, precipitating a proposed warmwater fish stocking effort in 2010 (USFWS 2011g). Federal funding for these stocking efforts was proposed by the Wildlife and Sport Fish Restoration (WSFR), a branch of the Service; therefore an intra-Service consultation between the Arizona Ecological Services Office and the WSFR was recently completed for stocking warmwater fish (in addition, a consultation was completed in 2010 for stocking rainbow trout). As a result of these previous consultations for fish-stocking actions at Peña Blanca Lake, a number of conservation measures have been put in place to eliminate bullfrongs (*Lithobates catesbeianus*) from the greater Peña Blanca Lake area (USFWS 2011g). These conservation measures--including signage, survey/monitoring measures, shoreline vegetation protection measures, and live bait restrictions--enabled the Service to offer a no jeopardy finding for the proposed restocking action.

In addition, Bear Canyon Lake, within the Mimbres River basin in Grant County, New Mexico (proposed Unit 40), was the subject of a recent intra-Service consultation with WSFR regarding the stocking of triploid rainbow trout (*Oncorhynchus mykiss)* and channel catfish (*Ictalurus punctatus*) into the Lake (USFWS 2011h). The Biological Opinion found that the project is not likely to jeopardize the continued existence of the frog or to destroy or adversely modify proposed critical habitat. It recommended the following conservation measures:

- Coordinate with the Service on the design and implementation of a study to determine the level of use of waterdogs in the Gila and Mimbres drainages
- Post an informational sign at Bear Canyon Lake for anglers and recreationists. The sign should include, ata minimum, the fishing regulations for Bear Canyon Lake, including that the use of bait fish and live American bullfrogs is illegal, and the releave of any live animals is also illegal.
- Immediately report bullfrogs, tiger salamanders, or crawfish captured or observed during NMDGF's annual monitoring of Chihuahua Chub populations along the Mimbres River.

3.8.2 Environmental Consequences

3.8.2.1 No Action Alternative

Under the No Action Alternative, no critical habitat would be designated under the ESA. Section 7 consultations would continue for proposed actions with a federal nexus, including water management, construction of roads, bridges and dams, and fish stocking, that could have impacts on recreational activities. Stream reaches, ephemeral drainages, stock tanks, and other impoundments occupied by the leopard frog would be subject to section 7 consultations regardless of the area's status as critical habitat. The conservation measures implemented as a result of section 7 consultation under the No Action Alternative may require specific modifications to recreation opportunities. These modifications may limit some types of recreation activities, restrict construction and maintenance of recreational facilities in or near critical habitat, and/or increase administrative costs to recreation agencies. The No Action Alternative is anticipated to have negligible to minor, indirect, adverse impacts to recreation opportunities related to such required conservation measures benefiting the habitat values for Chiricahua leopard frog. Additionally, under the No Action Alternative, some required section 7 conservation measures could have a neutral to minor, indirect, beneficial impact on recreation activities resulting from an increase in the habitat values of the leopard frog or improved access to areas for birding, wildlife viewing, or day hiking.

3.8.2.2 Alternative A

Compared to No Action, Alternative A would result in a small but unknown increase in the number of additional new and reinitiated section 7 consultations for recreation-related activities based solely on the presence of designated critical habitat and (2) the addition of an adverse modification of critical habitat analysis to section 7 consultations for Chiricahua leopard frog in critical habitat. The areas most likely to be affected are those not occupied by the leopard frog

but designated as critical habitat. The two unoccupied units in this designation together represent 0.6% of the total proposed critical habitat designation. The additional consultations would increase administrative costs to the Service, the action agencies, and any project proponent involved in the consultation process. Consultations for critical habitat may also result in the establishment of reasonable and prudent alternatives and other conservation measures designed to maintain the C. leopard frog PCEs. Conservation measures may adversely affect recreational opportunities, primarily by limiting the higher-impact activities such as OHV use and camping in critical habitat areas within Coronado National Forest, in the limited areas where they overlap. Conservation measures may also include restrictions on constructing recreational facilities in or near critical habitat to reduce impacts from construction, maintenance, and use by recreationists. A potential benefit of increasing section 7 consultations for recreation-related activities would be maintenance of C. leopard frog PCEs through conservation measures within designated critical habitat. The conservation of riparian or freshwater lake habitat values that would result may benefit such recreational activities as birding, wildlife viewing, photography, and day hiking.

Both the adverse and beneficial effects of critical habitat designation on recreation-related activities are expected to be minor because recreational use of most critical habitat areas is light and (1) few projects and operations would be subject to consultation based solely on the presence of designated critical habitat because most of the proposed segments are occupied by the leopard frog; (2) the outcome of those few consultations based solely on critical habitat that do not reach the threshold of adverse modification could only result in discretionary conservation recommendations to reduce impacts on PCEs because there is no incidental take statement or reasonable and prudent alternatives for adverse modification of critical habitat; and (3) the likelihood that reasonable and prudent alternatives developed under the jeopardy standard would be changed substantially with the addition of critical habitat designation and application of the adverse modification standard is small.

OHV Use—Coronado NF is considering changes to its Motorized Travel System that would decommission one existing authorized road that reaches near to proposed critical habitat (unit 7), and open another to all motorized vehicles (unit 8) (USFS 2011b). The designation of critical habitat would include consideration of destruction or adverse modification of habitat in these units.

New consultations conducted in unoccoupied unit 17, where FR 42, authorized for all vehicles, winds within ~1/2 mile of designated critical habitat, could result in minor impacts on recreational vehicle use, through measures limiting access.

Sportfishing--The most recent consultation with Coronado NF for warmwater fish stocking of Peña Blanca Lake concluded that the proposed stocking operation was “not likely to result in jeopardy to the species or destruction or adverse modification of critical habitat” (USFWS 2011g), assuming implementation of the conservation measures included in the proposed action and with an additional reasonable and prudent measure--that all fish stocking personnel shall adhere to Appendix G, Requirements for Working in Wetland and Aquatic Systems, spelled out in the Chiricahua Leopard Frog Recovery Plan (USFWS 2007a). These measures taken together have thus been decided by the Service to constitute no jeopardy or adverse modification, and incremental measures solely attributable to critical habitat from consultations on sportfishing activities are unlikely.

Proposed activities analyzed through the section 7 process could require mitigation to conserve designated critical habitat PCEs. However, the additional incremental benefit to leopard frog and impacts on recreational opportunities from critical habitat designation beyond that resulting from listing is expected to be small—in terms of potential modification to or restrictions on recreational activities. This is because impacts to habitat from recreational activities are currently being assessed in section 7 consultations on effects to these species. Based on past impacts to recreational opportunities within the areas of proposed designated critical habitat, there would potentially be minor, indirect, adverse impacts from critical habitat designation on some recreational opportunities and activities within designated critical habitat (e.g., fishing, overnight camping) from the limitations and restrictions imposed on recreational activities to preserve PCEs. However, other recreational activities and opportunities would be enhanced, and could benefit from critical habitat designation (e.g., birdwatching, wildlife viewing, day hiking), because of increased riparian habitat conservation or maintenance. The indirect adverse impacts on recreation would be similar to those past impacts described above: some recreational restrictions in designated critical habitat or potential closure of designated critical habitat to some forms of recreation.

3.8.2.3 Alternative B

Compared to the No Action Alternative, impacts associated with the designation of critical habitat would be similar to those identified for Alternative A. The exclusions are primarily private lands associated with existing Safe Harbor Agreements and/or conservation easements. Therefore, these exclusions could reduce the impacts of designation on all land management activities in these areas overall, including recreation, by requiring fewer consultations and thus fewer outcomes that could potentially restrict recreational uses. This would reduce administrative costs as well for the Service. The overall impacts on recreation would therefore be less than those in Alternative A, and still characterized as minor.

