



FEDERAL REGISTER

Vol. 76

Tuesday,

No. 70

April 12, 2011

Part II

Department of the Interior

Fish and Wildlife Service

50 CFR Part 17

Endangered and Threatened Wildlife and Plants; Proposed Endangered Status for the Three Forks Springsnail and San Bernardino Springsnail, and Proposed Designation of Critical Habitat; Proposed Rule

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

[Docket No. FWS-R2-ES-2009-0083;
92210-1117-0000-B4]

RIN 1018-AV84

Endangered and Threatened Wildlife and Plants; Proposed Endangered Status for the Three Forks Springsnail and San Bernardino Springsnail, and Proposed Designation of Critical Habitat

AGENCY: Fish and Wildlife Service, Interior.

ACTION: Proposed rule.

SUMMARY: We, the U.S. Fish and Wildlife Service (Service), propose to list the Three Forks springsnail (*Pyrgulopsis trivialis*) and the San Bernardino springsnail (*Pyrgulopsis bernardina*) as endangered under the Endangered Species Act of 1973, as amended (Act). If we finalize this rule as proposed, it would extend the Act's protections to these species. We also propose to designate critical habitat for both species under the Act. In total, approximately 4.5 hectares (11.1 acres) are being proposed for designation as critical habitat for Three Forks springnail in Apache County, and approximately 0.815 hectares (2.013 acres) for San Bernardino springsnail in Cochise County, Arizona. We seek information and comments from the public regarding the Three Forks and San Bernardino springsnails and this proposed rule.

DATES: We will accept comments received or postmarked on or before June 13, 2011. We must receive requests for public hearings, in writing, at the address shown in the **FOR FURTHER INFORMATION CONTACT** section by May 27, 2011.

ADDRESSES: You may submit comments by one of the following methods:

- *Federal eRulemaking Portal:* <http://www.regulations.gov>. Follow the instructions for submitting comments for Docket No. FWS-R2-ES-2009-0083.

- *U.S. mail or hand-delivery:* Public Comments Processing, Attn: Docket No. FWS-R2-ES-2009-0083; Division of Policy and Directives Management; U.S. Fish and Wildlife Service; 4401 N. Fairfax Drive, Suite 222; Arlington, VA 22203.

We will not accept e-mail or faxes. We will post all comments on <http://www.regulations.gov>. This generally means that we will post any personal information you provide us (see the

Public Comments Solicited section below for more information).

FOR FURTHER INFORMATION CONTACT:

Steve Spangle, Field Supervisor, Arizona Ecological Services Field Office, 2321 West Royal Palm Road, Suite 103, Phoenix, Arizona, 85021; telephone 602-242-0210; facsimile 602-242-2513. If you use a telecommunications device for the deaf (TDD), call the Federal Information Relay Service (FIRS) at 800-877-8339.

SUPPLEMENTARY INFORMATION: This document consists of: (1) A proposed rule to list the Three Forks Springsnail and San Bernardino Springsnail as endangered; and (2) proposed critical habitat designations for the two species.

Previous Federal Actions

We first identified the Three Forks springsnail as a candidate for listing on October 30, 2001 (66 FR 54808). We first identified the San Bernardino springsnail as a candidate for listing on December 6, 2007 (72 FR 69034). Candidates are those fish, wildlife, and plants for which we have on file sufficient information on biological vulnerability and threats to support preparation of a listing proposal, but for which development of a listing regulation is precluded by other higher priority listing activities.

On May 4, 2004, the Center for Biological Diversity petitioned the Service to list 225 species of plants and animals as endangered under the provisions of the Endangered Species Act, as amended (16 U.S.C. 1531 *et seq.*), including the Three Forks springsnail. On June 25, 2007, we received a petition from Forest Guardians to list 475 species in the southwestern United States as threatened or endangered under the provisions of the Act, including the San Bernardino springsnail. In our most recent annual Candidate Notice of Review dated November 10, 2010 (75 FR 69222), we retained a listing priority number (LPN) of 2 for the Three Forks springsnail and the San Bernardino springsnail in accordance with our priority guidance published on September 21, 1983 (48 FR 43098). An LPN of 2 reflects threats that are both imminent and high in magnitude, as well as the taxonomic classification as a full species.

Public Comments

We intend that any final action resulting from this proposed rule will be based on the best scientific and commercial data available and be as accurate and as effective as possible. Therefore, we request comments or

information from the public, other concerned governmental and tribal agencies, the scientific community, industry, or any other interested party concerning this proposed rule. We particularly seek comments concerning:

- (1) Biological, commercial trade, or other relevant data concerning any threats (or lack thereof) to these species and regulations that may be addressing those threats.

- (2) Additional information concerning the range, distribution, and population size of these species, including the locations of any additional populations.

- (3) Any information on the biological or ecological requirements of these species.

- (4) The reasons why we should or should not designate habitat as "critical habitat" under section 4 of the Act including whether there are threats to the species from human activity which are expected to increase due to the designation, and whether that increase in threat outweighs the benefit of designation such that the designation of critical habitat may not be prudent.

- (5) Specific information on:

- The amount and distribution of habitat for each species,
- What areas occupied at the time of listing and that contain features essential to the conservation of these species should be included in the designation and why,
- Special management considerations or protections that the features essential to the conservation of both species that have been identified in this proposal may require, including managing for the potential effects of climate change, and
- What areas not occupied at the time of listing are essential for the conservation of the species and why.

- (6) Land use designations and current or planned activities in the subject areas and their possible impacts on proposed critical habitat.

- (7) Any probable economic, national security, or other relevant impacts of designating any area that may be included in the final designation. We are particularly interested in any impacts on small entities or families, and the benefits of including or excluding areas that exhibit these impacts.

- (8) Whether we could improve or modify our approach to designating critical habitat in any way to provide for greater public participation and understanding, or to better accommodate public concerns and comments.

- (9) Information on the projected and reasonably likely impacts of climate change on both species and the critical habitat areas we are proposing.

You may submit your comments and materials concerning this proposed rule by one of the methods listed in the **ADDRESSES** section.

We will post your entire comment—including your personal identifying information—on <http://www.regulations.gov>. If you provide personal identifying information, such as your street address, phone number, or e-mail address, you may request at the top of your document that we withhold this information from public review. However, we cannot guarantee that we will be able to do so.

Comments and materials we receive, as well as supporting documentation we used in preparing this proposed rule, will be available for public inspection on <http://www.regulations.gov> at Docket No. FWS-R2-ES-2009-0083, or by appointment, during normal business hours, at the Arizona Ecological Services Field Office (see **FOR FURTHER INFORMATION CONTACT** section).

Background

Both the Three Forks springsnail and San Bernardino springsnail are members of the genus *Pyrgulopsis* in the family Hydrobiidae. In the arid Southwest, springsnails in this family are largely relicts of the wetter Pleistocene Epoch (2.5 million to 10,000 years ago) and are typically distributed across the landscape as geographically isolated populations exhibiting a high degree of endemism (found only in a particular area or region) (Bequart and Miller 1973, p. 214; Taylor 1987, pp. 5–6; Shepard 1993, p. 354; Hershler and Sada 2002, p. 255). Springsnails are strictly aquatic and respiration occurs through an internal gill. Springsnails in the genus *Pyrgulopsis* are egg-layers (Hershler 1998, p. 14). The larval stage is completed in the egg capsule and, upon hatching, tiny snails emerge into their adult habitat (Brusca and Brusca 1990, p. 759; Hershler and Sada 2002, p. 256). The sexes are separate and physical differences are noticeable between them, with females being larger than males. Mobility is limited, and significant migration likely does not occur, although aquatic snails have been known to disperse by becoming attached to the feathers of migratory birds (Roscoe 1955, p. 66; Dundee *et al.* 1967, pp. 89–90).

Springsnails in the family Hydrobiidae feed primarily on periphyton, which is a complex mixture of algae, detritus, bacteria, and other microbes that live upon submerged surfaces in aquatic environments (Mladenka 1992, pp. 46, 81; Hershler and Sada 2002, p. 256; Lysne *et al.* 2007, p. 649). The life span of most aquatic

snails is 9 to 15 months (Pennak 1989, p. 552); survival of one species in the genus *Pyrgulopsis* in the laboratory was 12.7 months (Lysne *et al.* 2007, p. 3).

Both the Three Forks springsnail and San Bernardino springsnail occur in springs, seeps, spring runs, and a variety of waters, but particularly rheocrene systems (water emerging from the ground as a free-flowing stream). In the desert Southwest, these spring ecosystems are commonly referred to as cienegas (Hendrickson and Minckley 1984, pp. 133, 169; Minckley and Brown 1994, pp. 223–287). Snails in the genus *Pyrgulopsis* are rarely found in mud or soft sediments (Hershler 1998, p. 14) and are typically more abundant in gravel to cobble size substrates (Frest and Johannes 1995, p. 203; Malcom *et al.* 2005, p. 75; Martinez and Thome 2006, pp. 12–13; Lysne *et al.* 2007, p. 650). These substrate types provide a suitable surface for springsnails to graze and lay eggs (Taylor 1987, p. 5; Hershler 1998, p. 14).

Proximity to springheads, where water emerges from the ground, plays a key role in the life history of springsnails. Many springsnail species exhibit decreased abundance further away from spring vents, presumably due to their need for stable water chemistry and flow regime provided by spring waters (Hershler 1984, p. 68; Hershler 1998, p. 11; Hershler and Sada 2002, p. 256; Martinez and Thome 2006, p. 14; Tsai *et al.* 2007, p. 216). Several habitat parameters of springs, such as substrate, dissolved carbon dioxide, dissolved oxygen, temperature, conductivity, and water depth, have been shown to influence the distribution and abundance of *Pyrgulopsis* snails (O'Brien and Blinn 1999, p. 231–232; Mladenka and Minshall 2001, pp. 209–211; Malcom *et al.* 2005, p. 75; Martinez and Thome 2006, pp. 12–15; Lysne *et al.* 2007, p. 650; Tsai *et al.* 2007, p. 2006). Dissolved salt may also be an important factor, because it is essential for shell formation (Pennak 1989, p. 552).

Three Forks Springsnail

The Three Forks springsnail was described as *Pyrgulopsis trivialis* by Hershler (1994, pp. 68–69). We have carefully reviewed the available taxonomic information (Landye 1973, p. 49; Taylor 1987, pp. 30–32; Hershler and Landye 1988, pp. 32–35; Hershler 1994, pp. 68–69; Hurt 2004, p. 1176) and conclude that Three Forks springsnail is a valid taxon. The Three Forks springsnail is a variably sized species, with a shell height (length) of 1.5 to 4.8 millimeters (mm) (0.06 to 0.19 in). A detailed description of the identifying characteristics of the Three

Forks springsnail is found in Taylor (1987, pp. 30–32) and Hershler and Landye (1988, pp. 32–35).

The Three Forks springsnail is known to occur in two separate spring complexes, Three Forks Springs and Boneyard Bog Springs in the North Fork East Fork Black River Watershed of the White Mountains on the Apache-Sitgreaves National Forests in Apache County, east-central Arizona (Myers 2000, p. 1; Nelson *et al.* 2002, p. 5). These spring complexes are found in open mountain meadows at 2,500 meters (m) (8,200 feet (ft)) elevation and are separated by 6 kilometers (km) (3.7 miles (mi)) of perennial flowing stream (Martinez and Myers 2008, p. 189). The species has been found in free-flowing springheads, concrete boxed springheads, spring runs, spring seeps, and shallow ponded water at Three Forks Springs and Boneyard Bog Springs (Martinez and Myers 2008, p. 189). A springsnail of the same genus was recently found in a spring along Boneyard Creek between Three Forks Springs and Boneyard Bog Springs (Myers 2010, p. 1). Although the locality of this new site suggests it is likely the same species, additional analysis will be needed for a definitive determination of its taxonomy.

Martinez and Myers (2008, p. 189–194) found the presence of Three Forks springsnail was associated with gravel/pebble substrates, shallow water up to 6 centimeters (cm) (2.4 in) deep, high conductivity, alkaline waters of pH 8, and the presence of pond snails, *Physa gyrina*. It has also been shown that density of Three Forks springsnail is significantly greater on gravel/cobble substrates (Martinez and Myers 2002, p. 1; Nelson 2002, p. 1), though the species has been reported as “abundant” in the fine-grained mud of a 0.01 hectare (ha) (0.025 acre (ac)) pond at Three Forks (Taylor 1987, p. 32). Abundance has been found to decrease downstream from springheads (Nelson *et al.* 2002, p. 11), consistent with studies of other springsnails (Hershler 1984, p. 68; Hershler 1998, p. 11; Hershler and Sada 2002, p. 256; Martinez and Thome 2006, p. 14; Tsai *et al.* 2007, p. 216).

The Three Forks springsnail was historically abundant at both Three Forks and Boneyard Bog springs (Myers 2000, p. 1; Nelson *et al.* 2002, p. 5). Nelson *et al.* (2002, p. 5) reported Three Forks springsnail densities of approximately 60 snails per square meter (72 per square yard) at Three Forks and approximately 790 snails per square meter (945 per square yard) at Boneyard Bog Springs. The number at a single springbrook, with an area of 213 square meters (254 square yards), at

Three Forks Springs in 2002 was estimated at tens of thousands of individual snails (Martinez 2009, pp. 31–32). The Three Forks springsnail no longer occurs in abundance at Three Forks Springs. Since 2004, annual surveys at Three Forks have detected very low numbers of the species, including two individuals found in August 2005 (Cox 2007, p. 1) and three individuals found in July 2008 (Bailey 2008, p. 1). Reasons for the decline are discussed in the Threats section of this proposed rule. The species continues to be abundant at Boneyard Bog Springs (Cox 2007, p. 1).

San Bernardino Springsnail

The San Bernardino springsnail was described by Hershler (1994, pp. 21–22) as *Pyrgulopsis bernardina* from specimens collected at the type locality (site of original collection) from two springs on San Bernardino Ranch (including Snail Spring), Cochise County, Arizona. We have reviewed the available taxonomic information (Landye 1973, p. 34; Landye 1981, p. 21; Hershler and Landye 1988, p. 41; Taylor 1987, p. 34; Hershler 1994, p. 21; Hurt 2004, p. 1176) and conclude that San Bernardino springsnail is a valid taxon. The San Bernardino springsnail has a narrow-conic shell and a height of 1.3 to 1.7 mm. A detailed description of the identifying characteristics of the San Bernardino springsnail is found in Hershler (1994, pp. 21–22).

The historical range of the San Bernardino springsnail in the United States may have included at least six populations within a complex of spring ecosystems along the Rio San Bernardino (also known as San Bernardino Creek or Black Draw) within the headwaters of the Rio Yaqui in Cochise County, southern Arizona, on what is now the San Bernardino National Wildlife Refuge (NWR) and the adjacent, private John Slaughter Ranch, including Snail Spring, House Spring, Horse Spring, Goat Tank Spring, House Pond, Tule Spring, and Mesa Seep (Cox *et al.* 2007, pp. 1–2; Service 2007, pp. 82–83; Malcom *et al.* 2005, p. 75; Malcom *et al.* 2003, p. 2; Velasco 2000, p. 1). The current range of the species is limited to two or possibly three springs, all located on the John Slaughter Ranch. The San Bernardino springsnail has recently been confirmed in Goat Tank Spring and Horse Spring (Martinez 2010, p. 2), though the species appears to exhibit low population numbers at these two sites. The species was formerly very abundant at Snail Spring on the John Slaughter Ranch (Malcom *et al.* 2003, p. 17; Malcom *et al.* 2005, p. 74) and was last confirmed

from that site in 2005 (Cox *et al.* 2007, p. 1).

In Sonora, Mexico, a springsnail in the same family as the San Bernardino springsnail occurs in the San Bernardino and Los Ojitos cienegas on the private Rancho San Bernardino within 0.25 mi (0.4 km) of San Bernardino NWR (Service 2007, p. 82; Malcom *et al.* 2005, p. 75). The snails found in Mexico are likely to be San Bernardino springsnails, since they occur in the same drainage; however, additional research is needed to verify if this is the case (Hershler 2009, p. 1; Hershler 2008, p. 1).

