

**§ 9903.201-1 CAS Applicability.**

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(b) \* \* \*

(6) Firm fixed-priced, fixed-priced with economic price adjustment (provided that price adjustment is not based on actual costs incurred), time-and-materials, and labor-hour contracts and subcontracts for the acquisition of commercial items.

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BILLING CODE 3110-01-P

**DEPARTMENT OF THE INTERIOR****Fish and Wildlife Service****50 CFR Part 17**

**Endangered and Threatened Wildlife and Plants; 90-Day Finding on a Petition To List the Northern Mexican Gartersnake as Threatened or Endangered With Critical Habitat**

**AGENCY:** Fish and Wildlife Service, Interior.

**ACTION:** Notice of 90-day petition finding and initiation of status review.

**SUMMARY:** We, the U.S. Fish and Wildlife Service (Service), announce a 90-day finding on a petition to list the northern Mexican gartersnake, *Thamnophis eques megalops*, as threatened or endangered with critical habitat under the Endangered Species Act of 1973, as amended (Act). The petitioners provided three listing scenarios for consideration by the Service: (1) Listing the United States population as a Distinct Population Segment (DPS); (2) listing the species throughout its range in the United States and Mexico based on its range-wide status; or (3) listing the species throughout its range in the U.S. and Mexico based on its status in the United States. We find the petition has presented substantial information that the northern Mexican gartersnake is a listable entity, and we find that the petition presents substantial scientific and commercial data indicating that listing may be warranted. Therefore, we are initiating a status review to determine if listing this species is warranted. To ensure that the status review is comprehensive, we are soliciting scientific and commercial information regarding this species. Any determinations on critical habitat will be made if and when a listing action is initiated for this species.

**DATES:** The finding announced in this document was made on December 13, 2005. To be considered in the 12-month

finding for this petition, comments and information should be submitted to us by March 6, 2006.

**ADDRESSES:** Data, information, comments, or questions concerning this petition and our finding should be submitted to the Field Supervisor, Arizona Ecological Services Field Office, 2321 West Royal Palm Drive, Suite 103, Phoenix, Arizona. The petition, supporting data, and comments will be available for public inspection, by appointment, during normal business hours at the above address.

If you wish to comment or provide information, you may submit your comments and materials by any one of the following methods:

1. You may submit written comments and information by mail to: Field Supervisor, Arizona Ecological Services Field Office, 2321 West Royal Palm Drive, Suite 103, Phoenix, Arizona.

2. You may hand-deliver written comments and information to our Field Supervisor, Arizona Ecological Services Field Office, 2321 West Royal Palm Drive, Suite 103, Phoenix, Arizona.

3. You may fax your comments to 602-242-2513.

4. You may send your comments by electronic mail (e-mail) directly to the Service at [MexGsnake@fws.gov](mailto:MexGsnake@fws.gov), or to the Federal Rulemaking Portal at <http://www.regulations.gov>. Please include "Attn: northern Mexican gartersnake" in the beginning of your message, and do not use special characters or any form of encryption. Electronic attachments in standard formats (such as .pdf or .doc) are acceptable, but please name the software necessary to open any attachments in formats other than those given above. Also, please include your name and return address in your e-mail message. If you do not receive a confirmation from the system that we have received your e-mail message, please submit your comments in writing using one of the alternate methods described above. In the event that our internet connection is not functional, please submit your comments by the alternate methods mentioned above.

**FOR FURTHER INFORMATION CONTACT:** Steve Spangle, Field Supervisor, Arizona Ecological Services Field Office (telephone 602-242-0210 and facsimile 602-242-2513).

**SUPPLEMENTARY INFORMATION:****Public Information Solicited**

When we make a finding that substantial information is presented to indicate that listing a species may be warranted, we are required to promptly commence a review of the status of the species. To ensure that the status review

is complete and based on the best available scientific and commercial information, we are soliciting information on the northern Mexican gartersnake. We request any additional information, comments, and suggestions from the public, other concerned governmental agencies, Native American Tribes, the scientific community, industry, or any other interested parties concerning the status of the northern Mexican gartersnake. We are seeking information regarding the species' historical and current status and distribution, its biology and ecology, ongoing conservation measures for the species and its habitat, and threats to the species and its habitat. If you wish to comment or provide information, you may submit your comments and materials concerning this finding to the Field Supervisor (see **ADDRESSES** section).

Our practice is to make any comments and materials provided, including names and home addresses of respondents, available for public review during regular business hours. Respondents may request that we withhold a respondent's identity, to the extent allowable by law. If you wish us to withhold your name or address, you must state this request prominently at the beginning of your submission. However, we will not consider anonymous comments. To the extent consistent with applicable law, we will make all submissions from organizations or businesses, and from individuals identifying themselves as representatives or officials of organizations or businesses, available for public inspection in their entirety. Comments and materials received will be available for public inspection, by appointment, during normal business hours at the above address.

**Background**

Section 4(b)(3)(A) of the Endangered Species Act of 1973, as amended (16 U.S.C. 1531 *et seq.*) (Act), requires that we make a finding on whether a petition to list, delist, or reclassify a species presents substantial scientific or commercial information indicating that the petitioned action may be warranted. We are to base this finding on all information available to us at the time we make the finding. To the maximum extent practicable, we are to make this finding within 90 days of our receipt of the petition, and publish our notice of this finding promptly in the **Federal Register**.

Our standard for substantial information within the Code of Federal Regulations (CFR) with regard to a 90-day petition finding is "that amount of

information that would lead a reasonable person to believe that the measure proposed in the petition may be warranted" (50 CFR 424.14(b)). If we find that substantial information was presented, we are required to promptly commence a review of the status of the species.

In making this finding, we relied on information provided by the petitioners and evaluated that information in accordance with 50 CFR 424.14(b). Our process of coming to a 90-day finding under section 4(b)(3)(A) of the Act and § 424.14(b) of our regulations is limited to a determination of whether the information in the petition meets the "substantial information" threshold.

We do not conduct additional research at this point, nor do we subject the petition to rigorous critical review. Rather, as the Act and regulations contemplate, in coming to a 90-day finding, we accept the petitioner's sources and characterizations of the information unless we have specific information to the contrary.

Our finding considers whether the petition states a reasonable case for listing the species under the Act on its face. Thus, our finding expresses no view as to the ultimate issue of whether the species should be listed. We reach a conclusion on that issue only after a more thorough review of the status of the species. In that review, which will be completed on or by September 15, 2006, we will perform a rigorous, critical analysis of the best available scientific and commercial information, not just the information in the petition. We will ensure that the data used to make our determination as to the status of the species is consistent with the Act and Information Quality Act (44 U.S.C. 3516).

#### Petition

On December 19, 2003, we received a petition dated December 15, 2003, requesting that we list the northern Mexican gartersnake, *Thamnophis eques megalops*, as threatened or endangered, and that critical habitat be designated concurrently with the listing. The petition, submitted by the Center for Biological Diversity (hereinafter referred to as the petitioners), was clearly identified as a petition for a listing rule, and contained the names, signatures, and addresses of the requesting parties. Included in the petition was supporting information regarding the species' taxonomy and ecology, historical and current distribution, present status, and potential causes of decline. We acknowledged the receipt of the petition in a letter to Mr. Noah Greenwald, dated

March 1, 2004. In that letter, we also advised the petitioners that, due to funding constraints in fiscal year 2004, we would not be able to begin processing the petition in a timely manner.

