DEPARTMENT OF THE INTERIOR

Fish and Wildlife Service

50 CFR Part 17

[Docket No. FWS-R2-ES-2009-0070]
[MO 92210-0-0008-B2]

Endangered and Threatened Wildlife and Plants; 12-Month Finding on a Petition to List the Tucson Shovel-Nosed Snake (*Chionactis occipitalis klauberi*) as Threatened or Endangered with Critical Habitat

AGENCY: Fish and Wildlife Service, Interior.

ACTION: Notice of 12–month petition finding.

SUMMARY: We, the U.S. Fish and Wildlife Service (Service), announce a 12–month finding on a petition to list the Tucson shovel-nosed snake (*Chionactis occipitalis klauberi*) as threatened or endangered with critical habitat under the Endangered Species Act of 1973, as amended (Act). After review of the best scientific and commercial information available, we find that listing the Tucson shovel-nosed snake as threatened or endangered throughout its range is warranted. Currently, however, listing the Tucson shovel-nosed snake is precluded by higher priority actions to amend the Lists of Endangered and Threatened Wildlife and Plants. Upon publication of this 12–month petition finding, we will add the Tucson shovel-nosed snake to our candidate species list. We will develop a proposed rule to list the Tucson shovel-nosed snake as our priorities allow. We will make any determination on critical habitat during development of the proposed rule.

DATES: The finding announced in this document was made on March 31, 2010.

ADDRESSES: This finding is available on the Internet at *http://www.regulations.gov* at Docket Number FWS-R2-ES-2009-0070. Supporting documentation we used in preparing this finding is available for public inspection, by appointment, during normal business hours by contacting the U.S. Fish and Wildlife Service, Arizona Ecological Services Office, 2321 West Royal Palm Road, Suite 103, Phoenix, AZ 85021-4951. Please submit any new information, comments, or questions concerning this finding to the above address.

FOR FURTHER INFORMATION CONTACT: Steve Spangle, Field Supervisor, Arizona Ecological Services Office (see **ADDRESSES**) (telephone 602-242-0210; facsimile 602-242-2513). If you use a telecommunications device for the deaf (TDD), please call the Federal Information Relay Service (FIRS) at 800-877-8339.

SUPPLEMENTARY INFORMATION:

Background

Section 4(b)(3)(B) of the Endangered Species Act of 1973, as amended (Act) (16 U.S.C. 1531 *et seq.*), requires that, for any petition containing substantial scientific or commercial information indicating that listing the species may be warranted, we make a finding within 12 months of the date of receipt of the petition. In this finding we determine that the petitioned action is: (a) Not warranted, (b) warranted, or (c) warranted, but immediate proposal of a regulation implementing the petitioned action is precluded by other pending proposals to determine whether species are threatened or endangered, and expeditious progress is being made to add or remove qualified species from the Lists of Endangered and Threatened Wildlife and Plants. Section 4(b)(3)(C) of the Act requires that we treat a petition for which the requested action is found to be warranted but precluded as though resubmitted on the date of such finding, that is, requiring a subsequent finding to be made within 12 months. We must publish these 12–month findings in the **Federal Register**.

Previous Federal Actions

We received a petition, dated December 15, 2004, from the Center for Biological Diversity requesting that we list the Tucson shovel-nosed snake as threatened or endangered throughout its range and designate critical habitat within its range in the United States. The petition, which was clearly identified as such, contained detailed information on the natural history, biology, current status, and distribution of the Tucson shovel-nosed snake. It also contained information on what the petitioner reported as potential threats to the subspecies from urban development, agricultural practices, collecting, inadequacy of existing regulations, drought, and climate change. In response to the petitioner's requests, we sent a letter to the petitioner, dated September 7, 2005, explaining that, due to funding constraints in fiscal year 2005, we would not be able to address the petition in a timely manner. On February 28, 2006, the petitioner filed a 60–day notice of intent to sue (NOI) the Department of the Interior for failure to issue 90–day and 12–month findings, and a proposed listing rule, as appropriate, in response to the petition as required by 16 U.S.C. 1533(b)(3)(A) and (B). In response to the NOI, we agreed to submit a 90–day finding to the **Federal Register** as expeditiously as possible.

On July 29, 2008, we made our 90–day finding that the petition presented substantial scientific information indicating that listing the Tucson shovel-nosed snake (*Chionactis occipitalis klauberi*) may be warranted. The finding and our initiation of a status review was published in the **Federal Register** on July 29, 2008 (73 FR 43905).

This notice constitutes the 12–month finding on the December 15, 2004, petition to list the Tucson shovel-nosed snake as threatened or endangered.

Species Information

Species Description

The Tucson shovel-nosed snake is a small snake (250–425 millimeters (mm) (9.84–16.73 inches (in) total length) in the family Colubridae, with a shovel-shaped snout, an inset lower jaw, and coloring that mimics coral snakes (Mahrdt *et al.* 2001, p. 731.1). The most notable features of the Tucson shovel-nosed snake distinguishing it from the other subspecies are (a) the red crossbands suffused with dark pigment, making them appear brown or partly black, and (b) both black and red crossbands not encircling the body (Center for Biological Diversity 2004, p. 2).

Taxonomy

In considering taxonomic data, the Service relies "on standard taxonomic distinctions and the biological expertise of the Department and the scientific community concerning the relevant taxonomic group" (50 CFR §424.11(a)) and "on the basis of the best scientific and commercial information" (50 CFR §424.11(b)). The Service, not any professional organization or expert, bears the responsibility for deciding what taxonomic entities are to be protected under the Act. We address any conflicting information or expert opinion by carefully evaluating the underlying scientific information and weighing its reliability and adequacy according to the considerations of the Act and our associated policies and procedures and using the best scientific information available.

Taxonomic nomenclature for the Tucson shovel-nosed snake has changed over time. The snake was first described as a subspecies, *Sonora occipitalis klauberi*, by Stickel in 1941 (p. 138). The genus was changed to *Chionactis* two years later (Stickel 1943, pp. 122–123). Since being described, the Tucson shovel-nosed snake has been widely

accepted as a subspecies (Klauber 1951, p. 187; Stebbins 2003, p. 394; Crother 2008a, p. 48; Collins and Taggart 2009, p. 28), and is one of four currently recognized subspecies of the Western shovel-nosed snake, *Chionactis occipitalis* (Crother 2008a, p. 48; Collins and Taggart 2009, p. 28).

In our 90–day finding for this petition (73 FR 43905), we determined that a recent study of genetic variation of mitochondrial DNA (Wood *et al.* 2006, hereafter Wood *et al.* 2008) found significant geographical structuring suggesting two distinct subspecies of Western shovel-nosed snake rather than four, combining western populations of *Chionactis occipitalis occipitalis*, the Mojave shovel-nosed snake, with *Chionactis occipitalis talpina*, the Nevada shovel-nosed snake; and southeastern populations of *C. o. occipitalis* with *Chionactis occipitalis annulata*, the Colorado Desert shovel-nosed snake, and *C. o. klauberi*. However, this study's inference was based on a single genetic marker of mitochondrial DNA and did not include examination of nuclear markers, which would more fully elucidate our understanding of the taxonomic standing of this subspecies. Therefore, in our 90–day finding, we continued to accept the currently recognized arrangement of subspecies, which includes *C. o. klauberi* (Mardt *et al.* 2001).

Additionally, the petition requested that the Service consider an "intergrade zone" between the Tucson shovel-nosed snake and the Colorado Desert shovel-nosed snake as part of the Tucson shovel-nosed snake's range. An intergrade zone is an area of overlap between the ranges of two subspecies where individuals may possess intermediate characters (attributes or features that distinguish a subspecies, such as coloration) or traits of both subspecies. It is generally recognized and accepted by practitioners of subspecies taxonomy that intergrade zones may exist between the ranges of two subspecies where the diagnostic characters of both subspecies may be found (Mayr 1942, p. 107; Huxley 1943, p. 210–211; Mayr 1963, p. 368; Mayr 1969, pp. 193–196; Mayr 1970, pp. 219–226; Wake 1997, pp. 7761–7762; Rodríguez-Robles and De Jesus-Escobar 2000, p. 42; Isaac *et al.* 2004, p. 465; Krysko and Judd 2006, p. 18; Wake 2006, p. 12). Current practice in the scientific literature is to objectively describe the ranges of different subspecies and any intergrade zones between them with narrative descriptions, maps, or both (e.g., Wake 1997, pp. 7761–7767; Rodríguez-Robles and De Jesus-Escobar 2000, Fig. 1; Mahrdt *et al.* 2001, p. 731.2; Leache and Reeder 2002, p. 202; Krysko and Judd 2006, p. 18; Wake 2006, p. 11). Following this practice, intergrade zones are identified, but not assigned to either of the subspecies. As such, we find that including all shovel-nosed snakes within the intergrade zone into the subspecies taxon of the Tucson shovel-nosed snake would not be consistent with current scientific practice in describing the ranges of subspecies and the intergrade zone between them, and, therefore, we do not consider shovel-nosed snakes within the intergrade zone to be members of the Tucson shovel-nosed snake subspecies.

In order to be compliant with 50 CFR 424.11(a) and to understand the taxonomic entity to consider for listing, the Service requested review and input on the issue of taxonomic classification and distribution of the Tucson shovel-nosed snake from nine individuals with biological and taxonomic expertise and background in this issue. Of the nine, six provided comments and input on specific questions we asked regarding the issue of determining species and subspecies, taxonomic classification, and geographical ranges (including the location of the boundary between the Tucson shovel-nosed snake and the intergrade zone) based on recent and historical studies and publications related to Tucson shovel-nosed snake taxonomic classification.