Malcom *et al.* 2005 (pp. 71, 75–76) showed that the density of San Bernardino springsnail was positively associated with cobble substrates, higher vegetation density, faster water velocity, higher dissolved oxygen, water temperatures of 14 to 22 degrees Celsius, and pH values between 7.6 and 8.0. San Bernardino springsnail density exhibited positive relationships to sand and cobble substrates, vegetation density, and water velocity, and negative relationships to silt and organic substrates, and water depth (Malcom *et al.* 2005, pp. 75–76). Substrates with higher silt content typically support fewer springsnails. No studies have been conducted to determine the species' limits or tolerances to specific habitat thresholds.

Limited information is available on population sizes for the San Bernardino springsnail. Malcom *et al.* (2003, p. 7; 2005, p. 74) estimated average springsnail density as 55,929 individuals per square meter (66,893 per square yard) at Snail Spring from September 2001 to March 2002. The species appears to occur in low population numbers at Goat Tank Spring and Horse Spring, often making detection difficult.

Summary of Factors Affecting the Species

Section 4 of the Act and implementing regulations at 50 CFR part 424 set forth procedures for adding species to the Federal Lists of Endangered and Threatened Wildlife and Plants. A species may be determined to be an endangered or threatened species 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; and (E) other natural or manmade factors affecting its continued

existence. Listing actions may be warranted based on any of the above threat factors, singly or in combination. Each of these factors is discussed below.

A. The Present or Threatened Destruction, Modification, or Curtailment of Its Habitat or Range

Wildfire Suppression

Fire frequency and intensity in southwestern forests are altered from historical conditions (Dahms and Geils 1997, p. 34; Danzer *et al.* 1997, p. 1). Before the late 1800s, surface fires generally occurred at least once per decade in montane forests with a pine component (Swetnam and Baisan 1996, p. 15), landscapes similar to those within which the Three Forks springsnail occurs. During the early 1900s, frequent widespread ground fires ceased to occur due to intensive livestock grazing that removed fine fuels, such as grasses. Coupled with fire suppression, changes in fuel load began to alter forest structure and natural fire regime (Dahms and Geils 1997, p. 34). Absence of low-intensity ground fires allowed a buildup of woody fuels that resulted in infrequent, but very hot, stand replacing fires (very hot fires which kill all or most of aboveground parts of the dominant vegetation, changing the aboveground structure substantially) (Danzer *et al.* 1997, p. 9; Dahm and Geils 1997, p. 34).

On May 17, 2004, and June 8, 2004, two wildfires, the KP and Three Forks fires, ignited near one another on U.S. Forest Service (USFS) lands and developed into hot crown fires (fires burning in tree canopies). Initial fire suppression efforts by the USFS were unsuccessful, and the USFS authorized additional actions to protect resources from what they considered to be extreme fire behavior (USFS 2005, p. 2–3). The additional actions included application of aerial fire retardants. Although this fire complex did not directly burn the Three Forks Springs area, surface waters within the Three Forks fire area were exposed to fire retardant (chemicals used to suppress fire) that likely drifted from high elevation retardant releases from aircraft (USFS 2005, pp. 4, 12).

Fire retardants are toxic to springsnails when they enter the aquatic systems the snails occupy. Some fire retardant chemicals are ammonia-based, which are toxic to aquatic wildlife; however, many formulations also contain yellow prussiate of soda (sodium ferrocyanide), which is added as an anticorrosive agent. Such formulations are toxic for fish, aquatic invertebrates, and algae (Angeler *et al.*

2006, pp. 171–172; Calfee and Little 2003, pp. 1527–1530; Little and Calfee 2002, p. 5; Buhl and Hamilton 1998, p. 1598; Hamilton *et al.* 1998, p. 3; Gaikwowski *et al.* 1996, pp. 1372–1373). Toxicity of these formulations is enhanced by sunlight (Calfee and Little 2003, pp. 1529–1533). Contamination of aquatic sites can occur via direct application or runoff from treated uplands.

During the fire suppression activities in the vicinity of Three Forks Springs, approximately 108,610 gallons (411,130 liters) of aerial fire retardant were applied (USFS 2005, p. 3). The nearest documented release into a waterway was 0.65 mi (1.05 km) from Three Forks Springs, though other undocumented aerial releases in the area could have been closer. The USFS (2005, p. 12) concluded that lethal concentrations of retardant contaminated Three Forks Springs waters. This contamination resulted in the near disappearance of springsnails following the fire. Available data indicate that the species was still abundant in all historically occupied sites at Three Forks Springs in 2002 and 2003, just prior to the fire (Arizona Game and Fish Department (AGFD) 2008, p. 57–70; Martinez 2009, pp. 31–32). Surveys in 2004, immediately following the fire, failed to locate any springsnails. 2005 surveys detected only two snails (Cox 2007, p. 1), 2008 surveys detected only three snails (Bailey 2008, p. 1), 2009 surveys located only one snail (Grosch 2010, p. 1), and 2010 surveys did not detect any snails (Sorensen 2010, p.1). Since these are short-lived species, finding even a few individuals 4 and 5 years after the fire seems to indicate that the species continues to persist, though precariously, at Three Forks Springs.

Lack of vegetation and forest litter following intense crown fires can expose soils to surface erosion during storms, often causing sedimentation, and erosion in downstream drainages (DeBano and Neary 1996, pp. 70–75). Surface erosion could not have directly affected the Three Forks springsnail or its habitat because the spring area did not burn. We do not have information that surface erosion following any wildfires has affected the Three Forks springsnail or its habitat in the past. However, since both Three Forks and Boneyard Bog spring complexes are surrounded by dense coniferous forests, it is reasonable to expect that surface erosion from high intensity wildfires may threaten them in the future.

Considering the toxic effect of fire retardant and the high potential for future wildfires in the area with exposure at both Three Forks and

Boneyard Bog springs, we conclude there is a high risk that the Three Forks springsnail could become extinct due to exposure to fire retardant chemicals in its habitat.

While fires occur within the range of the San Bernardino springsnail, we have no information on fire frequency or intensity in this area. However, if a wildfire were to occur, suppression efforts could include the application of fire retardant chemicals. In this scenario, we would expect San Bernardino springsnails to react negatively to exposure to fire retardants. Because wildfire is unpredictable, and exposure to fire retardants could occur in the future, we believe this represents a potential threat to the species.

Ungulate Grazing

Ungulate (hoofed mammal) grazing on spring ecosystems can alter or remove springsnail habitat and limit the distribution of springsnails, or result in extirpation. For instance, cattle trampling at a spring in Owens Valley, California, reduced banks to mud and sparse grass, limiting the occurrence of the endangered Fish Slough springsnail (*Pyrgulopsis pertubata*) (Bruce and White 1998, pp. 3–4). Additionally, a population of another closely related springsnail, Chupadera springsnail, (*P. chupaderae*), endemic to Socorro County, New Mexico, was extirpated due to the impacts of livestock grazing on its habitat (Arritt 1998, p. 10).

Since the mid- and late 1990s, livestock have been fenced out of both Three Forks and Boneyard Bog springs. However, free-ranging elk (*Cervus elaphus*) have access to both spring complexes. During field surveys in 2000 and 2008, Service staff noted evidence of elk wallowing at Boneyard Bog Springs (Martinez 2000, p. 1; Martinez 2008, p. 1). Areas affected by wallowing were characterized by banks reduced to mud and sparse grass, with stagnant, rather than flowing, water. These are not optimal habitat conditions for the Three Forks springsnail. Although the AGFD have stated that elk wallowing at Boneyard Bog Springs may be a problem for maintaining springhead integrity, they did not find the amount of habitat disturbed alarming (Shroufe 2003, p. 5). We have discussed with AGFD and the Forest Service the possibility of constructing an elk fence, but no action has been taken. Nevertheless, the maintenance of springhead integrity is critical to maintaining water quality and conserving springsnails (Hershler and Williams 1996, p. 1). The observed changes to springsnail habitat resulting from elk use at Boneyard Bog Springs

threatens the integrity of the spring system.

Ungulate grazing is not believed to be a current threat for the San Bernardino springsnail. Cattle grazing does not currently occur on the San Bernardino NWR. A small number of cattle graze on the John Slaughter Ranch, but they do not have access to the spring sites. Horse Spring is located in a horse pen (Martinez 2010, p. 2), but it is unclear what effect, if any, the horses have on the spring. However, past cattle grazing may have played a role in the extirpation of the species from what may have been its historical range. The San Bernardino Valley, including the John Slaughter Ranch, historically supported extensive cattle ranching (Hendrickson and Minckley 1984, pp. 142–144; Service 2007, p. iii–iv). At one time, livestock likely had access to all spring habitats along the Rio San Bernardino.

Springhead Inundation

Springhead inundation refers to pooling of water over a spring vent resulting in ponded water, sometimes relatively deep, that would otherwise exist as shallow free-flowing water. Inundation can alter springsnail habitats by causing shifts in water depth, velocity, substrate composition, vegetation, and water chemistry. Inundation has negatively affected other springsnails (70 FR 46304, August 9, 2005).

Three Forks springsnail habitats have been subjected to minor inundation. During the 1930s, concrete boxes were constructed around four springheads at Three Forks Springs. However, these boxes are small and the majority of the springs affected still exist as shallow, flowing-water ecosystems below the springboxes. Also, the species had been known to be locally abundant within springboxes until 1999, when the extirpation of the species from at least two boxed springheads at Three Forks Springs was noted (Myers 2000, p. 1). Extirpation is believed to be linked to invasion by the northern crayfish (*Orconectis virilis*) (see Factor C below). Habitats at Boneyard Bog Springs have not been affected by inundation. Springhead inundation does not appear to be a substantial threat to the Three Forks springsnail because uninundated springheads are in a relatively small portion of the species' occupied habitat, and the springboxes are relatively small.

Springhead inundation may be a threat to the San Bernardino springsnail. Three unnamed springs on the Slaughter Ranch no longer exist as free-flowing waters. Instead the springheads have been converted into one large

artificial pond referred to as House Pond, which serves as an important refuge for several native Yaqui fishes. Since inundation of this habitat, the San Bernardino springsnail has not been found in these springs, although it was previously believed to occur there (Cox *et al.* 2007, p.1).

Groundwater Depletion

Habitat loss due to groundwater depletion, or loss of water flow, is the primary threat to the San Bernardino springsnail. Since spring ecosystems rely on water discharged to the surface from underground aquifers, depletion of these groundwater sources can result in drying of springs. This threat is severe for the San Bernardino springsnail because, like all springsnails, it is strictly aquatic, breathing through an internal gill and filtering aquatic organisms for food. Groundwater depletion has been recognized as a threat to the biota of the Rio San Bernardino and associated springs for many years in the Yaqui Fishes listing document (49 FR 34490, August 31, 1984) and the Recovery Plan for Yaqui Fishes (Service 1994, p. 17). The extirpation of several suspected populations of San Bernardino springsnail are believed to have been caused by the loss of water flow attributable to water depletion and diversion for domestic water use (Landye 1973, p. 34; Malcom *et al.* 2003, p. 17), though the taxonomy of those populations is unconfirmed.

Two distinct aquifers exist in the San Bernardino Valley basin, one deep and the other shallow (Earman *et al.* 2003, p. 35). These aquifers exhibit different chemical and thermal properties. Many of the springs in the area are influenced by both the deep and the shallow aquifers (Earman *et al.* 2003, p. 166; Malcom *et al.* 2005, pp. 75–76). House Spring, Snail Spring, and Goat Tank Spring have a different chemical composition (isotopic signatures) than other springs in the area, as well as one another (Earman *et al.* 2003, p. 166), indicating that the interaction between the deep aquifer, shallow groundwater, and spring sources, is a complex phenomenon.

Managers of Slaughter Ranch operate an irrigation system that relies on the shallow aquifer and surface water from House Pond to provide water to turf grass and to a cattle pasture (Malcom *et al.* 2003, p. 18; Malcom 2007, p. 1; Cox *et al.* 2007, p. 2). Malcom (2007, p.1) and Cox (2007, p. 1) both reported a visible decline in flow from Snail and Tule Springs when this irrigation system is running. This may indicate that the drawdown of House Pond on

the Slaughter Ranch is hydrologically connected to Snail Spring, or otherwise influences spring flow. However, we have no direct evidence to prove this is the case. Regardless, Snail Spring no longer discharges from the springhead, and the presence of the San Bernardino springsnail was not documented during 2010 spot surveys in areas where it was previously abundant (Martinez 2010, p. 1). The factors contributing to the decline in spring water flows in the San Bernardino Valley, including those located on the Slaughter Ranch and the San Bernardino NWR, may include irrigation, groundwater pumping, extended drought conditions, climate change, and the natural dynamics of groundwater systems.

Regardless of the mechanisms, the cessation of water flow at Snail Spring dates back to at least the summer of 2002, when San Bernardino NWR staff and Slaughter Ranch managers tapped into the Slaughter Ranch domestic water supply from House Spring to maintain springsnail habitat (Smith 2003, p. 1; Malcom 2003, p. 18; Malcom 2007, p. 1). Use of the Slaughter Ranch domestic water supply to support springsnails was intended as an emergency measure that ultimately could not be maintained by House Spring. As a result, surface flow at Snail Spring has been periodically augmented by Slaughter Ranch managers using water diverted from House Pond. While the perception is that such augmentation maintains spring flow, the water chemistry of House Pond is believed to differ significantly from the water chemistry that would naturally flow from Snail Spring. Consistent natural water flow has not been observed in Snail Spring since 2005, and spot surveys have not found the San Bernardino springsnail since then (Cox *et al.* 2007, p. 1; Malcom 2007, p.1; Service 2007, p. 83; Martinez 2010, p. 1). However, these spot surveys have not been intensive, and it is possible the species has managed to survive in wet areas where an overflow pipe discharges water from House Pond, several meters downstream of the springhead.

We have no information indicating that Goat Tank Spring or Horse Spring has experienced any loss of water flow. Because the groundwater system feeding these springs comprises complex interactions between two separate aquifers, we cannot predict if these two springs will eventually cease flowing, as did the springhead at Snail Spring. Even though the species continues to persist at Goat Tank and Horse Springs, it occurs in low numbers most likely due to sub-optimal habitat conditions.

If groundwater depletion results in the continued drying of Snail Spring, a large part of the known range of the San Bernardino springsnail would be eliminated, and the San Bernardino springsnail would be more vulnerable to extinction. If groundwater depletion were to affect Goat Tank Spring and Horse Spring, the entire range of the species could be eliminated.

Groundwater depletion is not currently known to be a threat to the Three Forks springsnail.

Pesticides

Spring endemic species are typically adapted to the unique environmental conditions provided by spring water and may be quite sensitive to shifts in water quality (Hershler 1998, p. 11), including those caused by contamination. Malcom *et al.* (2003, p. 17) consider contamination from pesticides to be a significant threat to the San Bernardino springsnail because a number of herbicides and other pesticides have traditionally been used adjacent to springs on the Slaughter Ranch to maintain landscape conditions (Service 2005, p. 4). These include Roundup® and Rodeo®, which contain glyphosate, a broad-spectrum herbicide, with high water solubility. Pesticides with glyphosate can be slightly to moderately toxic to aquatic organisms, particularly zooplankton and microalgae (Montenegro-Rayó 2004, p. 34), which are food for springsnails.

In addition to possibly contaminating the food base for the springsnail, there may be direct effects to the springsnail. Tate *et al.* (1997, p. 286) reported that glyphosate killed half of the aquatic snails in the snail mimic lymnaea (*Pseudosuccinea columella*) when the dosage was 0.004 ounces per quart (99 milligrams per liter). In the same study, Tate *et al.* (1997, p. 286) continually exposed three successive generations of snails to varying concentrations of glyphosate in water. The results of the study indicate that long-term exposure to sub-lethal concentrations of glyphosate had a delayed effect on growth and development, egg-laying capacity, and hatching of mimic lymnaea snails (Tate *et al.* 1997, p. 288). Less than 50 percent of the eggs hatched at a dosage of 0.0004 ounces per quart (10 milligrams per liter). Thus, sub-lethal, as well as lethal, effects from the use of glyphosate or other pesticides on the Slaughter Ranch may be of concern for the San Bernardino springsnail.