3.9 Socioeconomics

A separate economic analysis of critical habitat designation for the Chiricahua leopard frog has been conducted (IEc 2011) in response to the 2011 proposed rule (76 FR 14126). This analysis includes a description of existing plans and regulations that provide protection for the leopard frog and its habitat. These form the “baseline” protections accorded the leopard frog even absent the designation of critical habitat; such protections include the 11 conservation plans that address the leopard frog, including forest plans and Habitat Conservation Plans (HCPs). The discussion of the regulatory baseline provides context for the evaluation of economic impacts expected to result from critical habitat designation, which are the focus of the economic analysis. The “incremental” economic impacts are those that will occur given designation of critical habitat for the leopard frog.

3.9.1 Existing Conditions

The proposed critical habitat designation consists entirely of rural lands, in variously low levels of development and population density. All the units are in counties with population densities

lower than their statewide average, with the exception of Pima County, which includes the city of Tucson, which is more than 25 miles (40 km) from the nearest proposed critical habitat unit (Table 8).

Table 8. Socioeconomic Profile of Counties

SOCIOECONOMIC PROFILE OF COUNTIES CONTAINING CRITICAL HABITAT FOR C. LEOPARD FROG							
State	**County**	**Population Density (persons/ sq. mile, 2010)**	**Population (2010)**	**% of Statewide Population (2010)**	**% Change (2000-2010)**	**Per Capita Income (2009 dollars)***	**Poverty Rate (2009)**
Arizona	**State Total**	**56.3**	**6,392,017**	**100%**	**24.6%**	**$25,285**	**3.3%**
	Yavapai	26.0	211,033	3.3%	26.0%	$25,458	14.2%
	Graham	8.0	37,220	0.58%	11.1%	$15,842	21.5%
	Gila	11.2	53,597	.84%	4.4%	$19,054	20.7%
	Pima	106.7	980,263	15.3%	16.2%	$24,556	18.9%
	Santa Cruz	38.3	47,420	.74%	23.6%	$15,706	25.0%
	Cochise	21.3	131,346	2.1%	11.5%	$22,419	16.2%
	Greenlee	4.6	8,437	.13%	-1.3%	$20,754	10.9%
	Apache	6.4	71,518	1.1%	3.0%	$11,614	35.4%
New Mexico	**State Total**	**17.0**	**2,059,179**	**100%**	**13.2**	**$22,461**	**18.2%**
	Catron	0.5	3,725	.18%	5.1%	$20,978	22.0%
	Sierra	2.9	11,988	.58%	-9.7%	$17,661	27.0%
	Grant	7.4	29,514	1.4%	-4.8%	$19,916	19.5%
	Hidalgo	1.4	4,894	.24%	-17.5%	$17,581	23.6%
	Socorro	2.7	17,866	.87%	-1.2%	$17,256	28.1%

Source: U.S. Census Bureau, Census 2010 and State & County QuickFacts

Table 9 provides an overview of the key economic sectors in the counties that comprise the designation, as measured by number of enterprises and number of employees.

Table 9. Economic Activity in States

ECONOMIC ACTIVITY IN STATES CONTAINING PROPOSED C. LEOPARD FROG CRITICAL HABITAT NUMBER OF EMPLOYEES AND ESTABLISHMENTS BY INDUSTRY (2009)				
Industry	**Arizona**		**New Mexico**	
	Employees	Establishments	Employees	Establishments
Forestry, Fishing, Hunting, & Agriculture	527	51	82	8
Mining	11,656	82	2,735	15
Utilities	4,302	93	372	15
Construction	27,893	3,409	1,356	166
Manufacturing	31,596	1,026	553	30
Wholesale Trade	12,458	1,330	142	23
Retail Trade	72,363	4,815	2,752	248

Transportation and warehousing	11,926	801	271	41
Information	8,360	476	303	28
Finance	15,856	1,896	506	72
Real estate	9,045	1,928	305	71
Professional, scientific, and technical services	23,084	3,555	675	87
Management of companies and enterprises	4,812	149	278	6
Administrative &Support & Waste Management & Remediation	28,923	1,780	157	31
Educational Services	9,463	503	169	11
Health care and social assistance	79,916	4,039	2,513	129
Arts, entertainment, & recreation	9,514	460	164	13
Accommodation & food services	56,582	2,922	2,195	176
Other services*	19,721	2,758	458	125
Industries not classified	115	53	38	2
Total	**438,112**	**32,126**	**16,024**	**1297**

Source: U.S. Census Bureau, 2009 County Business Patterns (NAICS)

In the Arizona counties that contain designated habitat, the principal sources of employment are health care, retail, and tourism, respectively. In the New Mexico counties, mining is an additional key employer. Within this context of overall economic activity, specific economic sectors that could be impacted by the designation of critical habitat is discussed below.

3.9.2 Environmental Consequences

Direct impacts of designation on socioeconomic resources could include impacts to small entities from making project modifications or implementing conservation measures on project subject to section 7 consultation, and the incremental costs of such consultations to the Service, Federal agencies, or project proponents. Indirect impacts faced by project proponents, land managers and landowners could include the following:

- **Time Delays.** Both public and private entities may experience incremental time delays for projects and other activities due to requirements associated with the need to reinitiate the section 7 consultation process and/or compliance with other laws triggered by the designation. To the extent that delays result from the designation, they are considered indirect, incremental impacts of the designation.
- **Regulatory Uncertainty -** The Service conducts each section 7 consultation on a case-by-case basis and issues a biological opinion on formal consultations based on species- and site-specific information. As a result, government agencies and affiliated private parties who consult with the Service under section 7 may face uncertainty concerning

whether project modifications will be recommended by the Service and what the nature of these modifications will be. This uncertainty may diminish as consultations are completed and additional information becomes available on the effects of critical habitat on specific activities. Where information suggests that this type of regulatory uncertainty stemming from the designation may affect a project or economic behavior, associated impacts are considered indirect, incremental impacts of the designation.

- **Stigma -** In some cases, the public may perceive that critical habitat designation may result in limitations on private property uses above and beyond those associated with anticipated project modifications and regulatory uncertainty described above. Public attitudes about the limits or restrictions that critical habitat may impose can cause real economic effects to property owners, regardless of whether such limits are actually imposed. All else equal, a property that is designated as critical habitat may have a lower market value than an identical property that is not within the boundaries of critical habitat due to perceived limitations or restrictions. As the public becomes aware of the true regulatory burden imposed by critical habitat, the impact of the designation on property markets may decrease. To the extent that potential stigma effects on markets are probable and identifiable, these impacts are considered indirect, incremental impacts of the designation.

3.9.2.1 No Action

Under the No Action alternative, no critical habitat would be designated. Section 7 consultations would continue to occur for the leopard frog as they do now in occupied areas, the outcome based solely on the likelihood that an action would jeopardize the continued existence of the species. Consultations with potential socioeconomic impacts would be conducted primarily on lands managed by USFS and BLM, or for permits issued by those agencies and FWS. These would include consultations for:

- Mining
- Recreation Planning (sportfish management and travel management activities)
- Habitat restoration
- Grazing and livestock management
- Construction/development activities

Consultations for these activities would likely continue with similar frequency under the No Action Alternative. The outcomes of these consultations are conservation measures that serve to limit the natural resource impacts, and are described in detail in the Recovery Plan (Service 2007a). These conservation measures may require specific modifications to recreation opportunities, construction practices, or resource development activities, which may increase operational and/or administrative costs to action agencies or private parties applying for permits. These impacts of the No Action Alternative would continue to be minor, based on the consultation history for typical actions.

3.9.2.2 Alternative A

Impacts on Small Entities

Table 10 below depicts the specific potential economic impacts of the proposed critical habitat designation on "small entities" (the definition of "small entities" excludes the Federal government; administrative consultation costs are discussed later). This analysis is required by the Regulatory Flexibility Act as amended by the Small Business Regulatory Enforcement Fairness Act (SBREFA) of 1996. It was conducted as part of the economic analysis accompanying the draft rule (IEc 2011), upon which much of this chapter relies. As the table indicates, in the sectors potentially affected, small businesses dominate the marketplace, accounting for 95% of all entities; therefore this analysis is helpful in characterizing the potential economic impacts throughout the designation.