We considered publications by Collins and Taggart (2009), Crother (2008a), Wood *et al.* (2008), Rosen (2003), Mahrdt *et al.* (2001), Klauber (1951), and the input from our solicited review by current experts in the field (four herpetological taxonomists and two *C. occipitalis* experts). The four herpetological taxonomists believed that, based on the most recent genetic work by Wood *et al.* (2008) using mitochondrial DNA, the subspecies *C. o. klauberi* does not warrant taxonomic recognition (Boundy 2008, p. 2; Burbrink 2008, p. 2; Crother 2008b, p. 2; Frost 2008, p. 2). They suggested, based on Wood *et al.* (2008), that two lineages of *C. occipitalis* exist in the northwestern and southeastern portions of the species' range, which are not consistent with the current subspecies designations and their current ranges. Three of the taxonomists, plus one of the species experts, suggested additional studies using nuclear DNA markers or microsatellites (numerous short segments of DNA that are distributed throughout the genetic material of an organism) were needed to determine if *C. o. klauberi* is distinct, and if so, where the boundaries of its range are actually located (Boundy 2008, p. 3; Burbrink 2008, p. 2; Crother 2008b, p. 3; Holm 2008, p. 2).

The two species experts believed that there is some agreement between morphological and mitochondrial DNA data, and supported acknowledging *C. o. klauberi* as a unique taxonomic entity (Holm 2008, p. 1; Rosen 2008a, pp. 6–12). One of the experts suggested a range similar to the one that is currently recognized for *klauberi* (Holm 2008, p. 5) and the other, although recommending retaining the current subspecies boundaries, acknowledged that the genetic data, as represented by nesting clades in Wood *et al.* (2008), argue for a much larger range that includes eastern populations of *C. o. annulata* (Rosen 2008a, p. 11).

According to most phylogenetic species concepts, the taxonomists (Boundy 2008, Burbrink 2008, Crother 2008b, Frost 2008) are using a criterion for species, not subspecies, and all four of these reviewers acknowledge that, following this reasoning, they do not believe subspecies are real biological units and that the concept of subspecies is antiquated. However, the Act recognizes conservation concern below the level of species by defining "species" to include subspecies and vertebrate Distinct Population Segments. Published lists of reptile and amphibian taxa, including those authored by our taxonomic peer reviewers (for example, Crother 2008a, Collins and Taggart 2009 (F. Burbrink is an author on the snake section)), still include subspecies, and the International Code of Zoological Nomenclature (ICZN), a universally accepted system of nomenclature (Frost *et al.* 2009, pp. 136–137), includes articles pertaining to the naming of subspecies (ICZN 1999). Therefore, we continue to recognize subspecies as unique taxonomic entities, including the Tucson shovel-nosed snake.

Additionally, mitochondrial DNA, as analyzed by Wood *et al.* (2008), represents a single genetic locus that accumulates mutations relatively slowly, and therefore differences between groups based on mitochondrial DNA typically reflect historical separation of groups rather than more recent population-level differences (Fallon 2007a, p. 1191). As a result, differentiation at mitochondrial genes reflects deep historical separation rather than more recent divergence, and does not reflect evolutionary difference shaped by the organism's ecology and environment (Fallon 2007a, p. 1191). Genetic differences among groups that have experienced more recent separation (such as those below the species level) may require combinations

of markers and/or additional genetic data to reveal variation, if it exists (Fallon 2007a, p. 1192). Microsatellites provide a highly variable marker widely accepted as appropriate for detecting changes at this level (Fallon 2007a, p. 1191), and would be applicable in determining the subspecies status of the Tucson shovel-nosed snake.

For the available information we considered, we find that uncertainty exists in both the taxonomic entity and subspecies range of *C. o. klauberi*. Information submitted by four of the six experts who provided input on these issues indicated that, while there are certain aspects of existing information that support rejecting the petitioned entity, there is uncertainty, and additional work is needed to clarify the validity and distribution of the subspecies (Boundy 2008, p. 3; Burbrink 2008, p. 2; Crother 2008b, p. 3; Holm 2008, p. 2). Specifically, they suggest that nuclear DNA markers or microsatellites be used to determine if *C. o. klauberi* is distinct, and if so, where the boundary between it and the intergrade zone is actually located. Public comment received related to this 12–month finding both supported the need for nuclear DNA markers or microsatellites (Arizona Game and Fish Department 2008, p. 3; Fallon 2007b, pp. 1–2; Jones 2008, p. 2), as well as questioned the validity of the subspecies based on Wood *et al.* (2008) (Carothers *et al.* 2008, pp. 9–14; James 2008, pp. 4–5; Taczanowsky 2008, pp. 1–2; Warren 2008, pp. 1 and 6). Therefore, because we received inconclusive expert opinion regarding the subspecies status of the Tucson shovel-nosed snake, as well as recommendations that further genetic study (nuclear DNA or microsatellites) is needed before this determination can be made, we regard the currently recognized taxonomic status and distribution of *C. o. klauberi* (Mardt *et al.* 2001) as the best available science, with the understanding that, as we acquire more information, the definition of this taxonomic entity (including its range) may change, and our finding may need to be revisited.

Biology

The diet of shovel-nosed snakes consists of a variety of invertebrates, including scorpions, beetle larvae, spiders, crickets, centipedes, native roaches, and ants, (Mattison 1989, p. 25; Rosen *et al.* 1996, pp. 22–23; Brennan and Holycross 2006, p. 98). Glass (1972, p. 447) and Rosen *et al.* (1996, p. 22) suggest that shovel-nosed snakes eat relatively frequently. The authors (pp. 22–23) further support this observation by noting that individual shovel-nosed snakes in captivity each consumed five to eight crickets per week and showed significant weight loss after a 2- to 3–week lapse in feeding.

Like the other three subspecies of the western shovel-nosed snake, the Tucson shovel-nosed snake uses "sand swimming" as its primary locomotion. The snake moves using a sideways swaying motion while it is either on or under the sand or loose soil (Stebbins 2003, p. 393). Klauber (1951, p. 192) suggests that shovel-nosed snakes rarely move more than 30.5 m (100 ft) in one night, as they do not normally move great distances below the sand surface; however, Rorabaugh (2002, p. 42) documented one shovel-nosed snake (*C. o. annulata*) that moved 37 m (121 ft) in about 2 hours. Shovel-nosed snakes were thought to be primarily nocturnal in activity, but specimens have been documented as active during crepuscular (dawn and dusk) and daylight hours (*C. occipitalis*: Rosen *et al.* 1996, pp. 21–22; *C. o. annulata*: Rorabaugh 2002, pp. 42–43; Brennan and Holycross 2006, p. 98). Shovel-nosed snakes are predominantly active at air temperatures between 70 and 90 degrees Fahrenheit (21 and 32 degrees Celsius) and when surface temperatures in the sun are between 75 and 115 degrees Fahrenheit (24 and 46 degrees Celsius) (Klauber 1951, p. 187; Rorabaugh 2002, pp. 42–43). Rosen *et al.* (1996, p. 21) and Rorabaugh (2002, p. 42) have also observed that shovel-nosed snakes have been documented to be active in the morning and just before sunset. Rosen *et al.* (1996, p. 21) further note that activity seems to be highest when summer and spring temperatures are moderate and when the relative humidity is high.

Reproductive studies have not been conducted specific to *C. o. klauberi*; however, some information is available for shovel-nosed snakes in general, which appear similar to that of other fossorial (burrowing) North American desert snakes in which sperm formation coincides with the period of maximum aboveground activity (Goldberg and Rosen 1999, pp. 155 and 157). Reproductive activity for shovel-nosed snakes occurs in April through July, and the clutch size ranges from two to four eggs (Klauber 1951, p. 194; Goldberg and Rosen 1999, p. 156), although Brennan and Holycross (2006, p. 98) state that clutch size is from two to nine eggs.

Limited information suggests the existence of four age classes in the Western shovel-nosed snake, based on snout-to-vent length (SVL): 0.5, 1.5, 2.5, and 3.5 years and older (Rosen *et al.* 1996, p. 12). Sex ratios for shovel-nosed snakes appear to be skewed towards males, but this is likely due to sampling bias, as most shovel-nosed snake sightings are on roads, and males likely cross roads more frequently in search of females (Rosen *et al.* 1996, p. 21). Rosen *et al.* (1996, p. 21) observed 1 female to 1.21 male shovel-nosed snakes while on foot in the Mohawk Dunes, suggesting that the extreme skewing seen in road collection represents observational bias.

Klauber (1951, p. 185) indicates that scattered sand hummocks, crowned with mesquite or other desert shrubs, are favorite refuges for shovel-nosed snakes. Rosen (2003, p. 8) suggests that the Tucson shovel-nosed snake is found in more productive creosote-mesquite floodplain environments, differing from the habitats preferred by other subspecies of the Western shovel-nosed snake. Rosen (2003, p. 8) describes the associated soils of the Tucson shovel-nosed snake as soft, sandy loams, with sparse gravel.

Distribution

The subspecies was historically known from Pima County in the Avra and Santa Cruz valleys (Rosen 2003, p. 4) and from western Pinal and a portion of eastern Maricopa counties (Klauber 1951, p. 196).

As of 2001, over one-third of the range of the Tucson shovel-nosed snake (Mardt *et al.* 2001, p. 731.2) had been converted to either urban development or agriculture (U.S. Geological Survey National Gap Analysis Program 2004). The area between the Tucson and Phoenix metropolitan areas is believed to encompass the majority of the current range of this subspecies, particularly west of Tucson northward along Avra Valley in Pima County to western Pinal County, and then north into eastern Maricopa County, although no systematic surveys have been conducted to assess the status of Tucson shovel-nosed snakes throughout their range (Arizona Game and Fish Department 2008, p. 2). The last verifiable record of the Tucson shovel-nosed snake in Pima County was in 1979, near the intersection of Avra Valley Road and Sanders Road in the Avra Valley (Rosen 2003, p. 10). Although habitat still exists in Pima County, the current distribution and abundance in Pima County is unknown. Most of the currently occupied range of the Tucson shovel-nosed snake is believed to lie in southwestern Pinal County and eastern Maricopa County, where the most recent records occur (Rosen 2008b, p. 8; Mixan and Lowery, p. 1).