We are unaware of any threat from pesticides to the Three Forks springsnail, because we have no information that pesticides are used in

the vicinity of Three Forks or Boneyard Bog springs.

In summary, the present destruction, modification, and curtailment of habitat and range of the Three Forks springsnail and the San Bernardino springsnail pose significant threats to these species. Threats to the habitat of the Three Forks springsnail are occurring principally from exposure to wildfire and fire retardants, and uncontrolled wild ungulate grazing. Threats to the habitat of the San Bernardino springsnail are caused by springhead inundation, groundwater depletion, and pesticide contamination.

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

Both the Three Forks and San Bernardino springsnails have been subjected to a limited number of scientific studies aimed at determining taxonomy, distribution, and habitat use. Although sampling can reduce population size of springsnails (Martinez and Sorensen 2007, p. 29), studies conducted on the Three Forks and San Bernardino springsnails have not resulted in the removal of large numbers of snails, and we do not believe they have had discernible effects on any population.

Unauthorized collecting has been identified as a threat to other snails, including springsnails (65 FR 10033, February 25, 2000; 58 FR 5938, January 25, 1993; 56 FR 49646, September 30, 1991), due to their rarity, restricted distribution, and generally well-known locations. However, there is currently no documentation of collection being a significant threat to either the Three Forks or San Bernardino springsnail.

In summary, we find that the Three Forks and San Bernardino springsnails are not threatened by overutilization for commercial, recreational, scientific, or educational purposes now, or in the foreseeable future.

C. Disease or Predation

Exceptionally heavy parasitism on the female reproductive system of the Three Forks springsnail has been observed on specimens from Three Forks Springs (Taylor 1987, p. 31). These parasites were not described, but aquatic snails are known to serve as intermediate hosts for a variety of parasitic flatworms (Dillon 2000, p. 227; Schmidt and Roberts 2000, p. 1). Parasitic infection can result in castration of individual snails, and may contribute to population decline (Dillon 2000, pp. 270–272). However, we have no information on whether this has occurred to the Three Forks springsnail populations. No

information is available on parasites for the San Bernardino springsnail.

Springsnails are vulnerable to predation by a variety of fish, amphibians, reptiles, mammals, and macroinvertebrates (Dillon 2000, p. 273). Nonnative crayfish are known predators of aquatic snails (Fernandez and Rosen 1996, pp. 24–25; Parkyn *et al.* 1997, p. 690). Gut content analysis has shown that nonnative mosquitofish (*Gambusia affinis*) consumes springsnails (Raisanen 1991, p. 71).

Nonnative crayfish likely prey on the Three Forks springsnail. These crayfish are relatively recent invaders at both Three Forks and Boneyard Bog springs. In a laboratory aquaria experiment that mimicked stream conditions found at Three Forks Springs, crayfish consumed snails in the family Physidae (which occupy similar habitats as springsnails) and their eggs within 1 week (Fernandez and Rosen 1996, pp. 24–25).

As discussed under Factor A, the Three Forks springsnail has been extirpated from concrete-boxed springheads at Three Forks Springs where it previously survived in abundance (Myers 2000, p. 1). The extirpation of the species from these springboxes coincided with the invasion of nonnative crayfish. Recognizing the threat, AGFD personnel conducted an intensive crayfish trapping program aimed at reducing potential predatory pressure at Three Forks Springs (Nelson *et al.* 2002, pp. 4, 6). Complete elimination of crayfish from an aquatic system is usually not possible (Helfrich *et al.* 2001, p. 4), and that was the case with the trapping effort at Three Forks Springs. Arizona has no native crayfish species (Inman 1999, p. 6). Since the Three Forks springsnail did not evolve in the presence of crayfish and is likely not evolutionarily adapted to cope with introduced crayfish, it is more susceptible to crayfish predation.

We are unaware of the presence of significant populations of nonnative predators within springs occupied by the San Bernardino springsnail.

In summary, we find that predation by nonnative crayfish is a threat to the Three Forks springsnail, but predation is not known to be a threat to the San Bernardino springsnail. We have no information indicating that disease is a threat for either species.

D. The Inadequacy of Existing Regulatory Mechanisms

A primary cause of decline of these springsnails is the loss, degradation, and fragmentation of habitat due to human activities, particularly application of aerial fire retardant, introduction of nonnative crayfish, groundwater

depletion, and application of pesticides. Existing Federal, State, and local laws have been unable to prevent ongoing loss of the limited habitat of these springsnails, and they are not expected to prevent further declines of the species.

The policy for delivery of wildland fire chemicals near waterways on USFS lands is described in the Interagency Standards for Fire and Fire Aviation Operations developed by the National Interagency Fire Center (NIFC). The policy directs the USFS to avoid aerial application of wildland fire chemicals within 300 ft (91 m) of waterways and avoid any ground application of wildland fire chemicals into waterways (NIFC 2011, p. 3). The closest accidental delivery of fire retardant into a waterway was approximately 0.65 mi (1 km) upstream of Three Forks Springs (USFS 2005, p. 12), well over the 300 ft (91 m) buffer established by NIFC policy. Nevertheless, all aquatic areas at Three Forks Springs were affected by fire retardant drift (USFS 2005, pp. 4, 12), likely from other unrecorded high-elevation drops. Additionally, although long term fire retardants containing sodium ferrocyanide are no longer on the USFS qualified products list as they were at the time of the KP/Three Forks Fires, fire retardant products currently on the qualified products list still contain substances toxic to the snail, as described under Factor A. Therefore, we find the existing regulatory mechanisms inadequate to protect the Three Forks springsnail from the detrimental effects of fire retardant drift.

The application of glyphosate herbicide within or near Snail Spring, Goat Tank Spring, and Horse Spring is not regulated. The Environmental Protection Agency is responsible for controlling the application of pesticides, which they do by putting a specimen label on each pesticide container that explains restrictions on their use. The specimen label for Rodeo[®], which is believed to be applied to the grass lawn on the Slaughter Ranch, does not restrict its use within and near aquatic sites (DowAgroSciences 2006, p. 11). Therefore, the label is inadequate to protect the San Bernardino springsnail from the detrimental effects of exposure to glyphosate.

The AGFD has conducted intensive crayfish trapping at Three Forks Springs in an effort to curb predation on the Three Forks springsnail. However, these efforts have not eliminated crayfish at Three Forks Springs nor prevented their spread into Boneyard Bog Springs. Existing regulatory mechanisms to prevent introduction of nonnative crayfish and to control them, once

introduced, are inadequate to protect the Three Forks springsnail.

We are not aware of State laws or local ordinances that would limit the use of groundwater on the Slaughter Ranch or in the San Bernardino watershed; an adequate groundwater supply is needed to protect and restore spring flow at Snail Spring and Tule Spring. Spring flow at Snail Spring seems to be reduced at times when the shallow groundwater aquifer is drawn down by the Slaughter Ranch and other users of the aquifer. There is a Warranty Deed that reserves water rights on the Slaughter Ranch to The Nature Conservancy (TNC), which previously owned the ranch (TNC 1982, pp. 1–20; Malcom 2007, p. 1; Eiden 2007, p. 1). When TNC sold what is now the San Bernardino NWR to the Service, and the Slaughter Ranch to private landowners, it conveyed all water rights it held and the control of the use of water on the ranch to the Service. Thus, through the Warranty Deed, the Service has the right to control the use of water on the Slaughter Ranch. The Service can withhold its consent for planned water uses and other activities by the owner and managers of the Slaughter Ranch if it determines that such activities may have an adverse effect on the fish and snail species occurring on the ranch. The San Bernardino NWR has proactively worked with the ranch over the past several years to moderate irrigation water use, and to install a water line from House Spring to assist in the maintenance of water flow at Snail Spring. The San Bernardino NWR is in the process of evaluating other sources of water for irrigation by the Slaughter Ranch that are not hydrologically connected to the shallow aquifer spring system. Although the Service is the sole owner of the water rights being used by the Slaughter Ranch, the San Bernardino NWR is initiating discussions with the Arizona Department of Water Resources to properly claim the water rights conveyed to the United States and to establish an agreement with the Slaughter Ranch for water use. Through these efforts we are hopeful that we can eventually ensure reliable flow and adequate water quality to provide for the continued survival of the species. At this time, however, threats to the San Bernardino springsnail from groundwater depletion persist.

Since 1919, Arizona's courts have handled surface water and groundwater separately. Surface water allocations are based on the "first in time, first in right" priority system, while groundwater is generally governed by the "reasonable use" doctrine, which indicates that the

landowner, without waste, can use water beneath the land for any beneficial purpose. Because the water rights system does not acknowledge the hydrologic connection between surface water and groundwater, it generally is not possible to limit groundwater pumping in order to protect surface water rights (Arizona Department of Water Resources 2009, p. 1).

Take of the Three Forks springsnail and the San Bernardino springsnail is regulated by Arizona Game and Fish Commission Order 42, which establishes no open season (no collecting) for any snail species in the genus *Pyrgulopsis* (AGFD 2009, p. 1). Although Order 42 prohibits direct taking of individuals, it does not prohibit habitat modification. Both species are also identified as priority species in the State Wildlife Action Plan prepared by AGFD. This plan helps guide AGFD and other agencies in determining what biotic resources should receive priority management consideration. However, it is not a regulatory document.

In summary, current regulatory mechanisms do not provide adequate protection for Three Forks and San Bernardino springsnail habitat from modification or destruction or the spread of nonnative predators. USFS and State regulatory mechanisms are adequate to control recreation and scientific collecting, but these do not appear to be threats to either species at this time.

E. Other Natural or Manmade Factors Affecting Its Continued Existence

Invasive Competitors

The nonnative New Zealand mudsnail (*Potamopyrgus antipodarum*) is an invasive freshwater snail of the family Hydrobiidae that has become a concern for spring-dependent aquatic snails, including springsnails. The mudsnail is known to compete with and slow the growth of native freshwater snails, including springsnails (Lysne and Koetsier 2008, pp. 103, 105; Lysne *et al.* 2007, p. 6). There is potential for invasion into the spring ecosystems occupied by the Three Forks and San Bernardino springsnails because the mudsnail can be easily transported and unintentionally introduced into aquatic environments via birds, recreationists, researchers, and resource managers.

The mudsnail was first discovered in the United States in the Snake River, Idaho, in 1987 and has since spread to the Colorado River basin in the western United States (U.S. Geological Survey 2002, p. 1). New Zealand mudsnails were detected along the Colorado River

at Lee's Ferry in northern Arizona in 2002 (AGFD 2002, p. 1). Since that time, detections of this exotic species have occurred along the Colorado River at the confluence of Diamond Creek, 226 miles downstream of Lee's Ferry (Montana State University 2008, p. 1), and more recently at Willow Beach Fish Hatchery, downstream of Lake Mead (Olson 2008, pp. 1–2). New Zealand mudsnails were also detected in Utah in 2001 and their dispersal through that State has been rapid (Vinson 2004, p. 9).

The mudsnail has characteristics that enable it to out-compete and replace native springsnails. Mudsnails tolerate a wide range of habitats, and can reach densities exceeding tens of thousands per square meter, particularly in systems with high primary productivity, constant temperatures, and constant flow (typical of spring systems), though faster moving water seems to limit colonization (Richards *et al.* 2001, pp. 378–379). Mudsnails can dominate the invertebrate composition of an aquatic system, accounting for up to 97 percent of invertebrate biomass (Hall *et al.* 2003, p. 409). In doing so, they can consume nearly all microorganisms attached to submerged substrates, making food no longer available for native species, in particular springsnails (Hall *et al.* 2003, p. 409). Although invasion by mudsnails is not considered an imminent threat, if the New Zealand mudsnail were to be introduced into the spring systems harboring the Three Forks or San Bernardino springsnail, the effect on springsnail populations could be devastating. Additionally, control would be difficult because mudsnails are small and therefore cryptic, and because chemical treatment to eradicate them would also eradicate springsnails.

Climate Change

Seager *et al.* (2007, pp. 1181–1184) analyzed 19 computer models of different variables to estimate the future climatology of the southwestern United States and northern Mexico in response to predictions of changing climatic patterns. All but 1 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 and all but 3 predicted a shift to increasing aridity (dryness) in the Southwest as early as 2021–2040 (Seager, *et al.* 2007, p. 1181). The Three Forks and San Bernardino springsnails depend on permanent flowing water for survival. Wetlands in the Southwest and northern Mexico are predicted to be at risk of drying (Seager *et al.* 2007, pp. 1183–1184), which has severe implications for

aquatic ecosystems. Potential drought associated with changing climatic patterns may adversely affect the spring habitats of the Three Forks and San Bernardino springsnails, not only reducing water availability, but also altering food availability and predation rates.

There are three predictions for anticipated effects from climate change in the Southwest. First, climate change is expected to shorten periods of snowpack accumulation, as well as lessen snowpack levels. With gradually increasing temperatures and reduced snowpack (due to higher spring temperatures and reduced winter-spring precipitation), annual runoff will be reduced (Garfin 2005, p. 42; Smith *et al.* 2003, p. 226), consequently reducing groundwater recharge. Second, snowmelt is expected to occur earlier in the calendar year because increased minimum winter and spring temperatures could melt snowpacks sooner, causing peak water flows to occur much sooner than the historical spring and summer peak flows (Garfin 2005, p. 41; Smith *et al.* 2003, p. 226; Stewart *et al.* 2004, pp. 217–218, 224, 230) and reducing flows later in the season. Third, the hydrologic cycle is expected to become more dynamic on average with climate models predicting increases in the variability and intensity of rainfall events. This will modify disturbance regimes by changing the magnitude and frequency of floods. All of these anticipated effects may alter the habitat for the springsnails by altering surface water flow and ground water recharge.

In addition, there will be increases in riverine system temperatures in drier climates that will result in periods of prolonged low flows and stream drying (Rahel and Olden 2008, p. 526) and will increase demand for water storage and conveyance systems (Rahel and Olden 2008, pp. 521–522). Warmer water temperatures across temperate regions are predicted to expand the distribution of existing aquatic nonnative species. In a study that compared the thermal tolerances of 57 fish species with predictions made from climate change temperature models, Mohseni *et al.* (2003, p. 389) concluded that there would be 31 percent more suitable habitat for aquatic nonnative species, which are often tropical in origin and adaptable to warmer water temperatures. This could result in an expansion in the range of nonnative species that is detrimental to the viability of springsnail populations.

Warmer water temperatures, altered stream flow events and groundwater recharge, and increased demand for

water storage and conveyance systems (Rahel and Olden 2008, pp. 521–522) are all likely to exacerbate existing threats to the Three Forks and San Bernardino springsnails and their habitats.

Endemism

Endemic species (organisms with narrowly distributed isolated populations) are susceptible to extinction from natural or human caused events. Biological and ecological factors that put a species at risk of extinction include specialized habitat preference, restricted distribution, poor dispersal ability, population size, fragmentation of range, and life history specialization (McKinney 1997, p. 497; O'Grady *et al.* 2004, p. 514), all of which characterize the Three Forks and San Bernardino springsnails. In addition, both species have suffered substantial reductions in overall numbers and populations. Although rarity itself is not a threat, rarity coupled with existing threats puts them at risk of decreased population viability, loss of genetic diversity, and outright extinction.

Extinction rates for freshwater species are five times higher than those for terrestrial species (Ricciardi and Rasmussen 1999, p. 1220). Spring-dependent species, such as springsnails, are especially at risk because spring ecosystems harbor a disproportionate percentage of endemic species (Minckley and Unmack 2000, pp. 52–53; Shepard 1993, pp. 354–357). Because both species have a very limited range, their populations are disjunct and isolated from each other, and potential habitat areas are isolated, they are particularly vulnerable to localized extinction should their habitat be degraded or destroyed. Because their mobility is limited, populations will have little opportunity to leave degraded habitat areas in search of suitable habitat. As a result, one contamination or wildfire event in the case of the Three Forks springsnail, or a short period of drawdown or exposure to pesticides in the aquatic habitat of the San Bernardino springsnail, could result in the loss of an entire population.