On May 17, 2005, the petitioners filed a complaint for declaratory and injunctive relief, challenging our failure to issue a 90-day finding in response to the petition as required by U.S.C. 1533(b)(3)(A) and (B). In a stipulated settlement agreement, we agreed to submit a 90-day finding to the **Federal Register** by December 16, 2005, and if positive, complete a 12-month finding on or by September 15, 2006 [*Center for Biological Diversity v. Norton*, CV-05-341-TUC-CKJ (D. Ariz)]. The settlement agreement was signed and adopted by the District Court for the District of Arizona on August 22, 2005. This notice constitutes our 90-day finding for the petition to list the northern Mexican gartersnake as threatened or endangered, pursuant to the Court's order.

#### Biology and Distribution

The northern Mexican gartersnake may occur with other native gartersnake species and can be difficult to identify in the field. The northern Mexican gartersnake is a medium-sized member of the family Colubridae with a maximum known length of 112 centimeters (cm) [44 inches (in)]. It ranges in background color from olive to olive-brown to olive-gray. Three stripes run the length of the body, with a yellow stripe down the back that darkens toward the tail. The pale yellow to light-tan lateral stripes distinguish the northern Mexican gartersnake from other gartersnake species because a portion of the lateral stripe is found on the fourth scale row. Paired black spots extend along the dorsolateral fields. A light-colored crescent extends behind the corners of the mouth.

The northern Mexican gartersnake is one of ten subspecies currently recognized under *Thamnophis eques*, has the largest historical distribution of these subspecies, and is the only subspecies known to occur in the United States. Robert Kennicott first described this northern subspecies of Mexican gartersnake in 1860 as *Eutenia megalops* from the type locality of Tucson, Arizona (Rosen and Schwalbe 1988). In 1951, Dr. Hobart Smith renamed the subspecies with its current scientific name of *Thamnophis eques megalops* (Rosen and Schwalbe 1988). A summary of taxonomic history can be found in Rosen and Schwalbe (1988).

The historical distribution of northern Mexican gartersnake in the United

States was constrained largely to Arizona and, to a lesser degree, New Mexico. There have been a number of inventory, monitoring, and/or survey efforts in the United States, most of which occurred in Arizona (which encompasses the vast majority of the historical distribution of northern Mexican gartersnakes in the United States). Fewer survey data were found in the literature for Mexico and New Mexico. In Arizona, the historical distribution once included the Santa Cruz, San Pedro, Colorado, Salt, Agua Fria, Rio Yaqui, and Verde River watersheds and presumably the Gila River watershed based on historically suitable habitat and geographic proximity to formerly extant populations.

In New Mexico, the northern Mexican gartersnake was once extant in the upper Gila River watershed in Grant and Hidalgo Counties. In April of 1977, Roger Conant, James S. Jacob, and a group of students counted approximately 100 northern Mexican gartersnakes in and around three small ponds on private land southwest of Mule Creek Village (Degenhardt et al. 1996). This population was considered a stronghold for the species in New Mexico (Degenhardt et al. 1996). Charlie Painter, State Herpetologist for the New Mexico Department of Game and Fish (NMDGF), returned to this location in May 1994 during favorable conditions and found only one specimen (C. Painter, pers. comm., New Mexico Department of Game and Fish, 2005). This represents a major decline in a stronghold population. Mr. Painter stated that he strongly suspects that northern Mexican gartersnakes are currently extirpated from New Mexico based on several factors including limited historical distribution in that State, modification and loss of suitable habitat, nonnative species introductions, and the lack of protections offered to non-listed, but declining native species on private land (all known records of northern Mexican gartersnakes in New Mexico are on private land) (C. Painter, pers. comm., New Mexico Department of Game and Fish, 2005).

The current distribution of northern Mexican gartersnakes within the United States is now generally believed to be limited to four geographic areas in Arizona: (1) Middle/upper Verde River—lower Tonto Creek; (2) Black River watershed; (3) upper Santa Cruz/San Pedro watersheds; and, (4) the San Bernardino National Wildlife Refuge in the upper Rio Yaqui watershed (Fitzgerald 1986; Rosen and Schwalbe 1988; Arizona Game and Fish

Department 1996; Rosen et al. 2001; Holycross and Burger 2005).

The subspecies is also historically known from the Sierra Madre Occidental and the Mexican Plateau in the Mexican states of Sonora, Chihuahua, Durango, Coahila, Zacatecas, Guanajuato, Nayarit, Hidalgo, Jalisco, San Luis Potosí, Aguascalientes, Tlaxcala, Puebla, México, Veracruz, and Querétaro (Rossman et al. 1996).

The northern Mexican gartersnake is considered a native riparian obligate (restricted to riparian areas when not engaged in dispersal behavior for the purposes of genetic emigration); occurring chiefly in the following general habitat types: (1) Source-area wetlands (e.g., cienegas (mid-elevation wetlands with highly organic, reducing soils), stock tanks (earthen water impoundments), etc.); (2) large river riparian woodlands and forests; and (3) streamside gallery forests (as defined by well-developed broadleaf deciduous riparian forests with limited, if any, herbaceous ground cover or dense grass) (Hendrickson and Minckley 1984; Rosen and Schwalbe 1988; Arizona Game and Fish Department 2001). Habitat characteristics preferred by the northern Mexican gartersnake varies based on the type of habitat. For example, in source-area wetlands, dense vegetation consisting of knot grass (*Paspalum distichum*), spikerush (*Eleocharis*), bulrush (*Scirpus*), cattail (*Typha*), deergrass (*Muhlenbergia*), sacaton (*Sporobolus*), Fremont cottonwood (*Populus fremontii*), Goodding's willow (*Salix gooddingii*), and velvet mesquite (*Prosopis velutina*) may be preferred (Rosen and Schwalbe 1988).

In small streamside riparian habitat, this snake is often associated with Arizona sycamore (*Platanus wrightii*), sugar leaf maple (*Acer grandidentatum*), velvet ash (*Fraxinus velutina*), Arizona cypress (*Cupressus arizonica*), Arizona walnut (*Juglans major*), Arizona alder (*Alnus oblongifolia*), alligator juniper (*Juniperus deppeana*), Rocky Mountain juniper (*J. scopulorum*), and a number of oak species (*Quercus* spp.) (McCranie and Wilson 1986; Cirett-Galan 1996).

In riparian woodlands consisting of cottonwood and willow or gallery forests of broadleaf and deciduous species along larger rivers, the northern Mexican gartersnake may be observed in less dense mixed grasses along the bank or in the shallows (Rossman et al. 1996; Rosen and Schwalbe 1988). Within and adjacent to the Sierra Madre Occidental in Mexico, it occurs in general habitat associations described as montane woodland, Chihuahuan desertscrub, mesquite-grassland, and Cordillera

Volcánica montane woodland (McCranie and Wilson 1987).