Survey efforts on the Florence Military Reservation (Mixan and Lowery

2008) and in the northern Avra Valley (Rosen 2003, 2004, and 2008b) provide the only recent intensive survey data available. Dr. Rosen conducted road surveys in 2003, 2004, and 2007, as well as trap arrays in 2007. From the road surveys he detected four Tucson shovel-nosed snakes, plus one photo-vouchered specimen from 2006, all near Eloy and Picacho in Pinal County, Arizona (Rosen 2004, p. 18; 2008b, p. 2). The trap arrays, which were set in previously occupied habitat in Pima County, did not result in any Tucson shovel-nosed snake captures. In the spring and summer of 2008, the Arizona Game and Fish Department conducted Tucson shovel-nosed snake surveys on the Florence Military Reservation in Pinal County, Arizona. A total of 29 Tucson shovel-nosed snakes were found during these surveys: 6 within trap arrays west of State Route 79 and 23 as road kill mortalities on State Route 79 (Mixan and Lowery 2008, p. 5).

In 2006, the Arizona Game and Fish Department coordinated attempts to collect shovel-nosed snake tissues for genetic analyses. Based on these efforts, populations are persisting in areas dominated by creosote flats along State Route 79, north of Florence and south of Florence Junction; along Maricopa Road (including State Route 238) between Maricopa and Gila Bend (likely including much of the Rainbow Valley and lower Vekol Wash); east of the San Tan Mountains; along State Route 349 between Maricopa and Casa Grande; south of Interstate 8 near the northern boundary of the Tohono O'odham Reservation; and in the vicinity of the Santa Cruz Flats near Eloy and Picacho (Arizona Game and Fish Department 2008, p. 2).

Factors Affecting the Tucson Shovel-Nosed Snake

Section 4 of the Act (16 U.S.C. 1533), and implementing regulations at 50 CFR 424, set forth procedures for adding species to the Federal Lists of Endangered and Threatened Wildlife and Plants. A species, subspecies, or distinct population segment of vertebrate taxa may be determined to be endangered or threatened due to one or more of the five factors described in section 4(a)(1) of the Act: (A) The present or threatened destruction, modification, or curtailment of its habitat or range; (B) overutilization for commercial, recreational, scientific, or educational purposes; (C) disease or predation; (D) the inadequacy of existing regulatory mechanisms; or (E) other natural or manmade factors affecting its continued existence. Below we provide a summary of our analysis of the threats to the Tucson shovel-nosed snake.

A. The present or threatened destruction, modification, or curtailment of its habitat or range.

Urban and Rural Development

As of 2001, more than 20 percent of the area within the range of the Tucson shovel-nosed snake had been converted to urban development (U.S. Geological Survey National Gap Analysis Program 2004). The effects of urban and rural development are expected to increase as human populations increase. The human population in Arizona increased by 394 percent from 1960 to 2000 (Social Science Data Analysis Network 2000, p. 1) and another 26.7 percent from 2000 to 2008 (U.S. Census Bureau 2008, p. 1). Since 2000, population growth rates in Arizona counties where the Tucson shovel-nosed snake historically occurred or may still occur have varied by county but are no less remarkable: Maricopa (28.7 percent); Pima (19.9 percent); and Pinal (82.1 percent) (U.S. Census Bureau 2008, p. 1). Increasing human populations threaten the Tucson shovel-nosed snake as further modification and loss of habitat is required to accommodate this growth.

Human population growth trends in Arizona are expected to continue into the future. By 2030, projections estimate the population in Arizona will have more than doubled when compared to the 2000 population estimate (U.S. Census Bureau 2005, p. 1). In particular, a wide swath (called the Sun Corridor "Megapolitan") from the international border in Nogales, through Tucson, Phoenix, and north past the Prescott area is predicted to house eight million people by 2030 (Gammage *et al.* 2008, pp. 15 and 22–23). This Megapolitan encompasses the entire historical range of the Tucson shovel-nosed snake and would contain approximately 82.5 percent more residents in 2030 than in 2000 (Gammage *et al.* 2008, pp. 22–23).

In response to our 90–day finding on the Tucson shovel-nosed snake, we received information stating that the prospect of continuing development is no longer a threat to the snake because of current economic conditions, and that these conditions have not only halted most real estate projects in central Arizona, but have also eliminated the demand for State Trust land in central Arizona to be sold for development (James 2008, p. 10). We acknowledge that development pressure across Arizona has slowed due to the recent economic downturn and housing market collapse. However, this does not negate the fact that development likely still will continue in the future, although perhaps at a slower pace than in the earlier part of this century. For instance, the most recent draft Pinal County Comprehensive Plan (February 2009) acknowledges that the county is in the middle of the Sun Corridor Megapolitan (Tucson, Phoenix, and the corridor between them), and proposes four shorter-term Growth Areas to define areas where development will occur or be encouraged to develop over the next decade, although it does not mean to discourage growth outside of these areas (Pinal County Comprehensive Plan 2009, p. 109). These four Growth Areas (Gateway/Superstition Vistas, West Pinal, Red Rock, and Tri-Communities) fall either completely or partially within the range of the Tucson shovel-nosed snake. The Gateway/Superstition Vistas Growth Area alone encompasses 71,225 hectares (176,000 acres, or 275 square miles) of State Trust land, at least two-thirds of which falls within the range of the snake, and it is anticipated that more than 800,000 to more than 1,000,000, people will one day live in this development (Pinal County Comprehensive Plan 2009, p. 115). The Comprehensive Plan (2009, p. 117) identifies many kilometers (miles) of new freeways and principal arterials in this Growth Area at buildout, which the plan acknowledges may take over a half century to realize (p. 115). Roads can have a negative effect on reptiles in general, and snakes specifically, and pose a threat to the Tucson shovel-nosed snake, as well. This is discussed in more detail in the Road Construction, Use, and Maintenance section below.

Additionally, the Maricopa County Comprehensive Plan calls for Growth Areas to the south and east of the Chandler and Mesa areas, which are within the range of the Tucson shovel-nosed snake (Maricopa County Comprehensive Plan 2002 (revised), p. 92). City comprehensive plans within the range of the snake also call for future Growth Areas; for example, the City of Eloy has designated six Growth Areas encompassing 15,520 acres mostly along the Interstate 10 corridor (City of Eloy General Plan 2004, pp. 7-6 through 7-10), of which more than half fall within the range of the snake. These Growth Areas include the locations of some of the most recent sightings of the snake (Rosen 2008b, p. 8). While much of this area has already been impacted by development or irrigated agriculture, any remaining habitat for the Tucson shovel-nosed snake will likely be negatively affected as development and

its associated infrastructure progress into these areas.

James (2008, p. 9) also stated that, as a consequence of restrictions imposed on both agricultural and municipal uses of groundwater by Arizona law, development within the range of the Tucson shovel-nosed snake, particularly in Pinal County, has primarily involved the conversion of agricultural land to municipal uses. Although James (2008, p. 9) considers the actual impact of development on suitable habitat for the Tucson shovel-nosed snake to be exaggerated, we did not find evidence to support this claim. As of 2001, more than one third of the area within the range of the snake was in agricultural use or under development (U.S. Geological Survey National Gap Analysis Program 2004). We acknowledge that the conversion of agricultural land to municipal uses has occurred and continues to occur within the range of the Tucson shovel-nosed snake (as noted above). Much of the land in the western half of Pinal County is primarily used for irrigated agriculture because of low desert valleys (Arizona Department of Agriculture 2009, p. 1), which includes a large portion of the range of the Tucson shovel-nosed snake. However, the above-mentioned Gateway/Superstition Vistas Growth Area occurs on 71,225 hectares (176,000 acres, or 275 square miles) of Arizona State Trust land that, while portions of it are moderately grazed, are not currently in irrigated agriculture. Additionally, conversion from agriculture to residential development involves building additional roadways and transportation corridors, which may negatively affect the snake, even in pockets of remaining habitat (see Road Construction, Use, and Maintenance section below). Therefore, while development may be occurring on lands that were already compromised by a previous use, it still poses a threat, as areas of remaining habitat (especially within the Sun Corridor Megapolitan) are expected to be developed for residential and commercial use over the next decade and beyond.

Road Construction, Use, and Maintenance

As noted in the previous section, roadways and transportation corridors are expected to increase over the next decade and beyond as counties within the range of the Tucson shovel-nosed snake, and particularly in Pinal County, continue to develop residential and commercial infrastructure. Roads pose unique threats to herpetofauna and specifically to the Tucson shovel-nosed snake, its prey base, and the habitat where it occurs through: (1) fragmentation, modification, and destruction of habitat; (2) increased genetic isolation; (3) alteration of movement patterns and behaviors; (4) facilitation of the spread of non-native species via human vectors; (5) increased recreational access and the likelihood of subsequent, decentralized urbanization; (6) interference with or inhibition of reproduction; and (7) population sinks through direct mortality (resulting in unnaturally high death rates that exceed birth rates within a population) (Rosen and Lowe 1994, pp. 146–148; Carr and Fahrig 2001, pp. 1074–1076; Hels and Buchwald 2001, p. 331; Smith and Dodd 2003, pp. 134–138; Angermeier *et al.* 2004, pp. 19–24; Shine *et al.* 2004, pp. 9–11; Andrews and Gibbons 2005, pp. 777–781; Roe *et al.* 2006, p. 161).

