# DRAFT ENVIRONMENTAL ASSESSMENT

# for the

# DESIGNATION OF CRITICAL HABITAT

# for the

# Northern Mexican Gartersnake

# and the

# Narrow-Headed Gartersnake

*Northern Mexican gartersnake* *Narrow-headed gartersnake*

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

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**DRAFT ENVIRONMENTAL ASSESSMENT FOR THE DESIGNATION OF CRITICAL HABITAT FOR NORTHERN MEXICAN GARTERSNAKE AND NARROW-HEADED GARTERSNAKE**

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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 northern Mexican gartersnake (*Thamnophis eques megalops*) and narrow-headed gartersnake (*Thamnophis rufipunctatus*) in Arizona and New Mexico, under the Endangered Species Act of 1973, as amended (ESA). The need for the Proposed Action is to comply with the ESA, which requires critical habitat to be designated, to the maximum extent prudent and determinable, when a species is determined to be endangered or threatened throughout all or a significant portion of its range. The two species were proposed for listing as threatened species in a proposed rule dated July 10, 2013 (78 FR 41500).

Based on its review of the best scientific information available, the Service has identified the presence of aquatic habitats to support individual and population growth, and support normal behavior, and the presence of terrestrial habitats in appropriate proximity to occupied aquatic habitats to support individual and population growth, and support normal behavior, to be physical or biological features (PBF) for these species.

The PBFs of critical habitat in lotic (actively moving water) systems are contained within the riverine and riparian ecosystems formed by the wetted channel and adjacent terrestrial habitat adjacent to the stream channel that includes riparian vegetation, small mammal burrows, boulder fields, rock crevices, and downed woody debris. The use of adjacent terrestrial habitat 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. The Service believes this area will sufficiently protect the majority of important terrestrial habitat for thermoregulation, shelter, foraging opportunities, protection from predators,

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and dispersal opportunities; and reduce the impacts of high flow events, thereby providing adequate protection to proposed critical habitat areas.

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 a total 27,784 ac (11,244 ha) comprising 9 units for the northern Mexican gartersnake in La Paz, Mohave, Yavapai, Gila, Cochise, Santa Cruz, and Pima Counties in Arizona, and in Grant County in New Mexico. The proposed designation includes both linear tracts along streams (measured as acres and stream miles) and polygons of terrestrial space (measured as acres) for the northern Mexican gartersnake to account for its natural history and habitat use. Land ownership within proposed critical habitat for the northern Mexican gartersnake in stream miles is as follows: Federal (62%), State (Arizona and New Mexico) (5%), tribal (0.3%), and private (32%).

For the narrow-headed gartersnake, Alternative A comprises 6 units proposed as critical habitat for the narrow-headed gartersnake, totaling 18,701 ac (7,568 ha), in Greenlee, Graham, Apache, Yavapai, Gila, and Coconino Counties in Arizona, as well as in Grant, Hidalgo and Catron Counties in New Mexico. Land ownership within proposed critical habitat for the narrow-headed gartersnake in stream miles is as follows: Federal (66%), State (Arizona and New Mexico) (2%), tribal (3%), and private (29%). There are no polygons of terrestrial area proposed for designation as critical habitat for the narrow-headed gartersnake.

Critical habitat for both gartersnake species is being proposed only in areas considered currently occupied.

Alternative B includes the areas included in Alternative A, minus 7,405 ac (2,997 ha) of lands for the northern Mexican gartersnake and 1,072 ac (3,431 ha) for the narrow-headed gartersnake that meet the definition of critical habitat. These lands would be excluded under section 4(b)(2) of the ESA 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 ESA, and described in the EA for each unit. The exclusions are associated with conservation lands and/or existing or proposed conservation programs.

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 and forest management, water resource management, aquatic habitat restoration, sportfish management, recreation, livestock grazing, border security, vegetation management, highway and bridge construction and maintenance, energy development, utility development or upgrades, mining, other land management and use. The Service expects consultation to primarily involve actions occurring within the stream, floodplain, or adjacent uplands that could impact riparian or aquatic habitat, contribute to changes in species composition, declines of prey species, or significantly benefit the status of harmful nonnative species in the action area.

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In the Service's analysis of potential future section 7 consultations for the gartersnakes it is likely that habitat attributes will be used as a surrogate for monitoring the amount of incidental take, because several factors combine to make detections of individuals, alive or dead, difficult. Therefore, jeopardy analysis and adverse modification analysis will likely be the same. The concept of using habitat as a proxy, or surrogate for species numbers was upheld in *Gifford Pinchot Task Force v. U.S. Fish and Wildlife Service*, 378 F.3d 1059 (9th Cir. 2004), as amended by 387 F3d 968 (9th Cir. Wash., Oct. 28, 2004). The Service anticipates that both a jeopardy analysis and an adverse modification analysis would focus on the effects of a proposed project's impacts to the physical features and biotic community that collectively define the PBFs for these gartersnakes determined by the Secretary to be essential for the conservation of these species in areas designated as critical habitat.

Therefore, the Service anticipates only minor incremental effects (administrative costs for section 7 consultations and re-initiations) with regard to ongoing and proposed projects, including developing and implementing conservation actions in currently occupied critical habitat for the northern Mexican or narrow-headed gartersnake.

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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 |
| AWSA | Arizona Water Settlements Act |
| BLM | U.S. Bureau of Land Management |
| BMPs | Best Management Practices |
| BO | Biological Opinion |
| BOR | Bureau of Reclamation |
| CAP | Central Arizona Project |
| CEQ | Council on Environmental Quality |
| CFR | Code of Federal Regulations |
| cm | Centimeter |
| DoD | Department of Defense |
| ESA | Endangered Species Act |
| FEMA | Federal Emergency Management Agency |
| FHWA | Federal Highway Administration |
| FONSI | Finding of No Significant Impact |
| FR | Federal Register |
| GRIC | Gila River Indian Community |
| 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 |
| NMOSE | New Mexico Office of the State Engineer |
| NRHP | National Register of Historic Places |
| NWR | National Wildlife Refuge |
| OHV | Off-highway vehicle |

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|---|---|
| PBFs | Physical and Biological Features |
| RU | Recovery Unit |
| 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 |

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# 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.

**Brumation:** An example of dormancy in reptiles that is similar to hibernation. It differs from hibernation in the metabolic processes involved.

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

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

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

**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).

**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.

**Physical and Biological Features (PBFs):** physical or biological features that are essential to the conservation of the species (such as space, food, cover, and protected habitat).

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**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.

**Streamside gallery forests**: well-developed broadleaf deciduous riparian forests with limited, if any, herbaceous ground cover or dense grass.

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

**Transitory Habitat**: habitat that is not permanent.

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# CHAPTER 1
# PURPOSE OF AND NEED FOR ACTION

## 1.1 Introduction

The United States Department of the Interior (USDI), U.S. Fish & Wildlife Service (Service) has prepared this Environmental Assessment (EA) to analyze the potential effects on the human environment that may result from the designation of critical habitat for the for northern Mexican (*Thamnophis eques megalops*) and narrow-headed (*T. rufipunctatus*) gartersnakes, listed as threatened (July 8, 2014 79 FR 38678) under the Endangered Species Act of 1973 (ESA), as amended (16 U.S.C. 1531 *et seq.*). The proposed rule to designate critical habitat for the northern Mexican and narrow-headed gartersnakes was published in the Federal Register on July 10, 2013 (78 FR 41550). Based on information we received during the 60-day comment period for the proposed rule to designate critical habitat, as well as relevant scientific research conducted after the proposed critical habitat rule was published, a revised proposed rule to designate critical habitat has been completed. This EA is used by the Service to determine 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.

The Service has determined that the preparation of environmental documentation compliant with the National Environmental Policy Act of 1969, as amended (NEPA; 42 U.S. Code [USC] §§4321 et seq.) is not necessary for federal listing (48 FR 49244) or for critical habitat designations outside the jurisdiction of the U.S. Court of Appeals for the Tenth Circuit (48 FR 49244). However, as described further in Section 2, portions of the proposed critical habitat for the northern Mexican gartersnake and the narrow-headed gartersnake occur within New Mexico, which is located within the jurisdiction of the U.S. Court of Appeals for the Tenth Circuit. As such, under the ruling in *Catron County Board of Commissioners New Mexico v. U.S. Fish and Wildlife Service*, *75 F.3d 1429 (10th Cir. 1996)*, the Service is preparing an EA to evaluate the proposed designation of critical habitat for the northern Mexican and narrow-headed gartersnakes (Perillo 2001; Coleman 2012).

This EA has been prepared in accordance with the requirements of NEPA; Council on Environmental Quality (CEQ) Regulations for Implementing the Procedural Provisions of NEPA (40 Code of Federal Regulations [CFR] Parts 1500-1508); USDI Regulations for the Implementation of NEPA (43 CFR Part 46); U.S. Fish and Wildlife Service NEPA Reference Handbook; and Secretarial Order 3355, *Streamlining NEPA Reviews and Implementation of Executive Order (EO) 13807, Establishing Discipline and Accountability in the Environmental Review and Permitting Process for Infrastructure Projects*. This EA is in accordance with the previous NEPA regulations because this NEPA process was initiated before September 14, 2020 when the new CEQ Regulations went into effect. This EA provides the required NEPA-compliant documentation for the proposed designation of critical habitat for the northern

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Mexican gartersnake and narrow-headed gartersnakes throughout their range, including a description of the existing setting in terms of physical and biological resources as well as socioeconomic conditions, and a discussion of potential impacts.

### 1.1.1. Purpose and Need of the Action

The *purpose* of this Proposed Action is to designate critical habitat for the northern Mexican gartersnake and narrow-headed gartersnake—species listed as threatened under the ESA. Critical habitat designation identifies geographic areas, occupied by the species at the time they were listed, on which are found those physical or biological feature (PBFs) that are essential for conservation of the snakes and that may also require special management. Protection of the habitat of a listed 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 for listed species.

The *need* for the Proposed Action is to comply with Section 4 of the ESA, which requires that critical habitat be designated for federally threatened or endangered species where such designation is prudent. Regulations (50 CFR §424.12[a][1]) state that the designation of critical habitat is not prudent when one or both of the following situations exist: (1) the species is threatened by taking or other human activity, and identification of critical habitat can be expected to increase the degree of threat to that species; and (2) such designation of critical habitat would not be beneficial to the species. Critical habitat is one of several provisions of the ESA that aid in protecting the habitat of a federally listed species until populations have recovered and threats have been minimized such that the species can be removed from the list of threatened and endangered species. Critical habitat designation is intended to assist in achieving long-term protection and recovery of this species and the habitat upon which it depends

### 1.1.2. Proposed Action

The Proposed Action is to designate 9 units as critical habitat for the northern Mexican gartersnake and 8 units for the narrow-headed gartersnake. These critical habitat areas constitute the Service's current best assessment of areas that meet the definition of critical habitat for the species. All units in the Proposed Action (Alternative A) are considered by the Service to be occupied. All proposed critical habitat units contain at least one PBF. The proposed units are described briefly in section 2.2, and incorporated here by reference to the revised proposed critical habitat rule (85 FR 23608).

## 1.2 Background

### 1.2.1 Critical Habitat

#### 1.2.1.1 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.

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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 PBFs (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 ESA, 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.

#### 1.2.1.2 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.

#### 1.2.1.3 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. 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, 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 conservation measures, 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]).

In making a determination on whether an action will result in jeopardy, the Service begins by looking at the current status of the species, or "baseline." Added to the baseline are the various effects – direct, indirect, interrelated, and interdependent – of the proposed Federal action. The Service also examines the cumulative effects of other non-Federal actions that may occur in the action area, including state, tribal, local, or private activities that are reasonably certain to occur in the project area. The Service's analysis is then measured against the definition of jeopardy. Under the ESA, jeopardy occurs when an action is reasonably expected, directly or indirectly, to diminish a species' numbers, reproduction, or distribution so that the likelihood of survival and recovery in the wild is appreciably reduced.

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.

A "non-jeopardy" 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 to minimize take and associated, mandatory terms and conditions that describe the methods for accomplishing the reasonable and prudent measures. 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.

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There are no ESA section 9 prohibitions that apply to 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, 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.

### 1.2.2 Northern Mexican and Narrow-headed Gartersnakes

The following briefly summarizes key information about the PBFs of the northern Mexican and narrow-headed gartersnakes that determine the proposed critical habitat. For more detail, and for a description of the species and information about its life history, habitat, and distribution, consult the proposed listing rule (78 FR 41500), the original proposed critical habitat designation (78 FR 41550), and the revised proposed critical habitat (85 FR 23608) which are herein incorporated by reference.

#### 1.2.2.1 Physical and Biological Features for the Northern Mexican and Narrow-headed Gartersnakes

In determining which areas to propose as critical habitat within the geographical area occupied at the time of listing, the Service considered the PBFs essential to the conservation of the species and that may require special management considerations or protection. The specific PBFs required for the northern Mexican and narrow-headed gartersnakes are derived from the best available research of the species' habitat, ecology, and life history. Both the research used to derive the PBFs and the species' specific needs are identified in the proposed listing rule (78 FR 41500) and the revised proposed critical habitat (85 FR 23608). These PBFs include:

(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 development of offspring; and

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

#### 1.2.2.2 Physical or Biological Features for the northern Mexican and narrow-headed Gartersnakes

Under the ESA and its implementing regulations (50 CFR §424.12), the Service is required to identify the PBFs essential to the conservation of the northern Mexican and narrow-headed gartersnakes in areas occupied at the time of listing. 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 PBFs essential to the conservation of the northern Mexican and narrow-headed gartersnakes are:

*Northern Mexican Gartersnake PBFs*

- Perennial or spatially intermittent streams that provide both aquatic and terrestrial habitat that allows for immigration, emigration, and maintenance of population connectivity of northern Mexican gartersnakes and contains
    a. slow-moving water (walking speed) with in-stream pools, off-channel pools, and backwater habitat;
    b. organic and natural inorganic structural features (e.g., boulders, dense aquatic and wetland vegetation, leaf litter, logs and debris jams) within the stream channel for thermoregulation, shelter, foraging opportunities, and protection from predators;
    c. terrestrial habitat adjacent to the stream channel that includes riparian vegetation, small mammal burrows, boulder fields, rock crevices, and downed woody debris for thermoregulation, shelter, foraging opportunities, brumation, and protection from predators; and
    d. water quality that is absent of pollutants or, if pollutants are present, at levels low enough such that recruitment of northern Mexican gartersnakes is not inhibited.

2. Hydrologic processes that maintain aquatic and terrestrial habitat through
    a. a natural flow regime that allows for periodic flooding, or if flows are modified or regulated, a flow regime that allows for the movement of water, sediment, nutrients, and debris through the stream network; and
    b. physical hydrologic and geomorphic connection between a stream channel and its adjacent riparian areas.
3. Prey base of primarily native anurans, but also fishes, small mammals, lizards, and invertebrate species.
4. An absence of nonnative fish species of the families Centrarchidae and Ictaluridae, bullfrogs (*Lithobates catesbeianus*), and/or crayfish (*Orconectes virilis, Procambarus clarki,* etc.), or occurrence of these nonnative species at low enough levels such that recruitment of northern Mexican gartersnakes is not inhibited and maintenance of viable prey populations is still occurring.
5. Elevations from 130 to 8,497 ft (40 to 2,590 m).
6. Lentic wetlands including off-channel springs, cienegas, and natural and man-made ponds (small earthen impoundment (both natural and man-made)) with
    a. organic and natural inorganic structural features (e.g., boulders, dense aquatic and wetland vegetation, leaf litter, logs and debris jams) within the ordinary high water mark for thermoregulation, shelter, foraging opportunities, brumation, and

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protection from predators;
   b. riparian habitat adjacent to ordinary high water mark that includes riparian vegetation, small mammal burrows, boulder fields, rock crevices, and downed woody debris for thermoregulation, shelter, foraging opportunities, and protection from predators; and
   c. water quality that is absent of pollutants or, if pollutants are present, at levels low enough such that recruitment of northern Mexican gartersnakes is not inhibited.
7. Ephemeral channels that connect perennial or spatially intermittent perennial streams to lentic wetlands (in southern AZ where water resources are limited).

*Narrow-headed Gartersnake PBFs*

Based on our current knowledge of the PBFs and habitat characteristics required to sustain the species' life-history processes, we determine that the primary constituent elements specific to narrow-headed gartersnakes are:

1. Perennial streams or spatially intermittent streams that provide both aquatic and terrestrial habitat that allows for immigration, emigration, and maintenance of population connectivity of narrow-headed gartersnakes and contains
   a. Pools, riffles, and cobble and boulder substrate, with low amount of fine sediment and substrate embeddedness;
   b. organic and natural inorganic structural features (e.g., cobble bars, rock piles, large boulders, logs or stumps, aquatic and wetland vegetation, logs, and debris jams) in the stream channel for basking, thermoregulation, shelter, prey base maintenance, and protection from predators;
   c. Water quality that is absent of pollutants or, if pollutants are present, at levels low enough such that recruitment of narrow-headed gartersnakes is not inhibited; and
   d. terrestrial habitat within 89 ft (27 m) of the active stream channel that includes boulder fields, rocks, and rock structures containing crack and crevices, small mammal burrows, downed woody debris, and vegetation for thermoregulation, shelter sites, and protection from predators.
2. Hydrologic processes that maintain aquatic and riparian habitat through
   a. a natural flow regime that allows for periodic flooding, or if flows are modified or regulated, a flow regime that allows for the movement of water, sediment, nutrients, and debris through the stream network, as well as maintenance of native fish populations; and
   b. physical hydrologic and geomorphic connection between the active stream channel and its adjacent terrestrial areas.
3. Prey base of native fishes, or soft-rayed, nonnative fish species.
4. An absence of nonnative predators, such as fish species of the families Centrarchidae and Ictaluridae, bullfrogs, and crayfish, or occurrence of nonnative predators at low enough densities such that recruitment of narrow-headed gartersnakes is not inhibited and maintenance of viable prey populations is still occurring.
5. Elevations of 2,300 to 8,200 ft (700 to 2,500 m).

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The Service is proposing for designation of critical habitat lands that are determined to be occupied at the time of listing and contain sufficient elements of PBFs to support life-history processes essential for the conservation of the species. Specific descriptions of the aquatic habitat, prey base and nonnative species interactions are found in the final listing rule (79 FR 38678) and the revised proposed critical habitat rule (85 FR 23608). Specifically, for both species, a stream or geographic area was considered as occupied if there were positive survey records from 1999 to 2019 and retained the necessary PBFs that will allow for the maintenance and expansion of existing populations.

## 1.3 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.

## 1.4 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. See Appendix C for other federal laws addressing various aspects of conservation of fish and wildlife and their habitat, which apply to the two gartersnakes.

In addition, both Arizona and New Mexico have taken a variety of actions that serve to protect the two gartersnake species. These actions are described in detail in the Service's "Incremental Effects Memo" (USFWS 2019), and summarized briefly here:

- *Arizona* – Both northern Mexican and narrow-headed gartersnakes are considered "Candidate Species" in the Arizona Game and Fish Department draft document, Wildlife of Special Concern (WSCA) (AGFD *In Prep*., p. 12). The purpose of the WSCA list is to provide guidance in habitat management implemented by land-management agencies, but the list has no regulatory authority. Additionally, both northern Mexican and narrow-headed gartersnakes are considered a "Tier 1b Species of Greatest Conservation Need (SGCN)" in the Arizona Game and Fish Department document, Arizona's Comprehensive Wildlife Conservation Strategy (CWCS) (AGFD 2006a, pp. 499–501). However, the Arizona Game and Fish Department does not have specified or mandated recovery goals for either the northern Mexican or narrow-headed gartersnake, nor has a state conservation agreement or recovery plan been developed for either species.

  The Arizona Game and Fish Department amended Commission Order 43, effective January 2005, to effectively close the season on the collection of both gartersnake species. Therefore, take of northern Mexican and narrow-headed gartersnakes is no longer permitted in Arizona without issuance of a scientific collecting permit (Ariz. Admin. Code R12–4–401 *et seq*.), or special authorization. While the Arizona Game and Fish Department can seek criminal or civil penalties for illegal take of these species, the same provisions are not in place for actions that result in destruction or modification of their habitat. On lands owned by the Arizona Game and Fish Department, such as the

Horseshoe Ranch (Agua Fria River), Bubbling Ponds and Page Springs State Fish Hatcheries (Oak Creek), and Upper Verde Wildlife Area (Verde River), management focuses on native species conservation which benefits these gartersnakes.

- *New Mexico* – The New Mexico Department of Game and Fish lists the northern Mexican gartersnake as state-endangered and the narrow-headed gartersnake as state-threatened under New Mexico Statutes Annotated [(NMSA) 17-2-37 to 17-2-46 (known as the "Wildlife Conservation Act")] (NMDGF 2006, Appendix H). This designation provides protection under the New Mexico Wildlife Conservation Act of 1974 (i.e., State Endangered Species Act) (19 NMAC 33.6.8) by prohibiting direct take of the species without a permit issued from the State. "Take," defined as "to harass, hunt, capture or kill any wildlife or attempt to do so" by NMSA 17-2-38.L., is prohibited without a scientific collecting permit.

  In 2007, the New Mexico Department of Game and Fish completed a recovery plan for narrow-headed gartersnakes in New Mexico (Pierce 2007, pp. 13–15). The Service's review of the plan found limited specific threat-mitigation guidance on the landscape, as well as stakeholder accountability for implementing activities prescribed in the plan. We also found that actions calling for targeted nonnative species removal or management were absent in the implementation schedule provided in Pierce (2007, p. 17). Harmful nonnative species are the primary driver of continued declines in both gartersnake species. No recovery plan, conservation plan, or conservation agreement exists in New Mexico for the northern Mexican gartersnake (NMDGF 2006, Table 6–3).

## 1.5 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 (July 10 2013, through September 9, 2013) on the proposed rule designation critical habitat (78 FR 41550) and during the public comment period (April 28, 2020 through June 29, 2020) on the revised proposed rule designating critical habitat (85 FR 23608):

- Economic impacts from designation on limitations to farming and ranching, including cumulative impacts of overlapping critical habitats for other species
- Impacts to other activities and operations such as small businesses, grazing, and off-road vehicle use
- Requests for exclusion based on:
  - Existing management plans for the spikedace, loachminnow, and southwestern willow flycatcher
  - Lack of scientific evidence of occupancy or the presence of PBFs on private property
  - National security
- The Service should work cooperatively with U.S. Border Patrol, whose increases in off-road patrols and pursuits of illegal entrants has damaged sensitive riparian habitat
- Designation of critical habitat is not prudent because:

    - Recent wildfires in Apache-Sitgreaves and Gila National Forests have destroyed significant amounts of gartersnake habitat, and will therefore force snakes to concentrate in smaller areas, making illegal collection easier
    - No clear determination of current occupancy has been established
- The proposed designation needs to more clearly define and justify activities that are considered adverse to conservation or habitat PBFs—example: definition of "developed areas"
- Inconsistency of scientific information to define thresholds to delineate units by occupancy at the time of listing

## 1.6 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 two gartersnakes, as well as during internal scoping within the Service and the comment period for the revised proposed rule, several resources were identified as potentially affected by the proposed designation. These resources, which are analyzed in Chapter 3.0 of this EA include Water Resources; Fisheries Management; Fish, Wildlife & Plants/Threatened, endangered, and sensitive species; Land Use and Management; Fire Management; Construction/Development–Roads, Bridges, Dams, Trails; Recreation; Socioeconomics; Livestock Grazing; and Tribal Resources.