The northern Mexican gartersnake is surface active at ambient temperatures ranging from 22° Celsius (C) to 33° C (71° Fahrenheit (F) to 91° and forages along the banks of waterbodies feeding primarily upon native fish [e.g., Gila topminnow (*Poeciliopsis occidentalis occidentalis*), desert pupfish (*Cyprinodon macularius*), Gila chub (*Gila intermedia*), and roundtail chub (*Gila robusta*)] and adult and larval native ranid frogs [e.g., lowland leopard frog (*Rana yavapaiensis*) and Chiricahua leopard frog (*Rana chiricahuensis*)], but may also supplement its diet with earthworms and vertebrates such as lizards, small rodents, salamanders, and hydrid frogs (treefrogs) (Rosen and Schwalbe 1988). An important component of suitable northern Mexican gartersnake habitat is an intact native prey base that is not significantly affected by nonnative, invasive species (Rosen and Schwalbe 1988, 1997; Clarkson and Rorabaugh 1989; Jennings et al. 1992; Holm and Lowe 1995; Fernandez and Rosen 1996; Rosen et al. 2001; Matthews et al. 2002; Holycross and Burger 2005). However, in some populations where the species is present with bullfrogs, adult northern Mexican gartersnakes will prey upon juvenile bullfrogs and/or bullfrog tadpoles (Holycross and Burger 2005). Juvenile northern Mexican gartersnakes may also prey upon nonnative mosquito fish (*Gambusia affinis*) (Holycross and Burger 2005).

Sexual maturity in male northern Mexican gartersnakes occurs at two years of age and at two to three years of age in females. Northern Mexican gartersnakes are ovoviviparous (eggs develop and hatch within the oviduct of the female). Mating occurs in April and May in their northern distribution followed by the live birth of between 7 and 26 neonates (newly born individuals) (average is 13.6) in July and August (Rosen and Schwalbe 1988). Approximately half of the sexually mature females within a population reproduce in any one season (Rosen and Schwalbe 1988).

#### Previous Federal Actions

We placed the northern Mexican gartersnake on the list of candidate species as a Category 2 species in 1988 (50 FR 37958). Category 2 species were those for which existing information indicated that listing was possibly appropriate, but for which substantial supporting biological data to prepare a proposed rule were lacking. In the 1996 Candidate Notice of Review (February 28, 1996; 61 FR 7596), the use of

Category 2 candidates was discontinued, and the northern Mexican gartersnake was no longer recognized as a candidate.

#### Discussion

We discuss below each of the major assertions made in the petition, organized by the listing factors found in section 4(a)(1) of the Act. Section 4 of the Act and its implementing regulations found at 50 CFR 424 set forth the procedures for adding species to the Federal list of endangered and threatened species. A species may be determined to be an endangered or threatened species if it is threatened by one or more of the five factors described in section 4(a)(1) of the Act and meets either the definition of endangered or threatened pursuant to section 3 of the Act. An endangered species is any species which is in danger of extinction throughout all or a significant portion of its range. A threatened species is any species which is likely to become an endangered species within the foreseeable future throughout all or a significant portion of its range. The five listing factors are: (1) The present or threatened destruction, modification, or curtailment of its habitat or range; (2) overutilization for commercial, recreational, scientific, or educational purposes; (3) disease or predation; (4) the inadequacy of existing regulatory mechanisms; and (5) other natural or manmade factors affecting its continued existence. The petitioners contend that all five factors are applicable to some degree for the northern Mexican gartersnake, as discussed below.

This 90-day finding is not a status assessment of the northern Mexican gartersnake and does not constitute a status review under the Act. The discussion presents information provided in the petition related to the factors used for evaluation of listing pursuant to section 4(a)(1) of the Act for the northern Mexican gartersnake.

#### A. Present or Threatened Destruction, Modification, or Curtailment of the Species' Habitat or Range

##### Geographic Range and Status

##### Information Provided in the Petition

The petitioners claim that northern Mexican gartersnake populations in Arizona are in decline and are clearly threatened and reference several reports that provide data on survey efforts for the species. However, the petitioners' state that information on the northern Mexican gartersnakes' population status in New Mexico, and in particular, Mexico is less certain but believed to indicate potential extirpations or

declines (Lowe 1985; Stebbins 1985; Rosen et al. 2001; Degenhardt et al. 1996; Howland 2000).

In 2000, Rosen et al. (2001) resurveyed northern Mexican gartersnake populations known to be extant during the early to mid 1980s in southeastern Arizona and included additional information collected from 1993 to 2001. Rosen et al. (2001) reported their results in terms of increasing, stabilized, or decreasing populations of northern Mexican gartersnake. The primary means used to sample the herpetofauna included various trapping techniques and field searches. Three sites (San Bernardino National Wildlife Refuge, Finley Tank at the Audubon Research Ranch near Elgin, and Scotia Canyon in the Huachuca Mountains) were intensively surveyed with varied results at each site that were discussed by the petitioners and in further detail below.

According to the petitioners, the northern Mexican gartersnake was the primary gartersnake species at the San Bernardino National Wildlife Refuge from the 1950s through the 1970s. The species is currently extirpated or near extirpation in this area based on substantial survey effort on the refuge from 1985 to 1989 and again from 1992 to 1999, which noted severe declines (Rosen and Schwalbe 1997; Rosen et al. 2001). Investigators described the decline at the refuge as severe because in 1995, 31 northern Mexican gartersnakes were observed on the refuge at a standardized capture rate of 0.248 captures/day while in 1999, one northern Mexican gartersnake was observed with a standardized capture rate of 0.002 captures/day; a several-fold decline. The decline of the northern Mexican gartersnake on the refuge is largely attributed to catastrophic declines and the ultimate extirpation of a primary prey species, the Chiricahua leopard frog, a federally threatened species (Rosen and Schwalbe 1997; Rosen et al. 2001).

The petitioners reference Rosen and Schwalbe (1997) which also provides a detailed assessment of the status of the northern Mexican gartersnake, as well as other aquatic herpetofauna (reptiles and amphibians) (including bullfrogs and both Chiricahua and lowland leopard frogs) within the San Bernardino National Wildlife Refuge. Their work summarizes many projects which commenced in 1985 and focused on (1) the impacts of bullfrog invasion on the northern Mexican gartersnake; (2) the effectiveness of bullfrog control measures; and (3) the effectiveness of leopard frog recovery efforts in the San Bernardino Valley. The primary means

used to sample the herpetofauna included various trapping techniques and field searches.

Rosen and Schwalbe (1997) noted the northern Mexican gartersnake as the primary historical gartersnake species in the San Bernardino National Wildlife Refuge, but sampling results in the mid-1980s indicated the species as "unusually uncommon." Observations of northern Mexican gartersnake populations in 1985 and 1986 in the San Bernardino National Wildlife Refuge indicated that recruitment was severely hampered due to the significantly limited number of specimens observed in the juvenile size classes. The investigators attributed this observation to bullfrog predation as most adult specimens captured displayed several scars from repeated apparent predation attempts by bullfrogs (Rosen and Schwalbe 1997). Bullfrog predation can be discerned by such tail-scarring. Native predators generally consume the entire animal whereas bullfrogs will often attempt to capture prey items larger than they can subdue and physically ingest, which results in the scarring observed in northern Mexican gartersnakes on the refuge and other areas where they occur with bullfrogs. Similar observations were made by Holm and Lowe (1995) in Scotia Canyon, Huachuca Mountains.

The petitioners reference Rosen and Schwalbe (1997) in stating that declines of northern Mexican gartersnakes have been noted in the San Bernardino Valley since before formal investigations commenced at the San Bernardino National Wildlife Refuge. Cumulative data of gartersnake captures (including both the northern Mexican gartersnake and the Marcy's checkered gartersnake (*Thamnophis marcianus marcianus*)) in the San Bernardino National Wildlife Refuge indicated a 39 percent decline in northern Mexican gartersnake capture rate per unit effort between the 1980s and the 1990s. These data were derived from aquatic trapping of northern Mexican gartersnake which provided Rosen and Schwalbe (1997) with substantial annual samples from 1993 to 1997. Rosen and Schwalbe (1997) reasoned this decline could be attributed to natural response to persistent drought conditions but that it may have "masked a critical, rapid decline" in northern Mexican gartersnake populations of southeastern Arizona. The qualitative and quantitative data generated from the exhaustive research conducted on this species in this area clearly confirms the species is nearing extirpation from the San Bernardino National Wildlife

Refuge, a former stronghold (Rosen and Schwalbe 1997; Rosen et al. 2001).