Proposed Determination

We have carefully assessed the best scientific and commercial information available regarding the past, present, and future threats to the Three Forks springsnail and the San Bernardino springsnail. The habitat and range of both species are threatened with destruction, modification, and curtailment. Existing regulatory mechanisms do not provide adequate protection for these species, and other

natural and manmade factors affect their continued existence. The Three Forks springsnail is also threatened by predation. These endemic species are threatened by limited distribution, lack of mobility, and the isolation of populations. As a result, any impact from increasing threats (loss of spring flow, contaminants) is likely to result in their extinction because the magnitude of threats is high.

The Endangered Species Act (Section 3(5)(C)(6) defines an endangered species as “any species which is in danger of extinction throughout all or a significant portion of its range.” Based on the immediate and ongoing significant threats to the Three Forks springsnail and San Bernardino springsnail throughout their entire limited range, such as habitat destruction from loss of spring flow, contamination, predation, and endemism), we consider both species to be in danger of extinction throughout all of their range. Therefore, the species is proposed as endangered, rather than threatened, because the threats are occurring now, making the species at risk of extinction at the present time. Since threats extend throughout their entire range, it is unnecessary to determine if they are in danger of extinction throughout a significant portion of their range. Therefore, on the basis of the best available scientific and commercial information, we are proposing to list the Three Forks springsnail and the San Bernardino springsnail as endangered species throughout their entire range.

Available Conservation Measures

Conservation measures provided to species listed as endangered or threatened under the Act include recognition, recovery actions, requirements for Federal protection, and prohibitions against certain practices. Recognition through listing results in public awareness and conservation by Federal, state, Tribal, local agencies, private organizations, and individuals. The Act encourages cooperation with the States and requires that recovery actions be carried out for all listed species. The protection measures required of Federal agencies and the prohibitions against certain activities are discussed, in part, below.

The primary purpose of the Act is the conservation of endangered and threatened species and the ecosystems upon which they depend. The ultimate goal of such conservation efforts is the recovery of these listed species, so that they no longer need the protective measures of the Act. Subsection 4(f) of the Act requires the Service to develop and implement recovery plans for the

conservation of endangered and threatened species. The recovery planning process involves the identification of actions that are necessary to halt or reverse the species' decline by addressing the threats to its survival and recovery. The goal of this process is to restore listed species to a point where they are secure, self-sustaining, and functioning components of their ecosystems.

Recovery planning includes the development of a recovery outline shortly after a species is listed, preparation of a draft and final recovery plan, and revisions to the plan as significant new information becomes available. The recovery outline guides the immediate implementation of urgent recovery actions and describes the process to be used to develop a recovery plan. The recovery plan identifies site-specific management actions that will achieve recovery of the species, measurable criteria that determine when a species may be downlisted or delisted, and methods for monitoring recovery progress. Recovery plans also establish a framework for agencies to coordinate their recovery efforts and provide estimates of the cost of implementing recovery tasks. Recovery teams (comprised of species experts, Federal and State agencies, nongovernmental organizations, and stakeholders) are often established to develop recovery plans. When completed, the recovery outline, draft recovery plan, and the final recovery plan will be available from our Web site (<http://www.fws.gov/endangered>), or from our Arizona Ecological Services Field Office (see **FOR FURTHER INFORMATION CONTACT**).

Implementation of recovery actions generally requires the participation of a broad range of partners, including other Federal agencies, States, nongovernmental organizations, businesses, and private landowners. Examples of recovery actions include habitat restoration (e.g., restoration of native vegetation), research, captive propagation and reintroduction, and outreach and education. The recovery of many listed species cannot be accomplished solely on Federal lands because their range may occur primarily or solely on non-Federal lands. To achieve recovery of these species requires cooperative conservation efforts on private and State lands.

If these species are listed, funding for recovery actions will be available from a variety of sources, including Federal budgets, State programs, and cost share grants for nonfederal landowners, the academic community, and nongovernmental organizations. In addition, pursuant to section 6 of the

Act, the State of Arizona would be eligible for Federal funds to implement management actions that promote the protection and recovery of the Three Forks springsnail and San Bernardino springsnail. Information on our grant programs that are available to aid species recovery can be found at: <http://www.fws.gov/grants>.

Although the Three Forks springsnail and San Bernardino springsnail are only proposed for listing under the Act at this time, please let us know if you are interested in participating in recovery efforts for this species. Additionally, we invite you to submit any new information on this species whenever it becomes available and any information you may have for recovery planning purposes (see **FOR FURTHER INFORMATION CONTACT**).

Section 7(a) of the Act, as amended, requires Federal agencies to evaluate their actions with respect to any species that is proposed or listed as endangered or threatened and with respect to its critical habitat, if any is designated. Regulations implementing this interagency cooperation provision of the Act are codified at 50 CFR part 402. Section 7(a)(1) requires Federal agencies, in consultation with the Service, to carry out programs for the conservation of listed species. Section 7(a)(4) requires Federal agencies to confer with the Service on any action that is likely to jeopardize the continued existence of a species proposed for listing or result in destruction or adverse modification of proposed critical habitat. If a species is subsequently listed, section 7(a)(2) requires Federal agencies to ensure that activities they authorize, fund, or carry out are not likely to jeopardize the continued existence of the species or destroy or adversely modify its critical habitat. If a Federal action may adversely affect a listed species or its critical habitat, the responsible Federal agency must enter into formal consultation with the Service.

For the Three Forks springsnail and San Bernardino springsnail, Federal agency actions that may require consultation as described in the preceding paragraph include activities approved under a forest management plan, a refuge comprehensive management plan, and activities that require a permit from the Army Corps of Engineers pursuant to section 404 of the Clean Water Act.

The USFS has established a closure around Three Forks Springs to prevent unauthorized access. The AGFD has implemented a crayfish trapping program and a Three Forks springsnail monitoring program. The effectiveness

of these measures is yet undemonstrated. We had recently established a captive refugium for Three Forks springsnail in coordination with USFS, AGFD, and the Phoenix Zoo. This refugium is no longer viable, but we hope to apply lessons learned to future efforts to establish refugia. We intend to work with the USFS, AGFD, the Zoo, and The Nature Conservancy (which owns property near Boneyard Bog Springs) to develop conservation actions for the Three Forks springsnail. Additionally, Service staff is currently working to publish additional results of field studies describing habitat relationships for the Three Forks springsnail.

Efforts to rehabilitate habitat on the San Bernardino NWR at Tule Spring have been initiated (Service 2003, p. 2), with the intention of potentially reintroducing San Bernardino springsnails. However, the inconsistency of water flow reduces the likelihood of successful reestablishment of the species on the San Bernardino NWR. The Service is also seeking to acquire, through donation, the John Slaughter Ranch for incorporation into the San Bernardino NWR. This would provide tremendous opportunities to protect, manage, and enhance springs on the property. However, it is uncertain if this transaction will occur. The Service intends to continue to work with AGFD and the John Slaughter Ranch to develop conservation actions for the San Bernardino springsnail, perhaps including the development of a domestic water well that would not affect surface waters.

The Act and its implementing regulations set forth a series of general prohibitions and exceptions that apply to all endangered wildlife. The prohibitions, codified at 50 CFR 17.21 for endangered wildlife, in part, make it illegal for any person subject to the jurisdiction of the United States to take (includes harass, harm, pursue, hunt, shoot, wound, kill, trap, capture, or collect; or to attempt any of these), import, export, ship in interstate commerce in the course of commercial activity, or sell or offer for sale in interstate or foreign commerce any listed species. It is also illegal to possess, sell, deliver, carry, transport, or ship any such wildlife that has been taken illegally. Certain exceptions apply to agents of the Service and State conservation agencies.

We may issue permits to carry out otherwise prohibited activities involving threatened or endangered wildlife species under certain circumstances. Regulations governing permits are codified at 50 CFR 17.22 for

endangered species. With regard to endangered wildlife, a permit must be issued for the following purposes: for scientific purposes, to enhance the propagation or survival of the species, and for incidental take in connection with otherwise lawful activities.

It is our policy, as published in the **Federal Register** on July 1, 1994 (59 FR 34272), to identify to the maximum extent practicable at the time a species is listed, those activities that would or would not constitute a violation of section 9 of the Act. The intent of this policy is to increase public awareness of the effect of a proposed listing on proposed and ongoing activities within the range of species proposed for listing. The following activities could potentially result in a violation of section 9 of the Act; this list is not comprehensive:

(1) Unauthorized collecting, handling, possessing, selling, delivering, carrying, or transporting of the species, including import or export across State lines and international boundaries, except for properly documented antique specimens of these taxa at least 100 years old, as defined by section 10(h)(1) of the Act;

(2) Introduction of nonnative species that compete with or prey upon the Three Forks springsnail and San Bernardino springsnail, such as the introduction of competing, nonnative species to the State of Arizona;

(3) The unauthorized release of biological control agents that attack any life stage of this species;

(4) Unauthorized modification of the springs or water flow of any stream or removal or destruction of emergent aquatic vegetation in any body of water in which the Three Forks springsnail and San Bernardino springsnail are known to occur; and

(5) Unauthorized discharge of chemicals or fill material into any waters in which the Three Forks springsnail and San Bernardino springsnail are known to occur.

Questions regarding whether specific activities would constitute a violation of section 9 of the Act should be directed to the Arizona Ecological Services Field Office (*see FOR FURTHER INFORMATION CONTACT*).

Critical Habitat

Background

Critical habitat is defined in section 3 of the Act as:

(i) The specific areas within the geographical area occupied by a species, at the time it is listed in accordance with the Act, on which are found those physical or biological features

(I) essential to the conservation of the species and

(II) which may require special management considerations or protection; and

(ii) specific areas outside the geographical area occupied by a species at the time it is listed, upon a determination that such areas are essential for the conservation of the species.

Conservation, as defined under section 3 of the Act, means the use of all methods and procedures that are necessary to bring any endangered species or threatened species to the point at which the measures provided under the Act are no longer necessary. Such methods and procedures include, but are not limited to, all activities associated with scientific resources management such as research, census, law enforcement, habitat acquisition and maintenance, propagation, live trapping, and transplantation, and, in the extraordinary case where population pressures within a given ecosystem cannot be otherwise relieved, may include regulated taking.

Critical habitat receives protection under section 7 of the Act through the prohibition against Federal agencies carrying out, funding, or authorizing the destruction or adverse modification of critical habitat. Section 7(a)(2) requires consultation on Federal actions that may affect critical habitat. The designation of critical habitat does not affect land ownership or establish a refuge, wilderness, reserve, preserve, or other conservation area. Such designation does not allow government or public access to private lands. Such designation does not require implementation of restoration, recovery, or enhancement measures by non-Federal landowners. Where a landowner seeks or requests Federal agency funding or authorization that may affect a listed species or critical habitat, the consultation requirements of Section 7(a)(2) of the Act would apply. However, even in the event of a destruction or adverse modification finding, the Federal action agency's and the applicant's obligation is not to restore or recover the species, but to implement reasonable and prudent alternatives to avoid destruction or adverse modification of critical habitat.

For inclusion in a critical habitat designation, the habitat within the geographical area occupied by the species at the time it was listed must contain the physical and biological features that are essential to the conservation of the species, and be included only if those features may require special management

considerations or protection. Critical habitat designations identify, to the extent known using the best scientific and commercial data available, those physical and biological features that are essential to the conservation of the species (such as space, food, cover, and protected habitat), focusing on the principal biological or physical constituent elements (primary constituent elements) within an area that are essential to the conservation of the species (such as roost sites, nesting grounds, seasonal wetlands, water quality, tide, soil type). Primary constituent elements are the elements of physical and biological features that, when laid out in the appropriate quantity and spatial arrangement to provide for a species' life-history processes, are essential to the conservation of the species.

Under the Act and regulations at 50 CFR 424.12, we can designate critical habitat in areas outside the geographical area occupied by the species at the time it is listed as critical habitat only when we determine that those areas are essential for the conservation of the species and that designation limited to those areas occupied at the time of listing would be inadequate to ensure the conservation of the species. When the best available scientific data do not demonstrate that the conservation needs of the species require such additional areas, we will not designate critical habitat in areas outside the geographical area occupied by the species. An area currently occupied by the species but that was not occupied at the time of listing may, however, be essential to the conservation of the species and may be included in the critical habitat designation.

Section 4 of the Act requires that we designate critical habitat on the basis of the best scientific and commercial data available. Further, our Policy on Information Standards Under the Endangered Species Act (published in the **Federal Register** on July 1, 1994 (59 FR 34271)), the Information Quality Act (section 515 of the Treasury and General Government Appropriations Act for Fiscal Year 2001 (Pub. L. 106-554; H.R. 5658)), and our associated Information Quality Guidelines, provide criteria, establish procedures, and provide guidance to ensure that our decisions are based on the best scientific data available. They require our biologists, to the extent consistent with the Act and with the use of the best scientific data available, to use primary and original sources of information as the basis for recommendations to designate critical habitat.

When we are determining which areas should be proposed as critical habitat, our primary source of information is generally the information developed during the listing process for the species. Additional information sources may include the recovery plan for the species, articles in peer-reviewed journals, conservation plans developed by States and counties, scientific status surveys and studies, biological assessments, or other unpublished materials and expert opinion or personal knowledge.

Habitat is often dynamic, and species may move from one area to another over time. Furthermore, we recognize that designation of critical habitat may not include all of the habitat areas that we may eventually determine, based on scientific data not now available to the Service, are necessary for the recovery of the species. For these reasons, a critical habitat designation does not signal that habitat outside the designated area is unimportant or may not be required for recovery of the species.

Areas that support populations, but are outside the critical habitat designation, will continue to be subject to conservation actions we implement under section 7(a)(1) of the Act. Areas that support populations are also subject to the regulatory protections afforded by the section 7(a)(2) jeopardy standard, as determined on the basis of the best available scientific information at the time of the agency action. Federally funded or permitted projects affecting listed species outside their designated critical habitat areas may still result in jeopardy findings in some cases. Similarly, critical habitat designations made on the basis of the best available information at the time of designation will not control the direction and substance of future recovery plans, habitat conservation plans (HCPs), or other species' conservation planning efforts if new information available to these planning efforts calls for a different outcome.

Prudency Determination

Section 4(a)(3) of the Act, as amended, and implementing regulations (50 CFR 424.12), require that, to the maximum extent prudent and determinable, we designate critical habitat at the time the species is determined to be endangered or threatened. Our regulations (50 CFR 424.12(a)(1)) state that the designation of critical habitat is not prudent when one or both of the following situations exist: (1) The species is threatened by taking or other human activity, and identification of critical habitat can be

expected to increase the degree of threat to the species, or (2) such designation of critical habitat would not be beneficial to the species.

There is no documentation that the Three Forks and San Bernardino springsnails are threatened by collection and, therefore, are unlikely to experience increased threats by identifying critical habitat. In the absence of a finding that the designation of critical habitat would increase threats to a species, if there are any benefits to a critical habitat designation, then a prudent finding is warranted. The potential benefits include: (1) Triggering consultation under section 7 of the Act, in new areas for actions in which there may be a Federal nexus where it would not otherwise occur because, for example, it has become unoccupied or the occupancy is in question; (2) focusing conservation activities on the most essential features and areas; (3) providing educational benefits to State or county governments or private entities; and (4) preventing people from causing inadvertent harm to the species.

The primary regulatory effect of critical habitat is the section 7(a)(2) requirement that Federal agencies refrain from taking any action that destroys or adversely modifies critical habitat. At present, the Three Forks springsnail occurs only on Federal lands in the White Mountains of east-central Arizona. Lands proposed for designation as critical habitat would be subject to Federal actions that trigger the section 7 consultation requirements. These include land-management actions and permitting by the Apache-Sitgreaves National Forests.

There may also be some educational or informational benefits to the designation of critical habitat. Educational benefits include the notification of lessees and the general public of the importance of protecting habitat.

At present, the only known extant population of the San Bernardino springsnail occurs on private lands in the United States. Although the species is believed to have historically occurred on the San Bernardino NWR, the species currently is not known to occur on Federal lands. However, the San Bernardino NWR has proposed to reintroduce the species onto the refuge; therefore, the species may occur in the future on Federal lands. In addition, lands proposed for designation as critical habitat, whether or not under Federal jurisdiction, may be subject to Federal actions that trigger the section 7 consultation requirement, such as the granting of Federal monies or Federal permits. These may include

implementation of the Comprehensive Conservation Plan by the San Bernardino NWR.