Roe *et al.* (2006, p. 161) conclude that mortality rates due to roads are higher in mobile species, such as shovel-nosed snakes (active hunters), than those of more sedentary species, which more commonly employ sit-and-wait foraging strategies. Mixan and Lowery (2008, p. 5) found 23 Tucson shovel-nosed snakes dead on the road near the Florence Military Reservation over 45 days of survey efforts, indicating this subspecies is vulnerable to road mortality. The effect of road mortality of snakes becomes most significant in the case of small, highly fragmented populations where removal of mature females from the population may appreciably degrade the viability of a population. Additionally, if snakes traverse only 37 m (121 ft) each night (Rorabaugh 2002, p. 42), roads that are wider than this may serve as barriers, further fragmenting the population.

Off-highway vehicle (OHV) use has grown considerably in Arizona. As of 2007, 385,000 OHVs were registered in Arizona (a 350 percent increase since 1998) and 1.7 million people (29 percent of the Arizona's public) engaged in off-road activity from 2005 to 2007 (Sacco 2007, pers. comm.). Over half of OHV users reported that merely driving off-road was their primary activity, versus using the OHV for the purpose of hunting, fishing, or hiking (Sacco 2007, pers. comm.). Given the pervasive use of OHVs on the landscape, OHV-related mortalities are likely a threat to Tucson shovel-nosed snakes. Ouren *et al.* (2007, pp. 16–22) provided additional data on the effects of OHV use on wildlife. Specifically, OHV use may cause mortality or injury to species that attempt to cross trails created through occupied habitat, and may even lead to depressed populations of snakes depending on the rate of use and number of trails within a given area (Ouren *et al.* 2007, pp. 20–21). This threat may be even more extensive from OHVs than from conventional vehicles because OHV trails often travel through undeveloped habitat. In particular, the Gateway/Superstition Vistas Growth Area has been and continues to be impacted by OHV use, although the Arizona State Land Department is in the process of fencing off a part of this area for dust-abatement reasons (Windes 2009, pers. comm.).

Solar Power Facilities and Transmission Corridors

Solar radiation levels in the Southwest, including Arizona, are some of the highest in the world, and interest in tapping into this source of potential energy is growing. Of the solar technologies available to harness this energy, Concentrating Solar Power (CSP) technologies are the most likely to be used, although photovoltaic cells could be used in some cases. CSP technologies use mirrors to reflect and concentrate sunlight onto receivers that collect solar energy and convert it to heat. This thermal energy can then be used to produce electricity via a steam turbine or heat engine driving a generator.

Within Arizona, the Bureau of Land Management (BLM) has received 35 solar right-of-way applications, including one that is pending on 850 hectares (2,100 acres) approximately 19 kilometers (12 miles) south of Eloy, which is within the range of the Tucson shovel-nosed snake (BLM 2009b, p. 1 and map). Additionally, within Arizona, the Arizona State Land Department is considering solar projects on some of the lands under its jurisdiction. These potential sites are mostly west of Phoenix and Gila Bend, but one project could be located along Interstate 10 in the vicinity of Red Rock, which is within the range of the Tucson shovel-nosed snake. Little information is available about these projects, so we do not know the exact location or extent of each project (Scott 2009, p. 29).

Solar energy development and transmission corridors pose similar threats to the Tucson shovel-nosed snake as development and roadway projects (see Rural and Urban Development and Road Construction, Use, and Maintenance sections above). An average utility-scale solar facility to generate 250 megawatts of electricity would occupy about 506 hectares (1,250 acres) of land (BLM 2009a, p. 1), and would involve removal of all vegetation within this area. Additionally, CSP facilities employ liquids such as oils or molten salts to create steam to power conventional turbines and generators, as

well as various industrial fluids, such as hydraulic fluids, coolants, and lubricants, all of which may present a contaminants-related risk should these fluids leak onto the ground (Scott 2009, p. 12). New transmission lines would need to be built to these facilities, as well as additional roads to maintain the facilities, likely increasing traffic in these areas. These activities pose a threat to the Tucson shovel-nosed snake through removal and contamination of remaining habitat and increased potential for road kill mortality.

Agricultural Uses

While the number of farms in Arizona has almost doubled since 1997, the total amount of farmed area has decreased (U.S. Department of Agriculture 2009, p. 7). Within Maricopa, Pima, and Pinal counties, the amount of irrigated farmland decreased from 2002 to 2007 by 13.5 percent (58,724 hectares (145,109 acres)), 4.1 percent (3,327 hectares (8,222 acres), and 0.7 percent (2,366 hectares (5,846 acres)), respectively (U.S. Department of Agriculture 2009, p. 273). This decrease in irrigated farmland is likely due to the conversion of agricultural areas to urban development. As of 2001, more than 10 percent of the area within the range of the Tucson shovel-nosed snake had been converted to agriculture (U.S. Geological Survey National Gap Analysis Program 2004).

Pinal County is the county with the most agricultural production within the range of the Tucson shovel-nosed snake. In 2007, the amount of farmland still in production in Pinal County was 125,420 hectares (309,920 acres), or approximately nine percent of the entire county (U.S. Department of Agriculture 2009, p. 273). Much of this land, however, is in the western half of the county (Arizona Department of Agriculture 2009, p. 1), which is within the range of the Tucson shovel-nosed snake. Conversion of low desert valleys to farmland renders habitats unsuitable for the Tucson shovel-nosed snake. Agricultural practices can impact this subspecies in a number of ways. Farmers typically use pesticides and herbicides to maintain high agricultural yields, but because arthropods are the primary food for the snake (Mattison 1989, p. 25; Rosen *et al.* 1996, pp. 22–23), the loss or contamination of this prey base may cause mortality, impaired health, or abandonment of an area. Additionally, traffic associated with agricultural roads can result in mortality of individuals (see Road Construction, Use, and Maintenance section above).

Wildfires

Fire has become an increasingly significant threat in the Sonoran Desert. Esque and Schwalbe (2002, pp. 180–190) discuss the effect of wildfires in the Arizona Upland and Lower Colorado River subdivisions of Sonoran desertscrub, both of which are found in the range of the Tucson shovel-nosed snake. The widespread invasion of non-native annual grasses appears to be largely responsible for altered fire regimes that have been observed in these communities, which are not adapted to fire (Esque and Schwalbe 2002, p. 165). In areas comprised entirely of native species, ground vegetation density is mediated by barren spaces that do not allow fire to carry across the landscape. However, in areas where non-native grasses have become established, the fine fuel load is continuous, and fire is capable of spreading quickly and efficiently (Esque and Schwalbe 2002, p. 175). Non-native annual grasses prevalent within the range of the Tucson shovel-nosed snake include brome grasses (*Bromus rubens* and *B. tectorum*) and Mediterranean grasses (*Schismus* spp.) (Esque and Schwalbe 2002, p. 165). The perennial African buffelgrass (*Pennisetum ciliare*), which also poses a fire risk to Sonoran desertscrub, is prevalent within the range of the snake in the Avra and Santa Cruz valleys (Van Devender and Dimmit 2006, p. 5), as well as along Interstate 10 to the City of Phoenix (Kidnocker 2009, p. 1).

After disturbances such as fire, non-native grasses may exhibit dramatic population explosions, which hasten their effect on native vegetation communities. Additionally, with increased fire frequency, these population explosions may lead to a type-conversion of the vegetation community from desert scrub to grassland (Esque and Schwalbe 2002, pp. 175–176; Overpeck and Weiss 2005, p. 2075). Fires carried by the fine fuel loads created by non-native grasses often burn at unnaturally high temperatures, which may result in soils becoming hydrophobic (water repelling), exacerbating sheet erosion, and contributing large amounts of sediment to receiving drainages and water bodies (Esque and Schwalbe 2002, pp. 177–178). Buffelgrass, in particular, is acknowledged as one of the most serious invasive weeds in the Sonoran Desert due to its ability to spread exponentially (Buffelgrass Working Group 2007, p. 2). It has the potential to invade much of southern and central Arizona, which can lead to recurring grassland fires and the destruction of native desert vegetation (Buffelgrass Working Group 2007, p. 2). These changes can negatively affect the habitat and prey base of the Tucson shovel-nosed snake, although precisely how snake populations would respond is unknown.

Summary of Factor A

Much of the habitat within the range of the Tucson shovel-nosed snake already has been converted to development or agriculture, and remaining habitat continues to be threatened by both these land uses, as well as the construction of large-scale solar power facilities and transmission lines. By the year 2030, the human population in Arizona is expected to be more than double the 2000 population, particularly in the Sun Corridor Megapolitan, which is an area completely encompassing the range of the Tucson shovel-nosed snake. Road construction, maintenance, and use have been documented to affect this subspecies directly through mortality and indirectly through habitat loss and fragmentation, the impacts of which will likely increase with new development and an increasing human population. The need for alternative energy sources is continuing to rise, which will lead to construction of solar energy facilities and transmission corridors in the State of Arizona, some of which will likely be sited within the range of the Tucson shovel-nosed snake. Agricultural use within the range of the snake has been decreasing, a trend that will probably continue as land use converts from agriculture to residential and commercial development. Agriculture that persists will continue to impact the snake by reducing the available prey base and fragmenting habitat. The threat of wildfire due to non-native plants is expected to rise, given the prevalence of Mediterranean grasses, brome grasses, and especially buffelgrass within the range of the Tucson shovel-nosed snake and the invasive nature of these grasses. How snakes would respond to vegetation community change brought about by increasing fire frequency is unknown. The best available information indicates shovel-nosed snakes travel only short distances (37 m (121 ft)), which likely makes the subspecies particularly susceptible to habitat fragmentation as barriers formed by the above-mentioned threats isolate small populations from one another. Therefore, we find that the present or threatened destruction, modification, or curtailment of its habitat or range is a threat to the Tucson shovel-nosed snake within the foreseeable future.