### 1.6.1 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 two gartersnakes is likely to have no or, at most, negligible effect on them:

- *Energy requirements and conservation potential (1502.16)*. Expanded section 7 consultations resulting from critical habitat designation of the two snakes is unlikely to require any additional increases in energy consumption because conservation actions would already be recommended to avoid jeopardy to the species since they are already listed as threatened under the ESA.
- *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 two gartersnakes because none of the proposed critical habitat units fall in areas with oil, gas, coal, or other minerals.
- *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 in the Federal Farmland Protection Act (FFPA) (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-

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value food and fiber crops (e.g., citrus, tree nuts, olive, cranberries, fruits, and vegetables). The designation of critical habitat will not cause, or result in, the conversion of prime farmland to nonagricultural uses. For this reason, 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). There are several NRHP-listed historical sites within, or within close range of, critical habitat units. 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. In addition, the proposed designation would not result in any ground-disturbing activities that have the potential to affect archeological or other cultural resources. Therefore, the designation poses no potential for adverse impact on a listed or eligible historic property.
- *Ecologically critical areas, Wild and Scenic Rivers, or other unique natural resources (1508.27)*. There is proposed critical habitat for both the narrow-headed and the northern Mexican gartersnakes along portions of the Verde (Wild and Scenic) River, including some overlap. Designation of critical habitat for the two gartersnakes would not affect the resource values of the Verde River, or limit conservation or resource protection activities associated with their status as wild and scenic rivers. Also, the designation of critical habitat for the two gartersnakes would not affect the eligibility of other streams for Wild and Scenic River status because any activities or management on critical habitat units would not affect the qualities that determine streams' eligibility criteria set forth by the Act.
- *Public health and safety (1508.27).* These topics are not analyzed in detail in this EA because the potential for effects on public health and safety from designation of critical habitat are negligible.
- *Climate change*– A detailed discussion of potential impacts of climate change on PBFs for the two gartersnakes is contained in the proposed listing rule (78 FR 41500) and final listing rule (79 FR 38678). The ecology and natural histories of northern Mexican and narrow-headed gartersnakes are strongly linked to water. Northern Mexican and particularly narrow-headed gartersnakes, and their prey bases, depend on permanent or nearly permanent water for survival. A large percentage of habitats within the current distribution of northern Mexican and narrow-headed gartersnakes are predicted to be at risk of becoming more arid with reductions in snow pack levels brought about by warmer temperatures.

  Rahel and Olden (2008) expect that climate-induced increases in water temperatures in drier climates such as the southwestern United States will result in periods of prolonged low flows and stream drying. These effects from changing climatic conditions may have profound effects on the amount, permanency, and quality of habitat for northern Mexican and narrow-headed gartersnakes as well as their prey base. Changes in amount or type of winter precipitation may affect snowpack levels as well as the timing of their discharge into high-elevation streams. Low or no snowpack levels would jeopardize the amount and reliability of stream flow during the arid spring and early summer months, which would increase water temperatures to unsuitable levels or eliminate flow altogether.

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*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 an 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.

USDI 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 U.S. 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 with a federal nexus 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 critical habitat units for both gartersnakes. 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 gartersnake 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 PBFs, it may produce beneficial impacts by improving the resilience of PBFs to the adverse impacts of climate change.

- *National Security*—Two units of proposed critical habitat for the northern Mexican gartersnake include stream segments that extend to the border with Mexico: Upper Santa Cruz River Subbasin, which includes land managed by Coronado NF; and San Pedro River Subbasin (San Pedro River subunit, which includes BLM land, and Bear Canyon Creek subunit, including Coronado NF lands. As such, these areas are subject to border security activities conducted by the U.S. Department of Homeland Security. Such activities that could impact critical habitat for the gartersnakes include road or fence construction. Under section 102 of the Illegal Immigration Reform and Immigrant Responsibility Act (IIRIRA), the Secretary of the DHS (DHS) is authorized to waive laws where the Secretary of DHS deems it necessary to ensure the expeditious construction of border infrastructure in areas of high illegal entry. While the Service does not anticipate that consultations for activities within these border areas would require such a waiver, the authority for such a waiver means there will be no impacts of the designation on national security.

## 1.7 Decision to be Made

Critical habitat is designated in a federal rule-making process that includes publication of proposed rule and final rule in the *Federal Register*. The proposed rule notice solicits public comment. The final rule notice includes responses to comments received. The decision to be made is whether to designate critical habitat for the northern Mexican and narrow-headed gartersnakes and, if so, according to which of the alternatives described in Chapter 2.

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# CHAPTER 2
# ALTERNATIVES, INCLUDING THE NO ACTION ALTERNATIVE

This section describes the alternatives for critical habitat designation for the northern Mexican gartersnake and the narrow-headed gartersnake. 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 1, which can be summarized as providing protection of habitat that is essential to the conservation of the species.

## 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 PBFs essential to the conservation of each of the two gartersnakes. The Service also considered all comments received from agencies and the public on the proposed rule for designating critical habitat for the two gartersnakes.

The Service is not currently proposing to designate any areas outside the geographic area considered occupied by the northern Mexican or narrow-headed gartersnake because occupied areas are distributed in several sub-basins and currently provide a distribution and configuration of habitat areas sufficient for the conservation of these species. Units are proposed for designation based on sufficient elements of PBFs being present to support the northern Mexican and narrow-headed gartersnakes' life-history processes. Some units contain all of the identified elements of PBFs and support multiple life-history processes. Some segments contain only some elements of the PBFs necessary to support the northern Mexican and narrow-headed gartersnakes' particular use of that habitat. A complete description of the process and criteria by which areas were evaluated for designation is contained in the original proposed rule designating critical habitat (78 FR 41500) and the revised proposed critical habitat rule (85 FR 23608).

Based on the above criteria, as described in more detail in the proposed rule and revised proposed rule for critical habitat designation, the Service developed three alternatives for impact analysis:

- No Action Alternative;
- Alternative A, Critical habitat designation with no exclusions; and
- Alternative B, Critical habitat designation with Exclusion Areas.

## 2.2 No Action Alternative

The No Action Alternative would designate no critical habitat for the northern Mexican and narrow-headed gartersnakes. 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 these species, the Service would not be meeting the requirements of the ESA. The ESA specifies that Service must designate critical habitat to the maximum extent

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prudent and determinable. Our proposed rule indicates that critical habitat is both prudent and determinable. However, analysis of this alternative describes the existing environment and consequences that are anticipated as a result of the proposed listing of the species, without the designation of critical habitat. Therefore, this alternative would have no incremental impacts beyond those already incurred from the listing of the two gartersnakes as threatened on July 10, 2014 (79 FR 38678).

## 2.3 Alternative A—Critical Habitat Designation with No Exclusions

The Service is proposing 9 units as critical habitat for the northern Mexican gartersnake, totaling 27,784 ac (11,244 ha). See Table 1 in Appendix A. These areas include linear tracts along streams (measured as stream miles) and polygons of terrestrial space (measured as acres) for the northern Mexican gartersnake to account for its natural history and habitat use.

The Service is proposing 8 units as critical habitat for the narrow-headed gartersnake, totaling 18,701 ac (7,568 ha). See Table 2 in Appendix A. There are no polygons of terrestrial space proposed for designation as critical habitat for the narrow-headed gartersnake because we relied on the lateral extent boundary for the active stream channel that includes aquatic and terrestrial features for occupied areas.

Tribal lands are included in this Alternative. The Service is required under the Act to propose all land that contains the features essential to conservation of the species as critical habitat in the proposed rule, including Tribal lands. However, should this alternative be selected, we will work with the Tribes to exclude Tribal lands in the final critical habitat rule per Secretarial Order 3206.

All units for both species are considered occupied. Full descriptions and maps of each unit are available in the revised proposed critical habitat rule, published on April 28, 2020 (85 FR 23608) and the Notice of Availability for this Environmental Assessment, which contains significant revisions to the proposed critical habitat rule and was published in the Federal Register, both incorporated here by reference.

## 2.4 Alternative B—Critical Habitat Designation with Exclusion Areas

Alternative B includes the areas included in Alternative A, minus 7,405 ac (2,997 ha) for the northern Mexican gartersnake and 1,072 ac (434 ha) of lands for the narrow-headed gartersnake that meet the definition of critical habitat. These lands would be excluded under section 4(b)(2) of the ESA 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 ESA, and described in the EA for each unit. The exclusions are associated with the following conservation lands and/or programs:

- Management plans from the White Mountain Apache Tribe, San Carlos Apache Tribe, Freeport McMoRan;
- Tribal Resolution prepared by the Yavapai Apache Nation;

- Lower Colorado River Multi-Species HCP, Pima County Sonoran Desert Conservation Plan Multi-Species HCP, Salt River Project Roosevelt and Horseshoe-Bartlett HCP, and San Rafael Ranch Low Effect HCP;
- Arizona Game and Fish Department's (AGFD) management plans for its Planet Ranch Conservation and Wildlife Area and Bubbling Ponds and Page Springs State Fish Hatcheries;
- AGFD's Safe Harbor Agreements (SHA)
- Cienega Creek Natural Preserve;
- Conservation activities at the Appleton-Whittell Research Ranch;
- Several properties managed by The Nature Conservancy; and
- Established conservation easements.

Tables 3 & 4 in Appendix A provide approximate areas 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 ESA for the final critical habitat rule. Detailed descriptions of the reasons for proposed exclusion for each unit are found in the revised proposed critical habitat designation (85 FR 23608).

## 2.5 Comparison of Potential Impacts of Proposed Critical Habitat Designation

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 conservation measures that would not occur in the absence of designation. This is because impacts to habitat, which will likely be used as a surrogate for "take" of individuals of the species, will be analyzed in section 7 consultations on effects to the species, owing to the close relationship between habitat condition and species survival.

See Table 5 in Appendix A.

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# 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 northern Mexican and narrow-headed gartersnakes. These resource categories were selected based on issues and concerns identified by the Service in the proposed rule listing the species (78 FR 41500), the proposed critical habitat rule (78 FR 41550), final listing rule (July 8, 2014 79 FR 38678), the revised proposed critical habitat rule (85 FR 23608), and in public comments to the proposed rule. 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.

### 3.1.1 Methodology for Analyzing Impacts

Descriptions of the affected environment presented in Sections 3.2 through 3.11 of this document are based on a number of sources. These include:

- Published literature;
- Available state and federal agency reports and management plans;
- Proposed listing rule (78 FR 41500) and final listing rule (79 FR 38678) for the two Arizona gartersnakes;
- Original proposed rule for designating critical habitat for the two Arizona gartersnakes (78 FR 41550) and revised proposed rule designating critical habitat (85 FR 23608);
- Biological opinions and conference opinions in which the Service considered impacts to either of the two snakes; and
- The 2019 final economic analysis for the proposed designation of critical habitat (IEc 2019).

In the context of an Environmental Assessment, the evaluation of the impacts of critical habitat designation focuses on potential outcomes of the potential increase in section 7 consultations that may result from the designation. 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 key factor related to the destruction or adverse modification determination is whether implementation of the proposed Federal action directly or indirectly alters the designated critical habitat in a way that appreciably diminishes the value of the critical habitat as a whole for the conservation of the listed species. As discussed above, the role of critical habitat is to support PBFs essential to the conservation of a listed species and provide for the conservation of the species. 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.

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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.

The most likely source of incremental effects of the proposed critical habitat in most instances comes from the inclusion of unoccupied areas (where the species historically occurred and are currently not known to occur). However, there are no areas being proposed for either gartersnake that are considered unoccupied, therefore, it is likely that section 7 consultation would already be required for the species in areas proposed as critical habitat.

In this situation, both a jeopardy analysis and an adverse modification analysis would focus on the effects of a proposed project's impacts to the PBFs for these gartersnakes determined to be essential for the conservation of these species in areas designated as critical habitat. As such, conservation measures recommended to minimize effects to the northern Mexican or narrow-headed gartersnake would coincidentally minimize effects to designated critical habitat. Accordingly, in occupied critical habitat it is unlikely that an analysis would identify a difference between measures needed to avoid the destruction or adverse modification of critical habitat from measures needed to avoid jeopardizing the species.

Table 6 in Appendix A provides a list of representative types of consultations that might be reinitiated to cover the two gartersnakes, or expanded to cover critical habitat for an existing consultation.

Examples of Federal actions that may affect northern Mexican and narrow-headed gartersnake include initiation of consultation on livestock grazing on Federal grazing allotments, forest management plans, land and resource management plans, travel management plans, transportation infrastructure improvement or development projects, prescribed fire and fuels treatment, and restoration or recovery activities that may affect these species. Most oil and gas, and renewable energy projects have not occurred near these critical habitat units recently. The Rosemont Mine is proposed on USFS lands in southern Arizona, which may result in groundwater loss impacting baseflow in Cienega Creek, potentially impacting the northern Mexican gartersnake. Resolution Copper Mine may impact the northern Mexican gartersnake indirectly from ground disturbance from habitat management activities on a mitigation property along the lower San Pedro River. Runoff and water pollution impacts from mining activities are mitigated by Clean Water Act regulations and effluent discharge permitting. Other potential mining activities are not yet proposed, but could occur in the Coronado National Forest and the Patagonia Mountains.

The number of potential consultations that may arise from projects or activities with a Federal nexus is uncertain. The Service cannot predict with certainty or detail what the effects of expanded, or reinitiated section 7 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. In the absence of more specific projections of activity levels within the proposed critical habitat area, we rely on data describing the number of historical consultations that have occurred as a result of the species' listing to estimate the number of future consultations. This analysis found no evidence

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of trends over time among historical consultations and therefore relies on an annual average number of consultations by type. We assume that the rate of future consultation activity is likely to be similar to annual average historical rates. In July 2014, pursuant to the Act, the Service listed both gartersnakes as threatened.

The type activities that have required consultation in the past and are likely to require consultation in the future include: irrigation maintenance or modification, forest clearing or harvest, bridge maintenance or modification, new construction in marshland, livestock grazing permits, water pipeline maintenance or modification, aquaculture, surface mining, transportation, erosion protection, recreation construction, residential development, stream restoration or modification, and electricity transmission line maintenance and modification.

The evaluation of impacts in this chapter focuses on costs and outcomes of the potential expansion in section 7 consultations resulting from the designation of critical habitat for the two snakes. Impacts of expanded consultations may include the following:

- Additional expenditures of time and money by federal agencies, including the Service, and nonfederal proponents to consider adverse modification in its consultations on the gartersnakes.
- Additional expenditures of time and money by federal agencies, including the Service, and nonfederal proponents to add consideration of the two Arizona gartersnakes to its consultations on other listed species whose critical habitat overlaps with the snakes.
- 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 reasonable and prudent conservation measures with terms and conditions, as applicable, 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 1.4.2 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 northern Mexican and narrow-headed gartersnakes as a result of section 7 consultation or of conservation measures 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 2019) to assess the potential economic effects of the proposed critical habitat areas. Guidelines issued by the U.S. Office of Management and Budget (OMB) for the economic analysis of regulations direct Federal agencies to measure the costs and benefits of a regulatory action against a baseline (i.e., costs and benefits that are "incremental" to the baseline). OMB defines the baseline as the "best assessment of the way the world would look absent the proposed action." In other words, the baseline includes any existing regulatory and socio-economic burden imposed on landowners, managers, or other resource users affected by the designation of critical habitat. The baseline includes the economic impacts of listing the species under the Act, even if the listing occurs concurrently with critical habitat designation. Impacts that are incremental to the baseline (i.e., occurring over and above existing constraints) are those that are solely attributable to the designation of critical habitat. This screening analysis focuses on the likely incremental effects of the critical habitat designation. Where appropriate, information from the economic analysis was incorporated into this EA.

Activities with a Federal nexus that may affect listed species are subject to section 7 consultation to consider whether actions may jeopardize the existence of the species, even absent critical habitat. As part of these consultations, critical habitat triggers an additional analysis evaluating whether an action will diminish the recovery potential or conservation value of the designated area. Specifically, following the designation, Federal agencies must also consider the potential for activities to result in the destruction or adverse modification of critical habitat. These consultations are the regulatory mechanism through which critical habitat rules are implemented. Any time and effort spent on this additional analysis, as well as the costs and benefits of implementing any recommendations resulting from this review, are economic impacts of the critical habitat designation.

Critical habitat may also trigger additional regulatory changes. For example, in some cases, a critical habitat designation may cause other Federal, state, or local permitting or regulatory agencies to expand or change standards or requirements. Regulatory uncertainty generated by critical habitat may also have impacts. For example, landowners or buyers may perceive that a critical habitat rule will restrict land or water use activities in some way and therefore value the use of the land less than they would have absent critical habitat. This is a perceptional, or stigma, effect of critical habitat on markets.

## 3.2 Water Resources

### 3.2.1 Existing Conditions

Continuing threats to the northern Mexican gartersnake and narrow-headed include activities that result in the loss of stream flow, including dams, water diversions, groundwater pumping, and development (78 FR 41500: 79 FR 38678). Both snakes depend on the presence of water, primarily for the maintenance of their primary aquatic prey bases, not because their own physiology requires an aquatic environment. The northern Mexican gartersnake is a riparian obligate and occurs chiefly in streams, rivers, cienegas, stock tanks, and spring sources that are

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often found within large-river riparian woodlands and forests and streamside gallery forests. Narrow-headed gartersnakes often forage underwater, using concealment and ambush behaviors within and between boulder and cobble complexes along the bottom of streams. PBFs for the northern Mexican gartersnake and the narrow-headed gartersnake include aquatic riparian habitat. See Section 1.2.2 for PBFs for each species.

Land uses that result in the dewatering of habitat, combined with increasing drought, have historically destroyed significant amounts of habitat throughout the northern Mexican and narrow-headed gartersnakes' ranges and have also contributed to population declines (78 FR 41500; 79 FR 38678). Actions that alter the amount, timing, or frequency of flow within a stream or the quantity of available water within wetland habitat such that the prey base for either gartersnake species, or the gartersnakes themselves are threats to the species and proposed critical habitat. Special management within proposed critical habitat will be needed to ensure these areas provide adequate water quantity, quality, and permanence and an adequate prey base. Common examples of activities that can result in the dewatering of habitat may include, but are not limited to, various types of channelization, dams, diversions, flood-control projects, groundwater pumping within aquifers associated with the river, dewatering of isolated within-channel pools or stock tanks, removal of flows in excess of those allotted under a given water right, mining activities, and wastewater discharge (78 FR 41500; 79 FR 38678). These activities could be impacted by critical habitat designation for the northern Mexican gartersnake and narrow-headed gartersnake but not more so than the listing itself.

Diversion and groundwater pumping occur from agricultural, industrial, and municipal uses. Increasing human population growth is driving higher and higher demands for water in the United States. Water is subsequently secured through dams, diversions, flood-control projects, and groundwater pumping, which affects gartersnake habitat through reductions in stream flow and in some cases, complete dewatering of stream reaches. Where surface water persists, increasing land development and recreation use adjacent to and within riparian habitat has led to further reductions in stream flow.

Operations of dams can modify, reduce, destroy, or increase riparian and stream habitats both downstream and upstream of a dam site. Dams may prevent movement of fish between populations (which affects prey availability for northern Mexican and narrow-headed gartersnakes) and dramatically alter the flow regime of streams through the impoundment of water. These diversions also require periodic maintenance and reconstruction, resulting in potential habitat damages and inputs of sediment into the active stream. Flow regimes within stream systems are a primary factor that shape fish community assemblages. The timing, duration, intensity, and frequency of flood events has been altered to varying degrees by the presence of dams, which has an effect on fish communities. In addition flood control projects permanently alter stream flow characteristics and have the potential to make streams unsuitable as habitat for the northern Mexican gartersnake by reducing or eliminating stream sinuosity and associated pool and backwater habitats that are critical to this species and their prey (78 FR 41500; 79 FR 38678).

In addition to activities that result in the dewatering of habitat, actions that would alter water chemistry beyond the tolerance limits of a gartersnake prey base could also threaten proposed critical habitat. Such activities could include, but are not limited to: Release of chemicals, biological pollutants, or effluents into the surface water or into connected groundwater at a point

source or by dispersed release (non-point source); aerial deposition of known toxicants, such as mercury, that are positively correlated to regional exceedances of water quality standards for these toxicants; livestock grazing that results in waters heavily polluted by feces; runoff from agricultural fields; roadside use of salts; aerial pesticide overspray; runoff from mine tailings or other mining activities; and ash flow and fire retardants from fires and fire suppression. These actions could adversely affect the ability of the habitat to support survival and reproduction of gartersnake prey species (78 FR 41550: 79 FR 38678).

Mining is a large industry in Arizona and New Mexico. Mines draw surface water or utilize groundwater wells for industrial purposes. Reductions in water availability to mining companies could delay or curtail production at mine facilities adversely affecting these companies. Designation of critical habitat may affect water use for mining projects on both BLM and Forest Service land. However, there is no indication that mining activities will have significant effects on baseflows of streams and rivers near mines.

*Water Rights*

Surface water resources in the Gila River are fully appropriated and subject to ongoing adjudication. Consumptive uses in the Gila River Basin total over 3 million acre-feet per year, with about 72 percent for irrigation and livestock uses, 25 percent for municipal and industrial uses, and 3 percent for mining operations (U.S. Bureau of Reclamation 2004). To facilitate consumptive use, numerous water storage and diversion structures have been constructed in the mainstem Gila River and its major tributaries.

In order to understand current surface water issues for the Gila River, it is necessary to explain several historical events. The Coolidge Dam was built between 1924 and 1928, and is owned and operated by the Bureau of Indian Affairs as part of the San Carlos Indian Irrigation Project (SCIIP), for purposes of providing irrigation to the Gila River Indian Community (GRIC) and the San Carlos Irrigation and Drainage District (SCIDD). The maximum storage capacity of Coolidge Dam is 869,000 acre-feet. The flows between Coolidge Dam and the Ashurst-Hayden Diversion Dam are appropriated to GRIC and SCIDD. All diversions of Gila River water are regulated under the 1953 Globe Equity 59 Decree. The Gila Water Commissioner is appointed by the U.S. District Court to administer the Decree, which controls use of the waters of the Gila River in the reach from above Virden, NM to its confluence with the Salt River west of Phoenix. Under the Decree, approximately 60 percent of the water goes to GRIC, while the remaining 40 percent goes to SCIDD. SCIDD provides water to a variety of private landowners and municipalities for irrigation purposes on approximately 50,000 acres, including the communities of the Casa Grande and Florence Valleys. The U.S. Bureau of Indian Affairs would be the Federal action agency for water resource actions involving San Carlos Lake and operation of the Coolidge Dam.

In 1952, Arizona sued California over water supplied by the Colorado River. The dispute grew to include the settlement of water rights of and between New Mexico and Arizona on the Gila River system. In 1964, the U.S. Supreme Court (Arizona v. California) allocated water to California and Arizona based on future growth projections, but limited New Mexico's allocation to its "present use" developed as of 1957. New Mexico protested this allocation, and its State Engineer entered into negotiations with Arizona to improve its position. The State Engineer saw an opportunity to secure water for New Mexico as part of the Central Arizona Project (CAP).

The Colorado River Basin Project Act of 1968 (CRBPA) authorized the CAP. The CAP delivers water from the Colorado River near Lake Havasu across Arizona through Phoenix and Tucson. Section 304(f) of the original CRBPA authorized an exchange of waters from the Gila River and its tributaries and underground water sources for CAP water in amounts that permit consumptive use of water in New Mexico not to exceed an annual average in any period of 10 consecutive years of 18,000 acre-feet over and above the consumptive uses provided for by Article IV of the decree of the U.S. Supreme Court in A*rizona v. California*.

The Arizona Water Settlements Act (AWSA) of 2004, in addition to settling several outstanding Indian water claims, authorizes water exchanges between the Gila River Indian Community and various parties in the State of Arizona, including mining companies and several municipalities in the upper Gila River watershed. Section 212(d) of the AWSA modified Section 304(f) of the CRBPA to allow the Secretary of Interior to contract with New Mexico water users or the State of New Mexico, with the approval of its Interstate Stream Commission (ISC), for water from the Gila River, its tributaries, and underground water sources in amounts that will permit consumptive use of water in New Mexico not to exceed an annual average in any period of 10 consecutive years of 14,000 acre-feet over and above the consumptive uses provided for by Article IV of the decree of the U.S. Supreme Court in *Arizona v. California*. Such increased consumptive uses shall continue only so long as delivery of Colorado River water to downstream Gila River users in Arizona is being accomplished in accordance with the AWSA, in quantities sufficient to replace any diminution of their supply resulting from such diversion from the Gila River, its tributaries, and underground water sources.