Although we make a detailed determination of the habitat needs of a listed species during the recovery planning process, the Act has no provision to delay designation of critical habitat until such time as a recovery plan is prepared. We reviewed the available information pertaining to habitat characteristics where these two species are located. This and other information represent the best scientific data available and lead us to conclude that the designation of critical habitat is both prudent and determinable for the Three Forks Springsnail and San Bernardino springsnail.

Critical Habitat Determinability

As stated above, section 4(a)(3) of the Act requires the designation of critical habitat concurrently with the species' listing "to the maximum extent prudent and determinable." Our regulations at 50 CFR 424.12(a)(2) state that critical habitat is not determinable when one or both of the following situations exist:

- (i) Information sufficient to perform required analyses of the impacts of the designation is lacking, or
- (ii) The biological needs of the species are not sufficiently well known to permit identification of an area as critical habitat.

When critical habitat is not determinable, the Act provides for an additional year to publish a critical habitat designation (16 U.S.C. 1533(b)(6)(C)(ii)).

We reviewed the available information pertaining to the biological needs of the species and habitat characteristics where this species is located. This and other information represent the best scientific data available and led us to conclude that the designation of critical habitat is both prudent and determinable for the Three Forks Springsnail and San Bernardino springsnail.

Methods

As required by section 4(b) of the Act, we used the best scientific data available in determining areas that contain the features that are essential to the conservation of the Three Forks springsnail and the San Bernardino springsnail. This includes information from the Service's Species Assessment and Listing Priority Assignment Forms (available at http://ecos.fws.gov/tess_public/pub/SpeciesReport.do?listing_Type=C); published literature; site visits; data compiled by the Arizona Heritage Data Management System at AGFD; topographic maps; data supplied

by the USFS, San Bernardino NWR, and AGFD; and other information in our files.

We also reviewed the available information pertaining to historical and current distribution, ecology, life history, and habitat requirements of the Three Forks springsnail and San Bernardino springsnail. This material included research published in peer-reviewed scientific journals, museum records, technical reports, and unpublished field observations by Service, State, Federal, and other experienced biologists, as well as additional notes and communications with qualified professionals and experts.

We plotted all known occurrences in springheads, spring runs, and ditches of the Three Forks and San Bernardino springsnails on 2007 U.S. Geological Survey (USGS) Digital Ortho Quarter Quad maps using ArcMap (Environmental Systems Research Institute, Inc.), a computer GIS program. For the San Bernardino springsnail, we also mapped the historical occurrence at Tule Spring on San Bernardino NWR. For the Three Forks springsnail at the Three Forks Spring complex, we believe that all springs occupied prior to the exposure to fire retardant in 2004 (see discussion above under Threat Factor A) are still occupied, although the Three Forks Springs population seems rather tenuous. Polygons were computer-generated by applying a 1 m (3.3 ft) buffer around these occurrence locations to capture the moist soils and vegetation that produce food for the snails and protect the substrate they use. Because of the small size of the springs and spring runs we are proposing to designate for the San Bernardino springsnail, we were precluded from mapping them precisely due to inaccuracies inherent in the use of satellites for locating and mapping. Therefore, for mapping purposes we created a circle that encompasses them. GPS coordinates have been field verified.

Physical and Biological Features

In accordance with section 3(5)(A)(i) and 4(b)(1)(A) of the Act and regulations at 50 CFR 424.12, in determining which areas within the geographical area occupied at the time of listing to propose as critical habitat, we consider the physical and biological features that are essential to the conservation of the species, and which may require special management considerations or protection. These include, but are not limited to:

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

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

(3) Cover or shelter;

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

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

We derive the specific physical and biological features required for the two Arizona springsnails from studies of these species' habitats, ecology, and life histories as described below. We have determined that the Three Forks springsnail and the San Bernardino springsnail require the following physical and biological features:

Space for Individual and Population Growth and Normal Behavior

The Three Forks and San Bernardino springsnails occur where water emerges from the ground as a free-flowing spring and spring run. Within spring ecosystems, proximity to springheads is important due to their need for appropriate water chemistry, substrate, and flow regime characteristics of springheads. The Three Forks springsnail inhabits free-flowing springs, concrete boxed springheads, spring runs, spring seeps, and shallow ponded water. The San Bernardino springsnail inhabits free-flowing springs, a concrete boxed springhead, and spring runs.

Food, Water, Air, Light, or Other Nutritional or Physiological Requirements

Martinez and Myers (2008, pp. 189–194) found the presence of Three Forks springsnail was associated with gravel and pebble substrates, shallow water up to 6 cm (2.35 in) deep, high conductivity, alkaline waters of pH 8, and the presence of pond snail, *Physa gyrina*. Three Forks springsnail density is significantly greater on gravel and cobble substrates (Martinez and Myers 2002, p. 1; Nelson 2002, p. 1), though the species has been reported as “abundant” in the fine-grained mud of a 0.01 ha (0.02 ac) pond at Three Forks Springs (Taylor 1987, p. 32). The density of San Bernardino springsnails is positively associated with cobble substrates, higher vegetation density, faster water velocity, higher dissolved oxygen, water temperature of 14 to 22 degrees Celsius, and pH values between 7.6 and 8.0 (Malcom *et al.* 2005, pp. 71, 75–76). San Bernardino springsnail

densities are higher in sand and cobble substrates, higher vegetation density, and higher water velocity, but lower in silt and organic substrates, and deeper water (Malcom *et al.* 2005, pp. 75–76). The species' tolerance to these habitat characteristics has not been quantified. Maintenance of high water velocity flows at springheads and spring runs is essential for both the Three Forks and San Bernardino springsnails.

Three Forks and San Bernardino springsnails consume periphyton on submerged surfaces. Periphyton is a complex mixture of algae, detritus, bacteria, and other microbes that grow attached to submerged surfaces such as cobble or larger plants, such as watercress. Periphyton are primary producers of energy (organisms at the beginning of a food chain that produce biomass from inorganic compounds) and can be sensitive indicators of environmental change in flowing waters. Spring ecosystems occupied by these springsnail species must support the periphyton upon which springsnails graze.

Sites for Breeding, Reproduction, and Rearing and Development of Offspring

Substrate characteristics influence the productivity of Three Forks and San Bernardino springsnails. Suitable substrates are typically firm, characterized by cobble, gravel, sand, woody debris, and aquatic vegetation such as watercress, though this is influenced by water flow and depth. Suitable substrates increase productivity by providing suitable egg laying sites, protection of young from predators, and provision of food resources.

Habitats That Are Protected From Disturbance and Representative of the Historical, Geographical, and Ecological Distribution of the Species

The Three Forks springsnail and the San Bernardino springsnail have restricted geographic distributions. Endemic species whose populations exhibit a high degree of isolation are extremely susceptible to extinction from both random and non-random catastrophic natural or human-caused events. Therefore, it is essential to maintain the spring systems upon which the Three Forks springsnail and San Bernardino springsnail depend. Adequate spring sites, free of inappropriate disturbance, must exist to promote population expansion and viability. This means protection from disturbance caused by exposure to fire retardant, recreation, elk grazing, water depletion, and water contamination. The Three Forks springsnail and San Bernardino springsnail must sustain and

expand their current distribution if ecological representation of these species is to be ensured. For the Three Forks springsnail, this means it must repopulate the Three Forks Spring complex to levels it occupied prior to the 2004 wildfire described under Factor A. For the San Bernardino springsnail, it must repopulate the entirety of the historical Snail Spring, and be re-introduced into a spring, which it historically occupied. At this time, we believe Tule Spring is the most likely candidate since it still retains some water flow.

Primary Constituent Elements (PCEs) for the Three Forks and San Bernardino Springsnails

Based on the above needs and our current knowledge of the life history, biology, and ecology of these species and the habitat requirements for sustaining the essential life history functions of these species, we have determined that the Three Forks springsnail and the San Bernardino springsnail PCEs are:

- (1) Adequately clean spring water (free from contamination) emerging from the ground and flowing on the surface;
- (2) Periphyton (attached algae), bacteria, and decaying organic material for food;
- (3) Substrates that include cobble, gravel, pebble, sand, silt, and aquatic vegetation, for egg laying, maturing, feeding, and escape from predators; and
- (4) Either an absence of nonnative predators (crayfish) and competitors (snails) or their presence at low population levels.

Special Management Considerations or Protections

When designating critical habitat, we assess whether the proposed areas contain features that are essential to the conservation of the species and may require special management considerations and protections. Threats to the physical and biological features essential to the conservation of the Three Forks springsnail and San Bernardino springsnail include loss of spring flows due to groundwater depletion and drought; inundation of springheads due to pond creation; degradation of water quality due to pollution, exposure to fire retardant, or other alteration of water chemistry; alteration of appropriate aquatic substrates due to wild ungulate grazing, inundation, and erosion; and, the introduction of nonnative predators and competitors. Due to one or more of the above threats, we find that all areas that we are proposing for critical habitat

contain essential physical or biological features that may require special management considerations or protections to ensure the conservation of the Three Forks springsnail and San Bernardino springsnail.

Criteria Used To Identify Critical Habitat

As required by section 4(b) of the Act, we used the best scientific and commercial data available in determining areas within the geographical area occupied at the time of listing that contain the features essential to the conservation of Three Forks springsnail and San Bernardino springsnail, and areas outside of the geographical area occupied at the time of listing that are essential for the conservation of Three Forks springsnail and San Bernardino springsnail. We have also reviewed available information that pertains to the habitat requirements of these species.

We are proposing to designate critical habitat in two areas occupied by the Three Forks springsnail at the time of listing, the Three Forks and Boneyard Bog spring complexes; three areas occupied by the San Bernardino springsnail at the time of listing, Snail Spring, Goat Tank Spring, and Horse Spring; and one area not occupied by the San Bernardino springsnail at the time of listing (but considered to have been historically occupied), Tule Spring. These springs all contain features essential to the conservation of the respective springsnail species. We have determined that Tule Spring, although not currently occupied, is essential to the conservation of the San Bernardino springsnail, as the geographic area occupied at the time of listing is not sufficient for conservation and the SBNWR has identified Tule Spring as a potential reintroduction site with the availability of restorable habitat on protected lands.

The Three Forks springsnail occurs in two separate spring complexes, Three Forks Springs and Boneyard Bog Springs. Historically, the species was abundant at these spring complexes. Recently, annual surveys have documented only two or three individual Three Forks springsnails at Three Forks Springs since 2004. The species continues to occur in abundance at Boneyard Bog Springs.

The San Bernardino springsnail may have historically occurred in a complex of at least six springs along the Rio San Bernardino within the headwaters of the Rio Yaqui in Arizona. Currently, it is known from Goat Tank Spring, Horse Spring, and likely from wet portions of Snail Spring on the private John

Slaughter Ranch. Although not currently occupied, Tule Spring on the nearby San Bernardino NWR contains a majority of the PCEs.

We evaluated both species of springsnail in the context of their distribution within their historical range, to determine what portion of their range must be included to ensure conservation of both species. For the Three Forks springsnail, we are designating all habitat containing PCEs that we consider to be currently occupied, which is also the entire known historically occupied habitat. For the San Bernardino springsnail, we are designating the three occupied springs and the only remaining historically occupied spring (but currently unoccupied) in the United States that still contains the PCEs for the species because we believe they are essential to conservation of the species as discussed above. If the two cienegas nearby in Mexico are determined to harbor the San Bernardino springsnail, we would not designate critical habitat for the species in either of those cienegas because we do not designate critical habitat outside the United States.

We assessed the critical life-history components of these springsnail species, as they relate to habitat. Three Forks and San Bernardino springsnails require unpolluted spring water in springheads and spring runs; periphyton, bacteria, and decaying organic material for food; rock-derived substrates for egg laying, maturing, feeding, and escape from predators; and absence or low levels of nonnative predators and competitors. The areas proposed as critical habitat for the Three Forks springsnail and the San Bernardino springsnail contain these PCEs that are essential to these life-history components of the species.

Both species occur or occurred in isolated populations in very small areas. For the Three Forks springsnail, catastrophic wildfires and firefighting actions (retardant drops), as well as overgrazing by elk, and random, intense natural disasters threaten the two populations with extinction. For the San Bernardino springsnail, known populations are at risk of extinction from groundwater pumping and exposure to pesticides. We are proposing for designation of critical habitat lands that we have determined are occupied at the time of listing and contain sufficient PCEs to support life history functions essential for the conservation of the species, and lands outside of the geographical area occupied at the time of listing that we

have determined are essential for the conservation of these species.

Units are proposed for designation based on sufficient PCEs being present to support life processes. Some units contained all PCEs and support multiple life processes. Some segments contain only a portion of the PCEs necessary to support use of that habitat, but remain an essential component necessary for

the conservation of the species because they will provide for population redundancy to protect against extinction.

Proposed Critical Habitat Designation

We are proposing two units of critical habitat for the Three Forks springsnail and four units of critical habitat for the San Bernardino springsnail. The critical habitat units we describe below

constitute our current and best assessment of the areas that meet the definition of critical habitat for the Three Forks springsnail and the San Bernardino springsnail. Table 1 summarizes the threats and current occupancy of the proposed critical habitat units. Table 2 provides approximate areas (ac/ha) and land ownership of the units.

TABLE 1—THREATS AND OCCUPANCY IN AREAS CONTAINING FEATURES ESSENTIAL TO THE CONSERVATION OF THE THREE FORKS AND SAN BERNARDINO SPRINGSNAILS.

Critical habitat unit	Threats requiring special management or protections	Currently occupied
Three Forks springsnail		
1. Three Forks Springs Unit	wildfire, fire retardant use, elk grazing, nonnative predators, and potential introduction of nonnative snails.	yes.
2. Boneyard Bog Springs Unit	wildfire, fire retardant use, elk grazing, nonnative predators, and potential introduction of nonnative snails.	yes.
San Bernardino springsnail		
1. Snail Spring Unit	groundwater depletion, drought, water contamination from pesticide use, and potential introduction of nonnative snails.	unknown.
2. Goat Tank Spring Unit	groundwater depletion, drought, water contamination from pesticide use, and potential introduction of nonnative snails.	yes.
3. Horse Spring Unit	groundwater depletion, drought, water contamination from pesticide use, and potential introduction of nonnative snails.	yes.
4. Tule Spring Unit	groundwater depletion, drought, and potential introduction of nonnative snails ..	no.

TABLE 2—OWNERSHIP AND APPROXIMATE AREA OF PROPOSED CRITICAL HABITAT UNITS

Critical habitat unit	Ownership	Total area
Three Forks springsnail		
1. Three Forks Springs Unit	Federal	2.5 ha (6.1 ac)
2. Boneyard Bog Springs Unit	Federal	2.0 ha (5.0 ac)
Total	4.5 ha (11.1 ac)
San Bernardino springsnail		
1. Snail Spring Unit	Private	0.457 ha (1.129 ac)
2. Goat Tank Spring Unit	Private	0.002 ha (0.005 ac)
3. Horse Spring Unit	Private	0.032 ha (0.078 ac)
4. Tule Spring Unit	Federal	0.324 ha (0.801 ac)
Total	0.815 ha (2.013 ac)

We present below brief descriptions of all units and reasons why they meet the definition of critical habitat for the Three Forks springsnail or San Bernardino springsnail. Unit descriptions are presented separately by species.