B. Overutilization for commercial, recreational, scientific, or educational purposes.

Based on the information available, overutilization of the Tucson shovel-nosed snake does not appear to pose a threat to this subspecies. Shovel-nosed snakes in general, and Tucson shovel-nosed snakes in particular, are not regularly seen in the pet trade (Arizona Game and Fish Department 2008). There have been few scientific or educational studies of Tucson shovel-nosed snakes over the years, and most recently they have been limited largely to surveys (Arizona Game and Fish Department 2008). Few animals have been collected for these studies other than animals found on highways, where their survival was already likely compromised. Additionally, Arizona State University and the University of Arizona recently began to accept photographic vouchers, versus physical specimens, in their respective museum collections, which may reduce the amount of collection. We believe these measures reduce the necessity for field biologists to collect physical specimens (unless discovered postmortem) for locality voucher purposes and, therefore, further reduce impacts to vulnerable populations of the Tucson shovel-nosed snake. Based on this information, we find that overutilization for commercial, recreational, scientific, or educational purposes is not a threat to the Tucson shovel-nosed snake.

C. Disease or Predation

Disease in Tucson shovel-nosed snakes has not yet been documented as a specific threat. However, little is known about disease in wild snakes. Predation on *Chionactis occipitalis* by a variety of carnivores has been documented, including by various snakes, foxes, coyotes, shrikes, and owls (Brennan and Holycross 2006, p. 98). However, we are not aware of data suggesting that predation poses a threat beyond that expected in a normally functioning ecosystem. Therefore, we do not consider disease or predation a threat to Tucson shovel-nosed snakes.

D. Inadequacy of existing regulatory mechanisms.

The Tucson shovel-nosed snake is considered a "Tier 1b Species of Greatest Conservation Need" in the Arizona Game and Fish Department draft document, Arizona's Comprehensive Wildlife Conservation Strategy (CWCS) (Arizona Game and Fish Department 2006, pp. 32 and 723). The purpose of the CWCS is to provide a foundation for the future of wildlife conservation and a stimulus to conservation partners to strategically think about their roles in prioritizing conservation efforts (Arizona Game and Fish Department 2006, p. 2). A Tier 1b species is one that requires immediate conservation actions aimed at improving conditions through intervention at the population or habitat level (Arizona Game and Fish Department 2006, p. 32). The CWCS, however, does not provide regulatory protection for the snake. It serves only to prioritize funds and guide implementation of conservation activities for Arizona's vulnerable wildlife (Arizona Game and Fish Department 2006, p. 9). The Arizona Game and Fish Department does not have specified or mandated recovery goals for the Tucson shovel-nosed snake, but it continues as a strong partner in research and survey efforts that further our understanding of current populations within Arizona.

With a valid hunting license, the Arizona Game and Fish Department allows for take of up to four Tucson shovel-nosed snakes per person per year as specified in Commission Order Number 43. The Arizona Game and Fish Department defines "take" as "pursuing, shooting, hunting, fishing, trapping, killing, capturing, snaring, or netting wildlife or the placing or using any net or other device or trap in a manner that may result in the capturing or killing of wildlife." If more than four are to be collected (e.g., for research purposes), a scientific collecting permit must be obtained. It is illegal to commercially sell, barter, or trade any native Arizona wildlife.

While we are aware that the Arizona Game and Fish Department enforces these laws to the extent that it can, encounters between humans and Tucson shovel-nosed snakes can result in the capture, injury, or death of the snake due to the lay person's fear or dislike of snakes, and the snake's resemblance to venomous coral snakes (Rosen and Schwalbe 1988, p. 43; Ernst and Zug 1996, p. 75; Green 1997, pp. 285–286; Nowak and Santana-Bendix 2002, p. 39). We believe that unregulated take may occur, but it is likely infrequent because Tucson shovel-nosed snakes generally are difficult to locate in the wild.

The majority of currently known populations of Tucson shovel-nosed snakes occur on lands managed by the Arizona State Land Department, which at present has no regulations or programs to protect the subspecies. State Trust Land is distinguished from public land (such as Federal land administered by the BLM or U.S. Forest Service) in that all uses of the land must benefit the 13 Trust beneficiaries, the largest of which are the Common Schools (Arizona State Land Department 2009a, p. 1). Arizona State Trust Lands are managed to enhance value and optimize economic return for the Trust beneficiaries (Arizona State Land Department 2009b, p. 1), which can include the sale or long-term lease of lands for commercial or residential development. Although State lands currently provide open space within the range of the Tucson shovel-nosed snake, there are no known plans to require protection of habitat on State lands, and no other protections are afforded the snake on State lands.

BLM manages some lands within the range of the Tucson shovel-nosed snake. BLM currently has no regulations to protect the Tucson shovel-nosed snake, and does not survey for the snake or its habitat. BLM lands usually are secure from agricultural and urban development; however, BLM may dispose of lands identified under its land use planning through the Federal Land Policy and Management Act of 1976 (43 U.S.C. 1701 *et seq.*), and may also issue permits for uses such as solar facilities and rights-of-way. Additionally, the open space provided by BLM lands can be and often is heavily impacted by OHV use, which may pose a threat to the Tucson shovel-nosed snake (see Road Construction, Use, and Maintenance under Factor A above).

Some lands within the range of the Tucson shovel-nosed snake are owned by county, city, or private entities. These lands may provide habitat for the Tucson shovel-nosed snake if they are maintained as natural open space; however, there are no regulatory mechanisms in place to protect the snake should the land use change.

We are aware of three habitat conservation plans currently being developed that include the Tucson shovel-nosed snake as a covered species: the Pima County Multi-species Conservation Plan, the Town of Marana Habitat Conservation Plan, and the City of Tucson's Avra Valley Habitat Conservation Plan. As none of these plans have been finalized, we will not explore the adequacies of these plans as possible regulatory mechanisms for the snake.

The Gila River Indian Community owns lands within the range of the Tucson shovel-nosed snake. We are not aware of any mechanisms in place to protect the snake on their lands.

Summary of Factor D

Currently, there are no regulatory mechanisms in place that specifically target the conservation of the Tucson shovel-nosed snake or its habitat. Regulations protecting the quantity and quality of open space are inadequate to protect the habitat of the Tucson shovel-nosed snake, particularly in the face of the significant population growth expected within the historical range of the snake discussed under Factor A. Therefore, we consider the inadequacy of existing regulatory mechanisms a threat to the Tucson shovel-nosed snake.

E. Other natural or manmade factors affecting its continued existence.

Seager *et al.* (2007, pp. 1181-1184) analyzed 19 different computer models of differing variables to estimate the future climatology of the southwestern United States and northern Mexico in response to predictions of changing climatic patterns. All but one of the 19 models predicted a drying trend within the Southwest; one predicted a trend toward a wetter climate (Seager *et al.* 2007, p. 1181). A total of 49 projections were created using the 19 models; all but 3 of the projections predicted a shift to increasing dryness in the Southwest as early as 2021–2040 (Seager *et al.* 2007, p. 1181). The current prognosis for climate change impacts on the Sonoran Desert of the American Southwest includes fewer frost days; warmer temperatures; greater water demand by plants, animals, and people; and an increased frequency of extreme weather events (heat waves, droughts, and floods) (Overpeck and Weiss 2005, p. 2074; Archer and Predick 2008, p. 24). How climate change will affect summer precipitation is less certain, because precipitation predictions are based on continental-scale general circulation models that do not yet account for land use and land cover change effects on climate or regional phenomena, such as those that control monsoonal rainfall in the Southwest (Overpeck and Weiss 2005, p. 2075; Archer and Predick 2008, pp. 23–24). Some models predict dramatic changes in Southwestern vegetation communities as a result of climate change (Overpeck and Weiss 2005, p. 2074; Archer and Predick 2008, p. 24), especially as wildfires carried by non-native plants (e.g., buffelgrass) potentially become more frequent, promoting the presence of exotic species over native ones (Overpeck and Weiss 2005, p. 2075). The shovel-nosed snake currently persists, often in abundance, within portions of its range (e.g., southwestern Arizona and southeastern California) that experience less precipitation and higher temperatures and are characterized by simpler vegetation communities (Turner and Brown 1982, pp. 190–202) than that found within the range of the Tucson shovel-nosed snake. Hence, if climates dry and become warmer, with concomitant changes in vegetation communities, the Tucson shovel-nosed snake may be able to persist under those conditions. However, the precise habitat components and ecological relationships necessary for persistence are unknown, so predicting the response of the snake to environmental change induced by climate change is speculative. If changes include increased fire frequency due to increasing non-native plants, this tends to increase uncertainty in predicting population response, because how the snake responds to these fire-altered communities is unknown. At this time, it is not possible to determine how these changes will affect the Tucson shovel-nosed snake, as potential trajectories of vegetation change within the range of the subspecies are difficult to predict due to uncertain changes in warm season precipitation variability and fire (Overpeck and Weiss 2005, p. 2075), and the response of the snake to changing vegetation communities is speculative.

Summary of Factor E

Temperatures in the desert Southwest are expected to rise in the next two decades and likely throughout the 21st century (Intergovernmental Panel on Climate Change 2007, pp. 45–46), with an increased frequency of extreme weather events, such as heat waves, droughts, and floods. We do not know the extent to which changing climate patterns will affect the Tucson shovel-nosed snake; however, this environmental change injects additional uncertainty into the future status of the subspecies.

Finding

In our review of the status of the Tucson shovel-nosed snake, we carefully examined the best scientific and commercial information available. We identified a number of potential threats to this species, including: urban and rural development; road construction, use, and maintenance; concentrating solar power facilities and transmission corridors; agriculture; wildfires; and lack of adequate management and regulation.

Limited surveys have been conducted only in small parts of its range, so information on rangewide population size and trends for the Tucson shovel-nosed snake is not available. As of 2001, over one-third of the area within the range of the snake had been converted to either urban development or agriculture. There are indications that in the Avra Valley, where the snake was once present, it has now disappeared or persists in such low numbers that it is difficult to locate. In other areas (e.g., Florence Military Reservation), the snake appears to be persisting. Therefore, based on the best available information, we find that the only information we have indicates that populations in the Avra Valley have declined, which is near development and agriculture; while in areas with little or no development or agriculture, the population is persisting.