Title I Section 107 and Title II Section 212 of the AWSA (Public Law 108–451) provides between $66 and $128 million in non-reimbursable funds for New Mexico to develop water supply alternatives, including a New Mexico Unit of the CAP if desired to accomplish the exchange. Funds will be deposited into the New Mexico Unit Fund, a State of New Mexico Fund established and administered by the New Mexico ISC. Beginning in 2012, $66 million, indexed to reflect changes since 2004 in the construction cost indices, has been deposited into the New Mexico Unit Fund in 10 equal annual payments. ISC funds may be used to cover costs of an actual water supply project, planning, environmental mitigation, or restoration activities associated with or necessary for the project, and may be used on one or more of 15 alternative projects ranging from Gila National Forest San Francisco River Diversion/Ditch improvements to a regional water supply project (the Demining Diversion Project). At this time, it is not known how the funds will be spent, or which potential alternative(s) may be chosen. While multiple potential project proposals have been accepted by the New Mexico Office of the State Engineer (NMOSE), implementation of the AWSA is still in the planning stages on these streams, and final notice is expected by the end of 2014. Should water be diverted from the Gila or San Francisco Rivers, flows would be diminished and direct and indirect losses and degradation of habitat for the narrow-headed gartersnake and its prey species would result.

Following notification by December 31, 2014 that the State of New Mexico intends to have the New Mexico Unit constructed or developed, an additional $34 to $62 million may be available. A Record of Decision is to be issued in the Federal Register by the Secretary of Interior no later than the end of 2019 (unless extended by the Secretary for reasons outside the control of the State of New Mexico) regarding the decision (78 FR 41500; 79 FR 38678). The Interior Department has denied a state entity an extension to receive $56 million in diversion

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construction funds. However, the New Mexico Central Arizona Project Entity still has nearly $70 million in the New Mexico Unit Fund.

One potential CAP project is the proposed Hooker Dam. The dam has been proposed in the reach above Mogollon Creek and below Turkey Creek as part of the CAP, but remains in deferment status. If constructed, however, Hooker Dam would significantly alter or reduce stream flow; favor nonnative, spiny-rayed fish species; and likely render the affected reach unsuitable for narrow-headed gartersnakes (78 FR 41500; 79 FR 38678).

*Watersheds (surface and groundwater)*

Critical habitat units are distributed between 25 different watersheds within Arizona and New Mexico (USGS 2005). Surface and groundwater rights in New Mexico and Arizona follow the doctrine of prior appropriation: first in time, first in right. Prior appropriations are typically based on date of appropriate and beneficial use. The state entities responsible for managing surface and ground water management in these states are the Arizona Department of Water Resources and the New Mexico Office of the State Engineer (NMOSE). These state agencies also oversee dam projects and floodplain management in their respective states as well as review and grant permits for new and changed water rights (ADWR 2011a; NMOSE 2011).

In 1931, New Mexico passed the groundwater code that set the procedure for obtaining groundwater rights. These procedures are similar to gaining surface water rights, with several important differences: NMOSE regulates declared underground water basins. Authority is given to NMOSE to establish such basins when regulation is necessary to protect prior appropriations, ensure water is put to beneficial use, and to maintain orderly development of the State's water resources (NMOSE 2005).

To control the overdraft of groundwater supplies from its growing economy, the Arizona Groundwater Management Code was passed in 1980. The Arizona Department of Water Resources set up Active Management Areas (AMAs) for areas with a heavy reliance on mined groundwater (ADWR 2011b). An AMA is established by ADWR when an area's water demand has exceeded the groundwater supply and an overdraft has occurred. In these areas, groundwater use has exceeded the rate where precipitation can recharge the aquifer (78 FR 41500: 79 FR 38678). 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 (ADWR 2011b). Geographically, these five AMAs overlap or are located near the proposed critical habitat of the northern Mexican or narrow-headed gartersnake, or both, in Arizona.

*Recent Consultations*

The Service conducted an intra-Service section 7 consultation in 2008 for the issuance of a section 10 incidental take permit of threatened and endangered species associated with operations of Horseshoe and Bartlett Dams and Reservoirs by Salt River Project in Maricopa and Yavapai Counties, Arizona. The permit would cover the operation of the dams as proposed with implementation of proposed minimization, mitigation, and monitoring measures. Both dams would continue to be operated in a manner consistent with their purpose of water storage reservoirs and to minimize spills of water past Granite Reef Dam with the two following added

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objectives: maintaining tall dense vegetation in Horseshoe and managing Horseshoe water levels to minimize impacts to covered aquatic species. Although both the northern Mexican gartersnake and narrow-headed gartersnake were not listed as threatened under the ESA in 2008, the Service included both species as aquatic species.

The Service determined that the effects of the proposed action were unlikely to jeopardize the gartersnakes if they became listed in the future. This determination was made based on several reasons, including proposed mitigation activities in the form of watershed management measures that would assist in maintaining suitable flow within the Verde Watershed. This type of mitigation was deemed particularly important because one of the largest threats facing the biotic community with this watershed is the increasing demand for water spurred by forecasted regional population growth and current and long-term drought conditions (Service 2008).

### 3.2.2 Environmental Consequences

Activities that occur on critical habitat units that affect water resources 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; destruction of riparian or wetland vegetation; and alterations of watersheds and floodplains. Actions that would alter the water quality or permanence of a breeding site or dispersal corridor may also affect critical habitat for the northern Mexican gartersnake and narrow-headed gartersnake, thus triggering a section 7 consultation. These activities include 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; 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; and fire retardant application.

#### 3.2.2.1 No Action

Under the No Action Alternative, no critical habitat would be designated for the northern Mexican gartersnake and narrow-headed gartersnake. The section 7 consultation process would be implemented for projects that effect the gartersnakes' reproduction, recruitment, population density, and distribution, including an analysis of habitat modifications that would limit dispersal, result in significant declines in the composition and density of native prey species, or otherwise directly or indirectly benefit the existence of harmful nonnative species. The section 7 consultation process would not consider additional consideration of critical habitat and associated PBFs. Section 7 consultations would be initiated only for may affect determinations of effects to either the northern Mexican gartersnake or narrow-headed gartersnake. These consultations would analyze relevant livestock grazing, improvement or development projects, prescribed fire and fuels treatment, restoration or recovery activities, and forest management, land and resource management, travel management plans proposed for Federal lands occupied by the either species. As they relate to water and wetland resources, such consultations would likely include the entire range of projects given in Table 4, Appendix A. Specifically, several water projects with a Bureau of Reclamation nexus could trigger section 7 consultations, including

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those being considered under the Arizona Water Settlement Act (AWSA), described above in section 3.2.1.

Therefore, this alternative would not have any impacts on water and wetland resource management beyond any conservation measures resulting from the listing of the northern Mexican gartersnake and narrow-headed gartersnake and associated requirements of section 7 of the ESA.

#### 3.2.2.2 Alternative A

All proposed critical habitat units are occupied by either the northern Mexican gartersnake, narrow-headed gartersnake, or both species; therefore, actions that include water and wetland resources in those areas would be subject to section 7 consultations irrespective of the area's status as critical habitat. Additionally, because habitat health is a main component of the PBFs and also a proxy for determining presence of the species, habitat evaluation would be a primary component of a jeopardy analysis. Alternative A (all proposed units, no exclusions) would not likely increase the number of section 7 consultations based solely on the presence of designated critical habitat. However, compared to the No Action Alternative, Alternative A would add the addition of an analysis of adverse modification of critical habitat to future section 7 consultations on the northern Mexican gartersnake and narrow-headed gartersnake in critical habitat. The presence of existing critical habitat for other species in several units would require adverse modification analysis regardless of the presence of gartersnake critical habitat, and all of the species depend on healthy riparian ecosystems (Natureserve 2012; Service 2011a).

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. Adverse modification of critical habitat may occur if the proposed action directly or indirectly alters the designated critical habitat in a way that appreciably diminishes the value of the critical habitat as a whole for the conservation of the listed species.

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. No additional conservation measures as a result of designating critical habitat are predicted because (1) all areas proposed for critical habitat are considered occupied by the species; and (2) the gartersnakes are intimately tied to their habitat, such that any potential conservation measures to avoid adverse modification of critical habitat are most likely also going to be required to avoid jeopardizing the species. Future consultations for critical habitat would likely contain conservation measures to minimize adverse effects to critical habitat. These potential conservation measures could include:

- Implement seasonal restriction or modification to projects to enable conservation and recovery of the species.
- Reduce the size and configuration of the proposed project to avoid, reduce or eliminate the effects to the species.

- Avoid ground disturbing activities that would eliminate riparian vegetation or sources of cover when harmful nonnative species are also present.
- Reduce or avoid project elements that would eliminate or significantly reduce the amount or quality of water in occupied habitat.
- Reduce or avoid project elements that would eliminate, significantly reduce, or alter the distribution, composition, and density of existing native (or nonnative, soft-rayed) prey populations in occupied habitat.
- Reduce or avoid project elements that would significantly enhance the distribution, composition, persistence, and density of nonnative species within occupied habitat.
- Implement in-situ conservation (on-site conservation of this species) by removing source populations of harmful nonnative species that contribute to the degraded status of northern Mexican or narrow-headed gartersnakes within a project's action area.
- Offset habitat loss with suitable habitat that is protected elsewhere within the species' range, including adequate funding to ensure that habitat is managed permanently for the protection of the species and is free of nonnative species or where they do not pose a threat to gartersnake reproduction, recruitment, and survivorship.
- Implement general, currently adopted conservation measures for native fish and amphibians.

In summary, the effects of critical habitat designation on water and wetland resource management activities are expected to be minor to moderate, because any modifications resulting from conservation of critical habitat would likely be similar in nature to those recommended in the jeopardy analysis in consultations for listed species, and additional section 7 consultations are not anticipated from the designation of critical habitat alone. Beneficial effects are anticipated on water and wetland resources, because any conservation measures designed to protect the two gartersnakes would most likely also protect water and wetland resources within and surrounding the critical habitat units.

#### 3.2.2.3 Alternative B

Alternative B (proposed units minus exclusions) would not likely increase the number of section 7 consultations based solely on the presence of designated critical habitat. The impacts associated with the designation of critical habitat under Alternative B could be less than those identified for Alternative A due to the acres excluded from critical habitat. These exclusions could reduce the economic impacts of designation on water resource management activities in these areas overall by requiring less extensive consultations overall. This would reduce administrative costs as well for the Service. Compared to the No Action Alternative, Alternative B would add the addition of an analysis of adverse modification of critical habitat to future section 7 consultations on the northern Mexican gartersnake and narrow-headed gartersnake in critical habitat.

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## 3.3 Fisheries Management

### 3.3.1 Existing Conditions

Unless specifically prohibited, all federal lands managed by the BLM and the U.S. Forest Service (USFS) are open to fishing. However, because of the scarcity of water on Arizona and New Mexico's public lands, fishing opportunities are limited. The Service, BLM, and USFS all participate in fisheries management by maintaining aquatic habitat and management of native and nonnative species. Because the gartersnake PBFs are closely tied with aquatic habitat and species, fisheries management activities may trigger section 7 consultation based on the presence of critical habitat.

Arizona and New Mexico are part of the Southwest Regional Fisheries Program of the Service. The mission of this program is to conserve, protect and enhance fishery and aquatic resources and their habitat for the continuing benefit of the American people. The Program includes 3 hatcheries in Arizona and New Mexico. In addition, critical habitat occurs on the following national wildlife refuges: Bill Williams River NWR and Buenos Aires NWR. Fishing is prohibited on the Buenos Aires NWR (Service 2013c).

The BLM Fisheries Program maintains, restores and conserves fish habitat on the public lands. Much of this work is accomplished in collaboration with others and funded through various partnerships with Federal, State and non-governmental organizations. The BLM works cooperatively with the Arizona Game and Fish Department (AGFD) and the New Mexico Department of Game and Fish (NMDGF) to actively manage habitat for fish and wildlife resources on public lands throughout the Arizona (BLM 2013).

The USFS region 3 includes Arizona and New Mexico. In terms of the PCH, recreational fishing occurs in the Coronado, Gila, Tonto, and Prescott National Forests (USFS 1999). In some of these areas, the AGFD and the NMDGF stock streams with hatchery raised fish.

*Recent Consultation*

A formal consultation to analyze the effects of fisheries activities on the gartersnakes has previously been conducted for Service funding of sportfish stocking in Arizona (Service 2011d). This biological opinion (BO) reviewed the AGFD sportfish stocking program, which had last been evaluated in 1994. This program involves 166 stocking sites and 18 species of native and nonnative sportfish. Both the northern Mexican and narrow-headed gartersnake were priority species for conservation activities described in the BO. The BO found that sportfish stocking was likely to adversely affect the gartersnakes. Conservation measures taken by the AGFD included creating or securing two gartersnake populations, developing outreach material to attempt to reduce deliberate killing by the public, restocking renovated streams with native fish, and conducting a statewide live bait use assessment and risk analysis to develop recommendations to amend live bait management (Service 2011d).

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### 3.3.2 Environmental Consequences

#### 3.3.2.1 No Action

Under the No Action Alternative, no critical habitat would be designated for the narrow-headed and northern Mexican gartersnakes. The section 7 consultation process would continue as presently conducted without consideration of PBFs. Section 7 consultations would be initiated only for *may affect* determinations of impacts to the either gartersnake. Such consultations would analyze relevant land, resource and fire management plans on federal lands currently occupied by the species. As they relate to fisheries, such consultations would likely include:

- U.S. Army Corps of Engineers – stream restoration;
- U. S. Bureau of Land Management – aquatic habitat restoration, and native aquatic species management;
- U.S. Forest Service – aquatic habitat restoration and native aquatic species management; and
- U.S. Fish and Wildlife Service – Intra-Service consultation may be required for issuance of section 10 permits for enhancement of survival, habitat conservation plans, and safe harbor agreements, Partners for Fish and Wildlife program projects, Wildlife and Sport Fish Restoration Funding appropriations, and National Wildlife Refuge planning.

Therefore, this alternative would not have any impacts on land use and management beyond any conservation measures resulting from the listing of the northern Mexican and narrow-headed gartersnakes and associated requirements of section 7 of the ESA.

#### 3.3.2.2 Alternative A

There are no areas being proposed for either gartersnake that are considered unoccupied, therefore, it is likely that section 7 consultation would be required for the species irrespective of the area's status as critical habitat. Additionally, because habitat health is a main component of the PBFs and also a proxy for determining presence of the species, habitat evaluation would be a primary component of a jeopardy analysis. Accordingly, in occupied critical habitat it is unlikely that an analysis would identify a difference between measures needed to avoid the destruction or adverse modification of critical habitat from measures needed to avoid jeopardizing the species. Compared to the No Action Alternative, Alternative A would result in the addition of an adverse modification of critical habitat analysis to section 7 consultations for the gartersnakes in critical habitat. As all proposed critical habitat units contain gartersnake populations, federal actions would be subject to Section 7 consultation irrespective of the critical habitat designation. The presence of existing critical habitat for other species in several units would require adverse modification analysis regardless of the presence of gartersnake critical habitat, and all of the species depend on healthy riparian ecosystems (Natureserve 2012; Service 2011a).

In the case of these gartersnakes, no additional conservation measures as a result of designating critical habitat are predictable because (1) all areas proposed for critical habitat are considered occupied by the species; and (2) the gartersnakes are intimately tied to their habitat (which includes the resident biotic community) such that any potential conservation measures to avoid

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adverse modification of critical habitat are most likely also going to be required to avoid jeopardizing these species. Further, any conservation measures to protect PBFs are likely to benefit native fish species, beyond their direct benefits to the gartersnakes. 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 native fish.

The same agencies and types of projects would be expected to trigger consultation with or without critical habitat. The same number of projects would also likely undergo consultation with critical habitat as without. In the case of the gartersnakes, habitat may be used as a proxy for the number of individuals taken and thus a jeopardy analysis and an adverse modification analysis would be the same.

If an action adversely modifies critical habitat for snakes, then the Service anticipates that it may also determine that the action may jeopardize the species (Service 2019). This is because both a jeopardy analysis and an adverse modification analysis would focus on the effects of a proposed project's impacts to the physical features, PBFs, or other habitat characteristics determined by the Secretary to be essential for the conservation of the species in areas designated as critical habitat. Therefore, the actions recommended to avoid adverse modification would be the same as those for avoiding jeopardy. Given these estimates, the effects of Alternative A (designation of critical habitat) would not be significantly different from the No Action Alternative (no designation of critical habitat).

Specific recommendations that may relate to fisheries to avoid destruction or adverse modification of critical habitat and to avoid jeopardy include the following:

- Implement in-situ conservation (on-site conservation of this species) by removing source populations of harmful nonnative species that contribute to the degraded status of northern Mexican or narrow-headed gartersnakes within a project's action area.
- Offset habitat loss with suitable habitat that is protected elsewhere within the species' range, including adequate funding to ensure that habitat is managed permanently for the protection of the species and is free of nonnative species or where they do not pose a threat to gartersnake reproduction, recruitment, and survivorship. Note: habitat loss, modification, or fragmentation on Federal lands should not be offset with protection of other Federal lands that would otherwise qualify for protection if the standards set forth in other agency guidance were applied to those lands.
- Implement general, currently adopted conservation measures for native fish and amphibians.

These actions would serve to maintain habitat and PBFs for the gartersnakes, which also support native fish species. As a result, native fish would benefit, though these beneficial effects of Alternative A on fish 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.

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In summary, the effects of critical habitat designation with regards to fisheries management are expected to be minor because (1) projects are not expected to trigger consultation based solely on the presence of designated critical habitat because all proposed units are occupied by the gartersnakes; (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 likely would be proposed to address critical habitat, beyond those already proposed in jeopardy consultations.

#### 3.3.2.3 Alternative B

Impacts associated with Alternative B (proposed units minus exclusions) would be similar to those identified for Alternative A, but with simpler section 7 consultations. The potential exclusions are primarily located where there are existing management plans for native fish that may be sufficient to protect the gartersnakes. Projects requiring a federal license, permit, or funding would still trigger jeopardy consultations with the Service on these locations. By excluding some areas from the critical habitat designation, the Service would require less extensive consultations overall. This would reduce administrative costs as well for the Service. By excluding more riparian areas there could be a negligible decrease in the beneficial impacts to fisheries species compared to Alternative A because less habitat would have the protections put in place by designating them as critical habitat. However, these negative impacts would likely be offset by the existing conservation plans in the exclusion areas.

## 3.4 Fish, Wildlife, Plants/Threatened, Endangered, and Sensitive 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). Both gartersnakes are dependent on the presence of water because their prey consists of aquatic organisms (Service 2019). Proposed critical habitat areas include one or more of the PBFs for the gartersnakes that are described in section 1.4 or in more detail in the proposed rule (July 10, 2013, 78 FR 41500) and proposed revised rule (85 FR 23608) designating critical habitat. The presence of these PBFs indicates 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 Bill Williams, Verde, Middle Gila, Upper Gila, Santa Cruz, San Pedro, Lower Colorado, and San Francisco 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. Northern

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Mexican gartersnakes occur at elevations from 130 to 8,497 feet (ft) in a wide range of biotic communities, including Sonoran Desertscrub at the lower elevations, through Semidesert Grassland, Interior Chaparral, and Madrean Evergreen Woodland and into the lower reaches of Petran Montane Conifer Forest as elevation increases (Service 2019). Narrow-headed gartersnakes occur at elevations from approximately 2,300–8,200 feet (700 m–2,500 m), inhabiting Petran Montane Conifer Forest, Great Basin Conifer Woodland, Interior Chaparral, and the Arizona Upland subdivision of Sonoran Desertscrub communities (Service 2019). Riparian areas are an important part of the ecology of these desert ecosystems. All proposed critical habitat units contain PBFs 1 and 2, which are aquatic, riparian, or stream habitat and adequate terrestrial space with sufficient structural characteristics to support life history functions adjacent to the streams.

#### 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. Both northern Mexican and narrow-headed gartersnakes are largely dependent on native fish as a primary source of food, but have been observed using nonnative, soft-rayed fish species as prey on occasion; for narrow-headed gartersnakes, fish are the principle prey item. Native species in the proposed designation range include gila trout (*Oncorhynchus gilae gilae*), Apache trout (*Oncorhynchus apache*), topminnows (*Poeciliopsis* spp.), spikedace (*Meda fulgida*), loachminnow (*Tiaroga cobitis*), sucker fish (*Pantosteus* [*Catostomus*] spp.), roundtail chub (*Gila robusta*), speckled dace (*Rhinichthys osculus*), and longfin dace (*Agosia chrysogaster*) (NMDGF 2006; AZGFD 2006). 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 (Service 2007). Several of these species predate directly on or compete with native fishes or amphibians that are the prey base of the gartersnakes. Most of the critical habitat units are deficient in PBF 3 and 4, and as such have populations of nonnative fish, bullfrogs and crayfish such that recruitment of the gartersnakes and maintenance of viable native fish or soft-rayed nonnative fish is not occurring.

#### 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*

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*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 (*Hyla* spp.), mole salamanders (*Ambystoma* spp.), toads (*Anaxyrus* spp.), and leopard frogs (*Lithobates* spp.) and reptiles such as gartersnakes (*Thamnophis* spp.) or mud turtles (*Kinosternon* 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 rivers, wetlands, 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).

#### 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 northern Mexican and narrow-headed gartersnakes. Tables 8 and 9 in Appendix A list the federally endangered, threatened, sensitive, and candidate species with designated critical habitat that overlaps with the proposed gartersnake critical habitat (Service 2011a).

### 3.4.2 Environmental Consequences

#### 3.4.2.1 No Action Alternative

Under the No Action Alternative, critical habitat for the narrow-headed and northern Mexican gartersnakes would not be designated under the ESA. The section 7 consultation process would continue as presently conducted without consideration of PBFs. Section 7 would be initiated only for *may affect* determinations of impacts on either gartersnake. 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 the full range of actions given previously in Table 1 in section 3.1.1. 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 gartersnakes and associated requirements of section 7 of the ESA.

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#### 3.4.2.2 Alternative A

All proposed critical habitat units are occupied by either the northern Mexican gartersnake, narrow-headed gartersnake, or both species; therefore, actions subject to section 7 consultations would be required irrespective of the area's status as critical habitat. The designation of critical habitat alone would not result in new and reinitiated consultations or conservation measures. Additionally, because habitat health is a main component of the PBFs and also a proxy for determining presence of the species, habitat evaluation would be a primary component of a jeopardy analysis. Accordingly, in occupied critical habitat it is unlikely that an analysis would identify a difference between measures needed to avoid the destruction or adverse modification of critical habitat from measures needed to avoid jeopardizing the species.

Compared to No Action Alternative, the Alternative A would result in the addition of an adverse modification of critical habitat analysis to section 7 consultations for the gartersnakes in critical habitat. As all proposed critical habitat units contain gartersnake populations, federal actions would be subject to Section 7 consultation irrespective of the critical habitat designation. The presence of existing critical habitat for other species in several units would require adverse modification analysis regardless of the presence of gartersnake critical habitat, and all of the species depend on healthy riparian ecosystems (Natureserve 2012; Service 2011a).

In the case of these gartersnakes, no additional conservation measures as a result of designating critical habitat are predicted because (1) all areas proposed for critical habitat are considered occupied by the species; and (2) the gartersnakes are intimately tied to their habitat (which includes the resident biotic community) such that any potential conservation measures to avoid adverse modification of critical habitat are most likely also going to be required to avoid jeopardizing these species.

Nonnative species, such as crayfish, that are considered harmful to the gartersnakes prey base may be adversely affected if managers implement a program to remove them from critical habitat. The adverse impacts on nonnative fish populations throughout the gartersnake 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.

The same agencies and types of projects would be expected to trigger consultation with or without critical habitat. The same number of projects would also likely undergo consultation with critical habitat as without. In the case of the gartersnakes, habitat may be used as a proxy for the number of individuals taken and thus a jeopardy analysis and an adverse modification analysis would be the same.