Three Forks Springsnail

Three Forks Springs Unit

The proposed Three Forks Springs Unit is a complex of springs, spring runs, spring seeps, a segment of an unnamed stream connecting them, and a small amount of upland area encircling them to make them a single

unit of approximately 2.5 ha (6.1 ac) in the vicinity of UTM Zone 12 coordinate 655710, 3747260 in Apache County. The entire unit is in Federal ownership and managed by the Apache-Sitgreaves National Forests of the USFS. The unit encompasses eight major springheads and spring runs, which each flow a short distance of several meters to an

unnamed tributary of the Black River. Two of the spring runs flow into a pond, which is occupied by the species and has an outflow run to the unnamed tributary. The spring complex contains spring seeps along the spring runs and the tributary. We are proposing to designate a single critical habitat unit that includes the springheads, spring runs, seeps, pond, and that portion of the unnamed tributary that connects the spring runs. The tributary itself is occupied where there are spring seeps along it and provides for springsnail movement among the occupied seeps, spring runs and springs, thus providing habitat connectivity. The area within the proposed unit contains a small amount of upland area adjacent to the springheads, spring runs, spring seeps and the tributary segment. The moist soils and vegetation in the adjacent uplands (approximately 1 m (3.3 ft) in width) are essential to the species because they produce food for the snails and protect the substrate they use. The remaining small amount of upland area is included to connect the entire essential, occupied habitat to form a single unit. Human-caused changes to the uplands adjacent to the aquatic habitats can be managed through this proposed unit designation to control threats to the aquatic habitats through conservation efforts by AGFD and through consultations between USFS and the Service under section 7 of the Act. For specific coordinates of the boundaries for the proposed critical habitat designation, please reference the unit descriptions in the Regulation Promulgation section below.

Threats to the Three Forks springsnail in this unit that may require special management of the physical and biological features include wildfire, fire retardant use to fight wildfires, erosion and sedimentation, elk grazing, predation by nonnative crayfish, and potential competition from nonnative snails. The Three Forks Springs complex has had documented occupancy since 1973 (Landye 1973, p. 49), and the species was considered abundant there until 2004 (AGFD 2008; Service 2008, p. 1) when the waters appear to have been contaminated by wildfire retardant drift. Surveys in 2004, immediately following a wildfire and fire retardant use, failed to locate springsnails, though surveys in subsequent years revealed the species in low numbers (Cox 2007, p. 1; Bailey 2008, p. 1). Fire retardant becomes non-toxic within a few days of contact with water, so currently, the Three Forks Springs Unit contains all of the PCEs essential to the species, and the unit

supports all of the Three Forks springsnail life processes.

Boneyard Bog Springs Unit

The proposed Boneyard Bog Springs Unit is a complex of springs, spring runs, spring seeps, and a segment of an unnamed stream connecting them, and a small amount of upland area encircling them to make them a single unit of approximately 2.0 ha (5.0 ac) in the vicinity of UTM Zone 12 coordinate 659970, 3750730 in Apache County. The entire unit is in Federal ownership and managed by the Apache-Sitgreaves National Forests of the USFS. The unit encompasses seven major springheads and spring runs, which each flow a short distance of several meters to an unnamed tributary of the Black River. The spring complex contains spring seeps along the spring runs and the tributary. We are proposing to designate a single critical habitat unit that includes the springheads, spring runs, seeps, and that portion of the unnamed tributary that connects the spring runs. The tributary itself is occupied where there are spring seeps along it and provides for springsnail movement among the occupied seeps, spring runs and springs and is essential for habitat connectivity. The area within the proposed unit contains a small amount of upland area adjacent to the springheads, spring runs, spring seeps and the tributary segment. The moist soils and vegetation in the adjacent uplands (approximately 1 meter (3.3 ft) in width) are essential to the species because they produce food for the snails and protect the substrate they use. The remaining small amount of upland area is included to connect all of the essential, occupied habitat to form a single unit. Human-caused changes to the uplands adjacent to the aquatic habitats can be managed through this proposed unit designation to control threats to the aquatic habitats through conservation efforts by AGFD and through consultations between USFS and the Service under section 7 of the Act. For specific coordinates of the boundaries for the proposed critical habitat designation, please reference the unit descriptions in the Proposed Regulation Promulgation section below.

Threats to the Three Forks springsnail in this unit that may require special management of the physical and biological features include wildfire, fire retardant use to fight wildfires, elk grazing, predation by nonnative crayfish, and potential competition from nonnative snails. This proposed unit contains all the PCEs and supports all of the Three Forks springsnail life processes.

San Bernardino Springsnail

Snail Spring Unit

The proposed Snail Spring Unit encompasses 0.457 ha (1.129 ac) in Cochise County. The entire unit is in private ownership and managed by the John Slaughter Ranch. The spring is approximately 5 m (16 ft) in diameter and has a spring run that goes south from the spring approximately 23.5 m (77 ft) to a manmade ditch, which runs 10.2 m (33.5 ft) to a dirt road. It passes under the road in a 3.5 m (11.5 ft) culvert, then flows approximately 17 m (56 ft) below the road. We are not proposing the road as critical habitat, but we are proposing to designate the culvert beneath the road because it contains flowing water that is a PCE. The spring and spring run down to the ditch is dry and is likely unoccupied, though they contain other PCEs such as substrate. It is unknown if the ditch is occupied when water and other PCEs are present. We are proposing to include a 1 m (3.3 ft) buffer of upland area around the spring, spring run and ditch because it has moist soils and vegetation that produce food for the snails and protect the substrate they use. Because of the small size of the spring, spring run, and ditch, we are precluded from mapping them precisely due to inaccuracies inherent in the use of satellites for locating and mapping. Therefore, for mapping purposes we created a circle that encompasses them. The proposed critical habitat is the spring, spring run, ditch and buffer within the 76 m (249 ft) diameter circle centered on UTM coordinate 663858, 3468182 in Zone 12.

Threats to the San Bernardino springsnail in this unit that may require special management of the physical and biological features include groundwater depletion, drought, water contamination from pesticide use, and potential introduction of nonnative snails. Groundwater depletion, perhaps from watering the lawn adjacent to Snail Spring, has threatened the species with a loss of flowing water in the past (Cox *et al.* 2007, p. 2; Smith *et al.* 2003, p. 1; Malcom *et al.* 2003, p. 18) and continues to threaten it. Groundwater depletion threatens the region more broadly as the human population grows and demands for water increase (Earman *et al.* 2003, p. 259), especially during periods of drought. Human-caused changes to the uplands adjacent to the aquatic habitats likely cannot be managed through this proposed unit designation to control threats to the aquatic habitat, particularly runoff from pesticide use on the adjacent lawn unless Federal actions or funding are

involved. If that occurs, we would enter into consultation under section 7 of the Act. The proposed Snail Spring Unit contains all the physical and biological features in a complex spatial arrangement and supports all of the San Bernardino springsnail life processes where water is present.

Goat Tank Spring Unit

The proposed Goat Tank Spring Unit encompasses 0.002 ha (0.005 ac) in Cochise County. The entire unit is in private ownership and managed by the John Slaughter Ranch. The spring is contained entirely within a square concrete box approximately 0.6 × 0.9 m (2 × 3 ft). There is also some spring seepage emanating from the base of cottonwood tree about 2 m (6.6 ft) from the springbox. We are proposing to include a 1 m (3.3 ft) of upland area around the springbox and spring seepage because it has moist soils and vegetation that produce food for the snails and protects the substrate snails use. Because of the small size of the springbox and spring seepage, we are precluded from mapping them precisely due to inaccuracies inherent in the use of satellites for locating and mapping. Therefore, for mapping purposes we created a circle that encompasses them. The proposed critical habitat is the springbox, spring seepage, and buffer within the 5 m (16 ft) diameter circle centered on UTM coordinate 663725, 3468162 in Zone 12.

Threats to the San Bernardino springsnail in this unit that may require special management of the physical and biological features include groundwater depletion, drought, water contamination from pesticide use, and potential introduction of nonnative snails. Groundwater depletion has affected the species with a loss of flowing water at nearby Snail Spring in the recent past (Cox *et al.* 2007, p. 2; Smith *et al.* 2003, p. 1; Malcom *et al.* 2003, p. 18) and continues to threaten it. Groundwater depletion threatens the region more broadly as the human population grows and demands for water increase (Earman *et al.* 2003, p. 259), especially during periods of drought. Human-caused changes to the uplands adjacent to the aquatic habitats likely cannot be managed through this proposed unit designation to control threats to the aquatic habitat, particularly runoff from pesticide use on the adjacent lawn unless Federal actions or funding are involved. If that occurs, we would enter into consultation under section 7 of the Act. The proposed Goat Tank Unit contains all the PCEs that support all of the San Bernardino springsnail life processes.

Horse Spring Unit

The proposed Horse Spring Unit encompasses 0.032 ha (0.078 ac) in Cochise County. The entire unit is in private ownership and managed by the John Slaughter Ranch. The spring emerges from a PVC pipe and flows in a springrun that is approximately 0.5 m (1.6 ft) wide and 15.5 m (50.9 ft) in length. We are proposing to include a 1 m (3.3 ft) buffer of upland area around the springhead and springrun because it has moist soils and vegetation that produce food for the snails and protect the substrate they use. Because of the small size of the springhead and springrun, we are precluded from mapping them precisely due to inaccuracies inherent in the use of satellites for locating and mapping. Therefore, for mapping purposes we created a circle that encompasses them. The proposed critical habitat is the springbox, spring seepage, and buffer within the 20 m (66 ft) diameter circle centered on UTM coordinate 663772, 3468091 in Zone 12.

Threats to the San Bernardino springsnail in this unit that may require special management of the physical and biological features include groundwater depletion, drought, water contamination from pesticide use, and potential introduction of nonnative snails. Groundwater depletion has affected the species with a loss of flowing water at nearby Snail Spring in the recent past (Cox *et al.* 2007, p. 2; Smith *et al.* 2003, p. 1; Malcom *et al.* 2003, p. 18) and continues to threaten it. Groundwater depletion threatens the region more broadly as the human population grows and demands for water increase (Earman *et al.* 2003, p. 259), especially during periods of drought. Human-caused changes to the uplands adjacent to the aquatic habitats likely cannot be managed through this proposed unit designation to control threats to the aquatic habitat, particularly runoff from pesticide use on the adjacent lawn unless Federal actions or funding are involved. If that occurs, we would enter into consultation under section 7 of the Act. The proposed Horse Spring Unit contains all the PCEs that support all of the San Bernardino springsnail life processes.

Tule Spring Unit

The proposed Tule Spring Unit encompasses 0.324 ha (0.801 ac) in Cochise County. The entire unit is in Federal ownership and managed by the San Bernardino NWR of the Service. The spring forms a pond approximately 23 m (75 ft) north-south and 13 m (43 ft) east-west, and it has a spring run that

is approximately 21.7 m (71 ft) in length. The spring run emerges from the southeastern side of the spring pond, runs northeast for approximately 12.5 m (41 ft) to a manmade ditch, which runs southeast 9.2 m (30 ft). We are proposing to include a 1 m (3.3 ft) buffer of upland area around the spring, spring run, and ditch because it has moist soils and vegetation that produce food for the snails and protect the substrate they use. Because of the small size of the spring, spring run, and ditch, we are precluded from mapping them precisely due to inaccuracies inherent in the use of satellites for locating and mapping. Therefore, for mapping purposes we created a circle that encompasses them. The proposed critical habitat is the spring, spring run, ditch and buffer within the 64 m (210 ft) diameter circle centered on UTM coordinate 664259, 3468499 in Zone 12.

The proposed Tule Spring Unit is currently unoccupied by the San Bernardino springsnail, but is considered to have been historically occupied (Malcom *et al.* 2007, p. 19) and shares a common aquifer and similarities in water chemistry, temperature and hydrology with Snail Spring. Tule Spring is essential to the conservation of the species because it provides a reintroduction opportunity to provide population redundancy of the species. When developing conservation strategies for species whose life histories are characterized by short generation time, small body size, high rates of population increase, and high habitat specificity; greater emphasis should be placed on the maintenance of multiple populations as opposed to protecting a single population (Murphy *et al.* 1990, pp. 41–51).

Effects of Critical Habitat Designation

Section 7 Consultation

Section 7 of the Act requires Federal agencies, including the Service, to ensure that actions they fund, authorize, or carry out are not likely to jeopardize the continued existence of a listed species or destroy or adversely modify critical habitat. Decisions by the courts of appeals for the Fifth and Ninth Circuit Courts of Appeals have invalidated our definition of “destruction or adverse modification” (50 CFR 402.02) (*see Gifford Pinchot Task Force v. U.S. Fish and Wildlife Service*, 378 F. 3d 1059 (9th Circuit 2004) and *Sierra Club v. U.S. Fish and Wildlife Service et al.*, 245 F.3d 434, 442F (5th Circuit 2001), and we do not rely on this regulatory definition when analyzing whether an action is likely to destroy or adversely modify critical

habitat. Under the statutory provisions of the Act, we determine destruction or adverse modification on the basis of whether, with implementation of the proposed Federal action, the affected critical habitat would remain functional (or retain those PCEs that relate to the ability of the area to periodically support the species) to serve its intended conservation role for the species.

If a species is listed or critical habitat is designated, section 7(a)(2) of the Act requires Federal agencies to ensure that activities they authorize, fund, or carry out are not likely to jeopardize the continued existence of the species or to destroy or adversely modify its critical habitat. If a Federal action may affect a listed species or its critical habitat, the responsible Federal agency (action agency) must enter into consultation with us. As a result of this consultation, we document compliance with the requirements of section 7(a)(2) through our issuance of:

(1) A concurrence letter for Federal actions that may affect, but are not likely to adversely affect, listed species or critical habitat; or

(2) A biological opinion for Federal actions that are likely to adversely affect listed species or critical habitat.

An exception to the concurrence process referred to in (1) above occurs in consultations involving National Fire Plan projects. In 2004, the USFS and the Bureau of Land Management (BLM) reached agreements with the Service to streamline a portion of the section 7 consultation process (BLM 2004, pp. 1–8; USFS 2004, pp. 1–8). The agreements allow the USFS and the BLM the opportunity to make “not likely to adversely affect” (NLAA) determinations for projects implementing the National Fire Plan. Such projects include prescribed fire, mechanical fuels treatments (thinning and removal of fuels to prescribed objectives), emergency stabilization, burned area rehabilitation, road maintenance and operation activities, ecosystem restoration, and culvert replacement actions. The USFS and the BLM must ensure staff are properly trained, and both agencies must submit monitoring reports to the Service to determine if the procedures are being implemented properly and that effects on endangered species and their habitats are being properly evaluated. As a result, we do not believe the alternative consultation processes being implemented as a result of the National Fire Plan will differ significantly from those consultations being conducted by the Service.

When we issue a biological opinion concluding that a project is likely to

jeopardize the continued existence of a listed species or destroy or adversely modify critical habitat, we also provide reasonable and prudent alternatives to the project, if any are identifiable. We define “Reasonable and prudent alternatives” at 50 CFR 402.2 as alternative actions identified during consultation that:

- Can be implemented in a manner consistent with the intended purpose of the action;

- Can be implemented consistent with the scope of the Federal agency’s legal authority and jurisdiction;

- Are economically and technologically feasible; and

- Would, in the Director’s opinion, avoid jeopardizing the continued existence of the listed species or destroying or adversely modifying critical habitat.

Reasonable and prudent alternatives can vary from slight project modifications to extensive project redesign or relocation of the project. Costs associated with implementing reasonable and prudent alternatives are similarly variable.

Regulations at 50 CFR 402.16 require Federal agencies to reinstate consultation on previously reviewed actions in instances where we have listed a new species or subsequently designated critical habitat that may have been affected and the Federal agency has retained discretionary involvement or control over the action (or the agency’s discretionary involvement or control is authorized by law). Consequently, Federal agencies may sometimes need to request reinitiation of consultation with us on actions for which formal consultation has been completed, if those actions with discretionary involvement or control may affect subsequently listed species or designated critical habitat.

Federal actions that may affect the Three Forks springsnail or the San Bernardino springsnail or their designated critical habitat require section 7(a)(2) consultation under the Act. On private lands, examples of Federal actions include, but are not limited to, Environmental Protection Agency authorization of discharges under the National Pollutant Discharge Elimination System and registration of pesticides; Federal Highway Administration approval of funding of road or highway infrastructure and maintenance; Corps authorization of discharges of dredged and fill material into waters of the United States under section 404 of the CWA; U.S. Department of Agriculture (USDA) Natural Resources Conservation Service technical assistance and other programs;

USDA-Rural Utilities Service infrastructure or development; U.S. Department of Homeland Security activities in regard to immigration enforcement and regulation; the Department of Housing and Urban Development Small Cities Community Development Block Grant and home loan programs; or a permit from us under section 10(a)(1)(B) of the Act. Federal actions not affecting listed species or critical habitat, and actions on State, Tribal, local, or private lands that are not federally funded, authorized, or permitted, do not require section 7(a)(2) consultations. In addition to several of the specific examples above, other Federal actions that may require consultation on Federal lands include land-management actions implemented by the applicable Federal land management agency.