We evaluated existing and potential threats to the Tucson shovel-nosed snake to determine what effects on the subspecies are currently occurring, whether these threats are likely to increase or decrease in the future, and which of the impacts may be expected to rise to the level of a threat to the subspecies, either rangewide or at the population level. We examined threats posed by urban and rural development; road construction, use, and maintenance; solar power facilities and transmission corridors; agricultural uses; wildfires; overutilization; disease and predation; the inadequacy of existing regulatory mechanisms; and climate change. We did not find that overutilization, disease, or predation are currently threatening the Tucson shovel-nosed snake. We also found it likely that the threat of agricultural uses will decrease in the future, as farmland is and will continue to be converted to residential and commercial uses.

Next we considered whether any of the potential threats are likely to increase within the foreseeable future. Data suggest that urban and rural development in most of the snake's range is likely to increase in the future. Comprehensive Plans encompassing the entire range of the snake encourage large Growth Areas in the next 20 years and beyond, portions of which occur in Tucson shovel-nosed snake habitat not already impacted by development or agriculture. These Plans also call for an increase in roads and transportation corridors, which have been documented to impact the snake through direct mortality. Additionally, development of solar energy facilities and transmission corridors throughout the State is being pursued, and demand for these facilities will likely increase. Some of these facilities are being considered within the range of the Tucson shovel-nosed snake and have the potential to degrade

or destroy approximately 506 hectares (1,250 acres), on average, of habitat per facility. We also believe that wildfires due to infestations of non-native grasses (especially buffelgrass) in the snake's habitat, which has native plants not adapted to survive wildfires, are likely to increase in frequency and magnitude in the future as these invasive grasses continue to spread rapidly. It appears that the snake only travels short distances, which makes the subspecies particularly susceptible to habitat fragmentation, as barriers created by development, roads, solar facilities, and wildfires isolate populations from one another. We found that regulations are not in place to minimize or mitigate these threats to the Tucson shovel-nosed snake and its habitat, and, therefore, they are likely to put the snake at risk of local extirpation or extinction.

Climate change is likely to continue for the next century, but there is uncertainty as to how climate change, described under Factor E, will affect the Tucson shovel-nosed snake and its habitat. Predictions are that temperatures in the Southwestern United States will continue to increase, with extreme weather events (such as heat waves, drought, and flooding) occurring with more frequency. How summer precipitation may be affected is less certain. Current models suggest that a 10- to 20–year (or longer) drought is anticipated, and some models predict dramatic changes in Southwestern vegetation communities as a result of climate change, although trajectories of vegetation change are difficult to predict because of variability in warm season precipitation and fire frequency. These changes could affect the habitat of the Tucson shovel-nosed snake, but because of the lack of specific modeling data within the range of the snake, we cannot predict how climate change will impact the Tucson shovel-nosed snake now or in the foreseeable future.

We next considered whether the existing level of threats causes us to conclude that the species is in danger of extinction now or in the foreseeable future. The threats discussed above, particularly those that lead to a loss of habitat, are likely to reduce the population of Tucson shovel-nosed snakes across its entire range. Given the limited geographic distribution of this snake and the fact that its entire range lies within the path of future development, we believe the subspecies is likely to become in danger of extinction within the foreseeable future. Therefore, we find that listing the Tucson shovel-nosed snake throughout its range is warranted.

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 subspecies at this time because, within the current distribution of the subspecies throughout its range, there are at least some populations of the Tucson shovel-nosed snake that exist in relatively natural conditions that are unlikely to change in the short-term. However, if at any time we determine that emergency listing of the Tucson shovel-nosed snake is warranted, we will initiate an emergency listing.

The Service adopted guidelines on September 21, 1983 (48 FR 43098) to establish a rational system for allocating available appropriations to the highest priority species when adding species to the Lists of Endangered or Threatened Wildlife and Plants or reclassifying threatened species to endangered status. The system places greatest importance on the immediacy and magnitude of threats, but also factors in the level of taxonomic distinctiveness by assigning priority in descending order to monotypic genera, full species, and subspecies (or equivalently, distinct population segments of vertebrates). We assigned the Tucson shovel-nosed snake an LPN of 3, based on our finding that the subspecies faces imminent and high-magnitude threats from the present or threatened destruction, modification, or curtailment of its habitat and the inadequacy of existing regulatory mechanisms. One or more of the threats discussed above is occurring or is expected to occur throughout the entire range of this subspecies. These threats are on-going and, in some cases (e.g., loss of habitat through urban development), considered irreversible. While we conclude that listing the Tucson shovel-nosed snake is warranted, an immediate proposal to list this subspecies is precluded by other higher priority listing, which we address below.

Significant Portion of the Range

The Act defines an endangered species as one ''in danger of extinction throughout all or a significant portion of its range,'' and a threatened species as one ''likely to become an endangered species within the foreseeable future throughout all or a significant portion of its range.'' The term ''significant portion of its range'' is not defined by the statute. For the purposes of this finding, a significant portion of a species' range is an area that is important to the conservation of the species because it contributes meaningfully to the representation, resiliency, or redundancy of the species. The contribution must be at a level such that its loss would result in a decrease in the ability to conserve the species.

If an analysis of whether a species is threatened or endangered in a significant portion of its range is appropriate, we engage in a systematic process that begins with identifying any portions of the range of the species that warrant further consideration. The range of a species can theoretically be divided into portions in an infinite number of ways. However, there is no purpose in analyzing portions of the range that are not reasonably likely to be significant and threatened or endangered. To identify only those portions that warrant further consideration, we determine whether there is substantial information indicating that (i) the portions may be significant and (ii) the species may be in danger of extinction there or likely to become so within the foreseeable future. In practice, a key part of this analysis is whether the threats are geographically concentrated in some way. If the threats to the species are essentially uniform throughout its range, no portion is likely to warrant further consideration. Moreover, if any concentration of threats applies only to portions of the range that are unimportant to the conservation of the species, such portions will not warrant further consideration.

On the basis of an analysis of factors that may threaten the Tucson shovel-nosed snake, we have determined that listing is warranted throughout its range. Therefore, it is not necessary to conduct further analysis with respect to the significance of any portion of its range at this time. We will further analyze whether threats may be disproportionate and warrant further consideration as a significant portion of its range at such time that we develop a proposed listing determination.

Preclusion and Expeditious Progress

Preclusion is a function of the listing priority of a species in relation to the resources that are available and competing demands for those resources. Thus, in any given fiscal year (FY), multiple factors dictate whether it will be possible to undertake work on a proposed listing regulation or whether promulgation of such a proposal is warranted but precluded by higher-priority listing actions.

The resources available for listing actions are determined through the annual Congressional appropriations process. The appropriation for the Listing Program is available to support work involving the following listing actions: proposed and final listing rules;

90–day and 12–month findings on petitions to add species to the Lists of Endangered and Threatened Wildlife and Plants (Lists) or to change the status of a species from threatened to endangered; annual determinations on prior "warranted but precluded" petition findings as required under section 4(b)(3)(C)(i) of the Act; critical habitat petition findings; proposed and final rules designating critical habitat; and litigation-related, administrative, and program-management functions (including preparing and allocating budgets, responding to Congressional and public inquiries, and conducting public outreach regarding listing and critical habitat). The work involved in preparing various listing documents can be extensive and may include, but is not limited to: gathering and assessing the best scientific and commercial data available and conducting analyses used as the basis for our decisions; writing and publishing documents; and obtaining, reviewing, and evaluating public comments and peer review comments on proposed rules and incorporating relevant information into final rules. The number of listing actions that we can undertake in a given year also is influenced by the complexity of those listing actions; that is, more complex actions generally are more costly. For example, during the past several years, the cost (excluding publication costs) for preparing a 12–month finding, without a proposed rule, has ranged from approximately $11,000 for one species with a restricted range and involving a relatively uncomplicated analysis to $305,000 for another species that is wide-ranging and involving a complex analysis.

We cannot spend more than is appropriated for the Listing Program without violating the Anti-Deficiency Act (see 31 U.S.C. § 1341(a)(1)(A)). In addition, in FY 1998 and for each fiscal year since then, Congress has placed a statutory cap on funds which may be expended for the Listing Program, equal to the amount expressly appropriated for that purpose in that fiscal year. This cap was designed to prevent funds appropriated for other functions under the Act (for example, recovery funds for removing species from the Lists), or for other Service programs, from being used for Listing Program actions (see House Report 105-163, 105th Congress, 1st Session, July 1, 1997).

Recognizing that designation of critical habitat for species already listed would consume most of the overall Listing Program appropriation, Congress also put a critical habitat subcap in place in FY 2002 and has retained it each subsequent year to ensure that some funds are available for other work in the Listing Program: "The critical habitat designation subcap will ensure that some funding is available to address other listing activities" (House Report No. 107 - 103, 107th Congress, 1st Session, June 19, 2001). In FY 2002 and each year until FY 2006, the Service has had to use virtually the entire critical habitat subcap to address court-mandated designations of critical habitat, and consequently none of the critical habitat subcap funds have been available for other listing activities. In FY 2007, we were able to use some of the critical habitat subcap funds to fund proposed listing determinations for high-priority candidate species. In FY 2009, while we were unable to use any of the critical habitat subcap funds to fund proposed listing determinations, we did use some of this money to fund the critical habitat portion of some proposed listing determinations, so that the proposed listing determination and proposed critical habitat designation could be combined into one rule, thereby increasing efficiency in our work. In FY 2010, we are using some of the critical habitat subcap funds to fund actions with statutory deadlines.

Thus, through the listing cap, the critical habitat subcap, and the amount of funds needed to address court-mandated critical habitat designations, Congress and the courts have in effect determined the amount of money available for other listing activities. Therefore, the funds in the listing cap, other than those needed to address court-mandated critical habitat for already listed species, set the limits on our determinations of preclusion and expeditious progress.