If an action adversely modifies critical habitat then the Service anticipates that it may also determine that the action may jeopardize the species (Service 2019). This is because both a jeopardy analysis and an adverse modification analysis would focus on the effects of a proposed project's impacts to the physical features, PBFs, or other habitat characteristics determined by the Secretary to be essential for the conservation of the species in areas designated as critical habitat. Therefore, the actions recommended to avoid adverse modification would be the same as

those for avoiding jeopardy. Given these estimates, the effects of Alternative A (designation of critical habitat) would not be significantly different from the No Action Alternative (no designation of critical habitat).

Specific recommendations to avoid destruction or adverse modification of critical habitat and to avoid jeopardy include the following:

- Implement seasonal restriction or modification to projects to enable conservation and recovery of the species.
- Reduce the size and configuration of the proposed project to avoid, reduce or eliminate the effects to the species.
- Avoid ground disturbing activities that would eliminate riparian vegetation or sources of cover when harmful nonnative species are also present.
- Reduce or avoid project elements that would eliminate or significantly reduce the amount or quality of water in occupied habitat.
- Reduce or avoid project elements that would eliminate, significantly reduce, or alter the distribution, composition, and density of existing native (or nonnative, soft-rayed) prey populations in occupied habitat.
- Reduce or avoid project elements that would significantly enhance the distribution, composition, persistence, and density of harmful nonnative species within occupied habitat.
- Implement in-situ conservation (on-site conservation of this species) by removing source populations of harmful nonnative species that contribute to the degraded status of northern Mexican or narrow-headed gartersnakes within a project's action area.
- Offset habitat loss with suitable habitat that is protected elsewhere within the species' range, including adequate funding to ensure that habitat is managed permanently for the protection of the species and is free of nonnative species or where they do not pose a threat to gartersnake reproduction, recruitment, and survivorship. Note: habitat loss, modification, or fragmentation on Federal lands should not be offset with protection of other Federal lands that would otherwise qualify for protection if the standards set forth in other agency guidance were applied to those lands.
- Implement general, currently adopted conservation measures for native fish and amphibians.

These actions would serve to maintain habitat and PBFs for the gartersnakes. As a result, native fish, wildlife, and plants, including candidate, proposed, or listed species would benefit. The species most likely to benefit are species that also depend on the maintenance of aquatic habitats, such as native fish. The beneficial effects of Alternative A on fish, wildlife, and plants are expected to be minor because although management practices, proposed and existing projects, or various uses of proposed critical habitat segments may be altered, the outcomes of consultations for critical habitat are not likely to substantially change.

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In summary, the effects of critical habitat designation with regards to fish, wildlife, and plants are expected to be minor because (1) projects are not expected to trigger consultation based solely on the presence of designated critical habitat, since all proposed units are occupied by the gartersnakes; (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.

#### 3.4.2.3 Alternative B

Impacts associated with Alternative B (proposed units minus exclusions) would be similar to those identified for Alternative A, but with less extensive section 7 consultations. The potential exclusions are primarily located where there are existing management plans for fish, wildlife, and plants with protections that may benefit the gartersnakes (Freeport McMoRan Corporation (FMC 2011); Roosevelt HCP (SRP 2002); Horseshoe-Bartlett HCP (SRP 2008); Pima County Multi-Species HCP (Pima County 2016); San Rafael Ranch Low Effect HCP (Harlow 2015)). Projects requiring a federal license, permit, or funding would still trigger jeopardy consultations with the Service on these locations. However, these exclusions would not impact the economic impacts of designation on land management activities in these areas overall, because consultations would still be required. This would reduce administrative costs as well for the Service. Any decrease in the beneficial impacts to wildlife and vegetation from designation with exclusions compared to Alternative A would likely be offset by the existing conservation plans in the exclusion areas. Impacts to wildlife from this alternative would therefore be expected to be minor.

## 3.5 Land Use and Management

### 3.5.1 Existing Conditions

The combined proposed critical habitat designation for the two gartersnakes includes lands under Federal (64%), state (4%), Tribal (1%) and private (31%) land ownership. Much of the Federal land is managed by the USDA Forest Service (USFS) in the Gila Wilderness and 4 National Forests: Apache, Gila, Tonto, and Coronado; the Bureau of Indian Affairs (BIA) on 2 Indian Reservations: San Carlos and White Mountain Apache; the Service in the Buenos Aires NWR and Bill Williams River NWR; and the Bureau of Land Management (BLM) in the San Rafael Ranch Natural Area (see Figure 3 in Appendix B). Federal lands are managed according to the pertinent management plan for each Forest Service district office, BIA regional office, Service regional office, and BLM field office.

Table 10 in Appendix A summarizes the land ownership status for the combined designation of the narrow-headed and the northern Mexican gartersnake.

There is a variety of land uses in designated critical habitat units. Forest Service lands dominate the Federal holdings, comprising approximately 36% of the Federal lands, with the two NWRs (Bill Williams River and Buenos Aires) comprising nearly 20% and BLM lands about 19%. Tribal lands comprise approximately 11% of proposed critical habitat.

On Forest Service lands, the principal land management activities affecting critical habitat units include aquatic habitat restoration, fire management plans, fire suppression, fuel reduction treatments, livestock grazing, mining, native aquatic species management, and recreation. These activities and their impacts are discussed in the individual resource sections of this chapter. Both the Apache-Sitgreaves and Gila National Forests are inhabited by both species of gartersnake.

BLM lands affecting critical habitat units are managed under the principles of multiple-use and ecosystem management for future generations. These lands include BLM public land, Las Cienegas National Conservation Area (NCA), San Pedro Riparian NCA, Gila Box Riparian NCA, San Rafael Ranch Natural Area, the Rawhide Mountains, Swansea Wilderness, 5 areas of critical environmental concern (Appleton-Whittell, Tree Rivers, Gila Middle Box, Gila Lower Box, and Eagle Creek Bat Cave), several wilderness study areas, and other tracts of land. These lands are managed for multiple use, including habitat restoration, fire management, grazing, and recreation. The Gila River Lower Box and Middle Box Wilderness Study Areas and Gila River NCA are inhabited by both gartersnake species.

There are two 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 Bill Williams River NWR in Mohave County, AZ, along the border of California which contains a portion of the Lower Colorado River.

BIA lands include two Indian reservations: White Mountain Apache and San Carlos Apache. The White Mountain Apache Indian reservation and the San Carlos Indian reservations are both located in the Upper Salt River Subbasin Unit. The White Mountain Apache Indian reservation is in Apache and Navajo Counties and the San Carlos Indian reservation is in northern Graham, southeastern Gila, and eastern Pinal Counties (WMAT 2013; San Carlos 2013). Both species of gartersnake occur in both reservations. Activities that occur on tribal lands include renewable energy development, grazing, road projects, and utility developments.

Lands owned by the State of Arizona include several state parks, state trust land, wildlife management areas, a cienega and cienega nature preserve, two fish hatcheries, a natural area, and two wildlife areas. On lands owned by the AGFD, such as the Bubbling Ponds and Page Springs State Fish Hatcheries (Oak Creek), management focuses on native species conservation which benefits the gartersnakes (AZGFD 2013).

Lands owned by the State of New Mexico include two Wildlife Management Areas (WMAs): Heart Bar and Red Rock. These areas are managed by NMDFG. Both properties are part of the Gaining Access into Nature (GAIN) program, offered by NMDFG. The GAIN program opens WMAs to additional wildlife-associated recreation activities beyond hiking and fishing, such as horseback riding and wildlife viewing (NMDFG 2013).

The proposed designation includes 99,320 acres (40,180 ha) of private land, which supports a variety of land uses:

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- Conservation land—lands managed by the Audubon Society, including the Appleton-Whittell Research Ranch (unit 9), managed for the rehabilitation and protection of grassland ecosystems, and several other private conservation land owners.
- Land enrolled in Safe Harbor Agreement—these lands are typically managed for recreation and/or ranching, with occupied ranch tanks. This includes land in the San Pedro River Subbasin Unit and San Rafael Ranch in the Upper Santa Cruz River Subbasin Unit.

### 3.5.2 Environmental Consequences

Land management activities on critical habitat units for both species include groundwater pumping and surface water diversion; livestock management; fire suppression and prescribed fire; surface disturbance construction activities including road construction and maintenance, timber harvest and thinning, and flood control; native fish and aquatic habitat recovery; sportfish stocking; and recreation developments and activities including off-road vehicle use. Most oil and gas, and renewable energy projects have not occurred near these critical habitat units recently. Nearby proposed mining projects, such as the Rosemont Mine proposed on USFS lands in southern Arizona, may impact baseflow in Cienega Creek. Additionally, Resolution Copper Mine may impact the northern Mexican gartersnake indirectly from ground disturbance from habitat management activities on a mitigation property along the lower San Pedro River. Runoff and water pollution impacts from mining activities are mitigated by Clean Water Act regulations and effluent discharge permitting. Other potential mining activities are not yet proposed, but could occur in the Coronado National Forest and the Patagonia Mountains.

#### 3.5.2.1 No Action

Under the No Action Alternative, no critical habitat would be designated for the gartersnakes. The section 7 consultation process would continue without consideration of PBFs. For example, conservation efforts 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 these conservation efforts would have benefits to preventing negative impacts on habitat.

Section 7 consultations would be initiated only for *may affect* determinations of impacts to the northern Mexican and narrow-headed gartersnakes. 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:

- BLM–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;
- 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 WSFR-funded projects; and for Partners for Fish and Wildlife programs benefiting the gartersnakes; and

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- USFS–for aquatic habitat restoration, fire management plans, fire suppression, fuels reduction treatments, forest plans, livestock grazing allotment management plans, mining permits, native fish and snake reestablishment, and travel management plans.

Therefore, this alternative would not have any impacts on land use and management beyond any conservation measures resulting from the listing of the two gartersnakes and associated requirements to avoid actions that would jeopardize the species, pursuant to section 7 of the ESA.

#### 3.5.2.2 Alternative A

All proposed critical habitat areas are occupied by the northern Mexican and narrow-headed gartersnakes; 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 the analysis of adverse modification of critical habitat to future section 7 consultations on the northern Mexican and narrow-headed gartersnake in critical habitat.

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 expanded 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 or measures, terms and conditions and potentially other conservation measures designed to maintain northern Mexican and narrow-headed gartersnake PBFs. These outcomes cannot be predicted precisely; however, based on past consultations for species with similar habitat requirements in this area, conservation measures have not fundamentally changed land use. Types of additional management actions that may be required include, but are not limited to:

- Revising resource management plans;
- Mapping, surveying, and monitoring northern Mexican and narrow-headed gartersnakes and preparing survey and monitoring reports;
- Implement seasonal restriction or modification to projects to enable conservation and recovery of the species;
- Reduce the size and configuration of the proposed project to avoid, reduce or eliminate the effects to the species;
- Avoid ground disturbing activities that would eliminate riparian vegetation or sources of cover when harmful nonnative species are also present;
- Reduce or avoid project elements that would eliminate or significantly reduce the amount or quality of water in occupied habitat;

- Reduce or avoid project elements that would eliminate, significantly reduce, or alter the distribution, composition, and density of existing native (or nonnative, soft-rayed) prey populations in occupied habitat;
- Reduce or avoid project elements that would significantly enhance the distribution, composition, persistence, and density of nonnative species within occupied habitat;
- Remove source populations of harmful nonnative species that contribute to the degraded status of northern Mexican or narrow-headed gartersnakes within a project's action area;
- Offset habitat loss with suitable habitat that is protected elsewhere within the species' range; and
- Implement conservation measures for native fish and amphibians.

In summary, the effects of critical habitat designation on land use and management are expected to be minor because (1) any reasonable and prudent alternatives developed under jeopardy analysis would not likely be changed substantially with the addition of adverse modification analysis; and (2) few if any additional conservation measures would be proposed to address critical habitat, beyond those 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 include private conservation lands, state lands (primarily those managed by the ADGF), and tribal lands. These exclusions could reduce the economic impacts of designation on land management activities in these areas overall, by requiring less extensive 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

Threats to both the northern Mexican gartersnake and narrow-headed gartersnake and their habitat include historical fire management activities such as fire exclusion, suppression, and severe wildland fires.

PBFs of northern Mexican gartersnake habitat that could be affected by fire management include:

- Perennial or spatially intermittent streams that provide both aquatic and terrestrial habitat that allows for immigration, emigration, and maintenance of population connectivity of northern Mexican gartersnakes and contains
    - slow-moving water (walking speed) with in-stream pools, off-channel pools, and backwater habitat;
    - organic and natural inorganic structural features (e.g., boulders, dense aquatic and wetland vegetation, leaf litter, logs and debris jams) within the stream channel for

thermoregulation, shelter, foraging opportunities, and protection from predators;
    - terrestrial habitat adjacent to the stream channel that includes riparian vegetation, small mammal burrows, boulder fields, rock crevices, and downed woody debris for thermoregulation, shelter, foraging opportunities, and protection from predators; and
    - water quality that is absent of pollutants or, if pollutants are present, at levels low enough such that recruitment of northern Mexican gartersnakes is not inhibited.
- Prey base of primarily native anurans, but also fishes, small mammals, lizards, and invertebrate species.

PBFs of the narrow-headed gartersnake habitat that could be affected by fire management include:

- Perennial streams or spatially intermittent streams that provide both aquatic and terrestrial habitat that allows for immigration, emigration, and maintenance of population connectivity of narrow-headed gartersnakes and contains
    - pools and riffles, coble and boulder substrate , with low amount of fine sediment and substrate embeddedness;
    - organic and natural inorganic structural features (e.g., cobble bars, rock piles, large boulders, logs or stumps, aquatic and wetland vegetation, logs, and debris jams) in the stream channel for basking, thermoregulation, shelter, prey base maintenance, and protection from predators;
    - water quality such that water is clear to allow visibility of prey; and
    - terrestrial habitat within 27.2 m (89 ft) of the active stream channel that includes small mammal burrows, boulder fields, rock crevices, downed woody debris, and vegetation for thermoregulation, shelter sites, and protection from predators.
- Prey base of native fishes, or soft-rayed, nonnative fish species.

The severity of wildfires on gartersnake habitat depends on burn severity, percent of area burned within each severity category, and the intensity and duration of precipitation events that follow. Low-intensity fires were common in southwestern forests prior to European settlement and fire has been a natural disturbance factor in these areas. These fires can actually have a positive effect on critical habitat by removing decadent ground cover and providing nutrients to remaining vegetation. As a result, riparian vegetative communities may be more resilient to wildfire, given that water is present. As long as root crowns are not damaged, low-intensity fires can also have a positive effect on Willows, an important component to narrow-headed gartersnake habitat. High severity burns that occur within the floodplain of proposed critical habitat are expected to have some level of shorter-term effect on resident gartersnake populations through effects to the vegetative structure and abundance, which may include a reduction of basking sites and a loss of cover.

Existing wildfire suppression policies intended to protect the expanding number of human structures on forested public lands have altered the fuel loads in the southwest and increased the probability of high-intensity wildfires. Possible effects of high-intensity wildfire on proposed critical habitat includes the removal of vegetation, the degradation of subbasin condition, altered stream behavior, and increased sedimentation of streams.

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Increased sedimentation in streams reduces the visibility of gartersnakes in the water column, hampering their hunting ability as well as resulting in fish kills (which are also caused by the disruption in the nitrogen cycle post-wildfire), which reduce the amount of prey available to gartersnake populations. The interstitial spaces between rocks located along the stream floor are important habitat for the narrow-headed gartersnake as a result of its specialized foraging strategy and specialized diet. When these spaces fill in with sediment, the narrow-headed gartersnake may be unable to forage successfully and may succumb to stress created by a depressed prey base. Additionally, unnaturally high amounts of sediment fill-in pools in intermittent streams, which reduces the amount and availability of habitat for fish and amphibian prey.

Besides fire and forest management practices, the nature and occurrence of wildlife in the Southwest is expected to also be affected by climate change and ongoing drought. Drought stress and a subsequent high degree of tree mortality from bark beetles make high-elevation forests more susceptible to high-intensity wildfires. Combined with a predicted reduction in snowpack and an earlier snowmelt, these factors suggest wildfires will be larger, more frequent, and more severe in the southwestern United States. Wildfires are expected to reduce vegetative cover and result in greater soil erosion, subsequently resulting in increased sediment flows in streams.

In 2011 and 2012, both Arizona (2011 Wallow Fire) and New Mexico (2012 Whitewater-Baldy Complex Fire) have experienced the largest wildfires in their respective State histories; indicative of the last decade that has been punctuated by wildfires of massive proportion. The 2011 Wallow Fire consumed approximately 540,000 acres (218,530 ha) of Apache-Sitgreaves National Forest, White Mountain Apache Indian Tribe, and San Carlos Apache Indian Reservation lands in Apache, Navajo, Graham, and Greenlee counties in Arizona as well as Catron County, New Mexico. The 2011 Wallow Fire impacted 97 percent of perennial streams in the Black River subbasin, 70 percent of perennial streams in the Gila River subbasin, and 78 percent of the San Francisco River subbasin and resulted in confirmed fish kills in each subbasin; each of these streams is known to support populations of either northern Mexican or narrow-headed gartersnakes. Several large wildfires on the Gila National Forest have resulted in post-fire ash flows and excessive sedimentation of streams and affected resident fish populations that serve as prey for narrow-headed gartersnakes. For example, in 2011, the Miller Fire significantly affected the Little Creek subbasin and has resulted in substantive declines in abundance of the fish community (78 FR 41500; 79 FR 38678).

*Fire Management on Federal Lands within Proposed Critical Habitat*

The majority of proposed critical habitat is located on Federal lands where fire management activities occur and include the land owned and managed by the BIA, BLM, Department of Defense (DoD); the Service, USFS, and NPS.

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

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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.

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. As human development and recreation increase in the southeastern Arizona and southwestern New Mexico, the presence of WUIs could increase within and around proposed critical habitat.

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.

Because both gartersnakes are currently listed and they overlap with other threatened and endangered species and critical habitat, federal agency fire management plans are already required to consult with the Service under the ESA. Past consultations 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 conservation measures such as:

- Evaluating the timing of activities such as brush removal to account for seasonal microhabitat needs;
- Encouraging, when available, relocation of activities to outside critical habitat areas, such as:
    - 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;

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- Water monitoring during herbicide use; and
- Agency and public education and outreach programs.

Under New Mexico's Recovery Plan for the Narrow-headed Gartersnake management strategies include minimizing impacts of fire on narrow-headed gartersnake populations, and encouraging firefighting management to reduce or eliminate the use of fish-killing fire retardants near streams (NMDGF 2007).

*Recent Consultations*

In 2006, the Tumacácori National Historical Park proposed to remove, treat, and re-treat tamarisk year-round for the next 10 years. Large piles of dead and down woody material would be pile-burned as determined by the fuels specialist, with these burns expected to be ongoing for the next ten years, in conjunction with the tamarisk removal. Implementing the proposed action in the WUI area as early as March 26 or in April would reduce the likelihood of encountering and harming hibernating snakes to an insignificant level. The Service found that the proposed action was not likely to jeopardize the continued existence of the northern Mexican gartersnake (Service 2006).

### 3.6.2 Environmental Consequences

#### 3.6.2.1 No Action

Under the No Action Alternative, no critical habitat would be designated for the northern Mexican gartersnake and narrow-headed gartersnake. The section 7 consultation process would be implemented for projects that effect the gartersnakes' reproduction, recruitment, population density, and distribution, including an analysis of habitat modifications that would limit dispersal, result in significant declines in the composition and density of native prey species, or otherwise directly or indirectly benefit the existence of harmful nonnative species. The section 7 consultation process would not consider additional consideration of critical habitat and associated PBFs. Section 7 consultations would be initiated only for may affect determinations of effects to either the northern Mexican gartersnake or narrow-headed gartersnake. These consultations would analyze relevant livestock grazing, improvement or development projects, prescribed fire and fuels treatment, restoration or recovery activities, and forest management, land and resource management, travel management plans proposed for Federal lands occupied by the either species. As they relate to fire management, such consultations would likely include:

- NPS, Gila Cliff Dwellings National Monument – general management plans and fire management plans;
- BIA – fire management plans;
- BLM – fire management plans, fire suppression, and land and resource management plans;
- USFS – fire management plans, fire suppression, fuel reduction treatments, and forest plans; and
- Service – national wildlife refuge planning.

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Therefore, this alternative would not have any impacts on fire management beyond any conservation measures resulting from the listing of the northern Mexican gartersnake and narrow-headed gartersnake and associated requirements of section 7 of the ESA.

#### 3.6.2.2 Alternative A

All proposed critical habitat units are occupied by either the northern Mexican gartersnake, narrow-headed gartersnake, or both species; therefore, actions that include fire management in those areas would be subject to section 7 consultations irrespective of the area's status as critical habitat. Alternative A (all proposed units, no exclusions) would not likely increase the number of section 7 consultations based solely on the presence of designated critical habitat. However, compared to the No Action Alternative, Alternative A would add the addition of an analysis of adverse modification of critical habitat to future section 7 consultations on the northern Mexican gartersnake and narrow-headed gartersnake in critical habitat.

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. Adverse modification of critical habitat may occur if the proposed action:

- Reduces the quality of the critical habitat unit, degrades the quality of the PBFs, or precludes the ability of the PBFs to be established; or
- Makes it so a given unit can no longer contribute to the recovery of the species when taking into consideration the environmental baseline of the critical habitat.

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. It is likely that any future conservation measures requested on behalf of the proposed critical habitat would already occur based on the presence of critical habitat for species with ecological similarities. No additional conservation measures as a result of designating critical habitat are predicted because (1) all areas proposed for critical habitat are considered occupied by the species; and (2) the gartersnakes are intimately tied to their habitat, such that any potential conservation measures to avoid adverse modification of critical habitat are most likely also going to be required to avoid jeopardizing the species. Potential conservation measures to avoid jeopardy would be the same as recommended project modification to avoid jeopardy. These conservation measures could include:

- Implement seasonal restriction or modification to projects to enable conservation and recovery of the species.
- Avoid ground disturbing activities that would eliminate riparian vegetation or sources of cover when harmful nonnative species are also present.
- Reduce or avoid project elements that would eliminate, significantly reduce, or alter the distribution, composition, and density of existing native (or nonnative, soft-rayed) prey populations in occupied habitat.

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- Reduce or avoid project elements that would significantly enhance the distribution, composition, persistence, and density of harmful nonnative species within occupied habitat.
- Offset habitat loss with suitable habitat that is protected elsewhere within the species' range, including adequate funding to ensure that habitat is managed permanently for the protection of the species and is free of nonnative species or where they do not pose a threat to gartersnake reproduction, recruitment, and survivorship.
- Implement general, currently adopted conservation measures for native fish and amphibians.

In summary, the effects of critical habitat designation on fire management activities are expected to be minor to moderate, because any modifications resulting from conservation of critical habitat would likely be similar in nature to those recommended in consultations for listed species, and additional section 7 consultations are not anticipated from the designation of critical habitat alone. Beneficial effects are anticipated on fire resources, because any conservation measures designed to protect the two gartersnakes would most likely also protect water and wetland resources within and surrounding the two critical habitat units.

#### 3.6.2.3 Alternative B

Alternative B (proposed units minus exclusions) would not likely increase the number of section 7 consultations based solely on the presence of designated critical habitat. The impacts associated with the designation of critical habitat under Alternative B would could possibly be less than those identified for Alternative A due to the acres excluded from critical habitat. Therefore, these exclusions could reduce the economic impacts of designation on water resource management activities in these areas overall, by requiring less administrative time to complete consultations. This would reduce administrative costs as well for the Service. The overall impacts to fire management would be characterized as minor. Compared to the No Action Alternative, Alternative B would add the addition of an analysis of adverse modification of critical habitat to future section 7 consultations on the northern Mexican gartersnake and narrow-headed gartersnake in critical habitat.

## 3.7 Construction/Development—Roads, Bridges, Dams, Trails

### 3.7.1 Existing Conditions

The proposed rule lists construction and maintenance of roads as a threat to northern Mexican gartersnake and narrow-headed gartersnake 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 2013b).