As mentioned above, activities that may be affected by the designation include livestock management, fire management, habitat management, water management, recreation, road and bridge construction, and resource development. Small entities may participate in section 7 consultations as a third party (the primary consulting parties being the Service and the Federal action agency). It is therefore possible that the small entities may spend additional time considering critical habitat during section 7 consultation for the leopard frog. These incremental administrative impacts to third parties are also considered in this analysis.

Review of the consultation history revealed that, of the seven activities listed above, fire management and recreation do not involve consultation with third parties, so small entities would not be affected by consultation for these activities. Habitat restoration activities also generally do not involve consultation with third parties, though a few consultations did include participation of cattle ranches. Accordingly, the small entities most likely to be affected by the designation of critical habitat for the leopard frog fall into four categories: livestock management, water management, transportation (roads and bridges), and development.

Table 11 describes the number of entities that may bear incremental impacts related to these activities. It presents the relevant small entity thresholds by North American Industry Classification System (NAICS) code, the total number of entities and small entities in proposed critical habitat, and the estimated annualized incremental impacts to small entities in each activity category. For reference, the table also presents the small entity size standard for each industry, which is the upper bound revenue figures for small entities within each industry; note that the average annual revenues for small businesses in the region will likely be lower.
As shown, this analysis estimates that up to 171 small entities may be affected by section 7 consultations stemming from this rule. Annualized incremental economic impacts to small businesses range from $254 per year for transportation and residential and commercial development to $8,390 per year for livestock management.

Although 171 entities would represent a substantial number, this is likely to be a high-end estimate of the number of small businesses that would be affected by this rule for several reasons:

- It assumes that each consultation projected to occur between 2012 and 2031 in the four activity categories will involve the participation of a third party;
- It assumes that one small entity will participate in each forecast consultation, but it is possible that the same entity may participate in multiple consultations. For example, the analysis forecasts up to 135 consultations that may involve the participation of small cattle ranches, but the number of ranches participating in these consultations could range from 1 to 135; and
- It assumes that each third party will be a small entity, although some consulting parties may not be small.
- Consequently, this approach likely overstates the number of small entities that may be affected by the critical habitat designation.

Similarly, although the highest annualized impact of $8,390 per year for livestock management would represent a significant impact if those costs are borne by only a few small ranchers with annual revenues that are considerably lower than the small entity revenue size standard of $750,000 per year, this is an unlikely outcome. In the extreme case where a single ranch participates in all 135 consultations, annualized impacts to that single entity would be $8,390; however, in the other extreme, if 135 small ranches each participate in a single consultation, annualized impacts to each entity would be approximately $62. If 68 small ranches participate (i.e., the midpoint between 1 and 135), the annualized impacts would be $123 per entity. Given that the consultations on livestock management activities are projected to occur on U.S. Forest Service allotments and other Federally managed areas that are spread over large parts of Arizona and New Mexico, it is unlikely that only a few ranchers would participate in all 135 of these consultations. If only a few did participate, it is unlikely that these entities would be small businesses. As a result, although the analysis does not have access to average annual revenues for small entities in the proposed critical habitat areas and thus cannot estimate annualized impacts as a percent of annual revenues, it is unlikely that these impacts would be significant.

These potential impacts are described in greater detail below (IEc 2011):

- **Livestock management.** Incremental costs to small livestock management entities are estimated at $8,390 on an annualized basis (discounted at seven percent). Assuming that between 1 and 135 small entities undergo section 7 consultation over the 20-year period considered in this analysis, annualized impacts per small entity are expected to be between $62 and $8,390.

- **Water Management**. Incremental costs to water management activities that may be borne by small entities are estimated at $508 on an annualized basis. Assuming that between 1 and 18 small entities undergo section 7 consultation, annualized impacts per small entity are expected to be between $28 and $508.

- **Transportation.** Incremental costs to road, bridge, and dam constrution activities that may be borne by small entities are estimated at $254 on an annualized basis. Assuming

that these impacts are borne by between one and nine small entities, annualized impacts per small entity are expected to be between $28 and $254

- **Residential and Commercial Development.** Potential incremental impacts to small development firms are estimated to be $850 on an annualized basis. Assuming that these impacts are borne by between one and nine small entities, annualized impacts per small entity are expected to be between $28 and $254.

Overall, given the absolute dollar projections and relatively small size in comparison to total annual revenues for a given entity, the likely potential impacts to small entities would be minor.

Table 10. Summary of Upper Bound Potential Impacts on Small Entities

ACTIVITY	INDUSTRY	SMALL ENTITY SIZE STANDARD	TOTAL NUMBER OF ENTITIES	NUMBER OF SMALL ENTITIES	NUMBER OF AFFECTED SMALL ENTITIES[1]	ANNUALIZED INCREMENTAL ECONOMIC IMPACTS TO SMALL BUSINESSES (7%)
Livestock Management	Beef Cattle Ranching and Farming	$750,000	162	135	Up to 135	$8,390
Water Management	Water Supply and Irrigation Systems	$7.0 million	120	104	Up to 18	$508
Transportation	Highway, Street, and Bridge Construction	$33.5 million	165	154	Up to 9	$254
Residential and Commercial Development	New Single-Family Housing Construction	$33.5 million	3,239	3,207	Up to 9	$254
	New Housing Operative Builders		62	58		
	Land Subdivision	$7.0 million	416	277		

Notes:

1. To estimate the number of affected small entities, this analysis assumes one small entity per forecast section 7 consultation, rounded up to the nearest unit. In the case of livestock management, the analysis forecasts 286 consultations over 20 years (74 formal and 212 informal), which exceeds the total number of small ranches in the area, so the analysis uses the total number of small ranches (135) as the upper bound.

2. Annual revenues are estimated using Risk Management Association (RMA), *Annual Statement Studies: Financial Ratio Benchmarks 2010 to 2011*, 2010. For each NAICS code, RMA provides the net sales and the number of entities falling within several sales categories: $0 to $500,000, $500,000 to $2 million, $2 to $10 million, or $10 to $50 million. Based on the number of entities and total net sales falling within each sales category, we developed an estimate of average net sales (revenues) per small entity. Specifically, the analysis averages data for the sales categories at or below the small business threshold for each industry.

Source: Dialog search of File 516, Dun and Bradstreet, "Duns Market Identifiers," on June 23, 2011.

(IEc, 2011).

Administrative Consulation Costs

In addition, the economic analysis considered the administrative costs of likely incremental consultations, based on a series of assumptions. The most important assumption is that designation of critical habitat is not expected to lead to any project modifications beyond those required by baseline protections for the leopard frog. Therefore the designation is not anticipated to trigger new consultations in occupied habitat. In addition, as described above, consultations in unoccupied habitat are unlikely to lead to project modifications given the nature and uses of the unoccupied lands. The incremental costs of designation will consist of : (1) re-initiating past consultations to consider adverse modification of habitat for the leopard frog; (2) consideration of adverse modification in the context of section 7 consultations that are projected to occur in occupied habitat regardless of the critical habitat designation; and (3) consideration of adverse modification in the context of section 7 consultations projected to occur in unoccupied habitat as a result of critical habitat designation.

Future consultations are projected for the leopard frog based on a review of the consultation history from 2002 to 2010, accounting for expected re-initiations of prior consultations. For the 20-year timeframe of this analysis, the estimated present value of total incremental costs of critical habitat designation is $1,300,000 assuming a seven percent real discount rate. This figure represents an annualized impact of approximately $115,000. As described above, these costs represent expectations of additional administrative effort as part of future section 7 consultations.