Congress also recognized that the availability of resources was the key element in deciding, when making a 12–month petition finding, whether we would prepare and issue a listing proposal or instead make a "warranted but precluded" finding for a given species. The Conference Report accompanying Public Law 97-304, which established the current statutory deadlines and the warranted-but-precluded finding, states (in a discussion on 90–day petition findings that by its own terms also covers 12–month findings) that the deadlines were "not intended to allow the Secretary to delay commencing the rulemaking process for any reason other than that the existence of pending or imminent proposals to list species subject to a greater degree of threat would make allocation of resources to such a petition [that is, for a lower-ranking species] unwise."

In FY 2010, expeditious progress is that amount of work that can be achieved with $10,471,000, which is the amount of money that Congress appropriated for the Listing Program (that is, the portion of the Listing Program funding not related to critical habitat designations for species that are already listed). However these funds are not enough to fully fund all our court-ordered and statutory listing actions in FY 2010, so we are using $1,114,417 of our critical habitat subcap funds in order to work on all of our required petition findings and listing determinations. This brings the total amount of funds we have for listing action in FY 2010 to $11,585,417. Starting in FY 2010, we are also using our funds to work on listing actions for foreign species since that work was transferred from the Division of Scientific Authority, International Affairs Program to the Endangered Species Program. Our process is to make our determinations of preclusion on a nationwide basis to ensure that the species most in need of listing will be addressed first and also because we allocate our listing budget on a nationwide basis. The $11,585,417 is being used to fund work in the following categories: compliance with court orders and court-approved settlement agreements requiring that petition findings or listing determinations be completed by a specific date; section 4 (of the Act) listing actions with absolute statutory deadlines; essential litigation-related, administrative, and listing program-management functions; and high-priority listing actions for some of our candidate species. The allocations for each specific listing action are identified in the Service's FY 2010 Allocation Table (part of our administrative record).

In FY 2007, we had more than 120 species with an LPN of 2, based on our September 21, 1983, guidance for assigning an LPN for each candidate species (48 FR 43098). Using this guidance, we assign each candidate an LPN of 1 to 12, depending on the magnitude of threats (high vs. moderate to low), immediacy of threats (imminent or nonimminent), and taxonomic status of the species (in order of priority: monotypic genus (a species that is the sole member of a genus); species; or part of a species (subspecies, distinct population segment, or significant portion of the range)). The lower the listing priority number, the higher the listing priority (that is, a species with an LPN of 1 would have the highest listing priority). Because of the large number of

high-priority species, we further ranked the candidate species with an LPN of 2 by using the following extinction-risk type criteria: International Union for the Conservation of Nature and Natural Resources (IUCN) Red list status/rank, Heritage rank (provided by NatureServe), Heritage threat rank (provided by NatureServe), and species currently with fewer than 50 individuals, or 4 or fewer populations. Those species with the highest IUCN rank (critically endangered), the highest Heritage rank (G1), the highest Heritage threat rank (substantial, imminent threats), and currently with fewer than 50 individuals, or fewer than 4 populations, comprised a group of approximately 40 candidate species ("Top 40"). These 40 candidate species have had the highest priority to receive funding to work on a proposed listing determination. As we work on proposed and final listing rules for these 40 candidates, we are applying the ranking criteria to the next group of candidates with LPN of 2 and 3 to determine the next set of highest priority candidate species.

To be more efficient in our listing process, as we work on proposed rules for these species in the next several years, we are preparing multi-species proposals when appropriate, and these may include species with lower priority if they overlap geographically or have the same threats as a species with an LPN of 2. In addition, available staff resources are also a factor in determining high-priority species provided with funding. Finally, proposed rules for reclassification of threatened species to endangered are lower priority, since as listed species, they are already afforded the protection of the Act and implementing regulations.

We assigned the Tucson shovel-nosed snake an LPN of 3, based on our finding that the subspecies faces immediate and high-magnitude threats from the present or threatened destruction, modification, or curtailment of its habitat; predation; and the inadequacy of existing regulatory mechanisms. One or more of the threats discussed above are occurring in each known population in the United States and throughout historically occupied habitats in Mexico. These threats are on-going and, in some cases (e.g., nonnative species), considered irreversible. Pursuant to the 1983 Guidelines, a "species" facing imminent high-magnitude threats is assigned an LPN of 1, 2, or 3 depending on its taxonomic status. Because the Tucson shovel-nosed snake is a subspecies, we assigned it an LPN of 3 (the highest category available for a subspecies). Therefore, work on a proposed listing determination for the Tucson shovel-nosed snake is precluded by work on higher priority candidate species (i.e., species with LPN of 2); listing actions with absolute statutory, court-ordered, or court-approved deadlines; and final listing determinations for those species that were proposed for listing with funds from previous fiscal years. This work includes all the actions listed in the tables below under expeditious progress.

As explained above, a determination that listing is warranted but precluded must also demonstrate that expeditious progress is being made to add or remove qualified species to and from the Lists of Endangered and Threatened Wildlife and Plants. (Although we do not discuss it in detail here, we are also making expeditious progress in removing species from the list under the Recovery program, which is funded by a separate line item in the budget of the Endangered Species Program. As explained above in our description of the statutory cap on Listing Program funds, the Recovery Program funds and actions supported by them cannot be considered in determining expeditious progress made in the Listing Program.) As with our "precluded" finding, expeditious progress in adding qualified species to the Lists is a function of the resources available and the competing demands for those funds. Given that limitation, we find that we are making progress in FY 2010 in the Listing Program. This progress included preparing and publishing the following determinations:

TABLE 1. ACTIONS TAKEN BY THE LISTING PROGRAM OF THE U.S. FISH AND WILDLIFE SERVICE FROM THE BEGINNING OF FY2010 TO DATE.

Publication Date	Title	Actions	FR Pages
10/08/2009	Listing *Lepidium papilliferum* (Slickspot Peppergrass) as a Threatened Species Throughout Its Range	Final Listing Threatened	74 FR 52013-52064
10/27/2009	90-day Finding on a Petition To List the American Dipper in the Black Hills of South Dakota as Threatened or Endangered	Notice of 90–day Petition Finding, Not substantial	74 FR 55177-55180
10/28/2009	Status Review of Arctic Grayling *(Thymallus arcticus)* in the Upper Missouri River System	Notice of Intent to Conduct Status Review	74 FR 55524-55525
11/03/2009	Listing the British Columbia Distinct Population Segment of the Queen Charlotte Goshawk Under the Endangered Species Act: Proposed rule.	Proposed Listing Threatened	74 FR 56757-56770
11/03/2009	Listing the Salmon-Crested Cockatoo as Threatened Throughout Its Range with Special Rule	Proposed Listing Threatened	74 FR 56770-56791
11/23/2009	Status Review of Gunnison sage-grouse *(Centrocercus minimus)*	Notice of Intent to Conduct Status Review	74 FR 61100-61102
12/03/2009	12-Month Finding on a Petition to List the Black-tailed Prairie Dog as Threatened or Endangered	Notice of 12–month petition finding, Not warranted	74 FR 63343-63366
12/03/2009	90-Day Finding on a Petition to List Sprague's Pipit as Threatened or Endangered	Notice of 90–day Petition Finding, Substantial	74 FR 63337-63343

TABLE 1. ACTIONS TAKEN BY THE LISTING PROGRAM OF THE U.S. FISH AND WILDLIFE SERVICE FROM THE BEGINNING OF FY2010 TO DATE.—Continued

Publication Date	Title	Actions	FR Pages
12/15/2009	90-Day Finding on Petitions To List Nine Species of Mussels From Texas as Threatened or Endangered With Critical Habitat	Notice of 90–day Petition Finding, Substantial	74 FR 66260-66271
12/16/2009	Partial 90-Day Finding on a Petition to List 475 Species in the Southwestern United States as Threatened or Endangered With Critical Habitat; Proposed Rule	Notice of 90–day Petition Finding, Not substantial and Subtantial	74 FR 66865-66905
12/17/2009	12–month Finding on a Petition To Change the Final Listing of the Distinct Population Segment of the Canada Lynx To Include New Mexico	Notice of 12–month petition finding, Warranted but precluded	74 FR 66937-66950
1/05/2010	Listing Foreign Bird Species in Peru and Bolivia as Endangered Throughout Their Range	Proposed ListingEndangered	75 FR 605-649
1/05/2010	Listing Six Foreign Birds as Endangered Throughout Their Range	Proposed ListingEndangered	75 FR 286-310
1/05/2010	Withdrawal of Proposed Rule to List Cook's Petrel	Proposed rule, withdrawal	75 FR 310-316
1/05/2010	Final Rule to List the Galapagos Petrel and Heinroth's Shearwater as Threatened Throughout Their Ranges	Final Listing Threatened	75 FR 235-250
1/20/2010	Initiation of Status Review for *Agave eggersiana* and *Solanum conocarpum*	Notice of Intent to Conduct Status Review	75 FR 3190-3191
2/09/2010	12–month Finding on a Petition to List the American Pika as Threatened or Endangered; Proposed Rule	Notice of 12–month petition finding, Not warranted	75 FR 6437-6471
2/25/2010	12-Month Finding on a Petition To List the Sonoran Desert Population of the Bald Eagle as a Threatened or Endangered Distinct Population Segment	Notice of 12–month petition finding, Not warranted	75 FR 8601-8621
2/25/2010	Withdrawal of Proposed Rule To List the Southwestern Washington/Columbia River Distinct Population Segment of Coastal Cutthroat Trout *(Oncorhynchus clarki clarki*) as Threatened	Withdrawal of Proposed Rule to List	75 FR 13068-13071
3/18/2010	90-Day Finding on a Petition to List the Berry Cave salamander as Endangered	Notice of 90-day Petition Finding, Substantial	75 FR 13068-13071
3/23/2010	90 Day Finding on a Petition to List the Southern Hickorynut Mussel (*Obovaria jacksoniana*) as Endangered or Threatened	Notice of 90-day Petition Finding, Not substantial	75 FR 13717-13720
3/23/2010	90-Day Finding on a Petition to List the Striped Newt as Threatened	Notice of 90-day Petition Finding, Substantial	75 FR 13720-13726
3/23/2010	12-Month Findings for Petitions to List the Greater Sage-Grouse (*Centrocercus urophasianus*) as Threatened or Endangered	Notice of 12-month petition finding, Warranted but precluded	75 FR 13910-14014

Our expeditious progress also includes work on listing actions that we funded in FY 2010 but have not yet been completed to date. These actions are listed below. Actions in the top section of the table are being conducted under a deadline set by a court. Actions in the middle section of the table are being conducted to meet statutory timelines, that is, timelines required under the Act. Actions in the bottom section of the table are high-priority listing actions. These actions include work primarily on species with an LPN of 2, and selection of these species is partially based on available staff resources, and when appropriate, include species with a lower priority if they overlap geographically or have the same threats as the species with the high priority. Including these species together in the same proposed rule results in considerable savings in time and funding, as compared to preparing separate proposed rules for each of them in the future.