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Roads pose unique threats to the northern Mexican gartersnake, its prey base, and the habitat where it occurs. The narrow-headed gartersnake is thought to be less affected by roads due to its more aquatic nature. Roads fragment occupied habitat and can result in diminished genetic viability in populations from increased mortality from vehicle strikes and adverse human encounters. Throughout the area proposed for designated critical habitat, roads often track along streams and present a mortality risk to gartersnakes seeking more upland, terrestrial habitat for brumation and gestation. Existing roads impact both species through the following mechanisms:

- Fragmentation of habitat;
- Increase in genetic isolation;
- Alteration of natural movement patterns and behaviors;
- Facilitation of the spread of nonnative species via human vectors;
- Increased recreational access and the likelihood of subsequent, decentralized urbanization;
- Interference with or inhibition of reproduction; and
- Contributions of pollutants to riparian and aquatic communities.

Formal consultations to analyze the effects on both gartersnake species from road, bridge, and dam construction or maintenance have not yet occurred. However, impacts to the northern Mexican gartersnake and narrow-headed gartersnake pertaining to construction and development have been discussed in biological opinions on other species with overlapping habitat as informal conferences. For example, the Service's Biological and Conference Opinion on the Federal Funding of Aquatic Inventory, Survey, and Monitoring Activities, and Conservation Activities for Aquatic Species by Arizona Game and Fish Department, 2011-2020, stated that changes to water flow due to construction of large water storage dams and operation of water diversions have affected habitat in the project area. Channelization as well as changes in flows has separated the floodplains from the existing river channels, which has reduced habitat diversity. Degradation of riparian and upland areas altered stream morphology and hydrology has also occurred due to construction and development and other threats (USFWS 2011e).

There are a high number of consultations for urban development and utilities, however, these projects typically do not result in adverse effects to the species and are for technical assistance only.

### 3.7.2 Environmental Consequences

Construction and maintenance of road, bridge, and dams could include clearing vegetation; water diversions; roadside use of salt and herbicides; increasing pervious surfaces; and compacting soils. These activities could occur as a result of urban, rural, and industrial road construction, enhancement and expansion of recreational opportunities, potential construction of Hooker Dam as part of the Central Arizona Project, the creation of reservoirs stocked with predatory fishes, and other construction and development projects.

Adverse effects of road, bridge, and dam construction on the northern Mexican gartersnake and narrow-headed gartersnake could result from:

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- Alteration of the amount, timing, or frequency of flow within a stream or the quantity of available water within wetland habitat;
- Alteration of water chemistry;
- Increased sediment load;
- Removal or alteration of the structural complexity of key terrestrial habitat within 600 feet of aquatic habitat;
- Introduction of nonnative predators and Bd;
- Long-term removal or alteration of gartersnake prey base;
- Removal or blocking access to suitable habitat; and
- Pedestrian and construction traffic on roads near gartersnake-occupied sites, resulting in direct mortality of gartersnakes.

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

#### 3.7.2.1 No Action

Under the No Action Alternative, no critical habitat would be designated for northern Mexican gartersnake and narrow-headed gartersnake. The section 7 consultation process would occur without consideration of PBFs. For example, proposed trail, bridge, and dam projects may be relocated or redesigned if the northern Mexican gartersnake and narrow-headed gartersnake 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 gartersnakes. Such consultations would analyze relevant travel management plans, and management plans on federal lands currently occupied by the species. As they relate to road, bridge, and dam construction and maintenance, such consultations would likely include:

- BLM – recreation projects involving construction/development within the Lake Havasu, Kingman, Tucson, Safford, and Hassayampa Districts. Consultations would be for the northern Mexican gartersnake; the narrow-headed gartersnake does not occur on BLM lands;
- USFS – Travel and forest management plans on the Prescott, Tonto, Coconino, Apache-Sitgreaves, Coronado, and Gila National Forests; and
- Service – Management plans for the Buenos Aires NWR pertaining to the northern Mexican gartersnake; the narrow-headed gartersnake does not occur on USFWS land.

Therefore, this alternative would not have any impacts on road, bridge, and dam construction beyond any conservation measures resulting from the listing of the northern Mexican gartersnake and narrow-headed gartersnake and associated requirements of section 7 of the ESA.

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#### 3.7.2.2 Alternative A

All proposed critical habitat areas are occupied by either the northern Mexican gartersnake or the narrow-headed gartersnake; 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 (designation of critical habitat) would result in the addition of an analysis of adverse modification of critical habitat to future section 7 consultations on the northern Mexican and narrow-headed gartersnake.

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. 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." 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 addition of adverse modification to 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 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 northern Mexican gartersnake and narrow-headed gartersnake PBFs. These outcomes cannot be predicted precisely; however, based on past consultations types of additional management actions that may be required include:

- Measures to minimize the amount of disturbance and preserve the appropriate width of riparian corridors that serve as gartersnake habitat;
- Measures to limit the amount of vegetation cleared in floodplains and areas where harmful nonnative species are known to be present;
- Implementing appropriate best management practices during construction to minimize the potential for erosion of sediments;
- Avoidance of construction activities that dewater or reduce water to unsuitable levels in proposed critical gartersnake habitat;
- Including information on the Northern Mexican gartersnake and narrow-headed gartersnake on interpretive signs; and
- Changing the extent, duration, and timing of construction and maintenance activities (USFWS 2011f).

In summary, the effects of critical habitat designation on construction and development are expected to be minor because (1) any reasonable and prudent alternatives developed under jeopardy analysis would not likely be changed substantially with the addition of adverse

modification analysis; and (2) very few if any additional conservation measures would be proposed to address critical habitat, beyond those proposed in jeopardy consultations. Past species consultations on federal lands have resulted in conservation measures that have not eliminated or fundamentally changed construction projects.

#### 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 include private conservation lands, state lands (primarily those managed by the ADGF and tribal lands. These exclusions could reduce the economic impacts of designation on construction and development activities in these areas overall, by requiring less extensive consultations. This would reduce administrative costs as well for the Service. The overall impacts on construction and development would be less than those in Alternative A, and still 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 narrow-headed and northern Mexican gartersnakes. Recreational opportunities include hiking, wading, boating, swimming, birding, wildlife viewing, photography, angling, hunting, camping, horseback riding, biking, and off-highway vehicle (OHV) use. Level of use and type of activity vary by site characteristics, landownership, management policy, and accessibility.

Recreational areas in the proposed critical habitat exist on Federal and state-owned lands, including properties managed by the USFS (Gila, Coronado, Coconino, Prescott, Apache-Sitgreaves, and Tonto National Forests), NPS (Gila Cliff Dwellings National Monument and Tuzigoot National Monument), BLM (Las Cienegas National Conservation Area, Agua Fria National Monument), Service (Bill Williams River and Buenos Aires National Wildlife Refuges), and New Mexico and Arizona State lands.

Most of the proposed habitat units 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. Activities such as camping, nature walking, hiking, and photography would also be analyzed for potential effects to designated critical habitat but impacts to these activities as a result of critical habitat designation are predicted to be negligible.

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*Roads, Trails, and Facilities*

Construction of roads, trails, and facilities increases sediment deposition or scouring within stream channels or ponds that could be habitat for the northern Mexican or narrow-headed gartersnake, or one or more of their prey species (USFWS 2013e).

Table 11 in Appendix A provides estimates of annual visitation at relevant NPS properties. The NPS manages the 111 acres (50 ha) of proposed critical habitat at the Gila Cliff Dwellings National Monument in Unit 1 for the narrow-headed gartersnake. There are no NPS campgrounds at Gila Cliff Dwellings National Monument, but the surrounding Wilderness Ranger District of the Gila National Forest offers boondocking and dispersed camping opportunities. Visitation has decreased nearly 30 percent over the last decade (NPS 2011).

A Notice of Intent (NOI) to prepare the EIS for the Gila Cliff Dwellings General Management Plan was published on April 16, 2008 (NPS 2013). In January 2010 the NPS terminated the Environmental Impact Statement (EIS) for the Gila Cliff Dwellings General Management Plan because it determined that an Environmental Assessment (EA) is the more appropriate NEPA compliance document. Future proposed actions resulting from the plan are among actions that could trigger future consultations, regardless of whether critical habitat is designated.

Recreational activities include exploring a major surface ruin, sightseeing, wildlife watching, and walking. Guided ranger programs are available in addition to contact with roving interpreters. Visitors leaving established trails have caused stream channel alteration – down cutting or deposition of the channel, flooding, or change of flow regime – and could continue to adversely impact natural resources in the Tuzigoot vicinity. The 2010 General Management Plan proposes the following activities as they relate to recreation:

- Provide natural surface trails along the marsh and riparian area.
- Marsh restoration and management activities. Construct boardwalk through the marsh, possibly along an existing old road alignment.
- Construct a modest workspace and storage building with emergency visitor services near the residential area (NPS 2010b).

The Buenos Aires NWR manages 99,323 acres (40,195 ha) of proposed critical habitat for the Northern Mexican gartersnake in Unit 10. Popular recreation activities include camping, picnicking, mountain biking, horseback riding, hiking, and backpacking. Motorized vehicles are restricted to roadways. Hunting is permitted on approximately 90 percent of the refuge and is subject to both Refuge and Arizona State Hunting Regulations. Recreational uses in the NWR will likely increase with population growth in southern Arizona and in light of the stated goal of the 2003 Comprehensive Conservation Plan (CCP) to provide safe, accessible, high-quality wildlife-dependent recreational opportunities. Specific objectives in the CCP include:

- Implement Brown Canyon Visitor Center improvements to serve 2,000 existing visitors and 2,000 new visitors;
- Provide 12 volunteer/research facilities on the Refuge;
- Provide a shuttle service for approximately 16 persons into Brown Canyon;

- Improve the Brown Canyon road for public and administrative access; and
- Improve the Refuge Visitor Center facilities and roads to more efficiently meet the needs of 35,000 existing visitors and 20,000 new visitors annually (USFWS 2002).

The National Visitor Use Monitoring program provides estimates of the volume and characteristics of recreation visits to the National Forest system. A National Forest Visit is defined as the entry of one person into a national forest to participate in recreation activities for an unspecified period of time. Table 12 in Appendix A presents the most recent annual visitation to National Forests where critical habitat is proposed.

The Prescott National Forest's 2015 Final Land and Resource Management Plan (LRMP) provide management direction based on conditions and trends and relating to the sustainability of ecological, economic, and social factors. The LRMP for the Prescott National Forest proposes recreation objectives including:

- Add two to five developed recreation areas during the 10 years following plan approval;
- Create up to four designated dispersed camping areas during the 10 years following plan approval;
- Construct or improve the facilities at five to 20 trailheads during the 10 years following plan approval;
- Mark boundaries of portions of two to five designated wilderness areas where risk of motorized or mechanized access is high during the 10 years following plan approval; and
- Protect, relocate, or rehabilitate two to five recreation areas or locations (including trails) that show evidence of resource damage during the 10 years following plan approval (USFS 2012).

Planning efforts such as the 2003 Verde River Wild and Scenic River Management Plan would decrease impacts on potential habitat preferred by the northern Mexican gartersnake over the long term. Desired conditions for recreation during the 10 years following plan approval could impact individuals, including designating dispersed camping areas and construction/addition of developed recreation facilities (USFS 2012).

On the Coronado National Forest (CNF), OHV use is authorized on certain roads open to all vehicles in or near proposed critical habitat. Many of these roads are used primarily to access dispersed hunting. The Coronado National Forest is currently completing a Final LRMP. The Draft LRMP includes objectives, standards, and management approaches for recreation within snake habitat (USFS 2011e). As recreation management plans are completed as needed, proposed activities could trigger section 7 consultation if the species is listed.

*OHV Use*

Motorized vehicle use on roads and trails increase sediment deposition or scouring within the stream channel or pond that is habitat for the northern Mexican or narrow-headed gartersnake, or one or more of their prey species within the range of either gartersnake species. Stream

sedimentation can adversely affect the potential for gartersnake prey species to survive or breed (USFWS 2013b).

Inconsistent management of OHV in the region has caused resource damage in popular and remote dispersed areas across the region. Pursuant to the 2005 Travel Management Rule (36 CFR 212, Subpart B, Designation of Roads, Trails, and Areas for Motor Vehicle Use), the National Forests in Arizona are currently developing an Environmental Impact Statement (EIS) which will establish a consistent plan for OHV use on the National Forests (USFWS 2005a). Apache-Sitgreaves, Gila, Cococino, Coronado, and Tonto National Forests contain critical habitat and are at varying stages of the National Environmental Policy Act (NEPA) process.

The Gila National Forest does not currently have limits on places where people can drive to go camping in the forest outside of wilderness (Gila Wilderness and Aldo Leopold Wilderness), proposed and established research natural areas (Gila River RNA), and other areas restricted to motor vehicle use. The forest's current direction allows people to drive and camp where off-road driving is allowed. Therefore, no special corridors are designated for motorized access to dispersed camping. All action alternatives propose to amend the Gila National Forest Plan and close Hells Hole for motorized use. All action alternatives also propose to prohibit motorized cross-country travel except where, in some alternatives, it is allowed for motorized dispersed camping and/or motorized big game retrieval. Since the potential to affect individuals still exists; a "may impact" determination was made for both snake species. None of the alternatives would affect the viability of either species (USFS 2010b).

There are no motorized trails within ¼ mile of perennial streams across the Coconino National Forest. Under the selected alternative for the 2011 Coconino Travel Management Plan EIS, a total of 33 miles (53 km) of roads within 328 feet (100 meters) and of 161 miles (259 km) of roads within ¼ mile of perennial streams will close. The closure of roads and the prohibition of unauthorized cross-country travel would benefit gartersnakes by reducing access near riparian zones, reducing sedimentation into streams, reducing damage to riparian vegetation by vehicles, reducing the potential spread of nonnative aquatic organisms and diseases, reducing the potential for forest users to handle and collect gartersnakes, and reducing disturbance to foraging forays into the uplands (USFS 2011e).

BLM manages road development through the BLM National Travel Management Plan, which strives to address the effects that population increases in the west, explosive growth in the use of off-highway vehicles, and the advances in technology have had on public lands. BLM's goal is to improve trails and OHV management through land use planning in order to minimize impacts to wildlife habitat resulting from the expansion of roads and trails on public lands (BLM 2012).

Popular recreational activities at the include hiking, viewing cultural sites, wildlife viewing, birdwatching, hunting (big-game and upland game-bird), scenic drives, and four-wheel driving (ORV travel is not allowed). Because the gartersnakes are not a federally listed species, there have been no previous consultations on BLM Travel Management Plans or RMPs to date, although changes to these plans are among the actions that could trigger future consultations.

*Sportfishing*

Legal or illegal introduction or stocking of nonnative, spiny-rayed fishes, bullfrogs, crayfish, tiger salamanders, or other predators on the prey base of northern Mexican or narrow-headed gartersnakes; or creating or sustaining a sport fishery that promotes the persistence of nonnative, spiny-rayed fishes or encourages the use of nonnative live fish, crayfish, tiger salamanders, or frogs as bait can adversely affect the gartersnakes. These activities directly or indirectly result in unnatural competition with and predation from harmful nonnative predators on these gartersnake species, leading to significantly reduced recruitment within gartersnake populations and diminishment or extirpation of their prey base (USFWS 2013e).

The 2009 Biological Opinion (BO) for the Buenos Aires NWR Habitat Management Plan concludes that implementation of the plan is not likely to jeopardize the existence of the candidate northern Mexican gartersnake. Existence on the Refuge may present an array of issues considering the high degree of public use, the maintenance of open water areas containing bullfrogs and fish, and the perceived inability or difficulty in controlling the nonnatives which threaten the species. Conservation measures include bullfrog control and the certainty that regular management of areas with high numbers of bullfrogs will occur. In the past, bullfrog gigging by the public was allowed. This action will be considered again as a tool to implement bullfrog control on the NWR (USFWS 2009).

Anglers may come into contact with individual gartersnakes of either species at stocking sites or sites with easy vehicular access to fishing opportunities. An important effect on these gartersnakes is the deliberate killing of snakes by humans. Conservation measures included in the recently completed sportfish consultations includes developing outreach material on gartersnakes to attempt to reduce the deliberate killing or injuring of gartersnakes by the public. Materials developed for this program will be posted at stocking sites that contain populations of gartersnakes (USFWS 2011d).

The LRMP for the Prescott National Forest specifies desired conditions for aquatic wildlife, including that nonnative fish species be present only where recreational fishing opportunities are emphasized. Nonnative fish species include bass, sunfish, certain trout species, and other fish that anglers enjoy. Many of these fish are stocked in streams or lakes to provide a fishing experience, but they can act as significant predators to a suite of native species of various taxa. Places where recreational fishing opportunities are emphasized should be separated from places where native species are desired. Among the recreational objectives: to work with partners to maintain and enhance recreational fishing opportunities in two lake/pond sites during the 10 years following plan approval (USFS 2012). Changes to the LRMP are among the actions that could trigger future consultations.

### 3.8.2 Environmental Consequences

#### 3.8.2.1 No Action

Under the No Action Alternative, no critical habitat would be designated for the two gartersnakes. Section 7 consultations would be triggered for proposed actions with a federal nexus, but only to determine jeopardy to the species. Stream reaches, stock tanks, and ponds occupied by the narrow-headed and northern Mexican gartersnakes would be subject to section 7

consultations regardless of the area's status as critical habitat. The No Action Alternative is anticipated to have minor, indirect, adverse impacts to recreation opportunities related to such required conservation measures benefiting the habitat values for the two gartersnakes.

#### 3.8.2.2 Alternative A

All proposed critical habitat is occupied by the two gartersnakes; therefore recreational actions in those areas would be subject to section 7 consultations irrespective of the area's status as critical habitat. Since the habitat evaluation is the primary component of a jeopardy analysis as well as for the evaluation of adverse modification to critical habitat, the same number and type of projects would likely undergo consultation with the designation of critical habitat as without. Therefore, compared to the No Action Alternative, Alternative A (proposed action) could result in a small but unknown expansion of section 7 consultations that would otherwise occur for the jeopardy analysis to include evaluation of adverse modification of critical habitat. A potential benefit of increasing section 7 consultations for recreation-related activities would be maintenance of gartersnakes PBFs through conservation measures within designated critical habitat. The conservation of riparian habitat values that would result may benefit such recreational activities such as wildlife viewing, birding, photography, swimming, and 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 because (1) any reasonable and prudent alternatives developed under jeopardy analysis would not likely be changed substantially with the addition of adverse modification analysis; (2) very few if any additional conservation measures would be proposed to address critical habitat, beyond those proposed in jeopardy consultations.

Those actions that could have impacts on recreational resources include the construction of roads, trails, recreational facilities and infrastructure; OHV use; and fish stocking. Such consultations would analyze relevant travel, land, and resource management plans on federal lands currently occupied by the species. As they relate to recreational resources, such consultations would likely include:

- USFS (forest, land and resource, and travel management plans);
- NPS – Gila Cliff Dwelling and Tuzigoot National Monuments (general, recreation, and travel management plans);
- BLM – Agua Fria National Monument (land and resource, travel management plans); and
- Service – Wildlife and Sport Fish Restoration Funding appropriations and NWR Planning.

*OHV Use* – The Coronado National Forest is considering changes to its Motorized Travel System that could decommission or open roads to OHV use in northern Mexican gartersnake CH units. The Tonto National Forest is also considering changes that could decommission or open roads to OHV use in northern Mexican gartersnake critical habitat units; as well as narrow-headed gartersnake critical habitat. The designation of critical habitat would include consideration of destruction or adverse modification of habitat in these units. The expanded

consultations, and the additional time needed to complete consultations that would have only considered effects on the species, would increase administrative costs to the Service and to the action agencies. The consultation time needed for both species would further increase administrative costs to the Service and to action agencies. The addition of critical habitat to consultations is unlikely to result in the establishment of reasonable and prudent alternatives and other conservation measures designed to maintain the gartersnakes PBFs, for the reasons discussed above.

*Sportfishing* – The recent consultation with the Wildlife and Sportfish Restoration Program for stocking or sportfish concluded that the proposed action was not likely to jeopardize the continued existence of either gartersnake, largely because trout species were the focus of stocking activities (USFWS 2011d). Proposed activities analyzed through the section 7 process could include conservation measures to conserve designated critical habitat PBFs. Expanded consultations for critical habitat is unlikely to result in the establishment of reasonable and prudent alternatives and other conservation measures designed to maintain the gartersnakes PBFs. The additional incremental benefit to the gartersnakes and impacts on recreational opportunities from critical habitat designation is expected to be relatively small – in terms of potential modification to or restrictions on recreational activities. Based on past impacts to recreational opportunities within the proposed critical habitat units, there would be potentially minor, indirect, adverse impacts from critical habitat designations on some recreational opportunities and activities within designated critical habitat (e.g. fishing) from the limitations and restrictions imposed on recreational activities to preserve PBFs. However, other recreational activities and opportunities would be enhanced and could benefit from critical habitat designation (e.g. wildlife viewing, camping, hiking, swimming, photography), 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 or potential closure of designated critical habitat to some forms of recreation.

#### 3.8.2.3 Alternative B

Alternative B (proposed units minus exclusions) would not likely increase the number of section 7 consultations based solely on the presence of designated critical habitat. The impacts associated with the designation of critical habitat under Alternative B would could possibly be less than those identified for Alternative A due to the acres excluded from critical habitat. These exclusions could reduce the economic impacts of designation on water resource management activities in these areas overall, by requiring less extensive consultations overall. The overall impacts on recreation would therefore be less than those in Alternative A but slightly more than the No Action Alternative, and still characterized as minor.

## 3.9 Socioeconomics

A separate economic analysis of critical habitat designation for the northern Mexican and narrow-headed gartersnakes has been conducted (IEc 2019) in response to the proposed rule. This analysis includes a description of existing plans and regulations that provide protection for the gartersnakes and their habitat. These form the “baseline” protections accorded the two gartersnakes even absent the designation of critical habitat. 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 two gartersnakes.

### 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 13 in Appendix A).

Table 14 in Appendix A 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.

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 implementing conservation measures on projects 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 are increased as a result from the designation beyond those that may occur from the listing of the species as threatened, 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.

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- **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 conservation measures 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 be triggered for proposed actions with a federal nexus, but only to determine jeopardy to the species. Consultations with potential socioeconomic impacts would be conducted primarily on lands managed by USFS, NPS, USFWS and BLM, or for permits issued by those agencies and FWS. These would include consultations for:

- Recreation Planning (sportfish management and travel management activities);
- Habitat restoration;
- Grazing and livestock management; and
- 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 more detail in the their respective sections of this EA. 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

There are no areas being proposed for either gartersnake that are considered unoccupied, therefore, it is likely that section 7 consultation would be required for the species irrespective of the area's status as critical habitat. Additionally, because habitat health is a main component of the PBFs and also a proxy for determining presence of the species, habitat evaluation would be a primary component of jeopardy analysis. Accordingly, in occupied critical habitat it is unlikely that an analysis would identify a difference between measures needed to avoid the destruction or adverse modification of critical habitat from measures needed to avoid jeopardizing the species. Compared to No Action Alternative, the Alternative A would result in the addition of an adverse modification of critical habitat analysis to section 7 consultations for the gartersnakes in critical

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habitat. As all proposed critical habitat units contain gartersnake populations, federal actions would be subject to Section 7 consultation irrespective of the critical habitat designation.

#### 3.9.2.3 Alternative B

Alternative B (proposed units minus exclusions) would not likely increase the number of section 7 consultations based solely on the presence of designated critical habitat. The impacts associated with the designation of critical habitat under Alternative B could possibly be less than those identified for Alternative A due to the acres excluded from critical habitat. These exclusions could reduce the economic impacts of designation on water resource management activities in these areas overall, by requiring less extensive consultations overall. This would reduce administrative costs as well for the Service. Cumulative impacts would be the same as in Alternative A. Compared to the No Action Alternative, Alternative B would add the addition of an analysis of adverse modification of critical habitat to future section 7 consultations on the northern Mexican gartersnake and narrow-headed gartersnake in critical habitat.