Concerns were expressed in public comments about the proposed rule that the designation of critical habitat would restrict the uses of land and water rights in ways that would impact the ability of agricultural producers to earn a living. The Service will continue to communicate with local farmers and ranchers about the actual impacts of designation which, as explained in other sections, are limited in scope (applying only to activities that have a federal nexus) and depth (producing additional restrictions <u>only</u> where considerations of adverse modification require more modifications than considerations of jeopardy alone).

3.9.2.3 Alternative B

The economic analysis of the incremental costs of consultations was conducted by proposed unit, so it is possible to extract units proposed for exclusion under Alternative B from the analysis. When those units are excluded from the designation, the total incremental cost of designation is reduced by almost 20 % to $1,057,000, representing an annualized impact of approximately $93, 100.

With respect to the potential economic impact on small entities, the units proposed for possible exclusion under Alternative B were proposed precisely because they are subject to protections from their participation in other conservation plans. Because of these protections, economic activities are already more limited on these lands and, therefore, excluding them does not yield a proportional benefit in reduced economic impacts. So while the exclusion of these lands reduces the potential economic impact of designation, it does not likely do so by almost 20%. Because

the potential economic impact is lower than that of Alternative A, it would still be considered minor.

3.10 Livestock Grazing

3.10.1 Existing Conditions

The proposed rule lists poor livestock management and livestock grazing as a threat to Chiricahua leopard frog habitat. Included in the Service's 2002 published final rule listing the Chiricahua leopard frog as threatened was a special rule (see 50 CFR §17.43 (b)), exempting operation and maintenance of livestock tanks on non-Federal lands from the Section 9 take prohibitions of the Endangered Species Act of 1973, as amended (16 U.S.C. 1531 *et seq*) (USFWS 2002). The Chiricahua Leopard Frog Recovery Plan (2007) states that the effects of livestock grazing on Chiricahua leopard frog habitat can include both the creation of habitat as well as the loss and degradation of habitat. In fact, managing livestock tanks gives ranchers and land or water mangers an opportunity to participate in the recovery of the frog in a manner that will provide sustainable habitat for frogs and other wildlife as they provide water for livestock (USFWS 2007a).

Beneficial effects of grazing activities can include the creation of perennial or transitory habitat, creation of basking areas, reducing the likelihood of regional development, and increases in algal and macrophyte growth from small amounts of livestock excrement in the water (SESA 2008). In addition, livestock tanks, constructed as water sources for livestock, also function as an important habitat type for the frog in Arizona and New Mexico. It is possible that the frog persists in these habitats because they may contain fewer non-native predators than natural sites (though not American bullfrogs) (Sredl and Saylor 1998), are less susceptible to introduction of disease because they are somewhat isolated, or because they hold perennial water, often during drought.

Adverse impacts of livestock grazing and its associated activities include the deterioration of watersheds; erosion and/or siltation of streams; elimination of undercut banks that provide cover for frogs; loss of wetland and riparian vegetation and backwater pools; spread of disease and non-native predators; degradation of water quality in ponds and livestock tanks from an increase in sediments and higher amounts of livestock excrement in the water; reduced water quantity in ponds and tanks due to water consumption by livestock; trampling of egg masses, as well as larval, juvenile, and adult frogs (USFWS 2007a).

With proper livestock management, minor losses of frogs and some temporary deterioration of habitats from grazing activities are not likely to result in extirpation of populations. Guidelines for proper management of livestock grazing practices in Chiricahua leopard frog habitat include:

- excluding cattle from breeding pools;
- rest-rotation and deferred utilization;
- varying livestock types; using lowered stocking rates or smaller breeds for lighter utilization levels (limit forage removal);
- temporary or permanent fencing of pastures or habitat;

- relocation of water and salting sites away from wetlands;
- maintenance of stream bank stability;
- management of upland herbaceous vegetation;
- emergency control structures;
- careful placement of tanks and regulating public access;
- consideration of tanks for habitat restoration/creation sites for future establishment or reestablishment of frog populations;
- determining if a site is expected to be colonized by non-native predators
- converting stock tanks to troughs or elevated tanks in which water is supplied by a pipeline, windmill, or solar pump.

Additional management guidelines include the construction of trick tanks or double tanks; keeping cattle out of some or all of the pond area; placing logs and branches in water to enhance under water cover and substrates for egg mass deposition; limit extent of time that livestock are allowed to congregate in aquatic sites occupied by Chiricahua leopard frogs; if the Chiricahua leopard frog is present, corrals should be moved or should not be proposed if adjacent to frog habitats where water quality degradation is likely to occur (USFWS 2007a).

Federal lands consist of 59% of the proposed critical habitat for the Chiricahua leopard frog, and livestock grazing occurs on both U.S. Bureau of Land Management (BLM) and U.S. Forest Service (USFS) lands. Livestock grazing in general has been in decline on BLM- and Forest Service-managed lands in the Southwest (USFWS 2005b). During the late 19th century, lands in this region were heavily overgrazed, degrading watersheds and altering fire regimes (USFWS 2007a). To address overgrazing, federal grazing permits were established on USFS and BLM lands in the early 20th century. The USFS established a system of range regulation between 1906 and 1907 that included limits on herd sizes, grazing seasons, areas of use and grazing fees (Lester 2002). The BLM established grazing permits in 1934 with the Taylor Grazing Act of 1934 (BLM 2011b).

Exclusion of riparian areas from grazing can result in a reduction in the number of livestock grazing permits, though permanent fencing and livestock exclusion from an entire pond or habitat is not recommended unless the site is not likely to become overgrown (USFWS 2007a). On allotments that contain the leopard frog, riparian areas have sometimes been excluded from grazing either year-round or seasonally (USFWS 2008a & 2008b; USFWS 2005b).

Since listing of the Chiricahua leopard frog, no Biological Opinions have been published that address the Chiricahua leopard frog in specific BLM grazing consultations. However, in 2008 the BLM addressed the Chiricahua leopard frog in consultation for the Aquatic Species Conservation at the San Pedro Riparian and Las Cienegas National Conservation Areas, Arizona. Livestock grazing with regards to the proposed project and the effects on the Chiricahua leopard frog was addressed in this consultation. The Service found that there would be no jeopardy to the Chiricahua leopard frog. The Service's finding was based on several factors, including efforts under the proposed project to minimize invasion and establishment of nonnative species, and other conservation measures proposed by the BLM. Conservation actions for livestock management included controlling livestock use at ponds through the use of fencing and gates to protect aquatic habitat sufficiently for aquatic species to thrive, while managing livestock access to increase effectiveness of pasture rotations and to manage vegetation (USFWS 2008a).

No Biological Opinions addressing BLM grazing allotments and the Chiricahua leopard frog have been published in New Mexico (USFWS 2010a). Although the BLM has not yet addressed effects to Chiricahua leopard frogs in their grazing consultation, the BLM has taken measure to protect aquatic and riparian systems on BLM lands (USFWS 2007a).

The USFS has addressed the leopard frog in at least one grazing consultation for each of the five National Forests within the Chiricahua leopard frog proposed critical habitat: Apache-Sitgreaves, Coconino, Coronado, Gila, and Tonto National Forests, in Arizona and New Mexico. Conservation efforts undertaken by USFS to avoid jeopardy to the Chiricahua leopard frog include:

- Excluding livestock grazing from key habitats identified with action areas as particularly important for Chiricahua leopard frog egg mass oviposition (USFWS 2008b; USFWS 2005b)
- Managing grazing allotments with recommendations from the Chiricahua Leopard Frog Recovery Plan; and
- Developing, in coordination with the Phoenix Zoo and other stakeholders, a Chiricahua leopard frog head-start program for reintroducing the species in the action area using the habitat for egg mass oviposition (USFWS 2008b).