Application of the “Adverse Modification” Standard

The key factor related to the adverse modification determination is whether, with implementation of the proposed Federal action, the affected critical habitat would continue to serve its intended conservation role for the species, or would retain those PCEs that relate to the ability of the area to periodically support the species. Activities that may destroy or adversely modify critical habitat are those that alter the PCEs to an extent that appreciably reduces the conservation value of critical habitat for the Three Forks springsnail or the San Bernardino springsnail. As discussed above, the role of critical habitat is to support the life history needs of the species and provide for the conservation of the species.

Section 4(b)(8) of the Act requires us to briefly evaluate and describe, in any proposed or final regulation that designates critical habitat, activities involving Federal actions that may adversely modify such habitat, or that may be affected by such designation.

Activities that, when carried out, funded, or authorized by a Federal agency, may affect critical habitat and, therefore, should result in consultation for the Three Forks springsnail and the San Bernardino springsnail include, but are not limited to:

(1) Actions that would reduce the quantity of water flow within the spring systems proposed as critical habitat.

(2) Actions that would result in the inundation of springheads within the spring systems proposed as critical habitat.

(3) Actions that would degrade water quality within the spring systems proposed for designation as critical habitat.

(4) Actions that would reduce the availability of coarse, firm aquatic substrates within the spring systems that are proposed as critical habitat.

(5) Actions that would reduce the occurrence of native aquatic macrophytes, algae, and/or periphyton within the spring systems proposed as critical habitat.

(6) Actions that would cause, promote, or maintain the presence of nonnative predators and competitors at unacceptable levels within the spring systems proposed as critical habitat.

Exemptions

Application of Section 4(a)(3) of the Act

The Sikes Act Improvement Act of 1997 (Sikes Act) (16 U.S.C. 670a) required each military installation that includes land and water suitable for the conservation and management of natural resources to complete an integrated natural resource management plan (INRMP) by November 17, 2001.

The National Defense Authorization Act for Fiscal Year 2004 (Pub. L. 108-136) amended the Act to limit areas eligible for designation as critical habitat. Specifically, section 4(a)(3)(B)(i) of the Act (16 U.S.C. 1533(a)(3)(B)(i)) now provides: "The Secretary shall not designate as critical habitat any lands or other geographical areas owned or controlled by the Department of Defense, or designated for its use, that are subject to an integrated natural resources management plan prepared under section 101 of the Sikes Act (16 U.S.C. 670a), if the Secretary determines in writing that such plan provides a benefit to the species for which critical habitat is proposed for designation."

There are no Department of Defense lands with a completed INRMP within the critical habitat designation.

Exclusions

Application of Section 4(b)(2) of the Act

Section 4(b)(2) of the Act states that the Secretary must designate and revise critical habitat on the basis of the best available scientific data after taking into consideration the economic impact, national security impact, and any other relevant impact of specifying any particular area as critical habitat. The Secretary may exclude an area from critical habitat if he determines that the benefits of such exclusion outweigh the benefits of specifying such area as part of the critical habitat, unless he determines, based on the best scientific data available, that the failure to designate such area as critical habitat will result in the extinction of the species. In making that determination, the legislative history is clear that the

Secretary has broad discretion regarding which factors to use and how much weight to give any factor.

Under section 4(b)(2) of the Act, in considering whether to exclude a particular area from the designation, we must identify the benefits of including the area in the designation, identify the benefits of excluding the area from the designation, and determine whether the benefits of exclusion outweigh the benefits of inclusion. If based on this analysis, we make this determination, then we can exclude the area only if such exclusion would not result in the extinction of the species.

Exclusions Based on Economic Impacts

Under section 4(b)(2) of the Act, we consider the economic impacts of specifying any particular area as critical habitat. In order to consider economic impacts, we are preparing an analysis of the economic and other impacts of proposing critical habitat for the Three Forks springsnail and San Bernardino springsnail. We will announce the availability of the draft economic analysis as soon as it is completed, at which time we will seek public review and comment. At that time, copies of the draft economic analysis will be available for downloading from the Internet at <http://www.regulations.gov>, or from the Arizona Ecological Services Field Office (see **FOR FURTHER INFORMATION CONTACT** section). We may exclude areas from the final rule based on the information in the economic analysis. During the development of a final designation, we will consider economic impacts, public comments, and other new information, and areas may be excluded from the final critical habitat designation under section 4(b)(2) of the Act and our implementing regulations at 50 CFR 424.19.

Exclusions Based on National Security Impacts

Under section 4(b)(2) of the Act, we consider whether there are lands owned or managed by the Department of Defense (DOD) where a national security impact might exist. In preparing this proposal, we have determined that the lands within the proposed designation of critical habitat for the Three Forks and San Bernardino springsnails are not owned or managed by the Department of Defense, and therefore, anticipate no impact to national security. There are no areas proposed for exclusion based on impacts on national security.

Exclusions Based on Other Relevant Impacts

Under section 4(b)(2) of the Act, we consider any other relevant impacts, in

addition to economic impacts and impacts on national security. We consider a number of factors including whether the landowners have developed any HCPs or other management plans for the area, or whether there are conservation partnerships that would be encouraged by designation of, or exclusion from, critical habitat. In addition, we look at any Tribal issues, and consider the government-to-government relationship of the United States with Tribal entities. We also consider any social impacts that might occur because of the designation.

We have evaluated the Forest Management Plan for the Apache-Sitgreaves National Forests with respect to providing adequate protection and management for the Three Forks springsnail. At this time, the Plan does not provide sufficient protection and management to satisfy the criteria necessary for proposed exclusion from critical habitat. There are currently no conservation plans for the private lands in the Snail Spring Unit for the San Bernardino springsnail.

In preparing this proposal, we have determined that the proposed designation does not include any Tribal lands or trust resources. We anticipate no impact to Tribal lands, partnerships, or HCPs from this proposed critical habitat designation. There are no areas proposed for exclusion from this proposed designation based on other relevant impacts.

Peer Review

In accordance with our joint policy published in the **Federal Register** on July 1, 1994 (59 FR 34270), we are requesting the expert opinions of at least three appropriate and independent specialists regarding this proposed rule. The purpose of peer review is to ensure that our proposed rule is based on scientifically sound data, assumptions, and analyses. We will invite these peer reviewers to comment, during the public comment period, on the specific assumptions and conclusions regarding the proposal to list the Three Forks springsnail and San Bernardino springsnail as endangered, and our decision regarding critical habitat for these species.

We will consider all comments and information received during the comment period on this proposed rule during preparation of a final rulemaking. Accordingly, the final decision may differ from this proposal.

Public Hearings

The Act provides for one or more public hearings on this proposal, if we receive any request for hearings.

Requests must be received within 45 days after the date of publication of this proposal in the **Federal Register**. Send your request to the person named in **FOR FURTHER INFORMATION CONTACT**. We will schedule public hearings on this proposal, if any are requested, and announce the dates, times, and places of those hearings, as well as how to obtain reasonable accommodations, in the **Federal Register** and local newspapers at least 15 days before the first hearing.

Required Determinations

Regulatory Planning and Review

The Office of Management and Budget (OMB) has determined that this rule is not significant and has not reviewed this rule under Executive Order 12866. OMB bases its determination upon the following four criteria:

(a) Whether the rule will have an annual effect of \$100 million or more on the economy or adversely affect an economic sector, productivity, jobs, the environment, or other units of the government.

(b) Whether the rule will create inconsistencies with other Federal agencies' actions.

(c) Whether the rule will materially affect entitlements, grants, user fees, loan programs, or the rights and obligations of their recipients.

(d) Whether the rule raises novel legal or policy issues.

Regulatory Flexibility Act (5 U.S.C. 601 et seq.)

Under the Regulatory Flexibility Act (RFA; 5 U.S.C. 601 *et seq.*, as amended by the Small Business Regulatory Enforcement Fairness Act (SBREFA) of 1996), whenever an agency must publish a notice of rulemaking for any proposed or final rule, it must prepare and make available for public comment a regulatory flexibility analysis that describes the effects of the rule on small entities (*i.e.*, small businesses, small organizations, and small government jurisdictions). However, no regulatory flexibility analysis is required if the head of the agency certifies the rule will not have a significant economic impact on a substantial number of small entities. SBREFA amended RFA to require Federal agencies to provide a statement of the factual basis for certifying that the rule will not have a significant economic impact on a substantial number of small entities.

At this time, we lack the available economic information necessary to provide an adequate factual basis for the required RFA finding. Therefore, we defer the RFA finding until completion of the draft economic analysis prepared

under section 4(b)(2) of the Act and E.O. 12866. This draft economic analysis will provide the required factual basis for the RFA finding. Upon completion of the draft economic analysis, we will announce availability of the draft economic analysis of the proposed designation in the **Federal Register** and reopen the public comment period for the proposed designation. We will include with this announcement, as appropriate, an initial regulatory flexibility analysis or a certification that the rule will not have a significant economic impact on a substantial number of small entities accompanied by the factual basis for that determination. We have concluded that deferring the RFA finding until completion of the draft economic analysis is necessary to meet the purposes and requirements of the RFA. Deferring the RFA finding in this manner will ensure that we make a sufficiently informed determination based on adequate economic information and provides the necessary opportunity for public comment.

Unfunded Mandates Reform Act

In accordance with the Unfunded Mandates Reform Act (2 U.S.C. 1501 *et seq.*), we make the following findings:

(a) This proposed rule will not produce a Federal mandate. In general, a Federal mandate is a provision in legislation, statute or regulation that would impose an enforceable duty upon State, local, or tribal governments, or the private sector and includes both "Federal intergovernmental mandates" and "Federal private sector mandates." These terms are defined in 2 U.S.C. 658(5)(7). "Federal intergovernmental mandate" includes a regulation that "would impose an enforceable duty upon State, local, or [T]ribal governments," with two exceptions. It excludes "a condition of Federal assistance." It also excludes "a duty arising from participation in a voluntary Federal program," unless the regulation "relates to a then-existing Federal program under which \$500,000,000 or more is provided annually to State, local, and [T]ribal governments under entitlement authority," if the provision would "increase the stringency of conditions of assistance" or "place caps upon, or otherwise decrease, the Federal Government's responsibility to provide funding," and the State, local, or [T]ribal governments "lack authority" to adjust accordingly. At the time of enactment, these entitlement programs were: Medicaid; AFDC work programs; Child Nutrition; Food Stamps; Social Services Block Grants; Vocational Rehabilitation State Grants; Foster Care, Adoption

Assistance, and Independent Living; Family Support Welfare Services; and Child Support Enforcement. "Federal private sector mandate" includes a regulation that would impose an enforceable duty upon the private sector, except (i) a condition of Federal assistance or (ii) a duty arising from participation in a voluntary Federal program.

The designation of critical habitat does not impose a legally binding duty on non-Federal Government entities or private parties. Under the Act, the only regulatory effect is that Federal agencies must ensure that their actions do not destroy or adversely modify critical habitat under section 7. While non-Federal entities that receive Federal funding, assistance, or permits, or that otherwise require approval or authorization from a Federal agency for an action, may be indirectly impacted by the designation of critical habitat, the legally binding duty to avoid destruction or adverse modification of critical habitat rests squarely on the Federal agency. Furthermore, to the extent that non-Federal entities are indirectly impacted because they receive Federal assistance or participate in a voluntary Federal aid program, the Unfunded Mandates Reform Act would not apply; nor would critical habitat shift the costs of the large entitlement programs listed above onto State governments.

(b) We do not expect this rule to significantly or uniquely affect small governments. Small governments will be affected only to the extent that any programs having Federal funds, permits, or other authorized activities must ensure that their actions will not adversely affect the critical habitat. Therefore, a Small Government Agency Plan is not required. However, we will further evaluate this issue as we conduct our economic analysis, and review and revise this assessment as warranted.

Takings

In accordance with E.O. 12630 (Government Actions and Interference with Constitutionally Protected Private Property Rights), we will analyze the potential takings implications of designating critical habitat for the Three Forks springsnail and San Bernardino springsnail in a takings implications assessment. The takings implications assessment will determine whether this designation of critical habitat for the Three Forks springsnail and San Bernardino springsnail poses significant takings implications for lands within or affected by the proposed revised designation. We will further evaluate

this issue as we conduct our economic analysis.

Federalism

In accordance with E.O. 13132 (Federalism), this proposed rule does not have significant Federalism effects. A Federalism assessment is not required. In keeping with Department of the Interior and Department of Commerce policy, we requested information from, and coordinated development of, this proposed critical habitat designation with appropriate State resource agencies in Arizona. The designation of critical habitat on lands currently occupied by the Three Forks springsnail or San Bernardino springsnail imposes no additional restrictions to those currently in place and, therefore, has little incremental impact on State and local governments and their activities. The designation may have some benefit to these governments because the areas that contain the features essential to the conservation of the species are more clearly defined, and the physical and biological features of the habitat necessary to the conservation of the species are specifically identified. This information does not alter where and what federally sponsored activities may occur. However, it may assist local governments in long-range planning (rather than having them wait for case-by-case section 7 consultations to occur).

Where state and local governments require approval or authorization from a Federal agency for actions that may affect critical habitat, consultation under section 7(a)(2) would be required. While non-Federal entities that receive Federal funding, assistance, or permits, or that otherwise require approval or authorization from a Federal agency for an action, may be indirectly impacted by the designation of critical habitat, the legally binding duty to avoid destruction or adverse modification of critical habitat rests squarely on the Federal agency.

Civil Justice Reform

In accordance with E.O. 12988 (Civil Justice Reform), the Office of the Solicitor has determined that the rule does not unduly burden the judicial system and that it meets the requirements of sections 3(a) and 3(b)(2) of the Order. We have proposed designating critical habitat in accordance with the provisions of the Act. This proposed rule uses standard property descriptions and identifies the physical and biological features within the designated areas to assist the public in understanding the habitat needs of

the Three Forks springsnail and San Bernardino springsnail.

Paperwork Reduction Act of 1995

This proposed rule does not contain any new collections of information that require approval by OMB under the Paperwork Reduction Act of 1995 (44 U.S.C. 3501 *et seq.*). This rule will not impose recordkeeping or reporting requirements on State or local governments, individuals, businesses, or organizations. An agency may not conduct or sponsor, and a person is not required to respond to, a collection of information unless it displays a currently valid OMB control number.

National Environmental Policy Act

It is our position that, outside the jurisdiction of the Circuit Court of the United States for the Tenth Circuit, we do not need to prepare environmental analyses as defined by the National Environmental Policy Act (NEPA) (42 U.S.C. 4321 *et seq.*) in connection with designating critical habitat under the Act. We published a notice outlining our reasons for this determination in the **Federal Register** on October 25, 1983 (48 FR 49244). This assertion was upheld by the Circuit Court of the United States for the Ninth Circuit (*Douglas County v. Babbitt*, 48 F.3d 1495 (9th Cir. 1995), cert. denied 516 U.S. 1042 (1996)).

Clarity of the Rule

We are required by Executive Orders 12866 and 12988 and by the Presidential Memorandum of June 1, 1998, to write all rules in plain language. This means that each rule we publish must:

- (a) Be logically organized;
- (b) Use the active voice to address readers directly;
- (c) Use clear language rather than jargon;
- (d) Be divided into short sections and sentences; and
- (e) Use lists and tables wherever possible.

If you feel that we have not met these requirements, send us comments by one of the methods listed in the **ADDRESSES** section. To better help us revise the rule, your comments should be as specific as possible. For example, you should tell us the numbers of the sections or paragraphs that are unclearly written, which sections or sentences are too long, the sections where you feel lists or tables would be useful, etc.

Government-to-Government Relationship With Tribes

In accordance with the President's memorandum of April 29, 1994,

"Government-to-Government Relations with Native American Tribal Governments" (59 FR 22951), E.O. 13175, and the Department of the Interior's manual at 512 DM 2, we readily acknowledge our responsibility to communicate meaningfully with recognized Federal Tribes on a government-to-government basis. In accordance with Secretarial Order 3206 of June 5, 1997 (American Indian Tribal Rights, Federal-Tribal Trust Responsibilities, and the Endangered Species Act), we readily acknowledge our responsibilities to work directly with Tribes in developing programs for healthy ecosystems, to acknowledge that tribal lands are not subject to the same controls as Federal public lands, to remain sensitive to Indian culture, and to make information available to Tribes.