## 3.10 Livestock Grazing

### 3.10.1 Existing Conditions

The proposed rule lists poor livestock management and livestock grazing as a threat to northern Mexican gartersnake and narrow-headed gartersnake habitat, largely in areas already compromised by the presence of harmful nonnative species (78 FR 41550; 79 FR 38678). Included in the Service's 2013 proposed rule listing the northern Mexican gartersnake and narrow-headed gartersnake as threatened was a special rule (see 50 CFR §17.42), exempting operation and maintenance of livestock tanks on non-Federal lands from the Section 9 take prohibitions of the ESA of 1973, as amended (16 U.S.C. 1531 *et seq*) (USFWS 2013b).

Beneficial effects to the gartersnakes from grazing activities can occur where stock tanks are well-managed. Well-managed stock tanks provide important habitat for northern Mexican gartersnakes and their prey base, especially when the tank: (1) remains devoid of harmful nonnative species while supporting native prey species; (2) provides adequate vegetation cover; and (3) provides reliable water sources in periods of prolonged drought. Well-managed stock tanks are an important, even vital, component to northern Mexican gartersnake conservation and recovery (USFWS 2013b).

Adverse impacts of livestock grazing and its associated activities include the removal of grasses and other vegetation; declines in the quality of remaining vegetation; losses or reductions in the prey base; increased aridity of habitat; loss of thermal cover and protection from predators; a rise in water temperatures to levels lethal to larval stages of amphibian and fish development; desertification; commencement of severe erosion; and reduction in the extent and quality of stream, cienega, and riparian habitat (USFWS 2013e; Szaro et al. 1985; Schulz and Leininger 1990; Schlesinger et al. 1990; Belsky et al. 1999; Zwartjes et al. 2008).

With proper livestock management, minor losses of gartersnakes 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 gartersnake habitat may include:

- Excluding cattle from key riparian areas;
- 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;
- Enhanced distribution of water resources within allotments; and
- Determining if a site is expected to be colonized by nonnative predators.

Federal lands consist of 62% of the proposed critical habitat for the northern Mexican gartersnake (in stream miles), and 66% of the proposed critical habitat for the narrow-headed gartersnake (in stream miles). Livestock grazing occurs on BIA, BLM, and USFS lands within the proposed designation for both species.

Livestock grazing in general has been in decline on BLM- and USFS-managed lands in the southwest (USFWS 2005b). Before the late 19$^{th}$ century, lands in this region were heavily overgrazed, degrading watersheds and altering fire regimes (USFWS 2007). To address overgrazing, federal grazing permits were established on BIA, USFS, and BLM lands in the early 20$^{th}$ 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). BLM established grazing permits in 1934 with the Taylor Grazing Act of 1934 (BLM 2011). BIA established the General Grazing Regulations Handbook in 1984 (BIA 1984).

Indirect benefits for both gartersnake species occur through recovery actions designed for their prey species. The northern Mexican gartersnake, in particular, has likely benefited from actions that assist with the recovery and mitigation of known threats to the Chiracahua leopard frog, at least in some areas, such as at the Las Cienegas Natural Conservation Area and in Scotia Canyon of the Huachuca Mountains. In recent years, significant strides have been made in controlling bullfrogs, which prey on both gartersnake species, on local landscape levels in Arizona, such as in the Scotia Canyon area, and in the Las Cienegas National Conservation Area. Recent efforts to return the Las Cienegas National Conservation Area to a wholly native biological community have involved bullfrog eradication efforts, as well as efforts to recover the Chiricahua leopard frog and native fish species. These actions should assist in conserving the northern Mexican gartersnake population in this area. Bullfrog control has been shown to be most effective in simple, lentic systems such as stock tanks (USFWS 2013e), but recent success has been shown possible on local landscape levels. 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).

### 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, the development of remote water sources, and seasonal variations in livestock grazing. Actions that would alter livestock grazing or the existence or quality of a stock tank may also affect critical habitat for the northern Mexican gartersnake and narrow-headed gartersnake, thus triggering a section 7 consultation. Such actions could lead to soil erosion or siltation and include 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 northern Mexican gartersnake and narrow-headed gartersnake. The section 7 consultation process would be implemented for livestock grazing projects with a federal nexus that could likely involve a significant number of allotments on Federal lands, but without additional consideration of critical habitat and associated PBFs. Section 7 consultations would be initiated only for *may affect* determinations of impacts to the northern Mexican gartersnake and narrow-headed gartersnake. 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:

- BIA – grazing permits, land management plans, erosion control projects;
- BLM – Programmatic Livestock Grazing Program-Stafford/Tucson Field Offices, Resource Management Plans, grazing permits issued by Lake Havasu, Kingman, and Hassayampa Districts (all BLM consultations would be for the northern Mexican gartersnake; the narrow-headed gartersnake does not occur on BLM lands); and
- USFS – Gila National Forest management and recovery plans, Prescott, Tonto, Coconino, Apache-Sitgreaves, Coronado, and Gila National Forest Plans, livestock grazing allotment management plans.

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 proposed special section 4(d) regulation (78 FR 41450; 79 FR 38678), and the benefits of these activities would outweigh any adverse effects to critical habitat and thus would not constitute adverse modification.

Therefore, this alternative would not have any impacts on livestock grazing beyond any conservation measures resulting from the listing of the northern Mexican gartersnake and narrow-headed gartersnake and associated requirements of section 7 of the ESA.

#### 3.10.2.2 Alternative A

All proposed critical habitat areas are occupied by the northern Mexican gartersnake and narrow-headed gartersnake; therefore, land management actions in all proposed critical habitat areas would be subject to section 7 consultations irrespective of the area's status as critical habitat. Compared to the No Action Alternative, Alternative A would result in the addition of an analysis

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of adverse modification of critical habitat to future section 7 consultations on both gartersnake species in critical habitat. As it relates to livestock grazing, such consultations could include grazing allotment management by BLM, USFS, NRCS; and the programmatic Safford/Tucson BLM Field Offices Livestock Grazing Program.

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 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 northern Mexican gartersnake and narrow-headed gartersnake PBFs. 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 key areas, such as leopard frog breeding pools, within critical habitat to prevent adverse effects from livestock use;
- Modifying AUMs and grazing seasons;
- Limiting the extent of time that livestock are allowed to congregate in aquatic sites;
- Reduce or avoid project elements that would eliminate or significantly reduce the amount or quality of water in occupied habitat;
- Maintenance of stream bank stability;
- Address source populations of harmful nonnative species with the action area, as possible;
- Construction of trick or double tanks; and
- Implement seasonal restriction or modification to projects to enable conservation and recovery of the species.

In summary, the effects of critical habitat designation on livestock grazing are expected to be minor because (1) any reasonable and prudent alternatives developed under jeopardy analysis would not likely be changed substantially with the addition of adverse modification analysis; and (2) very few if any additional conservation measures would be proposed to address critical habitat beyond those already proposed in jeopardy consultations. In areas where both species of gartersnake are known to occur, consultation time and costs would increase.

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

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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 include private conservation lands, state lands (primarily those managed the ADGF), and tribal lands. These exclusions could reduce the economic impacts of designation on grazing activities in these areas overall, by requiring less extensive consultations. This would reduce administrative costs as well for the Service. The overall impacts on livestock grazing would be less than those in Alternative A, and still characterized as minor.

## 3.11 Tribal Resources

### 3.11.1 Existing Conditions

Tribal trust resources are natural resources retained by or reserved for Indian tribes through treaties, statutes, judicial decisions, and executive orders. Indian lands are not Federal public lands or part of the public domain, and thus are not subject to public Federal land laws. Indian tribes manage Indian land in accordance with tribal goals and objectives, within the framework of applicable laws. However, as trustee for land held in trust by the United States for Indian tribes, BIA provides technical assistance on management planning and oversees a variety of programs on tribal lands. Secretarial Order #3206 outlines the responsibilities of the Service when actions taken under the authority of the ESA may affect Indian lands and tribal trust resources. The agency's responsibilities include ensuring that Indian tribes do not bear a disproportionate burden for the conservation of listed species. In addition, the Secretarial Order provides for the role of BIA in the section 7 consultation process: in addition to circumstances where BIA is the agency proposing an action, BIA also has a role to play where another Federal agency is proposing an action that may affect tribal rights or tribal trust resources. In such cases, the Service shall notify the affected tribe(s) and either provide for (where the action agency is another agency of the Department of Interior) or encourage (if the action agency is outside DOI) participation of the BIA in the consultation process.

The tribes with lands in proposed critical habitat are sovereign nations: White Mountain Apache, and the San Carlos Apache. The White Mountain Apache Indian reservation is in Apache and Navajo Counties and the San Carlos Indian reservation is in northern Graham, southeastern Gila, and eastern Pinal Counties (WMAT 2013; San Carlos 2013). The White Mountain and San Carlos Indian Reservations are bordered by the Tonto National Forest to the west and northwest; and the Apache-Sitgreaves National Forest to the west. The Coronado National Forest is south of the San Carlos Indian Reservation. Both species of gartersnake occur in all three reservations. Activities that occur on tribal lands include renewable energy development, grazing, road projects, and utility developments.

Table 15 in Appendix A shows socioeconomic information for the Yavapai Apache, White Mountain Apache, and the San Carlos Apache lands that would be included in the proposed

critical habitat designation.

Both tribes gain most of their income from their casinos. The San Carlos Apache Tribal Government owns and operates the Apache Gold Casino which opened in June 1994 (San Carlos 2013). The White Mountain Apache operate the Hon-Dah resort-casino; and in addition have developed several tribal enterprises based on outdoor recreation including the Sunrise Park Resort, a popular ski resort destination. Artificial lakes and dams were constructed in the 1950s and are stocked to support sportfishing (WMAT 2013; ASU 2013).

The tribes with lands in proposed critical habitat are sovereign nations. Secretarial Order #3206 outlines the responsibilities of the USFWS when actions taken under the authority of the ESA may affect Indian lands and tribal trust resources. The agency's responsibilities include ensuring that Indian tribes do not bear a disproportionate burden for the conservation of listed species. In this context, none of the three Indian Tribes currently have gartersnake management plans.

*White Mountain Apache*

The White Mountain Apache Tribe currently has a management plan in place for the loach minnow. The plan was completed in 2000 and provides for some level of conservation benefit for northern Mexican and/or narrow-headed gartersnakes on White Mountain Apache lands. White Mountain Apache lands were excluded from the 2012 Designation of Critical Habitat for Spikedace and Loach Minnow, for reasons of (1) Loach Minnow Management Plan; (2) Tribal sovereignty and (3) working relationship with the tribe (USFWS 2012).

*San Carlos Apache*

The San Carlos Apache Tribe completed a Fisheries Management Plan (FMP) in 2005 that includes specific management actions for fish habitat restoration (rehabilitate or restore native plants) and the long-term conservation of native fishes on tribal lands (eliminate nonnative fishes). The FMP provides some level of conservation benefit for northern Mexican and/or narrow-headed gartersnakes on San Carlos Apache lands. Carlos Apache lands were excluded from the 2012 Designation of Critical Habitat for Spikedace and Loach Minnow for reasons of (1) Fisheries Management Plan; (2) Tribal sovereignty; and (3) working relationship with the San Carlos Apache Tribe (USFWS 2012).

*Off-Highway Vehicle (OHV) Use*

Inconsistent management and insufficient enforcement of OHV in the region has caused resource damage in popular and remote dispersed areas across the region. Pursuant the 2005 Travel Management Rule (36 CFR 212, Subpart B, Designation of Roads, Trails, and Areas for Motor Vehicle Use), the National Forests in Arizona are currently developing an Environmental Impact Statement (EIS) which will establish a consistent plan for off-highway vehicle (OHV) use on the National Forests (USFWS 2005a). The Southwestern Region has a programmatic memorandum of agreement (PA) with the Advisory Council on Historic Preservation (ACHP) and State Historic Preservation Officers (SHPOs) that stipulates the Forest Service's responsibilities for

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complying with National Historic Preservation Act (NHPA). This agreement provides for the development of standard consultation protocols for common or special undertakings such as the Travel Management Rule. The Apache-Sitgreaves, Coronado, and Tonto National Forests border the San Carlos and White Mountain Apache Reservations. These National Forests are at varying stages of the NEPA process.

The Coconino National Forest recently consulted with both tribes for the 2011 Coconino Travel Management Plan EIS. Among the concerns expressed was the potential for damage and desecration to traditional cultural properties and sacred places as the number of people using motor vehicles for recreation purposes on the forest increases. Similarly, increased off-road use may threaten or destroy seasonal or scarce plant populations. Overcollection of plants used for ceremonial and traditional purposes by nontribal people is another concern resulting from increased visitation, access to plant collecting areas, and off-road vehicular (ORV) use (USFS 2011c).

The Apache-Sitgreaves National Forest recently consulted with both tribes for the Draft Environmental Impact Statement (DEIS) for Public Motorized Travel Management Plan. The White Mountain Apache Tribe provided written responses; and consultation meetings were held in April 2010. Two concerns were identified regarding travel management: (1) continued looting and damage to archaeological sites, and (2) insufficient consideration of protecting cultural resources. The White Mountain Apache Tribe did not identify any trespass or land management issues that could result from implementing any of the alternatives. These issues were taken into consideration and were incorporated into the development of alternatives. Approximately 944 miles (1519 km) of corridors and over 5,000 acres (2023 ha) considered for areas open to motorized use were removed from considerations for cultural resource concerns. Some of the corridors eliminated from consideration were located on or near known shrines. The open areas removed from consideration were located within lands with a high density of archaeological sites. The draft EIS concluded that no adverse impacts would occur (USFS 2010c).

The Coronado National Forest Final Land Resources Management Plan (LRMP) includes the following objectives, standards, and management approaches for tribal relations within snake habitat:

- Within 5 years of plan approval, the Forest will have completed NAGPRA repatriations of all items collected prior to 1990.
- Consulting with tribes to identify sacred sites or traditional cultural properties and to develop a strategy for appropriate recognition and management.
- Developing government-to-government relationships with tribal officials, to meet requirements of Executive Order 13175 and developing consultation protocols.
- Making Forest recreational or administrative sites available for use by tribal families and organizations through government-to-government agreements (USFS 2011b).

There have been no previous consultations involving the gartersnakes in any of the national forests containing proposed critical habitat bordering the three reservations. Regardless of whether critical habitat is designated, changes to land, resource, and management plans are

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among actions that could trigger future consultations. The ongoing or future development of Travel Management Plans for the Tonto and Coronado National Forests – as well as land and resource management plans – are also among the actions that could trigger future consultations.

### 3.11.2 Environmental Consequences

Activities that currently occur or are anticipated to occur on Tribal lands within designated critical habitat for the two gartersnakes include, but are not limited to, the following:

- Hunting;
- Cultural uses;
- Development (housing, roads, infrastructure associated with tourism and recreation, utility transmission lines, gas wells and pipelines, etc.);
- Vegetation management (exotic/invasive plant removal and prescribed burns);
- Wildlife conservation activities;
- Wetland/riparian restoration activities;
- Agricultural and water use;
- Sportfishery management and stocking;
- Livestock grazing; and
- Flood control-related infrastructure and activities.

#### 3.11.2.1 No Action Alternative

Under the No Action Alternative, no critical habitat would be designated for the two gartersnakes. Section 7 consultations would be triggered for proposed actions with a federal nexus, but only to determine jeopardy to the species. For example, the 4(d) rule under the ESA would exempt take of northern Mexican gartersnakes as a result of livestock use at or maintenance activities of livestock tanks located on Tribal lands and be replaced with special measures tailored to the conservation of the species on all non-Federal lands. Therefore, this alternative would not have any direct impacts on tribal resources beyond any conservation measures resulting from the listing of the gartersnakes and section 7 of the ESA.

Those actions that could have impacts on tribal resources include the construction of roads, trails, facilities and infrastructure; OHV use; and fish stocking. Such consultations would analyze relevant land use, natural resource, fisheries, economic development, and fire management plans on federal lands currently occupied by the species. As they relate to tribal resources, such consultations would likely include:

- USFS actions, particularly:
    - Development of Tonto and Coronado National Forests Travel Management Plans – Designation of roads and trails, restricting access to areas currently open for motorized use.

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- Implementation of Coconino National Forest Travel Management Plan – Increased ORV use and access to certain areas may increase potential for damage and desecration to TCPs and sacred places and threaten or destroy seasonal or scarce plant populations used for ceremonial and traditional purposes.
- Implementation of Coronado National Forest LRMP – NAGPRA repatriations, consultations to identify sacred sites or traditional cultural properties, government-to-government agreements and relationships.
- Implementation of Apache-Sitgreaves Public Motorized Travel Management Plan – designation of roads and trails.

- BLM (aquatic habitat restoration, fire management plans, fire suppression, land and resource management plans, livestock grazing allotment management plans, mining permits, native aquatic species management, and travel management plans).
- BIA (renewable energy development, grazing permits, road projects, and utility developments and upgrades).
- Service (habitat conservation plans, Wildlife and Sport Fish Restoration Funding appropriations).

The conservation measures implemented as a result of section 7 jeopardy consultations under the No Action Alternative may prompt specific modifications to tribal resources. These modifications may protect and/or identify cultural, historic, and archaeological resources including sacred sites and traditional cultural properties; and/or increase administrative costs to agencies. Designation of roads and trails for OHV use may reduce looting of archaeological resources and other disturbances, but increased access to certain areas could also threaten or destroy seasonal or scarce plant populations used for ceremonial and traditional purposes. The No Action Alternative is anticipated to have negligible to minor, indirect, adverse and beneficial impacts to tribal resources related to such required conservation measures.

#### 3.11.2.2 Alternative A

All proposed critical habitat on recreational lands is occupied by the gartersnakes; therefore activities in those areas would be subject to section 7 consultations irrespective of the area's status as critical habitat. Since the habitat evaluation is the primary component of a jeopardy analysis as well as for the evaluation of adverse modification to critical habitat, the same number and type of projects would likely undergo consultation with the designation of critical habitat as without. Therefore, compared to the No Action Alternative, Alternative A (all proposed units, no exclusions) could result in a small but unknown expansion of section 7 consultations that would otherwise occur for the jeopardy analysis to include the evaluation of adverse modification of critical habitat. Conservation measures may indirectly benefit tribal resources, primarily by limiting the higher-impact activities such as OHV use in the critical habitat areas within the Tonto and Coronado National Forests; which may also reduce looting of archaeological resources for the White Mountain Apaches. Potential benefits of expanding section 7 consultations for tribal resources could result from protecting, managing, or identifying cultural, historic, and archaeological resources; as well as developing government-to-government relations.

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Data in Table 15 in Appendix A demonstrate the economic vulnerability of the tribes affected by this proposal; their economies are characterized by low income and high poverty rates, making these communities particularly vulnerable to economic impacts associated with increased regulatory burden. Future impacts resulting from conservation efforts on tribal lands include administrative costs of Section 7 consultations, surveys and monitoring of habitat, development of fish management plans, and potential conservation measures to development and habitat restoration activities.

Beneficial and adverse effects of critical habitat designation on tribal resources overall are expected to be minor because (1) few projects and operations would be subject to consultation based solely on the presence of designated critical habitat because all of the proposed units are occupied by the gartersnakes, and (2) 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.

#### 3.11.2.3 Alternative B

Impacts associated with the designation of critical habitat would be similar to those identified for the No Action Alternative. Alternative B includes the proposed units, but excludes San Carlos, and White Mountain Apache lands. Since the exclusion is largely tribal land there would be no impacts associated with the designation of critical habitat.

## 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.

Past actions that have contributed cumulative impacts within the proposed critical habitat units include those that have triggered consultations for other species with overlapping critical designations, or for other listed species for whom jeopardy consultations have been conducted. Between 2014 (the year the species were listed) and 2019 (partial year), Federal agencies consulted with the Service 104 times on projects that might impact either or both gartersnakes, including formal consultations, informal consultations, and technical assistances. For 17 consultations and technical assistance efforts, Federal agencies considered both types of gartersnakes. Among the remaining 87 consultations and technical assistance efforts, 68 (78 percent) considered only the narrow-headed gartersnake while 19 (22 percent) considered only the northern Mexican gartersnake. Across all consultations and technical assistance efforts recorded between 2014 and 2019, 27 (26 percent) were formal consultations, 64 (62 percent) were informal consultations, and 13 (13 percent) were technical assistance efforts. On an annual

basis, this translates to approximately 5 formal consultations, 13 informal consultations, and 3 technical assistances each year. These section 7 consultations were for a variety of projects which included riparian fuels treatment, industrial mining, sportfish management, and habitat conservation planning for effects from reservoir operation and development under section 10 of the ESA (which triggered intra-Service section 7 consultation).

Reasonably foreseeable present and future actions from federal agencies requiring consultation are described in the Environmental Assessments for the other species whose critical habitat coincides with that proposed for the two gartersnakes. These could include, but not be limited to, livestock grazing, forest management plans, land and resource management plans, travel management plans, transportation infrastructure improvement or development projects, prescribed fire and fuels treatment, Wildlife and Sportfish Restoration Program projects, and restoration or recovery activities that may affect these species.

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 conservation measures that would not occur in the absence of designation. This is because impacts to habitat 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 two Arizona gartersnakes can be summarized as follows:

*Water and Wetland Resources* – The designation of critical habitat would not result in new consultations or conservation measures based on critical habitat alone. Because both gartersnakes are currently listed and they partially overlap with several threatened and endangered species and critical habitat in the area, federal agencies are already required to consult with the Service under the ESA for water and wetland resources in regards to other listed species, in particular an array of listed fish species. Future consultations for critical habitat would likely contain conservation measures to minimize adverse effects to critical habitat.

*Fisheries* – The designation of critical habitat alone would not result in new and reinitiated consultations or conservation measures. Conservation measures implemented as a result of critical habitat would likely be minor, because the PBFs are so ecologically connected to the species needs and because all critical habitat is considered occupied by the species and subject to consultation. Further, any conservation measures to protect PBFs are likely to benefit native fish species, beyond their direct benefits to the gartersnakes. 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 native fish.

*Fish, Wildlife, and Plants* – The designation of critical habitat alone would not result in new and reinitiated consultations or conservation measures. Conservation measures implemented as a result of critical habitat would likely be minor, because the PBFs are so ecologically connected

to the species needs and because all critical habitat is considered occupied by the species and subject to consultation. Further, any such conservation measures to protect PBFs are likely to benefit native wildlife and vegetation, beyond their direct benefits to the gartersnakes. 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 have an effect 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. 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 conservation measures that have not fundamentally changed land use.

*Fire Management* – Because both gartersnakes are currently listed and they overlap with other threatened and endangered species and critical habitat, federal agency fire management plans are already required to consult with the Service under the ESA. Past consultations 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 conservation measures such as:

- Evaluating the timing of activities such as brush removal to account for seasonal microhabitat needs;
- Encouraging, when available, relocation of activities to outside critical habitat areas, such as:
  - 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 conservation measures requested on behalf of the proposed critical habitat would already occur based on the presence of critical habitat for species with ecological similarities. Such conservation measures resulting from the proposed critical habitat designation would not likely impede the ability of any fire management plan to achieve its goals.

*Construction/Development* – Designation of critical habitat would not result in new and reinitiated consultations, conservation measures for construction projects, based on critical

habitat alone. Past species consultations on federal lands have resulted in conservation measures that have not eliminated or fundamentally changed construction projects. Future consultation with regards to critical habitat would likely result in minor conservation measures. On private land, designation of critical habitat does not affect construction project, except where a federal license, permit, or funding may be sought or required.

*Recreation* – Cumulative recreational impacts would not occur from critical habitat designations alone. Possible conservation measures are likely to be negligible, however, because any conservation measures recommended for the snakes in these units would already be implemented to avoid adverse species impacts.

*Socioeconomics* – Cumulative socioeconomic impacts could occur from overlapping critical habitat designations with the southwestern willow flycatcher, Gila chub, razorback sucker, bonytail chub and Mexican spotted owl, 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 gartersnakes in these units would already be implemented to avoid adverse species impacts. 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 conservation measures that have not eliminated or fundamentally changed livestock grazing. Future consultation with regards critical habitat could result in minor conservation measures 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 conservation measures anticipated.