3.10.2 Environmental Consequences

Activities that occur on critical habitat units that affect livestock grazing include but are not limited to permanent or temporary fencing, livestock exclusion from ponds, and seasonal variations in livestock grazing. Actions that would alter livestock grazing or the permanence of a breeding site or dispersal corridor may also affect critical habitat for the Chiricahua leopard frog thus triggering a section 7 consultation. These actions include soil erosion or siltation, prescribed fires, groundwater pumping, road and bridge construction, and destruction of riparian or wetland vegetation.

3.10.2.1 No Action

Under the No Action Alternative, no critical habitat would be designated for the Chiricahua leopard frog. The section 7 consultation process would continue as presently conducted without consideration of PCEs. For example, conservation efforts made by ranchers to maintain their livestock tanks on non-Federal lands would still be protected from the section 9 take prohibition under the special section 4(d) listing rule, and the benefits of these activities would outweigh any adverse effects to critical habitat and thus would not constitute adverse modification.

Section 7 consultations would be initiated only for *may affect* determinations of impacts to the leopard frog. Such consultations would analyze relevant programmatic grazing plans, Livestock Grazing Management Plans, and Livestock Permits on federal lands currently occupied by the species. As they relate to Livestock Grazing, such consultations would likely include:

- U.S. Bureau of Land Management—Programmatic Livestock Grazing Program-Stafford/Tucson Field Offices, Resource Management Plans

- U.S. Forest Service— Forest Plans, Grazing allotment management plans, and livestock grazing and management

Therefore, this alternative would not have any impacts on livestock grazing beyond any conservation measures or project modifications resulting from the listing of the Chiricahua leopard frog and associated requirements of section 7 of the ESA.

3.10.2.2 Alternative A

Most proposed critical habitat areas are occupied by the Chiricahua leopard frog; therefore, land management actions in those areas would be subject to section 7 consultations irrespective of the area's status as critical habitat. However, compared to the No Action Alternative, Alternative A (all proposed units, no exclusions) would result in (1) a small but unknown increase in the number of additional new and reinitiated section 7 consultations for livestock grazing based solely on the presence of designated critical habitat; and (2) the addition of an analysis of adverse modification of critical habitat to future section 7 consultations on the Chiricahua leopard frog in critical habitat.

New and Reinitiated Consultations

Because the PCEs that make up each critical habitat units are closely tied to adverse effects to the species, activities that would require consultation for critical habitat are primarily the same activities that currently require consultation for the species. The designation of critical habitat raises awareness of the species presence in an area, and therefore project proponents who have not requested consultations for actions that may affect the species may decide to do so.

In addition, livestock grazing is not allowed in the two units of critical habitat currently unoccupied by the leopard frog.allowed. These two sites include the Cave Creek area and Carr Barn Pond, both in Cochise County, AZ. Therefore, there are no permittees that could potentially propose projects that would require modification in order to avoid adverse modification of critical habitat.

Reinitiated consultations are consultations that have been completed for impacts to the species, but which might need to be re-opened to consider the likelihood of destruction or adverse modification to critical habitat. As it relates to livestock grazing, such consultations could include:

- Grazing Allotment Management—BLM, USFS, NRCS
- Programmatic Safford/Tucson BLM Field Offices Livestock Grazing Program

Addition of Adverse Modification Analysis to Future Consultations

The consultation analyses for effects on a listed species and effects on critical habitat are similar in many respects and are parallel processes because the health of a species cannot be disassociated from the health of its habitat. The outcomes of these future consultations would depend on the details of project proposals and the analysis of effects, which are unknown at this time.

The additional consultations, and the additional time required to complete consultations that would only have considered effects on the species, would increase administrative costs to the Service and to the action agencies. Implementing conservation measures resulting from those additional consultations would also increase costs for action agencies. Outcomes of consultations for critical habitat could also include reasonable and prudent alternative alternatives and other conservation measures designed to maintain leopard frog PCEs. These outcomes cannot be predicted precisely; however, based on past consultations types of additional management actions that may be required include, but are not limited to:

- Fencing critical habitat to prevent livestock use
- Modifying AUMs and grazing seasons
- Limiting the extent of time that livestock are allowed to congregate in aquatic sites
- Maintenance of stream bank stability, and
- Construction of trick or double tanks.

In summary, the effects of critical habitat designation on livestock grazing are expected to be minor because (1) few projects would be subject to new consultations based solely on the presence of designated critical habitat, because most of the proposed units are occupied by the leopard frog; (2) any reasonable and prudent alternatives developed under jeopardy analysis would not likely be changed substantially with the addition of adverse modification analysis; (3) very few if any additional conservation measures would be proposed to address critical habitat, beyond those already proposed in jeopardy consultations. The potential economic impacts of the proposed designation on grazing operations are discussed in Section 3.9.

As stated, previous grazing permits have excluded cattle from riparian corridors where the Chiricahua leopard frog is known to occur. Thus, it is not anticipated that Chiricahua conservation activities from listing critical habitat would result in further reductions in permitted or authorized AUMs on federal lands. It is also not anticipated that there will be a reduction in grazing permits. Livestock tanks provide sustainable habitat for the leopard frog and these tanks can help in the recovery of the frog (USFWS 2007a).

Impacts on grazing activities from critical habitat designation would be similar to current conditions. There are also impacts on grazing that cannot be separated from the impacts from designating critical habitat. These impacts include drought, current future market trends and fluctuations, and supplemental forage availability contributes to the cumulative impacts on livestock grazing (USFWS 2005b).

3.10.2.3 Alternative B

For Alternative B (proposed units minus exclusions), the impacts associated with the designation of critical habitat would be similar to those identified for Alternative A. However, the exclusions are primarily private lands associated with existing Safe Harbor Agreements and/or conservation easements. If these areas are included, designation of critical habitat affects them only to the extent that activities that have effects on critical habitat may require a federal license, permit or funding; also, enrollment in a Safe Harbor Agreement provides regulatory protection should conservation activities on the land result in incidental take of leopard frogs. Therefore, these exclusions could reduce the economic impacts of designation on livestock grazing

activities in these areas overall, by requiring fewer consultations overall. This would reduce administrative costs as well for the Service. The overall impacts on livestock grazing would still be characterized as minor.

3.11 Mining

3.11.1 Existing Conditions

Mining lands are located within Recovery Units 1 and 39. At Unit 1, the Twin Tanks livestock tank area, which held more than 1,000 frogs in 2008, is less than 0.5 mi (0.8 km) upslope of active mining at Freeport McMoRan's Sierrita Copper Mine near Green Valley, Arizona. Sierrita Copper Mine is an open-pit metals mine and concentrator, with molybdenum by-products. In addition to copper and molybdenum, the mine produces rhenium, a rare and highly valued metal (Sierrita, 2011).

Unit 39 includes 49 acres (20 ha) of lands owned by Freeport-McMoRan Copper and Gold Subsidiaries as part of the Chino Copper Mine, which is based in nearby Santa Rita and Hurley. In December 2008, Freeport-McMoRan announced plans to suspend mining and milling activities at Chino. The majority of the work force was laid off in 2009. To the Service's knowledge, no current plans exist to expand the mine into the area proposed for critical habitat

An open-pit copper mine (the Rosemont Mine) has been proposed in the northeastern portion of the Santa Rita Mountains, Pima County, Arizona (Units 8 and 9). The mine extends onto 3,670 acres of Coronado National Forest, managed by the U.S. Forest Service. The proposed Rosemont mine plan of operations (MPO) is for construction and operation of an open-pit mine to extract locatable materials such as copper, molybdenum, and silver. The proposed mine falls within the footprint of Units 8 and 9, which include several sites recently occupied by Chiricahua leopard frogs.

Recent Consultations
There have been a total of about 75 section 7 consultations involving the leopard frog that resulted in a Biological Opinion since 2000 in Arizona and New Mexico, each of which resulted in a *no jeopardy* determination. There have not been any consultations directly relating to mining.