Surveys at Finley Tank located on the Audubon Research Ranch near Elgin, Arizona, that occurred during the period from 1985 to 1988 and again in 2000 were cited by petitioners. Chiricahua leopard frogs were noted as abundant in the 1985 and 1986 field seasons but have not been observed there since 1988. The petitioners cited an observation by Dr. Phil Rosen found in Rosen et al. (2001) where he explained, "At sites where leopard frogs are absent, often apparently due to introduced centrarchid fish [especially largemouth bass (*Micropterus salmoides*) and green sunfish (*Lepomis cyanellus*)] as at Babocamari (Cienega), northern Mexican garter snakes have become rare prior to the arrival of the bullfrog. With only fish to eat, growth is probably markedly reduced, and further, at centrarchid sites there are generally few small-to medium-sized fish, of edible size for most gartersnakes. In that scenario, gartersnake reproduction is likely to be reduced, and juvenile growth slowed, as is consistent with the low densities and generally smaller snakes seen at the Babocamari." The decline of native leopard frogs from Finley Tank, possibly exacerbated by the effect of recent drought years on the habitat within and around Finley Tank, was, according to petitioners, the principle factor which led to the precipitous decline in northern Mexican gartersnakes since 1988 at this location.

The last intensively resurveyed area referenced by the petitioners and discussed in Rosen et al. (2001) was Scotia Canyon in the Huachuca Mountains of southeastern Arizona. A comparison of survey data from Holm and Lowe (1995) suggests a possible decline of northern Mexican gartersnake populations in this area based on survey data from 1980 to 1982, with low capture rates in 1993, and even lower capture rates in 2000. Rosen et al. (2001) noted that bullfrogs were first detected in Scotia Canyon in 1989, and by 1992 bullfrogs had overtaken the canyon. As referenced in the petition, this bullfrog invasion affected the northern Mexican gartersnake age-class distribution in Scotia Canyon to one favoring older adults (too large to be eaten by bullfrogs) with little, if any, recruitment in the juvenile age-class due to bullfrog predation on neonatal and juvenile gartersnakes (Holm and Lowe 1995; Rosen et al. 2001). Rosen et al. (2001) commented that the data were too sparse to confirm that extirpation of northern Mexican gartersnakes from Scotia Canyon was inevitable, but that northern Mexican gartersnakes may still

persist there as a population vulnerable to extirpation.

The petitioners also reference Holm and Lowe (1995) who also conducted a herpetofaunal assessment in Scotia Canyon in 1993, using techniques such as active searching during optimal conditions and trapping using drift fences (barriers at ground level that direct the movements of small vertebrate species into buried containers adjacent to the barrier) with minnow traps. The purpose of this assessment was to compare the 1993 herpetofaunal community to the 1980 through 1982 results in the same area. As discussed in Rosen *et al.* (2001), Holm and Lowe (1995) noted bullfrogs to have increased markedly over the time between surveys. Native rapid frogs were uncommon during the surveys during the early 1980s and were declared locally extirpated from the study area in 1993. Of 39 northern Mexican gartersnakes captured in 1993, 7 were adults, 2 were yearlings, and 30 were young of the year; as compared to 6 yearlings and 2 small adults captured in 1980 to 1982. Holm and Lowe (1995) suggested such a population structure of northern Mexican gartersnakes indicated that while adults are capable of living longer and achieving significant size, recruitment is low due to high mortality of juvenile snakes from bullfrog predation. Their finding was supported by 93 percent of northern Mexican gartersnakes that were observed with broken tails likely caused by bullfrog predation attempts based upon the predator community in this area (Holm and Lowe 1995).

Four southeastern Arizona cienega habitats were identified by the petitioners as being resurveyed and subsequently discussed in Rosen *et al.* (2001): the Arivaca Cienega, the Babocomari Cienega, Cienega Creek at Empire-Cienega Ranch, and Lower Cienega Creek at Cienega Creek County Preserve. The Arivaca Cienega was a historical locality for both the northern Mexican gartersnake and the Chiricahua leopard frog although neither species has been found at this location since 1980 (Rosen and Schwalbe 1988; Rosen *et al.* 2001). Arivaca Cienega was surveyed on June 13, 1985, and the authors recorded that bullfrogs were "extremely abundant" and grazing pressure was heavy with over 500 cattle grazing in the habitat (Rosen and Schwalbe 1988). This locality was again sampled in 1994 and 2000 with extensive trapping and survey effort which yielded a single northern Mexican gartersnake (Rosen *et al.* 2001). Rosen *et al.* (2001) commented that the northern Mexican gartersnake

population of the Arivaca Cienega likely succumbed to the effects of grazing and a massive bullfrog population, but that the single northern Mexican gartersnake found in 2000 indicated the "tenacity of a species that long ago apparently became rare in the area."

A herpetologist surveyed the Babocomari Cienega in June of 1958 and noted that northern Mexican gartersnakes, lowland leopard frogs, and "southern-form" (Chiricahua) leopard frogs were extremely abundant (Rosen and Schwalbe 1988; Rosen *et al.* 2001). Some 27 years later in 1985, research herpetologists again visited this location only to find four northern Mexican gartersnakes and no leopard frogs (Rosen *et al.* 2001). Surveys that occurred in 2000 did not find either species (Rosen *et al.* 2001). Babocomari Cienega was overtaken by black bullheads (*Ameiurus melas*) and largemouth bass (*Micropterus salmoides*) between the late 1950s and the mid-1980s (Rosen and Schwalbe 1988). Rosen *et al.* (2001) theorize that competition for prey and direct predation from nonnative fish were involved in the decline of northern Mexican gartersnakes and leopard frogs at Babocomari Cienega.

The remaining two cienegas identified by the petitioners and addressed by Rosen *et al.* (2001) are both associated with Cienega Creek in Santa Cruz and Pima counties of Arizona. The first, a former stronghold for northern Mexican gartersnakes, was Cienega Creek at Empire-Cienega Ranch which was considered the "most natural cienega remaining in southern Arizona that supports a large and dense population of Gila topminnow" (Rosen *et al.* 2001). Aquatic habitat parameters at this location prevented investigators from setting traps per standard protocols, which indirectly placed greater emphasis, and less certainty, on hand-collection of northern Mexican gartersnakes. Regardless, three adult northern Mexican gartersnakes were captured by hand at this location: two in 1986 and one in 2000. While still extant, both northern Mexican gartersnakes and leopard frogs have declined precipitously from this area and bullfrogs have successfully invaded.

The last of the cienega habitats that was specifically investigated by Rosen *et al.* (2001) and identified by the petitioners was Lower Cienega Creek at Cienega Creek County Preserve. Rosen *et al.* (2001) states that this cienega was historically lush with aquatic and emergent vegetation. Overgrazing during the early and mid-1980s denuded much of the area's vegetation and resulted in significant erosion evidenced by the

downcutting of stream banks, in some cases in excess of 4.6 meters (15 feet) deep. Lowland leopard frogs have nonetheless remained extant through 2001 (Rosen *et al.* 2001). According to the petitioners, the cienega was purchased by Pima County in the 1990s and grazing has been prohibited on-site since that time. Subsequent trips to this area since the change in ownership have revealed a significant improvement in habitat characteristics. By 1998, the first northern Mexican gartersnake was observed on the new Cienega Creek preserve and has been occasionally observed there since (Rosen *et al.* 2001). Rosen *et al.* (2001), in acknowledgement of management objectives for this area, the potential for habitat regeneration and persistence, and its influence on Cienega Creek as a whole, stated that Cienega Creek "appears to have the highest potential of any site in the U.S. for preservation of the (northern) Mexican gartersnake."