*Tribal Resources* – Cumulative impacts to tribal resources would occur from critical habitat designations for the southwestern willow flycatcher, Gila chub, razorback sucker, and Huachuca water-umbel. The proposed designation could result in additional, minor restrictions to the areas where this previous designation already led to limitations on development or recreational activities. These cumulative impacts are likely to be negligible, however, because any modifications or conservation measures recommended for the snakes in these units would already be implemented to avoid adverse species impacts. Based on past critical habitat designation on these reservations, it has been the tribe's position that a designation of critical habitat on its lands improperly infringes upon its tribal sovereignty and the right to self-

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government. The three Tribes whose lands are included in the proposed designation may believe that their Tribe would incur more substantial adverse impacts (USFWS 2011g).

## 3.13 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 two gartersnakes—expanded consultations, would not be expected to 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 conservation measures to avoid or reduce adverse effects to critical habitat would be the same as those proposed to avoid jeopardy.

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# 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 northern Mexican and narrow-headed gartersnakes includes the 9 units for the northern Mexican gartersnake and 8 units for the narrow-headed gartersnake. The designations in these units total 27,784 ac (11,244 ha) for the northern Mexican gartersnake, and 18,701 ac (7,568 ha) for the narrow-headed gartersnake. Overall, Federal lands account for 64% of the proposed acreage. The total acreage proposed for designation represents 0.07% of the areas of the counties involved, therefore the size context of the designation suggests that impacts of critical habitat designation would not be significant.

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 gartersnake 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:

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- 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 conservation measures required that have not already been, or would be, required in previous consultations on the same lands, or that would not otherwise be sought due to the listing of these gartersnakes. Critical habitat only affects activities on non-Federal lands to the extent that a federal permit, license, or funding may be required or sought. The Service has several conservation tools for non-Federal landowners—including conservation easements, Safe Harbor Agreements, Habitat Conservation Plans, etc. to encourage land management activities that benefit or do less harm the gartersnakes. In addition, the section 4(d) rule limits liability for take violations resulting from stock tank maintenance activities on non-Federal lands. The Service will continue to educate the public 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 gartersnake critical habitat is considered occupied by the species, conservation measures related to water management that are recommended to avoid jeopardy would be substantially the same as those recommended to avoid adverse modification.
- Impacts to the unique characteristics of the area would be negligible. A portion of the Verde River, the only Wild and Scenic Rivers in Arizona, is included in the designation. However, any conservation measures along these rivers would only enhance their contributing resource values. Taken together, the impacts of the designation will increase the health of aquatic ecosystems on designated lands because of more protections.
- The impacts do not pose any uncertain, unique, or unknown risks. This analysis was based on past consultations that considered the two gartersnakes and the likely future impacts from gartersnake conservation. Past section 7 consultations within proposed designated critical habitat would likely be reinitiated to include the gartersnakes. New activities could result in section 7 consultations. A number of activities, including livestock grazing, habitat conservation planning for effects from reservoir operation and development, wildland fire, sportfish management, and riparian fuels treatment and/or habitat management, would likely have some gartersnake-related conservation measures associated with them.
- The designation of critical habitat by the Service for the conservation of threatened species is not a precedent-setting action with significant effects because 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 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

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effects of land management plans. Cumulative impacts of this designation and other federal actions on land management activities on private lands would not be significant because actual land management restrictions only apply where a federal permit, license, or funding may be required, and the conservation measures that would accompany a federal permit, license, or funding would be the same as those recommended for the species themselves.

- Critical habitat designation is not likely to affect sites, objects, or structures of historical, scientific, or cultural significance. There are several NRHP-listed historical sites within, or within close range of, critical habitat units. However, the proposed designation would not result in any ground-disturbing activities that have the potential to affect archeological or other cultural resources.
- Critical habitat designation would not adversely affect an endangered or threatened species or its habitat. Designation will have long-term, beneficial, conservation-related effects on the survival and recovery of the two gartersnakes, as well as all native aquatic or riparian species that occur within these designated units, through maintenance of PBFs.
- 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.

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# CHAPTER 5
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# APPENDIX A: TABLES

## Table 1. Land Ownership Proposed Critical Habitat Units for the Northern Mexican Gartersnake

[Area estimates reflect all land within critical habitat unit boundaries. County-owned lands are considered as private lands.]

| Unit | Subunit | Land Ownership by Type Acres (Hectares) | | | | Total Size Acres (Hectares) |
|---|---|---|---|---|---|---|
| | | Federal | State | Tribal | Private | |
| 1. Upper Gila River Subbasin | Gila River | | 22 (9) | | 1,006 (407) | 1,028 (416) |
| | Duck Creek | | | | 104 (42) | 104 (42) |
| **Unit Total** | | | 22 (9) | | 1,110 (449) | 1,132 (458) |
| 2. Tonto Creek | | 3,337 (1,350) | | | 966 (391) | 4,302 (1,741) |
| **Unit Total** | | 3,337 (1,350) | | | 966 (391) | 4,302 (1,741) |
| 3. Verde River Subbasin | Verde River | 646 (261) | 570 (231) | 88 (36) | 2,829 (1,145) | 4,133 (1,672) |
| | Oak Creek | 193 (78) | 134 (54) | | 687 (278) | 1,014 (410) |
| | Spring Creek | 17 (7) | 1 (<1) | | 80 (32) | 99 (40) |
| **Unit Total** | | 856 (346) | 705 (285) | 88 (36) | 3,597 (1,456) | 5,246 (2,123) |
| 4. Bill Williams River Subbasin | Bill Williams River | 1,002 (405) | 202 (82) | | 601 (243) | 1,805 (730) |
| | Big Sandy River | 339 (137) | | | 593 (240) | 932 (377) |
| | Santa Maria River | 780 (316) | | | 532 (215) | 1,312 (531) |
| **Unit Total** | | 2,121 (858) | 202 (82) | | 1,727 (699) | 4,049 (1,639) |
| 5. Lower Colorado River | | 4,467 (1,808) | | | | 4,467 (1,808) |
| **Unit Total** | | 4,467 (1,808) | | | | 4,467 (1,808) |
| 6. Arivaca Cienega | | 149 (60) | 1 (<1) | | 62 (25) | 211 (86) |
| **Unit Total** | | 149 (60) | 1 (<1) | | 62 (25) | 211 (86) |
| | Cienega Creek | 755 (306) | 308 (125) | | 550 (222) | 1,613 (653) |

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|---|---|---|---|---|---|---|
| 7. Cienega Creek Subbasin | Empire Gulch & Empire Wildlife Pond | 268 (109) | 57 (23) | | | 326 (132) |
| | Gardner Canyon & Maternity Wildlife Pond | 74 (30) | | | | 74 (30) |
| | Unnamed drainage & Gaucho Tank | 15 (6) | | | | 15 (6) |
| **Unit Total** | | 1,112 (451) | 366 (148) | | 550 (222) | 2,030 (821) |
| 8. Upper Santa Cruz River Subbasin | Sonoita Creek | | | | 224 (91) | 224 (91) |
| | Cott Tank Drainage | 13 (5) | | | | 13 (5) |
| | Santa Cruz River | | 70 (28) | | 91 (37) | 161 (65) |
| | Unnamed drainage & Pasture 9 Tank | | 36 (15) | | 5 (2) | 42 (17) |
| | Unnamed drainage & Sheehy Spring | | 5 (2) | | 20 (8) | 25 (10) |
| | Scotia Canyon | 31 (13) | | | | 31 (13) |
| | FS799 Tank | 0.7 (0.3) | | | | 0.7 (0.3) |
| | Unnamed Wildlife Pond | | | | 0.1 (<0.1) | 0.1 (<0.1) |
| **Unit Total** | | 45 (18) | 111 (45) | | 340 (138) | 496 (201) |
| 9. Upper San Pedro River Subbasin | San Pedro River | 4,911 (1,988) | | | 215 (87) | 5,126 (2,074) |
| | Babocomari River | 197 (80) | 8 (3) | | 199 (81) | 404 (164) |
| | O'Donnell Canyon | 58 (24) | | | 181 (73) | 239 (97) |
| | Post Canyon | 30 (12) | | | 47 (19) | 77 (31) |
| | Unnamed Drainage & Finley Tank | | | | 3 (1) | 3 (1) |
| | House Pond | 0.6 (0.2) | | | | 0.6 (0.2) |
| **Unit Total** | | 5,197 (2,103) | 8 (3) | | 645 (261) | 5,850 (2,367) |
| **Grand Total** | | 17,284 (6,995) | 1,414 (572) | 88 (36) | 8,996 (3,640) | 27,784 (11,244) |

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Note: Area sizes may not sum due to rounding.

## Table 2. Land Ownership of Proposed Critical Habitat for Narrow-headed Gartersnake

| Unit | Subunit | Land Ownership by Type Acres (Hectares) | | | | Size of Unit |
|---|---|---|---|---|---|---|
| | | Federal | State | Tribal | Private | |
| 1. Gila River Subbasin | Gila River | 1,123 (455) | 119 (48) | | 2,267 (917) | 3,510 (1,420) |
| | West Fork Gila River | 358 (145) | 154 (62) | | 51 (20) | 562 (228) |
| | Little Creek | 157 (64) | 5 (2) | | | 162 (65) |
| | Middle Fork Gila River | 569 (230) | | | | 569 (230) |
| | Iron Creek | 58 (23) | | | | 58 (23) |
| | Gilita Creek | 149 (60) | | | | 149 (60) |
| | Black Canyon | 245 (99) | | | 6 (2) | 251 (102) |
| | Diamond Creek | 169 (98) | | | | 169 (98) |
| **Unit Total** | | 2,827 (1,144) | 278 (113) | | 2,323 (940) | 5,429 (2,197) |
| 2. San Francisco River Subbasin | San Francisco River | 1,581 (640) | | | 1,441 (583) | 3,120 (1,263) |
| | Whitewater Creek | 112 (45) | | | 96 (39) | 208 (84) |
| | Saliz Creek Creek | 182 (74) | | | 36 (15) | 218 (88) |
| | Tularosa River | 338 (137) | | | 492 (199) | 829 (336) |
| | Negrito Creek | 272 (110) | | | 65 (26) | 337 (136) |
| | South Fork Negrito Creek | 171 (69) | | | 21 (9) | 192 (78) |
| **Unit Total** | | 2,753 (1,114) | | | 2,152 (871) | 4,905 (1,985) |
| 3. Blue River Subbasin | Blue River | 2,105 (852) | | | 399 (162) | 2,504 (1,013) |
| | Campbell Blue Creek | 300 (121) | | | 61 (25) | 361 (146) |
| | Dry Blue Creek | 106 (43) | | | | 106 (43) |
| **Unit Total** | | 2,510 (1,016) | | | 460 (186) | 2,971 (1,202) |
| 4. Eagle Creek | | 99 (40) | | 236 (96) | 1 (<1) | 336 (136) |
| **Unit Total** | | 99 (40) | | 236 (96) | 1 (<1) | 336 (136) |
| | Black River | 653 (264) | | 111 (45) | | 763 (309) |

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|---|---|---|---|---|---|---|
| 5. Black River Subbasin | Bear Wallow Creek | 127 (51) | | 47 (19) | | 174 (70) |
| | North Fork Bear Wallow Creek | 61 (25) | | | | 61 (25) |
| | Reservation Creek | 96 (39) | | 36 (14) | | 132 (54) |
| | Fish Creek | 107 (43) | | | | 107 (43) |
| | East Fork Black River | 370 (150) | | | | 370 (150) |
| **Unit Total** | | 1,414 (572) | | 194 (78) | | 1,607 (650) |
| 6. Canyon Creek | | 155 (63) | | 77 (31) | | 232 (94) |
| **Unit Total** | | 155 (63) | | 77 (31) | | 232 (94) |
| 7. Tonto Creek Subbasin | Tonto Creek | 1,003 (406) | | | 75 (30) | 1,078 (436) |
| | Houston Creek | 16 (6) | | | 2 (1) | 18 (7) |
| | Haigler Creek | 266 (108) | | | 28 (11) | 294 (119) |
| **Unit Total** | | 1,285 (520) | | | | 1,832 (741) |
| 8. Verde River Subbasin | Verde River | 823 (333) | | | 101 (41) | 923 (374) |
| | Oak Creek | 360 (146) | 51 (21) | | 337 (136) | 748 (303) |
| | West Fork Oak Creek | 161 (65) | | | | 161 (65) |
| **Unit Total** | | 1,343 (544) | 51 (21) | | 437 (177) | 1,832 (741) |
| **Total** | | 12,386 (5,013) | 329 (133) | 507 (205) | 5,479 (2,217) | 18,701 (7,568) |

Note: Area sizes may not sum due to rounding.

## Table 3. Areas Considered for Exclusion for the Northern Mexican Gartersnake (by critical habitat unit)

| ***Unit* Subunit** | **Landowner, Property Name** | **Ownership Type** | **Area Acres (Hectares)** | **Portion of Unit or Subunit** |
|---|---|---|---|---|
| *Upper Gila River Subbasin Unit* | | | *515 (208)* | *45%* |
| Gila River | Freeport McMoRan (Freeport McMoRan Corporation management plans) | Private | 500 (202) | 48% |
| Duck Creek | Freeport McMoRan (Freeport McMoRan Corporation management plans) | | 15 (6) | 14% |
| *Verde River Subbasin Unit* | | | *460 (186)* | *9%* |
| Verde River | The Nature Conservancy, Verde Valley Preserve and Verde Valley property | Private | 16 (6) | 0.4% |

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|---|---|---|---|---|
| | Salt River Project, Camp Verde Riparian Preserve (Roosevelt and Horseshoe-Bartlett HCPs) | Private | 96 (39) | 2% |
| | Yavapai-Apache Nation | Tribal | 207 (84) | 5% |
| Oak Creek | Arizona Game and Fish Department, Bubbling Ponds Hatchery and Page Springs Hatchery (State Wildlife Action Plan) | State | 142 (57) | 14% |
| *Bill Williams River Subbasin Unit* | | | *329 (133)* | *8%* |
| Bill Williams River | Arizona Game and Fish Department, Planet Ranch Conservation and Wildlife Area (State Wildlife Action Plan) | State | 329 (133) | 18% |
| *Cienega Creek Subbasin Unit* | | | *543 (220)* | *27%* |
| Cienega Creek | Pima County, Cienega Creek Natural Preserve (Pima County MSCP) | Private | 543 (220) | 34% |
| *Upper Santa Cruz River Subbasin Unit* | | | *238 (96)* | *48%* |
| Sonoita Creek | The Nature Conservancy, Patagonia-Sonoita Creek Preserve | Private | 123 (50) | 55% |
| Santa Cruz River | San Rafael Cattle Company, San Rafael Ranch (San Rafael Ranch Low Effect HCP) | Private | 91 (37) | 57% |
| Unnamed drainage & Pasture 9 Tank | San Rafael Cattle Company, San Rafael Ranch (AGFD's SHA, San Rafael Ranch Low Effect HCP) | Private | 5 (2) | 12% |
| Unnamed drainage & Sheehy Spring | San Rafael Cattle Company, San Rafael Ranch (AGFD's SHA, San Rafael Ranch Low Effect HCP) | Private | 20 (8) | 80% |
| Unnamed Wildlife Pond | Private Ranch (AGFD's SHA) | Private | 0.07 (0.03) | 100% |
| *Upper San Pedro River Subbasin Unit* | | | *5,320 (2,152)* | *91%* |
| San Pedro River (Fort Huachuca requested exclusion) | Bureau of Land Management, San Pedro Riparian National Conservation Area (national security) | Federal | 4,496 (1,820) | 88% |
| | Private (national security) | Private | 215 (87) | 4% |
| Babocomari Ruver (Fort Huachuca | Bureau of Land Management, San Pedro Riparian National Conservation Area (national security) | Federal | 195 (79) | 49% |

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|---|---|---|---|---|
| requested exclusion) | Arizona State Land Department (national security) | State | 8 (3) | 2% |
| | Private (natural security) | Private | 199 (81) | 49% |
| O'Donnell Canyon | National Audubon Society, Appleton-Whittell Research Ranch (AGFD's SHA) | Private | 173 (70) | 72% |
| | The Nature Conservancy, Canelo Hills Preserve | Private | 1.8 (0.7) | 0.8% |
| Post Canyon | National Audubon Society, Appleton-Whittell Research Ranch (AGFD's SHA) | Private | 15 (6) | 19% |
| | Private Ranch (AGFD's SHA) | Private | 15 (6) | 19% |
| Unnamed Drainage & Finley Tank | National Audubon Society, Appleton-Whittell Research Ranch (AGFD's SHA) | Private | 3 (1) | 100% |
| **Grand Total** | | | 7,405 (2,997) | 27% |

## Table 4. Areas considered for exclusion for the narrow-headed gartersnake (by critical habitat unit)

| ***Unit Subunit*** | **Landowner, Property Name** | **Ownership Type** | **Area Acres (Hectares)** | **Portion of Unit or Subunit** |
|---|---|---|---|---|
| *Upper Gila River Subbasin Unit* | | | *563 (228)* | *10%* |
| Gila River | Freeport McMoRan (Freeport McMoRan Corporation management plans) | Private | 563 (228) | 10% |
| *Eagle Creek Unit* | | | *236 (96)* | *70%* |
| Eagle Creek | San Carlos Apache Tribe | Tribal | 236 (96) | 70% |
| *Black River Subbasin Unit* | | | *195 (79)* | *12%* |
| Black River | San Carlos Apache Tribe | Tribal | 55 (22) | 7% |
| | White Mountain Apache Tribe | Tribal | 56 (23) | 7% |
| Bear Wallow Creek | San Carlos Apache Tribe | Tribal | 48 (19) | 27 |
| | White Mountain Apache Tribe | Tribal | <.01 (<.01) | <.01% |
| Reservation Creek | White Mountain Apache Tribe | Tribal | 36 (15) | 27% |
| *Canyon Creek Unit* | | | *77 (31)* | *33%* |
| Canyon Creek | White Mountain Apache Tribe | Tribal | 77 (31) | 33% |
| **Grand Total** | | | 1,072 (434) | 6% |

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## Table 5. Comparison of Potential Impacts of Proposed Critical Habitat Designation

| Resource | No Action | Alternative A—Proposed Designation with no exclusions | Alternative B—Proposed Designation with Exclusions |
|---|---|---|---|
| Water & Wetland Resources | No impact beyond those conservation measures resulting from the listing of the two gartersnakes | • Addition of adverse mod analyses to section 7 consultations that would be undertaken for the species<br>• Minor impacts from delays, increased costs, or project alterations resulting from additional analysis under section 7 consultation, including species monitoring, mapping, surveying<br>• Minor beneficial impacts on water resources due to increased conservation measures to help conserve PBFs and natural stream hydrology and geomorphology | • Minor impacts similar to Alternative A, but less extensive consultations because of reduced area of designated critical habitat<br>• Beneficial impacts roughly equivalent to Alternative A, owing to conservation measures in excluded units |

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| Resource | No Action | Alternative A—Proposed Designation with no exclusions | Alternative B—Proposed Designation with Exclusions |
|---|---|---|---|
| Fisheries Management | No impact beyond those conservation measures resulting from the listing of the gartersnakes and associated requirements of section 7, ESA. | • Addition of adverse mod analyses to section 7 consultations that would be undertaken for the species<br>• Minor impacts from delays, increased costs, or project alterations resulting from additional analysis under section 7 consultation, including species monitoring, mapping, surveying<br>• Likely beneficial impacts on wildlife that use riparian and aquatic habitats and especially gartersnakes and native fish and amphibians, from proposed conservation measures to promote native fish and amphibian populations. | • Minor adverse impacts similar to Alternative A, but less extensive consultations because of reduced area of designated critical habitat. Beneficial impacts roughly equivalent to Alternative A, owing to conservation measures in excluded units |

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| Resource | No Action | Alternative A—Proposed Designation with no exclusions | Alternative B—Proposed Designation with Exclusions |
|---|---|---|---|
| Natural Resources: Fish, Wildlife, Plants, Biological Communities | No impact beyond those conservation measures resulting from the listing of the gartersnakes and associated requirements of section 7, ESA. | • Addition of adverse mod analyses to section 7 consultations that would be undertaken for the species<br>• Likely beneficial impacts on wildlife that use riparian and aquatic habitats and especially gartersnakes and native fish and amphibians, from proposed conservation measures to promote native fish and amphibian populations. | • Minor adverse impacts similar to Alternative A, but less extensive consultations because of reduced area of designated critical habitat<br>• Beneficial impacts roughly equivalent to Alternative A, owing to conservation measures in excluded units |
| Land Use & Management | No impact beyond those conservation measures resulting from the listing of the two gartersnakes and associated requirements of section 7, ESA. | • Addition of adverse mod analyses to section 7 consultations that would be undertaken for the species<br>• Minor impacts from delays, increased costs, or project alterations resulting from additional section 7 analyses, including species monitoring, mapping, surveying<br>• Likely beneficial impacts on two gartersnakes, from proposed conservation measures to conserve snake habitat | • Minor impacts similar to Alternative A, but less extensive consultations because of reduced area of designated critical habitat<br>• Beneficial impacts roughly equivalent to Alternative A, owing to conservation measures in excluded units |
| Fire Management | No impact beyond those conservation measures resulting | • Addition of adverse mod analyses to section 7 consultations | • Minor impacts similar to Alternative A, but |

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| Resource | No Action | Alternative A—Proposed Designation with no exclusions | Alternative B—Proposed Designation with Exclusions |
|---|---|---|---|
| | from the listing of the two gartersnakes and associated requirements of section 7, ESA. | that would be undertaken for the species<br>• Minor impacts from delays, increased costs, or project alterations resulting from additional section 7 analyses, including species monitoring, mapping, surveying | less extensive consultations because of reduced area of designated critical habitat<br>• Beneficial impacts roughly equivalent to Alternative A, owing to conservation measures in excluded units |
| Construction/ Development | No impact beyond those conservation measures resulting from the listing of the two gartersnakes and associated requirements of section 7, ESA. | • Addition of adverse mod analyses to section 7 consultations that would be undertaken for the species<br>• Minor impacts from delays, increased costs, or project alterations resulting from additional section 7 analyses, including measures to reduce harmful nonnative species impacts, limiting use on trails, relocating whole or parts of construction projects, and changing the time and/or duration of a construction project. | • Minor impacts similar to Alternative A, but less extensive consultations because of reduced area of designated critical habitat<br>• Beneficial impacts roughly equivalent to Alternative A, owing to conservation measures in excluded units |
| Recreation | No impact beyond those conservation measures resulting from the listing of the two gartersnakes and associated requirements of | • Addition of adverse mod analyses to section 7 consultations that would be undertaken for the species<br>• Minor impacts from | • Minor impacts from project alterations or potential limitations on recreational access resulting from additional section 7 analyses, less than |

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| Resource | No Action | Alternative A—Proposed Designation with no exclusions | Alternative B—Proposed Designation with Exclusions |
|---|---|---|---|
| | section 7, ESA | project alterations or potential limitations on recreational access resulting from additional section 7 analyses | Alternative A |
| Socioeconomics | No impact beyond those conservation measures resulting from the listing of the two gartersnakes and associated requirements of section 7, ESA | •Minor impacts from delays, increased costs, or project alterations resulting from additional section 7 analyses | •Minor impacts from delays, increased costs, or project alterations resulting from additional section 7 consultations, less than Alternative A |

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| Resource | No Action | Alternative A—Proposed Designation with no exclusions | Alternative B—Proposed Designation with Exclusions |
|---|---|---|---|
| Livestock Grazing | No impact beyond those conservation measures resulting from the listing of the two gartersnakes and associated requirements of section 7, ESA. | • Addition of adverse mod analyses to section 7 consultations that would be undertaken for the species<br>• Minor impacts from delays, increased costs, or project alterations resulting from additional section 7 analyses, including measures to reduce harmful nonnative species impacts, permanent or temporary fencing, and maintenance of stream bank stability.<br>• Likely beneficial impacts on both snakes, from proposed conservation measures to conserve and create their habitat. | • Minor impacts similar to Alternative A, because of reduced area of designated critical habitat<br>• Beneficial impacts roughly equivalent to Alternative A. |
| Tribal Resources | No impact beyond those conservation measures resulting from the listing of the two gartersnakes and associated requirements of section 7, ESA | • Addition of adverse mod analyses to section 7 consultations that would be undertaken for the species<br>• Minor impacts from delays, increased costs, or project alterations resulting from additional section 7 analyses | • No impacts, because all tribal lands are excluded under this alternative |

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| Resource | No Action | Alternative A—Proposed Designation with no exclusions | Alternative B—Proposed Designation with Exclusions |
|---|---|---|---|
| | | •Likely beneficial impacts on both snakes, from proposed conservation measures to conserve and create their habitat. | |

## Table 6. Federal Actions Which Might Lead to Consultation on 2 Arizona Gartersnakes

| Federal Agency | Actions Leading to Consultation |
|---|---|
| National Park Service | • General management plans<br>• Fire management plans<br>• Recreation management<br>• Travel management |
| Natural Resources Conservation Service | • Wildlife habitat |
| U.S. Army Corps of Engineers | • Bridge projects<br>• Stream restoration<br>• Vegetation management<br>• Urban development |
| U.S. Bureau of Indian Affairs | • Grazing permits<br>• Renewable energy development<br>• Road projects<br>• Utility developments |
| U.S. Bureau of Reclamation | • Transportation, storage, and delivery of water |
| U.S. Department of Transportation | • Highway and bridge construction and maintenance<br>• Renewable energy transmission |
| U.S. Department of Defense | • Land and resource management plans<br>• Operational plans<br>• Fire management plans<br>• Fire suppression<br>• Integrated natural resource management |

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| Federal Agency | Actions Leading to Consultation |
|---|---|
| | plans<br>• Aquatic habitat restoration |
| U.S. Bureau of Land Management | • Aquatic habitat restoration<br>• Fire management plans<br>• Fire suppression<br>• Land and resource management plans<br>• Livestock grazing allotment management plans<br>• Mining permits<br>• Renewable energy development permits<br>• Native aquatic species mgmt.<br>• Travel management plans<br>• Recreation mgmt. |
| U.S. Forest Service | • Aquatic habitat restoration<br>• Fire management plans<br>• Fire suppression<br>• Fuel reduction treatments<br>• Forest plans<br>• Livestock grazing allotment management plans<br>• Mining permits<br>• Native aquatic species mgmt.<br>• Travel management plans<br>• Recreation mgmt. |
| U.S. Fish & Wildlife Service (intra-Service consultation) | • Issuance of Section 10 permits for:<br>  o Enhancement of survival<br>  o Habitat Conservation Plans<br>  o Safe Harbor Agreements<br>• Partners for Fish & Wildlife projects<br>• Wildlife and Sport Fish Restoration Funding<br>• National Wildlife Refuge planning |

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## Table 7. Number of Past Consultations in Proposed Critical Habitat Units of 2 Arizona Gartersnakes (2014-2019)

| Consultation Type | Narrow-Headed Gartersnake Only | Northern Mexican Gartersnake Only | Both Species | Total | Average Per Year |
|---|---|---|---|---|---|
| Formal consultations | 17 | 8 | 2 | 27 | 5.4 |
| Informal consultations | 42 | 8 | 14 | 64 | 12.8 |
| Technical assistances | 9 | 3 | 1 | 13 | 2.6 |
| Total | 68 | 19 | 17 | 104 | 20.8 |

Source: U.S. Fish and Wildlife Service TAILS database November 6, 2019.