TABLE 2. LISTING ACTIONS FUNDED IN FY 2010 BUT NOT YET COMPLETED.

Species	Action
Actions Subject to Court Order/Settlement Agreement	
6 Birds from Eurasia	Final listing determination
Flat-tailed horned lizard	Final listing determination
6 Birds from Peru	Proposed listing determination
Sacramento splittail	Proposed listing determination
Mono basin sage-grouse	12–month petition finding
Greater sage-grouse	12–month petition finding
Big Lost River whitefish	12–month petition finding
White-tailed prairie dog	12–month petition finding
Gunnison sage-grouse	12–month petition finding
Wolverine	12–month petition finding
Arctic grayling	12–month petition finding
Agave eggergsiana	12–month petition finding
Solanum conocarpum	12–month petition finding
Mountain plover	12–month petition finding
Hermes copper butterfly	90–day petition finding
Thorne's hairstreak butterfly	90–day petition finding
Actions with Statutory Deadlines	
48 Kauai species	Final listing determination
Casey's june beetle	Final listing determination
Georgia pigtoe, interrupted rocksnail, and rough hornsnail	Final listing determination
2 Hawaiian damselflies	Final listing determination
African penguin	Final listing determination
3 Foreign bird species (Andean flamingo, Chilean woodstar, St. Lucia forest thrush)	Final listing determination
5 Penguin species	Final listing determination
Southern rockhopper penguin – Campbell Plateau population	Final listing determination
5 Bird species from Colombia and Ecuador	Final listing determination
7 Bird species from Brazil	Final listing determination
Queen Charlotte goshawk	Final listing determination
Salmon crested cockatoo	Proposed listing determination
Black-footed albatross	12–month petition finding
Mount Charleston blue butterfly	12–month petition finding
Least chub[1]	12–month petition finding
Mojave fringe-toed lizard[1]	12–month petition finding
Pygmy rabbit (rangewide)[1]	12–month petition finding
Kokanee – Lake Sammamish population[1]	12–month petition finding
Delta smelt (uplisting)	12–month petition finding

TABLE 2. LISTING ACTIONS FUNDED IN FY 2010 BUT NOT YET COMPLETED.—Continued

Species	Action
Cactus ferruginous pygmy-owl[1]	12–month petition finding
Northern leopard frog	12–month petition finding
Tehachapi slender salamander	12–month petition finding
Coqui Llanero	12–month petition finding
Susan's purse-making caddisfly	12–month petition finding
White-sided jackrabbit	12–month petition finding
Jemez Mountains salamander	12–month petition finding
Dusky tree vole	12–month petition finding
Eagle Lake trout[1]	12–month petition finding
29 of 206 species	12–month petition finding
Desert tortoise – Sonoran population	12–month petition finding
Gopher tortoise – eastern population	12–month petition finding
Amargosa toad	12–month petition finding
Wyoming pocket gopher	12–month petition finding
Pacific walrus	12–month petition finding
Wrights marsh thistle	12–month petition finding
67 of 475 southwest species	12–month petition finding
9 Southwest mussel species	12–month petition finding
14 parrots (foreign species)	12–month petition finding
Southeastern pop snowy plover & wintering pop. of piping plover[1]	90–day petition finding
Eagle Lake trout[1]	90–day petition finding
Ozark chinquapin[1]	90–day petition finding
Smooth-billed ani[1]	90–day petition finding
Bay Springs salamander[1]	90–day petition finding
Mojave ground squirrel[1]	90–day petition finding
32 species of snails and slugs[1]	90–day petition finding
Calopogon oklahomensis[1]	90–day petition finding
42 snail species	90–day petition finding
White-bark pine	90–day petition finding
Puerto Rico harlequin	90–day petition finding
Fisher – Northern Rocky Mtns. population	90–day petition finding
Puerto Rico harlequin butterfly[1]	90–day petition finding
42 snail species (Nevada & Utah)	90–day petition finding
HI yellow-faced bees	90–day petition finding
Red knot *roselaari* subspecies	90–day petition finding
Honduran emerald	90–day petition finding
Peary caribou	90–day petition finding

TABLE 2. LISTING ACTIONS FUNDED IN FY 2010 BUT NOT YET COMPLETED.—Continued

Species	Action
Western gull-billed tern	90–day petition finding
Plain bison	90–day petition finding
Giant Palouse earthworm	90–day petition finding
Mexican gray wolf	90–day petition finding
Spring Mountains checkerspot butterfly	90–day petition finding
Spring pygmy sunfish	90–day petition finding
San Francisco manzanita	90–day petition finding
Bay skipper	90–day petition finding
Unsilvered fritillary	90–day petition finding
Texas kangaroo rat	90–day petition finding
Spot-tailed earless lizard	90–day petition finding
Eastern small-footed bat	90–day petition finding
Northern long-eared bat	90–day petition finding
Prairie chub	90–day petition finding
10 species of Great Basin butterfly	90–day petition finding
High Priority Listing Actions[3]	
19 Oahu candidate species[3] (16 plants, 3 damselflies) (15 with LPN = 2, 3 with LPN = 3, 1 with LPN =9)	Proposed listing
17 Maui-Nui candidate species[3] (14 plants, 3 tree snails) (12 with LPN = 2, 2 with LPN = 3, 3 with LPN = 8)	Proposed listing
Sand dune lizard[3] (LPN = 2)	Proposed listing
2 Arizona springsnails[3] *(Pyrgulopsis bernadina* (LPN = 2), *Pyrgulopsis trivialis* (LPN = 2))	Proposed listing
2 New Mexico springsnails[3] *(Pyrgulopsis chupaderae* (LPN = 2), *Pyrgulopsis thermalis* (LPN = 11))	Proposed listing
2 mussels[3] (rayed bean (LPN = 2), snuffbox No LPN)	Proposed listing
2 mussels[3] (sheepnose (LPN = 2), spectaclecase (LPN = 4),)	Proposed listing
Ozark hellbender[2] (LPN = 3)	Proposed listing
Altamaha spinymussel[3] (LPN = 2)	Proposed listing
5 southeast fish[3] (rush darter (LPN = 2), chucky madtom (LPN = 2), yellowcheek darter (LPN = 2), Cumberland darter (LPN = 5), laurel dace (LPN = 5))	Proposed listing
8 southeast mussels (southern kidneyshell (LPN = 2), round ebonyshell (LPN = 2), Alabama pearlshell (LPN = 2), southern sandshell (LPN = 5), fuzzy pigtoe (LPN = 5), Choctaw bean (LPN = 5), narrow pigtoe (LPN = 5), and tapered pigtoe (LPN = 11))	Proposed listing
3 Colorado plants[3] (Pagosa skyrocket *(Ipomopsis polyantha*) (LPN = 2), Parchute beardtongue *(Penstemon debilis*) (LPN = 2), Debeque phacelia *(Phacelia submutica*) (LPN = 8))	Proposed listing

[1] Funds for listing actions for these species were provided in previous FYs.
[2] We funded a proposed rule for this subspecies with an LPN of 3 ahead of other species with LPN of 2, because the threats to the species were so imminent and of a high magnitude that we considered emergency listing if we were unable to fund work on a proposed listing rule in FY 2008.
[3] Funds for these high-priority listing actions were provided in FY 2008 or 2009

We have endeavored to make our listing actions as efficient and timely as possible, given the requirements of the relevant law and regulations, and constraints relating to workload and personnel. We are continually considering ways to streamline processes or achieve economies of scale, such as by batching related actions

together. Given our limited budget for implementing section 4 of the Act, these actions described above collectively constitute expeditious progress.

The Tucson shovel-nosed snake will be added to the list of candidate species upon publication of this 12–month finding. We will continue to monitor the status of this species as new information becomes available. This review will determine if a change in status is warranted, including the need to make prompt use of emergency listing procedures.

We intend that any proposed listing action for the Tucson shovel-nosed snake will be as accurate as possible. Therefore, we will continue to accept additional information and comments from all concerned governmental agencies, the scientific community, industry, or any other interested party concerning this finding.

References Cited

A complete list of all references cited in this document is available on the Internet at http://www.regulations.gov and upon request from the Field Supervisor at the Arizona Ecological Services Office (see **ADDRESSES** section).

Author

The primary author of this notice is the Arizona Ecological Services Office (see **FOR FURTHER INFORMATION CONTACT** section).

Authority

The authority for this action is section 4 of the Endangered Species Act of 1973, as amended (16 U.S.C. 1531 *et seq.*).

Dated: March 18, 2010

Rowan W. Gould,

Acting Director, Fish and Wildlife Service.

[FR Doc. 2010–7133 Filed 3–30–10; 8:45 am]

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