According to the surveyors, the many sites in southeastern Arizona resurveyed by Rosen *et al.* (2001) since the 1980s yielded mixed results. Populations possibly increased at 1 site (lower Cienega Creek), were possibly stable at 2 (lower San Raphael Valley, Arivaca), were negative at 14 [Empire-Cienega Creek, Babocomari, Bog Hole, O'Donnell Creek, Turkey Creek (Canelo), Post Canyon, Scotia Canyon, Lewis Springs (San Pedro River), San Pedro River near Highway 90, Barchas Ranch Pond (Huachuca Mountain bajada), Heron Spring, Sharp Spring, Elgin-Sonoita windmill well site, and Upper 13 Reservoir (San Raphael Valley)], and showed major, demonstrable declines at 2 sites (San Bernardino National Wildlife Refuge and Finley Tank). No confirmed locality extirpations of northern Mexican gartersnake in southeastern Arizona were documented in Rosen *et al.* (2001).

#### Habitat

##### Information Provided in the Petition

The petitioners state that northern Mexican gartersnake habitat is threatened by a variety of factors such as livestock grazing, water withdrawal, streambed modification, dams and dam operation, groundwater pumping, recreation, mining, encroaching urban development, pollution, woodcutting, cultural impacts, and climate change (Hendrickson and Minckley 1984; Szaro *et al.* 1985; Lowe 1985; Rosen and Schwalbe 1988; and Rosen *et al.* 2001). The petitioners did not provide substantial information that addresses such threats to northern Mexican gartersnake habitat such as woodcutting,

pollution, cultural impacts, mining, and recreation but cited Lowe (1985), which discusses how such activities have led to the extirpations of riparian reptile and amphibian populations, and in some cases, communities in specific geographic areas.

The petitioners specifically identify the loss of and continuing threats to wetland and cienega habitats and reiterate their importance to this particular gartersnake subspecies (Hendrickson and Minckley 1984; Lowe 1985). Hendrickson and Minckley (1984) state that cienegas habitats are an aquatic climax community based on their data review. Many of these unique habitats of the southwestern United States, and Arizona in particular, have been lost in the past century to streambed modification, livestock grazing, cultural impacts, stream flow stabilization by upstream dams, channelization, and stream flow reduction from groundwater pumping and diversions (Hendrickson and Minckley 1984).

Many sub-basins where cienegas have been severely modified or lost entirely overlap, wholly or partially, the historical distribution of the northern Mexican gartersnake including the San Simon, Sulphur Springs, San Pedro, and Santa Cruz valleys of southeastern and south-central Arizona. The San Simon Valley possessed several natural cienega habitats with "luxuriant vegetation" prior to 1885 and was used as a watering stop for pioneers, military, and surveying expeditions (Hendrickson and Minckley 1984). In the subsequent decades, the disappearance of grasses and commencement of severe erosion were the result of heavy grazing pressure by large herds of cattle as well as the effects from wagon trails that paralleled arroyos, occasionally crossed them, and often required stream bank modification (Hendrickson and Minckley 1984). Today, only the artificially-maintained San Simon Cienega exists in this valley. Similar accounts of past conditions, adverse effects from historical anthropogenic activities, and subsequent reduction in the extent and quality of cienega habitats in the remaining valleys are also provided in Hendrickson and Minckley (1984).

The regional, ecological ramifications of future climate change were noted by the petitioners as a significant threat to the northern Mexican gartersnake habitat. Specifically, the petitioners restated findings discussed in the Final Report of the Southwest Regional Climate Change Symposium and Workshop that occurred in September 1997. Those findings indicated that the

future climate in the American southwest may include decreases in summer and winter precipitation and an increase of up to 4 °C (7 °F) in average temperature. The petitioners claim that such changes in weather patterns and climactic conditions will result in more variability in flows that could compromise perennial and intermittent streams.

The petitioners also contend that northern Mexican gartersnake populations are vulnerable to local extirpation from the effects of livestock grazing within and adjacent to stock tanks, cienegas, and riparian areas (Rosen and Schwalbe 1988). Specifically, the loss of bank-side vegetation removes an essential habitat component for such behaviors as foraging and escaping predation. Once a northern Mexican gartersnake population has been extirpated, Rosen and Schwalbe (1988) state that unassisted recolonization of extirpated habitat is often precluded because it is either isolated between lengthy dewatered reaches of intermittent streams or not available to suitable overland routes of movement for an aquatic habitat specialist.

The petitioners cite Rosen and Schwalbe (1988) which provides an example of where a known (as of 1983) northern Mexican gartersnake population was extirpated in 1984 in Little Ash Creek of the upper Agua Fria watershed, potentially due to effects of overgrazing the stream banks and emergent vegetation. A survey of the area in April 1984 produced not a single specimen, and the authors noted severe overgrazing that had removed virtually all the cover used by northern Mexican gartersnakes in years prior. In August of the following year, the area was resurveyed. Rosen and Schwalbe (1988) noted that livestock had been removed from the area and that the vegetation had regrown to become suitable for northern Mexican gartersnake, yet an intensive survey again yielded no specimens.

The petitioners note that stock tanks used in livestock management also experience intentional or unintentional introductions of nonnative species of fish, amphibians, and crayfish by anglers and private landowners (Rosen et al. 2001). The alteration of habitat, such as bank-side vegetation removal and degradation, around stock tanks, may also favor nonnative predators as a secondary effect from livestock grazing and a threat to northern Mexican gartersnake (Rosen and Schwalbe 1988). Alternatively, well-managed stock tanks can provide habitat suitable for occupation of the northern Mexican

gartersnake, both structurally and in terms of its prey base, especially when the tank remains devoid of nonnative species while supporting native prey species (Rosen and Schwalbe 1988).

The petitioners discuss how Szaro et al. (1985) assessed the effects of grazing on a similar species of gartersnake, the wandering (terrestrial) gartersnake (*Thamnophis elegans vagrans*). The assessment compared wandering (terrestrial) gartersnake populations in both grazed and ungrazed portions of the same stream. Results indicated that snake abundance and biomass were significantly higher in ungrazed habitat with a five-fold difference in number of snakes captured, despite the difficulties of observing snakes in dense, complex habitat (Szaro et al. 1985). Szaro et al. (1985) also noted the importance of riparian vegetation in thermoregulation, foraging, and predation-avoidance behaviors. The petitioners claim that the northern Mexican gartersnake continues to be impacted by on-going livestock operations and provided specific reports of adverse effects to northern Mexican gartersnake habitat from livestock grazing on public and private lands in southeastern Arizona where the species is thought to be extant (Rosen et al. 2001).

Lastly, the historical and potential future effects to northern Mexican gartersnake habitat from human population growth and subsequent water needs were discussed by the petitioners. Specifically, once-perennial extensive reaches of historical habitat for the northern Mexican gartersnake along the San Pedro and Santa Cruz rivers have been lost to the effects of groundwater pumping in response to increasing human populations and ensuing urbanization and development within the region. The petitioners also express concern for extant populations of northern Mexican gartersnake in the Arivaca Cienega and upper Verde River because of projected population growth, urbanization, and development in those areas and evidence of adverse effects to the water supply of these waterbodies due to increasing numbers of regional groundwater wells required to support such growth.