Notes:

1. This analysis only includes consultations that took place in currently proposed critical habitat units, which excludes some past consultations for these species.
2. Because the data were compiled before the end of 2019, we create annual averages by dividing the total number of consultations by five years instead of six.
3. The formal consultation category includes one reinitiated consultation for the narrow-headed gartersnake in 2014.
4. The informal consultation category includes ten informal emergencies for the narrow-headed gartersnake.

## Table 8. Federally Endangered, Threatened, and Candidate Species whose critical habitat overlaps with proposed Northern Mexican Gartersnake CH

| Unit | Subunit | Co-occurring Listed Species* | Existing Critical Habitat* |
|---|---|---|---|
| 1. Upper Gila River Subbasin | Gila River | LM, SD, SWWF, YBCU | LM, SD, SWWF, YBCU |
| | Duck Creek | YBCU | YBCU |
| 2. Tonto Creek | | CLF, SWWF, YBCU | LM, SD, SWWF, YBCU |
| 3. Verde River Subbasin | Verde River | SD, SWWF, YBCU | LM, SD, RS, SWWF, YBCU |
| | Oak Creek | YBCU, SWWF | LM, SD, YBCU, SWWF |
| | Spring Creek | GC, LM, SD | GC, LM, SD |

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| | | | |
|---|---|---|---|
| 4. Bill Williams River Subbasin | Bill Williams River | SWWF | SWWF |
| | Big Sandy River | SWWF | SWWF |
| | Santa Maria River | SWWF, YBCU | SWWF, YBCU |
| 5. Lower Colorado River | | YBCU | YBCU |
| 6. Arivaca Cienega | | YBCU | YBCU |
| 7. Cienega Creek Subbasin | Cienega Creek | CLF, DP, GC, GT, HWU, SWWF, YBCU | CLF, GC, SWWF, YBCU |
| | Empire Gulch & Empire Wildlife Pond | CLF, GC, GT, SWWF, YBCU | CLF, GC, SWWF, YBCU |
| | Gardner Canyon & Maternity Wildlife Pond | CLF, SWWF, YBCU | CLF, SWWF, YBCU |
| | Unnamed drainage & Gaucho Tank | SWWF, YBCU | SWWF, YBCU |
| 8. Upper Santa Cruz River Subbasin | Santa Cruz River | HWU, CHLT, GT, GC | HWU |
| | Sonoita Creek | YBCU | YBCU |
| | Cott Tank Drainage | GT | |
| | Unnamed drainage & Pasture 9 Tank | HWU, STS | HWU |
| | Unnamed drainage & Sheehy Spring | GC | |
| | Scotia Canyon | CLF, STS | CLF, HWU |
| | FS799 Tank | STS | |
| | Unnamed Wildlife Pond | STS | |
| 9. Upper San Pedro River Subbasin | San Pedro River | HWU, GT, YBCU | HWU, YBCU |
| | Babocomari River | YBCU | YBCU |
| | O'Donnell Canyon | CLF, GC, GT, DP | GC |
| | Post Canyon | CLF | |
| | Unnamed Drainage & Finley Tank | CLF | |
| | House Pond | CLF | CLF |

*Species codes:
CLF = Chiracahua leopard frog (*Lithobates chiricahuensis*)
CHLT = Canelo Hills ladies'-tresses (*Spiranthes delitescens*)
DP = Desert pupfish (*Cyprinodon macularis*)
GC = Gila chub (*Gila intermedia*)
GT = Gila topminnow (*Poeciliopsis occidentalis*)
HWU = Huachuca water umbel (*Lilaeopsis schaffneriana var. recurva*)
LM = Loachminnow (*Tiaroga cobitis*)
SD = Spikedace (*Meda fulgida*)
STS = Sonoran tiger salamander (*Ambystoma tigrinum stebbinsi*)
SWWF = Southwestern willow flycatcher (*Empidonax trailii extimus*)
YBCU = yellow-billed cuckoo (*Coccyzus americanus*)

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## Table 9. Federally Endangered, Threatened, and Candidate Species whose critical habitat overlaps with proposed narrow-headed gartersnake CH

| Unit | Subunit | Co-occurring Listed Species* | Existing Critical Habitat* |
|---|---|---|---|
| 1. Upper Gila River Subbasin | Gila River | LM, SD, SWWF, YBCU | LM, SD, SWWF, YBCU |
| | West Fork Gila River | LM, SD | LM, SD |
| | Little Creek | LM, SD | LM, SD |
| | Middle Fork Gila River | | |
| | Iron Creek | | |
| | Gillita Creek | | |
| | Black Canyon | | |
| | Diamond Creek | CLF, LM, SD | CLF, LM, SD |
| 2. San Francisco River Subbasin | San Francisco River | LM, SD, SWWF,YBCU | LM,SD, SWWF, YBCU |
| | Whitewater Creek | LM, SD, SWWF, YBCU | LM, SD, SWWF, YBCU |
| | Saliz Creek | LM, SD | LM, SD |
| | Tularosa River | CLF, LM, SD | CLF, LM, SD |
| | Negrito Creek | CLF, LM | CLF, LM |
| | South Fork Negrito Creek | CLF | CLF |
| 3. Blue River Subbasin | Blue River | LM, SD, YBCU | LM, SD, YBCU |
| | Campbell Blue Creek | CLF, LM, NMJM, SD | CLF, LM, NMJM, SD |
| | Dry Blue Creek | LM | LM |
| 4.Eagle Creek | | LM, SD | LM, SD |
| 5. Black River Subbasin | Black River | LM, NMJM | LM, NMJM |
| | Bear Wallow Creek | AT | |
| | North Fork Bear Wallow Creek | AT | |
| | Reservation Creek | | |
| | Fish Creek | AT | |
| | East Fork Black River | AT, NMJM, TFS | LM, NMJM |
| 6. Canyon Creek | | AT | |
| 7. Tonto Creek Subbasin | Tonto Creek | SWWF, YBCU | SD, SWWF |
| | Houston Creek | SD | SD |

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| | | | |
|---|---|---|---|
| | Haigler Creek | | |
| 8. Verde River Subbasin | Verde River | AT, SD, YBCU | LM, RS, SD, YBCU |
| | Oak Creek | YBCU | LM, SD, YBCU |
| | West Fork Oak Creek | | |

*Species codes:
AT = Apache trout (*Oncorhynchus apache*)
CLF = Chiracahua leopard frog (*Lithobates chiricahuensis*)
LM = Loachminnow (*Tiaroga cobitis*)
NMJM = New Mexico meadow jumping mouse (*Zapus hudsonius luteus*)
RS = Razorback sucker (*Xyrauchen texanus*)
SD = Spikedace (*Meda fulgida*)
SWWF = Southwestern willow flycatcher (*Empidonax trailii extimus*)
TFS = Three forks springsnail (*Pyrgulopsis trivialis*)
YBCU = yellow-billed cuckoo (*Coccyzus americanus*)

## Table 10. Approximate Proposed Critical Habitat Acres (ha) by Land Ownership and State (2 designations combined)

| Land Owner | Federal ac (ha) | State ac (ha) | Tribal ac (ha) | Private ac (ha) |
|---|---|---|---|---|
| Northern Mexican Gartersnake | 17,284 (6,995) | 1,414 (572) | 88 (36) | 8,996 (3,640) |
| Narrow-headed Gartersnake | 12,386 (5,013) | 329 (133) | 507 (205) | 5,479 (2,217) |
| **Total** | **29,670 (12,008)** | **1,743 (705)** | **595 (241)** | **14,475 (9,119)** |

## Table 11. Annual National Park Visitation Estimates

| National Monument | 2000 | 2005 | 2010 | Percent Change, 2000-2005 | Percent Change, 2005-2010 | Percent Change, 2000-2010 |
|---|---|---|---|---|---|---|
| Gila Cliff Dwellings NM | 46,194 | 40,058 | 32,652 | -13.3 | -18.5 | -29.3 |

Source: NPS 2011.

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## Table 12. Annual National Forest Visitation Estimates

| National Forest | National Forest Visits |
|---|---|
| Gila (2011) | 514,000 |
| Tonto (2008) | 4,801,000 |
| Prescott (2007) | 1,187,000 |
| Coronado (2007) | 2,453,000 |
| Apache-Sitgreaves (2007) | 1,521,000 |
| Coconino (2010) | 2,868,000 |
| **Total** | **13,334,000** |

Source: USFS 2007-2011.

## Table 13. Socioeconomic Profile of Counties

| Location | Population Density (persons/ sq. mile, 2010) | Population (2010) | % of Statewide Population (2010) | % Change (2000-2010) | Per Capita Income (2010 dollars)* | Poverty Rate (2010) |
|---|---|---|---|---|---|---|
| **Arizona** | 56.3 | 6,392,017 | 100% | 24.6% | $25,680 | 15.3% |
| ***Counties*** | | | | | | |
| Graham | 8.1 | 37,220 | 0.58% | 11.1% | $15,644 | 20.0% |
| Gila | 11.2 | 53,597 | .84% | 4.4% | $19,600 | 18.9% |
| Pinal | 70.0 | 375,770 | 5.9% | 24.6% | $21,716 | 13.5% |
| Apache | 6.4 | 71,518 | 0.58% | 11.1% | $12,294 | 34.4% |
| Navajo | 10.8 | 107,060 | 1.7% | 9.0% | $16,745 | 24.4% |
| Yavapai | 26.0 | 211,033 | 3.3% | 26.0% | $25,527 | 13.7% |
| Cococino | 7.2 | 131,824 | 2.1% | 11.7% | $22,632 | 18.6% |
| Mohave | 15.0 | 200,186 | 3.1% | 29.1% | $21,523 | 16.1% |
| La Paz | 4.6 | 20,489 | 0.32% | 3.9% | $21,165 | 20.3% |
| Cochise | 21.3 | 131,346 | 2.1% | 11.5% | $23,010 | 15.7% |
| Santa Cruz | 38.3 | 47,420 | .74% | 23.6% | $16,209 | 25.2% |
| Pima | 106.7 | 980,263 | 15.3% | 16.2% | $25,093 | 16.4% |
| Greenlee | 4.6 | 8,437 | .13% | -1.3% | $21,281 | 13.5% |

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

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## Table 14. Economic Activity in States Containing Proposed CH

| NUMBER OF EMPLOYEES AND ESTABLISHMENTS BY INDUSTRY (2009) | | | | |
|---|---|---|---|---|
| | Arizona | | New Mexico | |
| Industry | 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)

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## Table 15. Socioeconomic profile of tribal reservations included in proposed designation for northern Mexican gartersnake or narrow-headed gartersnake

| Location | Population Density (persons/ sq. mile, 2010) | Population (2010) | % of Statewide Population (2010) | % Change (2000-2010) | Per Capita Income (2010 dollars)* | Poverty Rate (2010) |
|---|---|---|---|---|---|---|
| **Arizona** | **56.3** | **6,392,017** | **100%** | **24.6%** | **$25,680** | **15.3%** |
| **Tribal Nation** | | | | | | |
| White Mountain Apache | 5 | 13,409 | 0.2% | 7.9% | $9,688 | 47% |
| San Carlos Apache | 3 | 10,068 | 0.2% | 7.3% | $10,222 | 46% |

Source: U.S. Census Bureau, 2010 Census and American Community Survey.

* In 2010 inflation-adjusted dollars

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# APPENDIX B: FIGURES

**Figure 1: Narrow-headed Gartersnake**

**Figure 2: Northern Mexican Gartersnake**

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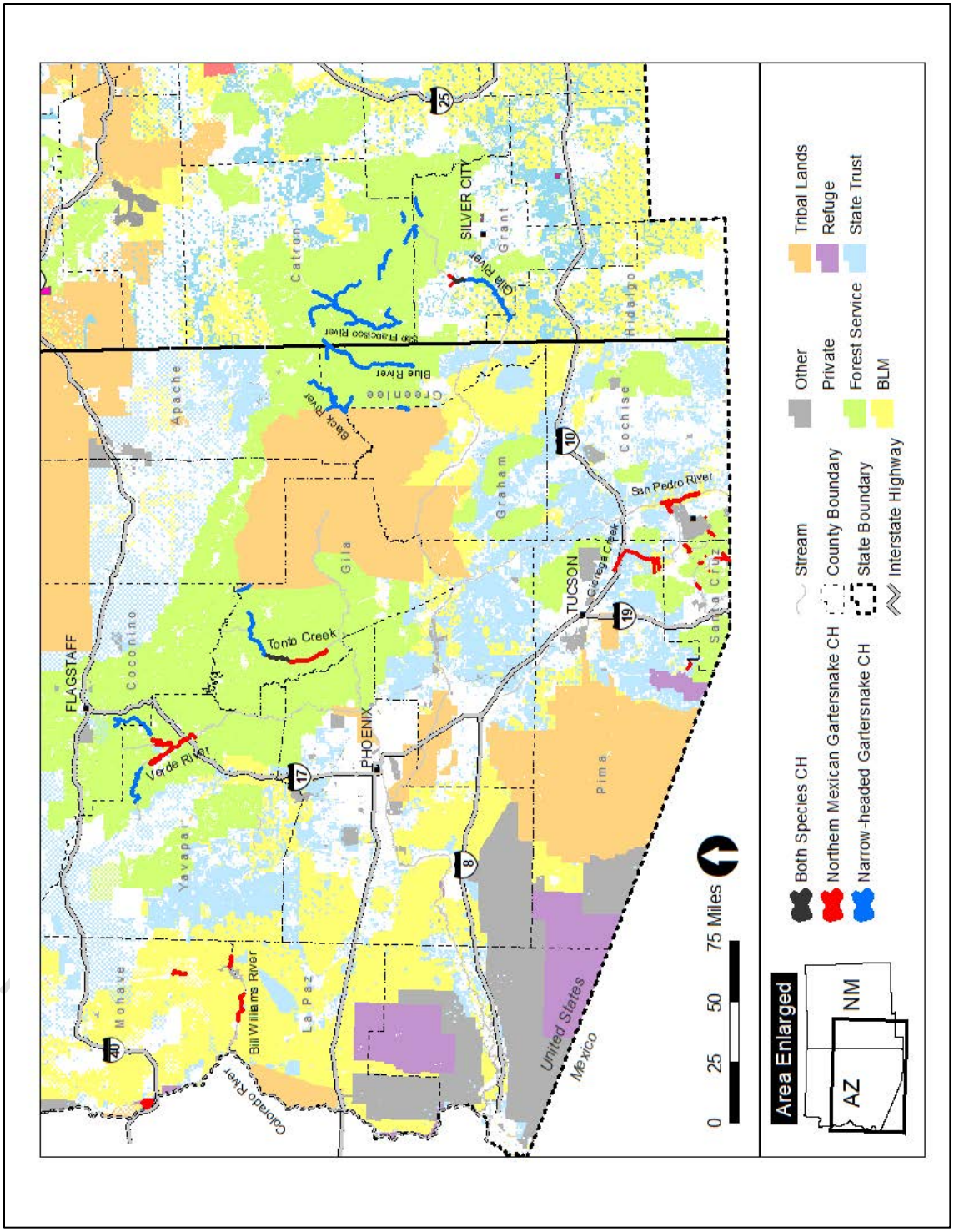


**Figure 3. Land Ownership of Proposed Critical Habitat Units for Northern Mexican and Narrow-Headed Gartersnakes**

# APPENDIX C: RELATED FEDERAL LAWS

- 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.) requires that ". . . the public lands be managed in a manner that will protect the quality of scientific, scenic, historical, ecological, environmental, air and atmospheric, water resource, and archeological values; that . . . will preserve and protect certain public lands in their natural condition; (and ) that will provide food and habitat for fish and wildlife . . ."
- 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 and "...where appropriate and to the extent practicable, will preserve and enhance the diversity of plant and animal communities." Additionally, sec. 219.12(g) requires the maintenance of viable populations of native vertebrates in National Forests.
- 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 that address management and resource protection of areas that support, or in the past supported, populations of the two gartersnakes. About 11% of proposed critical habitat for northern Mexican gartersnake (2,976 acres (1,609 ha)) and 63% of proposed critical habitat for narrow-headed gartersnake (11,766 acres (4,762 ha) occurs on lands managed by the USFS. The Prescott, Tonto, Coconino, Apache-Sitgreaves, Coronado, and Gila National Forests contain occupied habitat for one or both species. All six of these forests include general guidelines to manage habitat and work towards recovery of all listed species in accordance with their responsibilities under Section 7(a)(1) of the ESA.
- The Clean Water Act (CWA) provides for the restoration and maintenance of the chemical, physical, and biological integrity of the nation's lakes, streams, and coastal waters. Two key programs include Federal effluent limitations and state water quality standards (section 402 of the CWA), and the issuance of permits for the discharge of pollutants and dredged and fill materials into navigable waters (section 404). Both programs include enforcement mechanisms. It is worth noting that riparian habitat in the Southwest is usually above the ordinary high water mark and often does not meet the definition of jurisdictional wetlands of the United States.
- The U.S. Army Corps of Engineers (COE) regulates the discharge of fill material to waters of the United States, including New Mexico meadow jumping mouse habitat, pursuant to Section 404 of the Clean Water Act, and issues permits for actions proposed within such waters. Jurisdictional, nontidal waters of the United States regulated by the COE are defined in 33 CFR 328.4(c) as those that comprise the area of a water course that extends up to the ordinary high-water mark.

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- The U.S. Bureau of Land Management (BLM) implementation-level planning is required to consider all site-specific methods and procedures needed to bring species and their habitats to the condition under which management under the BLM sensitive species policies would no longer be necessary. BLM State Directors are responsible for developing and implementing procedures for the conservation of special status species on BLM-administered lands within their states (Bureau of Land Management 2008). 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 the two gartersnakes. Proposed critical habitat for northern Mexican gartersnake habitat occurs on 7,851 acres (3,177 ha) of the BLM Gila and Colorado River Districts within the Cienega Creek, Upper San Pedro River, and Bill Williams River Subbasin units. Proposed critical habitat for narrow-headed gartersnake occurs on 485 acres (196 ha) of the Las Cruces District within the Gila River Subbasin Unit. Similar to the USFS, BLM management includes cattle grazing, recreation, and fire. The BLM Tucson District has a progressive aquatic species restoration effort underway on its Las Cienegas National Conservation Area (NCA) and San Pedro Riparian NCA that includes repatriation of several listed species including northern Mexican gartersnake and several of its prey species. A total of 12,243 acres (4,955 ha) on these two NCAs are included in proposed critical habitat for northern Mexican gartersnake within the Cienega Creek (739 acres (299 ha), Empire Gulch & Empire Wildlife Pond (284 acres (115 ha), Gardner Canyon & Maternity Wildlife Pond (74 acres (33 ha), and Unnamed drainage & Gaucho Tank (269acres (109 ha)), Babocomari River (197 acres (80 ha)), O'Donnell Canyon (58 acres (24 ha), Post Canyon (19 acres (8 ha), and San Pedro River (4,909 acres (1,987 ha)) subunits. Through its aquatic species restoration program, BLM will allow release of northern Mexican gartersnakes to 20 identified sites on Las Cienegas NCA and 6 sites on San Pedro Riparian NCA. To date, Chiricahua leopard frogs, Gila topminnow, Gila chub, and/or desert pupfish have been released or naturally immigrated to 16 sites at Las Cienegas NCA and released to 4 sites on San Pedro Riparian NCA with the initial goal of establishing viable populations of prey species before reintroducing northern Mexican gartersnakes to any of these sites. Northern Mexican gartersnakes have been released to two sites at Las Cienegas NCA within Cienega Creek, Empire Gulch & Empire Wildlife Pond subunits of proposed critical habitat.
- National Wildlife Refuge System Improvement Act of 1997 (16 U.S.C. 668dd) establishes wildlife conservation, coupled with the purpose(s) for which each refuge was established, as the principal management direction on that refuge. The statute also requires preparation of a comprehensive conservation plan (CCP) for each refuge, and it prescribes the process for determining the compatibility of public uses on refuges. National wildlife refuges may provide additional protections, above those that are already being implemented pre-listing, under their management authorities. The goals of the National Wildlife Refuge System include explicit attention to the needs of threatened and endangered species. Section 7(a)(2) of the ESA requires Federal agencies to evaluate their actions with respect to any species that is proposed or listed as endangered or threatened and with respect to its critical habitat, if any is designated. Most of the Arivaca Cienega and all of the Lower Colorado River units of proposed critical habitat for northern Mexican gartersnake are located on Buenos Aires NWR and Bill Williams River

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NWR, respectively. Both of these national wildlife refuges have conservation plans that strive to manage for migratory birds, riparian habitat, and listed species.

- NPS will survey for, protect, and strive to recover all species native to national park system units that are listed under the Act. NPS will fully meet its obligations under the NPS Organic Act and the Act to both proactively conserve listed species and prevent detrimental effects on these species. To meet these obligations, NPS will cooperate with both the Service and the National Marine Fisheries Service to ensure that NPS actions comply with both the written requirements and the spirit of the Act.

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