3.11.2 Environmental Consequences

Mining-related activities that occur on critical habitat units include, but are not limited to, diversion and impoundment of surface water, clearing vegetation, drilling and blasting, grading and stockpiling soils, and construction and operation of the mine pit, waste rock, and leach facilities. Construction and operation of the mine pit may result in the creation of a large, permanent pit lake, which may concentrate dissolved metals and toxins and may lower pH levels. Disposal of waste materials in surface facilities such as tailings, waste rock, and leaching operations may contribute to degradation of groundwater quality and changes in surface water

discharge to Davidson Canyon and Cienega Creek. The availability of water for stock water tanks may be reduced (Forest Service 2011).

Mine operations may also create conditions conducive to the introduction, establishment, or spread of non-native species, potentially impacting Chiricahua leopard frog populations.

The magnitude of the resulting effects of the proposed mining activities on Chiricahua leopard frog populations are uncertain at this time, but impacts may include changes in groundwater and surface water quality and flow rates. Chiricahua leopard frogs require reasonable water quality and quantity for habitat stability. The proposed Rosemont open-pit copper mines could lower groundwater elevations to meet mining demands. This in turn could affect stream flows. Additionally, recent research indicates that Chiricahua leopard frog tadpoles are sensitive to cadmium and copper above certain levels (USFWS 2007). Frogs, which are often found in artificial aquatic systems such as mine adits, seeps and springs, and stock tanks, are unable to inhabit highly polluted waters, making the introduction of copper into Chiricahua leopard frog habitat a potentially significant threat.

Though it is far from the boundaries of the Recovery Units discussed in the proposed rule, the Cananea Mine, operated by Mexicana de Cananea Company, can be used as an example of how open-pit copper mining, such as that proposed at the Rosemont Mine, can impact Chiricahua leopard frog populations. Mexicana de Cananea Company operates one of the ten largest open pit copper mines in the world at Cananea (U.S. Bureau of Land Management 1998). Acidic water from leach ponds spilled into the San Pedro River on several occasions from 1977-79, with resulting pHs as low as 3.1, low dissolved oxygen, and high levels of iron, copper, manganese, zinc, and suspended solids. Large die-offs of aquatic animals were noted (Jackson *et al.* 1987), and the Chiricahua leopard frog has not been observed in the San Pedro River since 1979.

3.11.2.1 No Action

Under the No Action Alternative, no critical habitat would be designated for the Chiricahua leopard frog. The section 7 consultation process would continue as presently conducted, but without consideration of PCEs. The special rule (section 4(d)) for the exemption of section 9 take prohibitions of the ESA as related to the operation and maintenance of livestock tanks on non-Federal lands would continue to be implemented.

Section 7 consultations would be initiated only for *may affect* determinations of impacts to the leopard frog. These consultations would analyze relevant land, resource, and other management plans proposed for federal lands occupied by the Chiricahua leopard frog. Jeopardy consultations with the U.S, Forest Service related to the Rosemont mine may occur. Similar types of consultations have recommended measures such as:

- Development of a Habitat Conservation Plan (HCP);
- Creation of diversions to route stormwater efficiently through or around project facilities and to transport runoff water to downstream watersheds that are designed, located, and operated consistent with topography;
- Development of a water source enhancement and mitigation plan;
- Replacement of improved water sources; and

- Design and location of the heap leach facility to collect all possible drainage and solution.

Therefore, this alternative would not have any impacts on mining beyond any conservation measures or project modifications resulting from the listing of the Chiricahua leopard frog and associated requirements of section 7 of the ESA.

3.11.2.2 Alternative A

Compared to the No Action Alternative, Alternative A (all proposed units, no exclusions) would result in (1) a small but unknown increase in the number of additional new and reinitiated section 7 consultations due to the potential of impacts to current and future mining operations based solely on the presence of designated critical habitat; and (2) the addition of an analysis of adverse modification of critical habitat to future section 7 consultations on the Chiricahua leopard frog in critical habitat.

New Consultations

Mining activities proposed in the units of critical habitat where the frog is currently extant in the northeastern portion of the Santa Rita Mountains (Units 8 and 9 in Pima County, Arizona) could require consultations for jeopardy due to the presence of the species and the designation of critical habitat.

Addition of Adverse Modification Analysis to Future Consultations

The additional consultations to include adverse modification, and the additional time required to complete consultations that would only have analyzed jeopardy to the species, would increase administrative costs to the Service and to the action agencies. Implementing conservation measures resulting from those additional consultations would also increase costs for action agencies. Outcomes of consultations could also include reasonable and prudent alternative alternatives and other conservation measures designed to maintain leopard frog PCEs. These outcomes cannot be predicted precisely; however, based on past consultations, the types of additional management actions that may be required include, but are not limited to:

- Mapping, surveying, and monitoring leopard frog habitat and preparing survey and monitoring reports.

In summary, the effects of critical habitat designation on mining activities are expected to be minor. The Chiricahua leopard frog has been listed since 2002; thus Federal activities that have the potential to impact mining activities have considered the leopard frog since its listing. Conservation measures recommended to avoid destruction or adverse modification of critical habitat would likely be similar in nature to those imposed from consultations for jeopardy to listed species, with the addition of a surveying and monitoring component.

3.11.2.3 Alternative B

For Alternative B (proposed units minus exclusions), the impacts associated with the designation of critical habitat would be the same as those identified for Alternative A. The exclusions are primarily private lands associated with existing Safe Harbor Agreements and/or conservation

easements. Units in the vicinity of existing and proposed mining operations discussed within this section are not proposed for exclusion. The overall impacts related to mining would still be characterized as minor.

3.12 Cumulative Impacts

The Council on Environmental Quality regulations define cumulative effects as "the impact on the environment which results from the incremental impact of the proposed action when added to other past, present, and reasonably foreseeable future actions regardless of what agency (Federal or non-federal) or person undertakes such other actions." (40 CFR §1508.7)

Actions that could have cumulative impacts include: (1) section 7 outcomes from consultations on other species; (2) designation of critical habitat for other species; and (3) past, present, or future actions contained in land management or habitat restoration plans.

One unit of designated critical habitat (unit 32) overlaps with critical habitat for the Gila chub. In addition, several units overlap with critical habitat for the Mexican Spotted Owl (units 5, 6, 11, 12, 14, 17, 24, 26, 27, 29, 31, and 42). Therefore, actions generating consultations for those species in these overlapping units, and the project modifications and conservation measures resulting from those consultations, could contribute cumulative impacts when added to those of the leopard frog critical habitat designation. These cumulative impacts are likely to be negligible, however, again because any modifications or conservation measures recommended for the frog in these units would already be implemented to avoid adverse species impacts, with the small exception of the unoccupied unit 17, which is unoccupied by the leopard frog but also includes acreage designated as critical habitat for the MSO.

Past actions that have contributed cumulative impacts within the proposed critical habitat units include those documented in the consultation history for the species, to be found at http://www.fws.gov/southwest/es/arizona/Biological.htm (Arizona) and http://www.fws.gov/southwest/es/NewMexico/ES_bio_op.cfm (New Mexico). The following is a sample of the types of past consultations that have been conducted with federal agencies on proposed actions within areas occupied by the Chiricahua leopard frog:

- USDA Forest Service
    - Repatriation of native Gila trout
    - Emergency consultations for fire suppression and management (Fork Fire, Meown Fire)
    - Negrito/Yeguas Grazing Allotment permit
    - Addition of CFT Legumine as a pesticide in Apache Sitgreaves NF
    - Addition of riprap to 4 bridge substructures for water scour mitigation in Apache Sitgreaves NF
- Bureau of Land Management
    - Creating and restoring wetlands at San Pedro Riparian and Las Cienegas National Conservation Areas
- Department of Homeland Security--implementing recovery activities for species through restoration and maintenance
- U.S. Fish & Wildlife Service
    - Use of piscide rotenone to remove nonnative trout

    - Stocking trout at Peña Blanca Lake
    - Extending a Fire Management Plan at Buenos Aires NWR
- Bureau of Reclamation—Central Arizona Project water delivery development
- US Army Corps of Engineers
    - Obtaining Clean Water Act permit (section 404) for restoration of Gila River
    - Dam rehabilitation
- Federal Highway Administration—bridge replacement

Reasonably foreseeable present and future actions from these same agencies requiring consultation could include, but not be limited to, dredge-and-fill activities, grazing programs, construction and maintenance of stock tanks, logging and other vegetation removal activities, management of recreation, road construction, fish stocking, issuance of rights-of-way, prescribed fire and fire suppression, and discretionary actions authorizing mining such as the Rosemont copper mine currently proposed on private and Federal lands (Coronado NF and BLM lands) in Pima County, AZ.