#### Summary of Habitat Threats and Evaluation of Information in the Petition

The petitioners have provided substantial scientific information that a variety of anthropogenic activities and other factors that affect the habitat of northern Mexican gartersnake.

*B. Overutilization for Commercial, Recreational, Scientific, or Educational Purposes*

Information Provided in the Petition

The petitioners state that lawful or unlawful field collecting of northern Mexican gartersnakes has not historically been a significant threat to the species. However, the petitioners cite that illegal field collecting may significantly impact small isolated populations, especially if reproductive females are removed from the population (Painter 2000). The northern Mexican gartersnake may not be collected without special authorization by the AGFD or the NMDGF. Specific discussion of the regulatory protections for the northern Mexican gartersnake is provided in Section D "Inadequacy of Existing Regulatory Mechanisms" below.

Evaluation of Information in the Petition

Since collection of the species is not known to be a major threat, the petitioners did not argue that field collection of the species for commercial, recreational, scientific, or educational purposes has contributed significantly to the current status of the northern Mexican gartersnake. However, the petitioners did provide a rational argument that small, isolated populations may be particularly vulnerable to extirpation from the future illegal collection of reproductive females.

*C. Disease and Predation*

Information Provided in the Petition and Service Files

The petitioners acknowledge that disease has not been a direct cause for population decline of the northern Mexican gartersnake. Based on our information, while disease has not been documented as a specific threat to northern Mexican gartersnake in the United States or Mexico, disease and nonnative parasites have been implicated in the decline of its native prey species. The chytrid fungus outbreak has been identified as a chief causative agent in the significant declines of many of the native ranid frog species and regional concerns exist for the native fish community due to nonnative parasites such as the Asian tapeworm (*Bothriocephalus acheilognathi*) in southeastern Arizona (Rosen and Schwalbe 1997; Morell 1999; Sredl and Caldwell 2000; Hale 2001; Bradley et al. 2002).

The petitioners discussed the threats from nonnative species invasions to northern Mexican gartersnakes'

functional prey base. The petitioners indicated that riparian communities in Arizona have been significantly impacted by a shift in species composition, from being historically dominated by native fauna to being increasingly impacted by an expanding assemblage of nonnative species (Rosen and Schwalbe 1988, 1995, 1996, 1997; Holm and Lowe 1995; Degenhardt et al. 1996; Fernandez and Rosen 1996; Rosen et al. 2001). The petitioners referenced research that suggested that a decline of native prey species resulting from the replacement with nonnative species has a significant adverse effect on northern Mexican gartersnakes (Rosen and Schwalbe 1988, 1995, 1996, 1997; Holm and Lowe 1995; Degenhardt et al. 1996; Rosen et al. 2001). Subsequently, the status of primary native prey species for northern Mexican gartersnake is declining (Rosen and Schwalbe 1988, 1995, 1996, 1997; Holm and Lowe 1995; Degenhardt et al. 1996; Fernandez and Rosen 1996; Rosen et al. 2001).

The petitioners identified several species as primary prey species for the northern Mexican gartersnake that had special Federal or state status. For example, the lowland leopard frog has been extirpated from New Mexico and from its former distribution in the lower Gila and Colorado rivers, and is considered Wildlife of Special Concern by the Arizona Game and Fish Department (AGFD). The Chiricahua leopard frog was listed as threatened without critical habitat under the Act on June 13, 2002 (67 FR 40790). The Gila chub was listed as endangered under the Act on November 2, 2005 (70 FR 66663). The Gila topminnow was listed as endangered under the Act on March 11, 1967 (32 FR 4001). The roundtail and headwater chubs were petitioned for listing as threatened or endangered under the Act, and we published a substantial 90-day finding on the petition for both species on July 12, 2005 (70 FR 39981) indicating that the petition provided substantial information for us to initiate a status review for the two species. Additionally, the roundtail chub is listed as threatened by the State of Arizona. The decline of many gartersnake prey species may be tied to predation by and competition with nonnative invaders; namely bullfrogs, crayfish, and nonnative fish (Rosen and Schwalbe 1988; Holm and Lowe 1995; Rosen et al. 2001).

Petitioners state that the northern Mexican gartersnake is particularly vulnerable to a loss in native prey species (Rosen and Schwalbe 1988). Rosen et al. (2001) examined this issue in greater detail and proposed two

plausible explanations: (1) The species is reluctant to increase foraging efforts at the risk of increased predation; and (2) the species needs substantial food regularly to maintain its weight and health. If forced to forage more often for smaller prey items, a reduction in growth and reproductive rates may likely result (Rosen et al. 2001).

Direct observations of predation of northern Mexican gartersnake by native species are not well documented in the literature; however, several species of native fauna opportunistically take other native individuals when available (Rosen and Schwalbe 1988). Some examples of native predators on the northern Mexican gartersnake may include birds of prey, other snakes (kingsnakes (*Lampropeltis sp.*), whipsnakes (*Masticophis sp.*), etc.), wading birds, raccoons (*Procyon lotor*), skunks (*Mephitis sp.*), and coyotes (*Canus latrans*) (Rosen and Schwalbe 1988). The scientific community does not currently believe these native predators are responsible for the historical decline of northern Mexican gartersnake as all these species collectively evolved as a native biological community.

Alternatively, the petitioners note that nonnative predation threats have been and continue to be a serious factor in the decline of the northern Mexican gartersnake from both effects to the species itself and to its primary prey base. Many nonnative fishes have been introduced into northern Mexican gartersnake habitats, such as bullhead, green sunfish, and largemouth bass (Rosen and Schwalbe 1988). Rosen et al. (2001) noted the three most damaging nonnative predators to the northern Mexican gartersnake and its prey base in southern Arizona were bullfrogs, crayfish, and the green sunfish.

The petitioners claim that, of the various nonnative predators that have been introduced to post-settlement Arizona, the bullfrog appears to be the most detrimental to the northern Mexican gartersnake (Rosen and Schwalbe 1988, 1995, 1996; Holm and Lowe 1995; Rosen et al. 2001). Bullfrogs act as competitors to the northern Mexican gartersnake by sharing prey items such as frogs, fish, lizards, birds, and even mammals (Rosen and Schwalbe 1995). Bullfrogs are particularly damaging to and persistent in native riparian communities because adult bullfrogs are cannibalistic and larval bullfrogs can be sustained by grazing on aquatic vegetation, which means that a population of adult bullfrogs can sustain itself even when the native vertebrate prey base has been

extirpated by the species (Rosen and Schwalbe 1995).

The petitioners referenced documentation that discussed scientists and landowners having directly and indirectly observed bullfrogs eating northern Mexican gartersnakes in the juvenile and occasionally sub-adult size classes (Rosen and Schwalbe 1988, 1995, 1996; Holm and Lowe 1995; Rosen et al. 2001). A well-circulated photograph of an adult bullfrog in the process of consuming an adult or subadult northern Mexican gartersnake at Parker Canyon Lake, Cochise County, Arizona, taken by John Carr in 1964, provides photographic documentation of bullfrog predation (Rosen and Schwalbe 1988, 1995). The petitioners referenced a common observation in northern Mexican gartersnake populations that co-occur with bullfrogs is a preponderance of large, mature adult snakes with conspicuously low numbers of individuals in the neonate and juvenile age size classes due to bullfrogs eating young small snakes, indicating low recruitment (reproduction and survival of young) (Rosen and Schwalbe 1988; Holm and Lowe 1995).

The petitioners contend that bullfrogs that are unable to capture, subdue, and consume northern Mexican gartersnakes continue to maintain persistent predation pressure on individuals. Signs of attempted predation on northern Mexican gartersnakes can be readily observed in the field by examining the tail region of individual northern Mexican gartersnakes (Holm and Lowe 1995; Rosen and Schwalbe 1996). Rosen and Schwalbe (1988) discuss such observations from the San Bernardino National Wildlife Refuge where 78 percent of specimens observed had broken tails with a "soft and club-like" terminus, instead of a long, fine point, which suggests repeated injury (multiple predation attempts). Rosen and Schwalbe (1988) also noted bleeding from this region by gravid females when palpated for egg counts resulting from these "squeeze-type" of injuries inflicted by adult bullfrogs. Holm and Lowe (1995) observed that 89 percent of captured northern Mexican gartersnakes possessed similar tail injuries during survey work in Scotia Canyon in 1993, indicating heavy predation from abundant bullfrogs occurring there as well. These observations made by researchers and referenced by the petitioners indicate that, while a sub-adult or adult northern Mexican gartersnake may survive an individual predation attempt from a bullfrog while incurring tail damage, secondary effects from infection of the

wound can result in mortality of individuals (Rosen et al. 1995). Smaller snakes are swallowed whole by bullfrogs.

The petitioners discuss specific research and field experimentation that has been dedicated to understanding the effects of bullfrog predation on the northern Mexican gartersnake and its prey base in southeastern Arizona, and possible methods for bullfrog eradication (Rosen and Schwalbe 1988, 1997; Holm and Lowe 1995; Rosen et al. 2001). Specifically, northern Mexican gartersnake and Chiricahua leopard frog (prey for the gartersnake) populations were repeatedly surveyed from 1986 through 1997 at locations on the San Bernardino National Wildlife Refuge that suffered from various degrees of bullfrog invasion. Survey sites ranged from an entirely native herpetofaunal community to one dominated by bullfrogs of various age classes.

The petitioners reference experimentation with bullfrog removal protocols was conducted at various sites on the San Bernardino National Wildlife Refuge in addition to a control site with similar habitat on the Buenos Aires National Wildlife Refuge with no bullfrog removal (Rosen and Schwalbe 1997). Removal protocols employed during this study (the extensive removal of adult bullfrogs) resulted in "remarkable blooms" in younger age-class bullfrogs where removal efforts were intensive (Rosen and Schwalbe 1997). Evidence from dissection samples of young adult and sub-adult bullfrogs indicated that these age-classes readily prey upon younger bullfrogs [4.25 inches (109 mm) snout-vent length] as well as juvenile gartersnakes, which suggests that the selective removal of large adults (favoring the young adult and sub-adult age classes) may indirectly lead to increased predation of leopard frogs and juvenile gartersnakes (Rosen and Schwalbe 1997). Consequently, this strategy was viewed as being potentially "self-defeating" and "counter-productive" but worthy of further investigation (Rosen and Schwalbe 1997). Both leopard frog and northern Mexican gartersnake populations at various locales on the San Bernardino National Wildlife Refuge, where bullfrogs have invaded, were notably affected by nonnative predation (Rosen and Schwalbe 1997). Rosen and Schwalbe (1997) also indicated that northern Mexican gartersnakes are precariously close to extirpation from that area.

The petitioners state that Rosen et al. (2001) concluded that the presence and expansion of nonnative predators (mainly bullfrogs, crayfish, and green

sunfish) continue to be the primary causes of decline in northern Mexican gartersnake populations in southeastern Arizona due to their deleterious effects to the northern Mexican gartersnake and its prey populations. Specifically, Rosen et al. (2001) identified the expansion of the bullfrog into the Sonoita Grasslands and to the threshold of the Canelo Hills in the upper Santa Cruz River watershed, and the expansion of crayfish into Lewis Springs area of the upper San Pedro River watershed (these areas comprise one of the remaining four, disjunct, geographic areas in the United States where the species remains extant), as particularly threatening to the northern Mexican gartersnake because these nonnative species have proven difficult, if not impossible, to eradicate once established in complex, inter-connected habitats as discussed below.

The petitioners reference Rosen and Schwalbe (1997) who state that effective bullfrog and nonnative fish removal is possible in simple systems that can be manipulated, such as stock tanks; however, it can be expensive and specially-designed fencing is likely needed to prevent reinvasion. No methods are available to effectively remove bullfrogs or crayfish from lotic (moving water), or complex inter-connected systems. The petitioners references indicate that the inability of land managers to effectively address the invasion of nonnative species in such habitats highlights the particularly serious nature of this specific threat. While potential threats from human land use activities can usually be lessened or removed completely with adjustments to land management practices, the concern for the apparent irreversibility of nonnative species invasions becomes paramount.

While northern Mexican gartersnake populations can be significantly affected by bullfrog introductions, the petitioners contend they can also be adversely affected by disturbances in the fish community caused by *nonnative fish introductions* (Rosen et al. 2001). The observations of the northern Mexican gartersnake populations and individual growth trends made by Dr. Rosen at Finley Tank prior to the arrival of the exotic bullfrog provides insight on the effects of nonnative fish invasions and the potential nutritional ramifications of a fish-only diet in a species that normally has a varied diet which is largely supported by amphibian prey items (Rosen et al. 2001). The more energy that is expended in foraging, coupled by the reduced number of small to medium-sized fish available in low



densities, leads to nutritional deficiencies for both growth and reproduction because energy is instead allocated to maintenance and the increased energy costs of intense foraging activity (Rosen et al. 2001).

#### Evaluation of Information in the Petition

The petitioners have provided substantial scientific information that effects of nonnative predation directly on northern Mexican gartersnake and indirectly on its prey base have had negative implications for its status and continue to threaten the species.

#### D. Inadequacy of Existing Regulatory Mechanisms

##### Information Provided in the Petition

The petitioners contend that existing regulatory mechanisms, at both the State and Federal levels, have failed to cease or reverse the decline of the northern Mexican gartersnake. The petitioners identified the Service, AGFD, NMDGF, U.S. Forest Service, and the U.S. Bureau of Land Management as agencies who share a responsibility to protect the northern Mexican gartersnake either via jurisdictional directive or through land-management decisions.

At this time, northern Mexican gartersnake is considered State Endangered in New Mexico and take is prohibited without a scientific collecting permit issued by the NMDGF as per New Mexico Statutory Authority (NMSA) 17-2-41.C and New Mexico Administrative Code (NMAC) 19.33.6. However, while the NMDGF can issue monetary penalties for illegal take, only recommendations are afforded with respect to actions that result in destruction or modification of habitat (NMSA 17-2-41.C and NMAC 19.33.6).