Effects of proposed critical habitat designation on most resource areas are generally similar under each of the two action alternatives, and vary only in terms of potential area affected. These effects consist primarily of the potential for minor changes to projects resulting from reinitiation of consultation, new consultations that would include unoccupied areas, and implementation of discretionary conservation recommendations. Critical habitat designation is unlikely to result in any additional project modifications that would not occur in the absence of designation. This is because impacts to habitat, whether occupied by Chiricahua leopard frog or not, are already analyzed in section 7 consultations on effects to the species, owing to the close relationship between habitat condition and species survival.

Considering the specific resource impacts of the proposed action when added to the past, present and reasonably foreseeable future actions mentioned above, the cumulative impacts of critical habitat designation of the Chiricahua leopard frog can be summarized as follows:

Water Resources—The designation of critical habitat would result in new and reinitiated consultations, project modifications, and conservation measures based on critical habitat alone, as described in Section 3.2.2.2. Past species consultations related to water resource projects have all resulted in “no jeopardy” findings and, based on this consultation history, future consultations for critical habitat would likely result in minor project modifications. Therefore, when considering other present and future consultations and land management plans, this critical habitat designation will likely contribute only minor cumulative impacts, given the small number and limited nature of additional project modifications anticipated.

Wetlands and Floodplains-- The designation of critical habitat would result in new and reinitiated consultations, project modifications, and conservation measures based on critical habitat alone, as described in Section 3.3.2.2. Past species consultations related to projects affecting wetlands or the floodplain have all resulted in “no jeopardy” findings and, based on the consultation history, future consultations for critical habitat would likely result in minor project modifications. Therefore, when considering other present and future consultations and land management plans, this critical habitat designation will likely contribute only minor cumulative

impacts, given the small number and limited nature of additional project modifications anticipated.

Fish, Wildlife, and Plants-- The designation of critical habitat would result in new and reinitiated consultations, with a limited increase in project modifications and conservation measures. Based on previous consultation outcomes, additional project modifications would likely be minor, because habitat issues have been considered in species consultations and because almost all of the proposed units are occupied and, therefore, have been subject to consultation. Further, any such modifications or conservation measures to protect PCEs in unoccupied critical habitat are likely to benefit native wildlife and vegetation, beyond their direct benefits to the leopard frog. Adding the protections from other species critical habitat and consultations, the designation of critical habitat would be expected to produce minor beneficial cumulative impacts to natural resources.

Land Use and Management—The designation of critical habitat does not directly limit or impose restrictions on land use or management on private lands, except where a federal license, permit, or funding may be sought or required. However, if private landowners perceive the designation as imposing real restrictions, this perception could encourage them to manage their lands in ways that are not helpful to species conservation and recovery--by, for example, allowing bullfrogs to take over water sources or allowing stock tanks not in-use to dry up. The Service intends to help avoid or mitigate these cumulative impacts on land management by continuing to work to educate local communities and landowners on the specific implications of critical habitat for their lands.

With respect to federal lands, past species consultations have resulted in project modifications that have not fundamentally changed land use. Given the small number and limited nature of additional project modifications anticipated from future consultation, when considering future consultations or land management plans, this critical habitat designation will contribute only minor cumulative impacts,.

Fire Management-- Because there are other threatened and endangered species and critical habitat in the area, federal agency fire management plans are already required to consult with the Service under the ESA. Past consultations in the area regarding fire management plans or emergency fire suppression activities have included assessment of jeopardy for the Chiricahua leopard frog and impacts to critical habitat for other species (USFWS 2004a; USFWS 2004b; USFWS 2010b). These consultations have impacted fire management activities through modifications and measures such as:

- Restriction of the timing of activities such as brush removal to non-breeding seasons
- Restriction to outside critical habitat and breeding areas of the following activities:
    - Construction of fuel breaks and Wildland-Urban Interface buffers
    - Mechanical, herbicide, or burning treatments to reduce fuel
    - Construction of access roads
    - Off-Highway Vehicle and All-Terrain Vehicle use
    - Refueling and garbage disposal
- Species surveys before and after fire management treatments
- Water monitoring during herbicide use

- Agency and public education and outreach programs

It is likely that any future modifications requested on behalf of the proposed critical habitat would already occur based on the presence of critical habitat for species such as the spotted owl, gila chub, spikedace, and loachminnow. Such project modifications resulting from the proposed critical habitat designation would not likely impede the ability of any fire management plan to achieve its goals. When considered along with past consultation outcomes, this critical habitat designation would therefore contribute only minor cumulative impacts, give the small number and limited nature of additional project modifications.

Construction/Development-- Designation of critical habitat would result in some new and reinitiated consultations, project modifications or conservation measures for construction projects, based on critical habitat alone. Past species consultations on federal lands have resulted in project modifications that have not eliminated or fundamentally changed construction projects. Future consultation with regards to critical habitat would likely result in minor project modifications. On private land, designation of critical habitat does not limit construction project, except where a federal license, permit, or funding may be sought or required. When considering future consultations with regards to construction, this critical habitat designation will contribute only minor cumulative impacts given the small number and limited nature of additional project modifications anticipated.

Recreation-- Cumulative recreational impacts would occur from overlapping critical habitat designations for the Gila chub and Mexican spotted owl, as mentioned above, where previous designations had already established limitations on recreational activity or land uses, if the proposed designation added new restrictions. These cumulative impacts are likely to be negligible, however, again because any modifications or conservation measures recommended for the frog in these units would already be implemented to avoid adverse species impacts, with the small exception of the unoccupied unit 17, which is unoccupied by the leopard frog but also includes acreage designated as critical habitat for the MSO.

Socioeconomics—Cumulative socioeconomic impacts would occur from overlapping critical habitat designations for the Gila chub and Mexican spotted owl, as mentioned above, where previous designations had already established limitations on economic activity or land uses, and the proposed designation adds new restrictions. These cumulative impacts are likely to be negligible, however, again because any modifications or conservation measures recommended for the frog in these units would already be implemented to avoid adverse species impacts, with the small exception of the unoccupied unit 17, which is unoccupied by the leopard frog but also includes acreage designated as critical habitat for the MSO. But because the private land in Unit 17 is owned by the American Museum of Natural History in the Chiricahua Mountains, Cochise County, Arizona, its economic value is tied to hábitat conservation and would likely experience a beneficial impact from designation. Where designation impacts recreation, grazing, or road construction development, cumulative economic impacts are possible when considering past and present consultation outcomes, but would likely be minor, as discussed in corresponding sections.

Livestock Grazing-- Designation of critical habitat would result in some new or reinitiated consultations, project modifications or conservation measures based on critical habitat alone.