In the December 2003 petition, the petitioners state that the AGFD allows for the collection of up to four northern Mexican gartersnakes per person per year as specified in Commission Order Number 43 (Arizona Game and Fish Department 2001). However, according to our information, in 2005, the AGFD amended Commission Order Number 43, which closed the season on northern Mexican gartersnakes. Take of northern Mexican gartersnakes is no longer permitted in Arizona without issuance of a scientific collecting permit as per Arizona Administrative Code R12-4-401 et seq. While the AGFD can seek criminal or civil penalties for illegal take of northern Mexican gartersnakes, only recommendations are afforded with respect to actions that result in destruction or modification of the northern Mexican gartersnakes' habitat. The northern Mexican gartersnake is

considered a "Candidate Species" in the AGFD's draft Wildlife of Special Concern in Arizona (WSCA) (Arizona Game and Fish Department 1996). A "Candidate Species" is one "whose threats are known or suspected but for which substantial population declines from historical levels have not been documented (though they appear to have occurred)" (Arizona Game and Fish Department 1996). The purpose of the WSCA list is to provide guidance in habitat management implemented by land-management agencies. No specific conservation actions are mandated or otherwise afforded under this designation. The petitioners also claimed that neither agency has mandated recovery goals for the northern Mexican gartersnake, nor does either State have conservation agreements for this species.

The petitioners provided an assessment of the northern Mexican gartersnakes' legal status in Mexico, all subspecies under *Thamnophis eques* are listed as "Amenazadas," or Threatened, in the species' southern distribution in Mexico by the Secretaria de Medio Ambiente y Recursos Naturales (Secretaria de Medio Ambiente y Recursos Naturales 2003). This legal distinction means that the species is in danger of disappearance in the short- or medium-term future from the destruction and modification of its habitat and/or from the effects of shrinking population sizes (SEMARNAT 2001 [NOM-059-ECOL-2001]). This designation prohibits taking of the species, unless specifically permitted, as well as activities that intentionally destroy or adversely modify its habitat (SEMARNAT 2000 [LGVS] and 2001 [NOM-059-ECOL-2001]). Additionally, in 1988, the Mexican Government passed a regulation that is similar to the National Environmental Policy Act of the United States. This Mexican regulation requires an environmental assessment of private or government actions that may affect wildlife and/or their habitat (SEMARNAT 1988 [LGEEPA]).

The U.S. Bureau of Land Management considers the northern Mexican gartersnake as a "Special Status Species" and agency biologists actively attempt to identify gartersnakes incidentally observed during fieldwork for their records (L. Young, U.S. Bureau of Land Management, pers. comm., 2005). Otherwise, no specific protection or land-management consideration is afforded to the species on U.S. Bureau of Land Management lands.

The U.S. Forest Service does not include northern Mexican gartersnake on their "Management Indicator Species

List" but it is included on the "Regional Forester's Sensitive Species List". This means that northern Mexican gartersnakes are "considered" in land management decisions, and individual U.S. Forest Service biologists may opportunistically capture and identify the gartersnakes observed incidentally in the field for their records, but are not required to do so. The petitioners claim that management under the U.S. Forest Service does not adequately protect the northern Mexican gartersnake from ongoing threats. For example, the petition states that no particular management consideration was given to the extant populations of northern Mexican gartersnake on the actively-used Dukuesne and Lone Mountain grazing allotments on the Coronado National Forest where cattle are allowed direct access to northern Mexican gartersnake habitat.

According to information presented in the Petition, the vast majority of extant populations of northern Mexican gartersnake in the United States occur on U.S. Bureau of Land Management and U.S. Forest Service managed lands, yet the petitioners contend that neither the U.S. Bureau of Land Management or the U.S. Forest Service have management plans for the northern Mexican gartersnake.

Riparian species represent a unique community in Arizona and approximately 50 percent of federally listed species that are native to Arizona are riparian or aquatic species. The petitioners noted, as previously mentioned, several prey species of the northern Mexican gartersnake that had special legal status. Specifically, the petitioners named four primary prey species for the northern Mexican gartersnake, the Chiricahua leopard frog, Gila topminnow, Gila chub, and roundtail chub are federally listed or have been petitioned for listing (i.e., roundtail chub). Other listed or proposed riparian species, or their proposed or designated critical habitat, overlap the current or historical distribution of the northern Mexican gartersnake. However, the petitioners contend that, despite secondary protections that may be afforded to the northern Mexican gartersnake from federally listed species and/or their critical habitat, riparian and aquatic habitats in general continue to be adversely impacted for reasons previously discussed and the status of the northern Mexican gartersnake has continued to decline throughout its range in the United States.

#### Evaluation of Information in the Petition

The petitioners have provided substantial information that current regulatory mechanisms may not adequately protect the northern Mexican gartersnake and that the species may be continuing to decline throughout its distribution in the United States, and potentially in Mexico.

#### *E. Other Natural or Manmade Factors Affecting the Species' Continued Existence*

##### Information Provided in the Petition

Marcy's checkered gartersnake may have ecological implications to the decline and future conservation of the northern Mexican gartersnake in southern Arizona according to information presented in the petition. Marcy's checkered gartersnake is a semi-terrestrial species that is able to co-exist to some degree with nonnative predators. This is largely due to its ability to forage in more terrestrial habitats, specifically in the juvenile size classes (Rosen and Schwalbe 1988). In every age class, the northern Mexican gartersnake forages in aquatic habitats where bullfrogs also occur, which increases not only the encounter rate between the two species, but also the juvenile mortality rate of the northern Mexican gartersnake. Marcy's checkered gartersnake is a potential benefactor of this scenario. The petitioners contend that as northern Mexican gartersnake numbers decline within a population, space becomes available for occupation by checkered gartersnakes, which maintains density-dependent pressures on the gartersnake population, potentially accelerating the decline of the northern Mexican gartersnake

(Rosen and Schwalbe 1988). This, in combination with the other factors described above that have adversely affected the northern Mexican gartersnake prey base and the suitability of occupied and formerly occupied habitat, has contributed to the decline of this species.

##### Evaluation of Information in the Petition

The petitioners have provided substantial scientific information indicating that under certain circumstances the Marcy's checkered gartersnake may outcompete the northern Mexican gartersnake and could exacerbate the decline of the northern Mexican gartersnake in areas that contain small populations of the subspecies.

#### **Finding**

We have reviewed the petition and literature cited in the petition. On the basis of our review, we find that the petition presents substantial information indicating that listing the northern Mexican gartersnake may be warranted. The petition provides information that the main threats appear to be predation and competition with nonnative species, and secondary threats are habitat destruction and alteration from a variety of human activities. As such, we will initiate a status review of the northern Mexican gartersnake and, following a review of available scientific and commercial data, make a determination of whether listing the species under the Act is warranted at that time.

We have reviewed the available information to determine if the existing and foreseeable threats pose an emergency. We have determined that an

emergency listing is not warranted for this species at this time because some local populations within the middle/upper Verde River—lower Tonto Creek and upper Santa Cruz/San Pedro watersheds are not facing immediate threats. However, if at any time we determine that emergency listing of the northern Mexican gartersnake is warranted, we will initiate an emergency listing.

The petitioners also request that critical habitat be designated for this species. We always consider the need for critical habitat designation when listing species. If we determine in our 12-month finding that listing the northern Mexican gartersnake is warranted, we will address the designation of critical habitat in the subsequent proposed rule.

#### **References Cited**

A complete list of all references cited herein is available upon request from the Field Supervisor (see **ADDRESSES** section).

#### **Author**

The primary authors of this document are staff at the Arizona Ecological Services Office (see **ADDRESSES** section).

#### **Authority**

The authority for this action is the Endangered Species Act of 1973, as amended (16 U.S.C. 1531 *et seq.*).

Dated: December 13, 2005.

#### **Marshall Jones,**

*Deputy Director, Fish and Wildlife Service.*  
[FR Doc. 06-1 Filed 1-3-06; 8:45 am]

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