Past species consultations on federal land have resulted in project modifications that have not eliminated or fundamentally changed livestock grazing. Future consultation with regards critical habitat could result in minor project modifications to livestock grazing. The Service is aware of the concerns from private ranchers about the cumulative impact of this designation on ranching activities. However, on private land, designation of critical habitat does not limit livestock grazing, except where a federal license, permit, or funding may be sought or required. In addition, conservation efforts made by ranchers to maintain their livestock tanks on non-Federal lands would still be protected, under the special section 4(d) listing rule, from the Section 9 take prohibition. Therefore, when considering future consultations with regards to livestock grazing, this critical habitat designation will contribute only minor cumulative impacts given the small number and limited nature of additional project modifications anticipated.

Mining--
Overall, the minor impacts from critical habitat designation would similarly result in minor incremental impacts when added to other past, present, or reasonably foreseeable future actions.

3.13 Relationship Between Short-Term and Long-Term Productivity

Proposed designation of critical habitat is a programmatic action that would not impact short-term or long-term productivity.

3.14 Irreversible and Irretrievable Commitment of Resources

NEPA requires a review of irreversible and irretrievable effects that result from the Proposed Action. Irretrievable effects apply to losses of use, production, or commitment of non-renewable natural resources caused by the action. Irreversible effects apply primarily to the use of non-renewable resources, such as minerals or cultural resources, or to those resources that are only renewable over long periods of time, such as soil productivity and forest health. Irreversible effects can also include the loss of future opportunities in the area of impact. The types of impacts caused by the designation of critical habitat for the Chiricahua leopard frog—incremental consultations, additional conservation measures, and potential project modifications-- would not result in lost production or use of non-renewable natural resources. There would be no loss of future opportunities resulting from designation of critical habitat, because the unoccupied units are already managed for habitat conservation.

CHAPTER 4
ANALYSIS OF SIGNIFICANCE

The primary purpose of preparing an environmental assessment under NEPA is to determine whether a proposed action would have significant impacts on the human environment. If significant impacts may result from a proposed action, then an environmental impact statement is required (40 CFR §1502.3). Whether a proposed action exceeds a threshold of significance is determined by analyzing the *context* and the *intensity* of the proposed action (40 CFR §1508.27).

Context refers to the setting of the proposed action and potential impacts of that action. The context of a significance determination may be society as a whole (human, national), the affected region, the affected interests, or the locality. Intensity refers to the severity of the impacts.

The context of short and long-term impacts of the proposed designation of critical habitat for the Chiricahua leopard frog includes the 43 management units within the eight recovery units—an area that includes 13 counties in Arizona and New Mexico. The designations in these units total a maximum (without exclusions) of 11,467 acres (4640 ha). In the area with the highest concentration of critical habitat (units 1-14 in Santa Cruz and southeastern Pima counties in AZ, southwestern Cochise county in AZ), the designation acreage of 4,107 acres (1662 ha) accounts for less than 0.2% of the total land area. Further, in this region of highest concentration, 96% of the acreage proposed for designation as critical habitat is on Federal lands; overall, Federal lands account for 59% of the proposed acreage. Impacts of critical habitat designation in this context would not be significant because of the relatively small areas they represent within the 13 counties.

Under regulations of the Council of Environmental Quality (CEQ), which is responsible for ensuring compliance with NEPA, intensity is determined by considering 10 criteria (CFR 40 §1508.27[b]): (1) beneficial and adverse impacts; (2) the degree of impacts on health and safety; (3) impacts on the unique characteristics of the area; (4) the degree to which the impacts would likely be highly controversial; (5) the degree to which the proposed action would impose unique, unknown, or uncertain risks; (6) the degree to which the proposed action might establish a precedent for future actions with significant effects or represent a decision in principle about a future consideration; (7) whether the proposed action is related to other actions, which cumulatively could produce significant impacts; (8) the degree to which the proposed action might adversely affect locales, objects, or structures eligible for listing in the National Register of Historic Places; (9) the degree to which the proposed action might adversely affect an endangered or threatened species or its habitat, as determined to be critical under the ESA of 1973; and (10) whether the proposed action threatens a violation of federal, state, or local law.

Potential impacts on environmental resources, both beneficial and adverse, would be minor. Impacts of critical habitat designation on natural resources within the areas proposed as leopard frog critical habitat were analyzed and discussed in Chapter 3 of this EA. Applying the analysis of impacts to the significance criteria identified above, the Service concludes that the adverse impacts of critical habitat designation would not be significant, based on the following judgments:

- There would be no impacts on <u>public health or safety</u> from the proposed designation of critical habitat and no impacts on unique characteristics of the geographic area. The impacts on fire management activities would be minor, because wildland fire suppression and wildland fire management within WUI areas would not be significantly impeded by the designation of critical habitat. Impacts on flood control would be minor, since flood control methods and plans would not be significantly impeded by the designation of critical habitat.

- Potential impacts on the quality of the environment are not likely to be highly controversial, because there would be very few project modifications required that have

not already been required in previous consultations on the same lands. Public comments did demonstrate some controversy among non-Federal landowners regarding potential restrictions on land management activities on their lands. However, critical habitat only restricts activities on non-Federal lands to the extent that a federal permit, license, or funding may be required or sought. The Service has put in place several agreements with private landowners—including conservation easements, Safe Harbor Agreements, to encourage land management activities that benefit the leopard frog. In addition, the section 4(d) rule limits liability for take violations resulting from stock tank maintenance activities. The Service will continue to educate non-enrolled landowners on the actual impacts of critical habitat designation on non-Federal lands.

Impacts on water management and resource activities are not expected to be controversial because, as discussed in the analysis of impacts on water resources, the constraints on current water management activities are expected to be limited. Because the Chiricahua leopard frog has been a listed species since 2002, federal activities impacting water resources and water management activities have been through the consultation process, and mitigating measures and conservation activities have been developed for these activities to protect the Chiricahua leopard frog. Conservation constraints or limitations related to proposed designated critical habitat would be similar to those imposed from species-related constraints.

- Impacts to the unique characteristics of the area would be negligible. The nearest Wild and Scenic River is 7.5 miles (12 km) from the closest critical habitat unit. There are no impacts on unique cultural and historic resources in the area, or Areas of Environmental Concern. Taken together, the impacts of the designation will increase the health of aquatic ecosystems on designated lands.

- The impacts do not pose any uncertain, unique, or unknown risks. This analysis was based on past consultations, past impacts of Chiricahua leopard frog conservation on activities within frog recovery areas, and the likely future impacts from leopard frog conservation. Past section 7 consultations within proposed designated critical habitat would likely be reinitiated. New activities would result in section 7 consultations. A number of activities, including livestock grazing, wildland fire, sportfish management, and riparian habitat management, would likely have some leopard frog conservation-related constraints or limitations imposed on them.

- The designation of critical habitat by the Service for the conservation of threatened species is not a precedent-setting action with significant effects. The agency has designated critical habitat for numerous other species.

- The proposed action is not related to other actions which cumulatively could produce significant impacts. There would not be significant cumulative impacts because, as described in section 3.11 of this EA, the cumulative impacts would be limited to section 7 consultation outcomes and subsequent effects on other species, the effects of designated critical habitat for other species, and the effects of land management plans. Cumulative impacts of this designation and other federal actions on land management

- Critical habitat designation is not likely to affect sites, objects, or structures of historical, scientific, or cultural significance. The proposed designation would not result in any ground-disturbing activities that have the potential to affect archeological or other cultural resources. There are several NRHP-listed historical sites within, or within close range of, critical habitat units. While these sites are each no more than 1.5 miles (2.4 km) from the nearest critical habitat boundary, potential conservations measures or project modifications to protect critical habitat PCEs also would not modify or pose risk of harm to any historic properties listed in or eligible for the National Register of Historic Places.

- Critical habitat designation would not adversely affect an endangered or threatened species or its habitat. Designation will have long-term, beneficial, conservation-related impacts on the Chiricahua leopard frog survival and recovery through maintenance of PCEs.

- Proposed critical habitat designation would not violate any federal, state, or local laws. The designation of critical habitat is required by law in order to comply with the ESA.

CHAPTER 5
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CHAPTER 6
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