We have determined that there are no Tribal lands occupied at the time of listing with features essential for the conservation, and no Tribal lands that are essential for the conservation, of the Three Forks springsnail and San Bernardino springsnail. Therefore, we have not proposed designation of critical habitat for the Three Forks springsnail and San Bernardino springsnail on Tribal lands.

Energy Supply, Distribution, or Use

Executive Order 13211, "Actions Concerning Regulations That Significantly Affect Energy Supply, Distribution, or Use," requires agencies to prepare Statements of Energy Effects when undertaking certain actions. This proposed rule to designate critical habitat for the Three Forks springsnail and San Bernardino springsnail is not a significant regulatory action, and we do not expect it to significantly affect energy supplies, distribution, or use. Therefore, this action is not a significant energy action, and no Statement of Energy Effects is required. However, we will further evaluate energy-related issues as we conduct our economic analysis, and review and revise this assessment as warranted.

References Cited

A complete list of all references cited in this rule is available on the Internet at <http://www.regulations.gov> or upon request from the Field Supervisor, Arizona Ecological Services Field Office (*see FOR FURTHER INFORMATION CONTACT* section).

Authors

The primary authors of this document are the staff members of the Arizona Field Services Office (*see FOR FURTHER INFORMATION CONTACT*).

List of Subjects in 50 CFR Part 17

Endangered and threatened species, Exports, Imports, Reporting and recordkeeping requirements, and Transportation.

Regulation Promulgation

Accordingly, we propose to amend part 17, subchapter B of chapter I, title

50 of the Code of Federal Regulations, as set forth below:

PART 17—[AMENDED]

1. The authority citation for part 17 continues to read as follows:

Authority: 16 U.S.C. 1361–1407; 16 U.S.C. 1531–1544; 16 U.S.C. 4201–4245; Pub. L. 99–625, 100 Stat. 3500, unless otherwise noted.

2. In § 17.11(h) add entries for “Springsnail, San Bernardino” and “Springsnail, Three Forks” to the List of Endangered and Threatened Wildlife in alphabetic order under SNAILS to read as follows:

§ 17.11 Endangered and threatened wildlife.

* * * * *
(h) * * *

Species		Historic range	Vertebrate population where endangered or threatened	Status	When listed	Critical habitat	Special rules
Common name	Scientific name						
*	*	*	*	*	*		*
SNAILS							
*	*	*	*	*	*		*
Springsnail, San Bernardino	<i>Pyrgulopsis bernardina</i>	U.S.A. (AZ)	Entire	E	17.95(f)	NA	
*	*	*	*	*	*		*
Springsnail, Three Forks.	<i>Pyrgulopsis trivialis</i>	U.S.A. (AZ)	Entire	E	17.95(f)	NA	
*	*	*	*	*	*		*

3. In § 17.95, amend paragraph (f) by adding entries for “San Bernardino Springsnail (*Pyrgulopsis bernardina*)” and “Three Forks Springsnail (*Pyrgulopsis trivialis*)” to follow the entry for “Rough hornsnail (*Pleurocera foremani*)” to read as follows:

§ 17.95 Critical habitat—fish and wildlife.

* * * * *
(f) Clams and Snails.
* * * * *

San Bernardino Springsnail (*Pyrgulopsis bernardina*)

(1) Critical habitat units are depicted for Cochise County, on the map in paragraph (5) of this entry.

(2) The physical and biological features of critical habitat for the San Bernardino springsnail are:

- (i) Adequately clean spring water (free from contamination) emerging from the ground and flowing on the surface;
- (ii) Periphyton (attached algae), bacteria, and decaying organic material for food;
- (iii) Substrates, which include cobble, gravel, pebble, sand, silt, and aquatic vegetation, for egg laying, maturing, feeding, and escape from predators; and
- (iv) Either an absence of nonnative predators (crayfish) and competitors (snails) or their presence at low population levels.

(3) We have determined that all of the areas designated as critical habitat

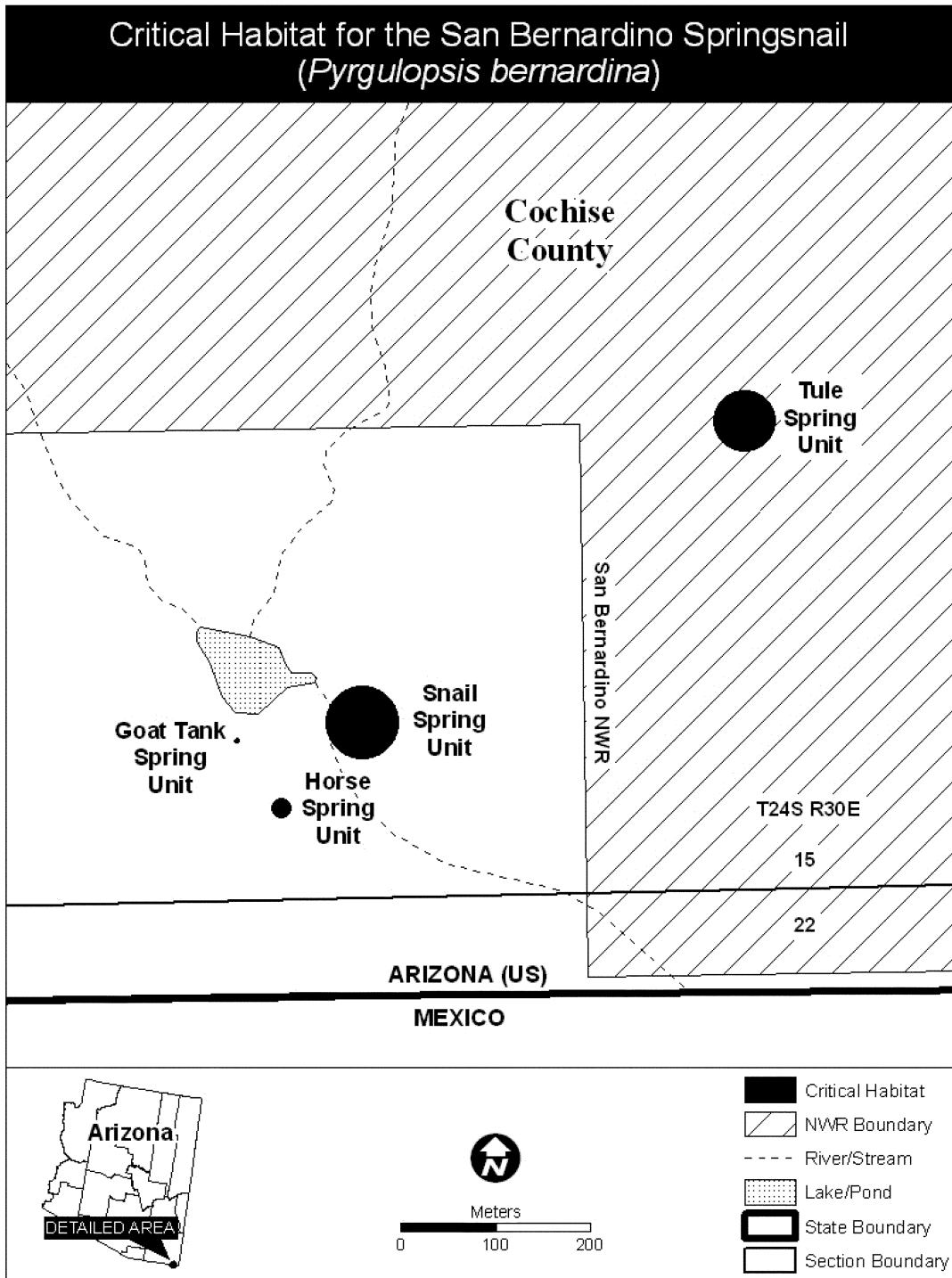
contain one or more of the physical and biological features, and there are no developed areas other than the road culvert and concrete springbox included to protect water within them.

(4) Critical habitat map units were plotted on 2007 USGS Digital Ortho Quarter Quad maps using Universal Transverse Mercator (UTM) coordinates in ArcMap. Because of the small size of the springs, spring runs and ditches, for mapping purposes we created a circle that encompasses them.

(5)

Note: Index map of critical habitat for the San Bernardino springsnail follows:

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BILLING CODE 4310-55-P

(6) Snail Spring Unit 0.457 ha (1.129 ac) in Cochise County, Arizona. The proposed unit is a spring approximately 5 m (16 ft) in diameter and has a spring run that goes south from the spring approximately 23.5 m (77 ft) to a manmade ditch, which runs 10.2 m (33.5 ft) to a dirt road. It passes under the road in a 3.5 m (11.5 ft) culvert, then flows approximately 17 m (56 ft) below the road. The culvert beneath the road

is included in critical habitat, but not the road itself. We include 1 m (3.3 ft) of upland area around the spring, spring run and ditch because it has moist soils and vegetation that produce food for the snails and protect the substrate essential to the species. The critical habitat is the spring, spring run, ditch and buffer within the 76 m (249 ft) diameter circle centered on UTM coordinate 663858, 3468182 in Zone 12 with the units in

meters using North American Datum of 1983 (NAD 83).

(7) Goat Tank Spring Unit 0.002 ha (0.005 ac) in Cochise County. The unit is a spring contained entirely within a square concrete box approximately 0.61 × 0.91 m (2 × 3 ft) and spring seepage emanating from the base of cottonwood tree about 2 m (6.56 ft) from the springbox. We include 1 m (3.3 ft) of upland area around the spring box and spring. The critical habitat is the

springbox, spring seepage, and buffer within the 5 m (16.4 ft) diameter circle centered on UTM coordinate 663725, 3468162 in Zone 12 with the units in meters using North American Datum of 1983 (NAD 83).

(8) Horse Spring Unit 0.032 ha (0.078 ac) in Cochise County. The unit is a spring and springrun approximately 0.5 m (1.6 ft) wide and 15.5 m (50.9 ft) in length. We include 1 m (3.3 ft) of upland area around the springhead and spring run. The proposed critical habitat is the springbox, spring seepage, and buffer within the 20 m (66 ft) diameter circle centered on UTM coordinate 663772, 3468091 in Zone 12 with the units in meters using North American Datum of 1983 (NAD 83).

(9) Tule Spring Unit 0.324 ha (0.801 ac) in Cochise County, Arizona. The unit is a spring, which forms a pond approximately 23 m (75 ft) north-south and 13 m (43 ft) east-west, and it has a spring run that is approximately 21.7 m (71 ft) in length. The spring run emerges

from the southeastern side of the spring pond, runs northeast for approximately 12.5 m (41 ft) to a manmade ditch, which runs southeast 9.2 m (30 ft). We include 1 m (3.3 ft) of upland area around the spring, spring run, and ditch. The proposed critical habitat is the spring, spring run, ditch and buffer within the 64 m (210 ft) diameter circle centered on UTM coordinate 664259, 3468499 in Zone 12 with the units in meters using North American Datum of 1983 (NAD 83).

* * * * *

Three Forks Springsnail (*Pyrgulopsis trivialis*)

(1) Critical habitat units are depicted for Apache County, Arizona, on the map at paragraph (5) of this entry below.

(2) The primary constituent elements of critical habitat for the Three Forks springsnail are:

(i) Adequately clean spring water (free from contamination) emerging from the ground and flowing on the surface;

(ii) Periphyton (attached algae), bacteria, and decaying organic material for food;

(iii) Substrates that include cobble, gravel, pebble, sand, silt, and aquatic vegetation, for egg-laying, maturing, feeding, and escape from predators; and

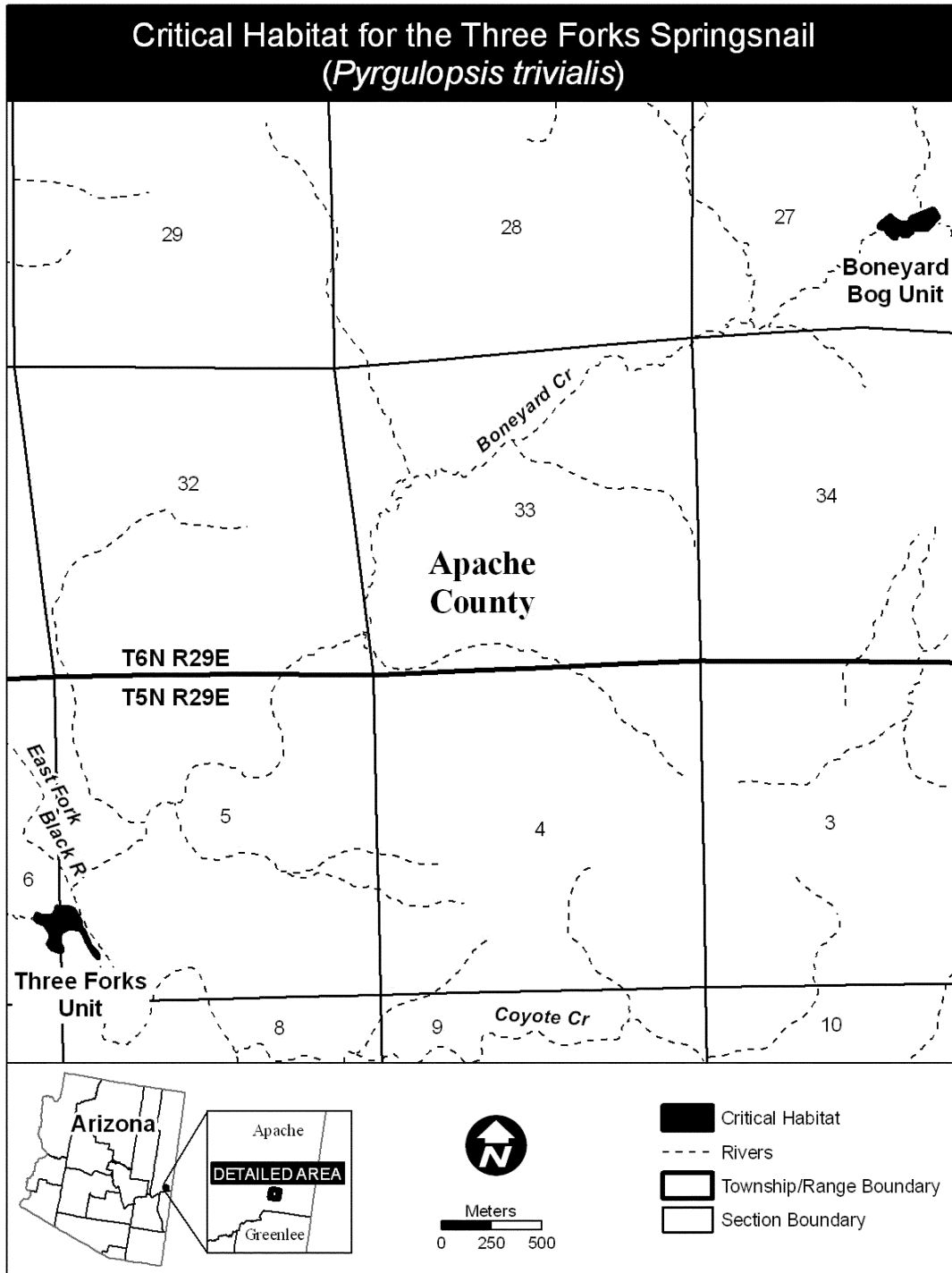
(iv) Either an absence of nonnative predators (crayfish) and competitors (snails) or their presence at low population levels. .

(3) We have determined that all of the areas designated as critical habitat contain one or more of the physical and biological features, and there are no developed areas other than concrete springboxes included to protect water within them.

(4) Critical habitat map units were plotted on 2007 USGS Digital Ortho Quarter Quad maps using Universal Transverse Mercator (UTM) coordinates in ArcMap.

(5)

Note: Index map of critical habitat for the Three Forks springsnail follows:



(6) Three Forks Springs Unit (2.5 ha; 6.1 ac). The Three Forks Spring Unit consists of all areas within boundary points with the following coordinates in UTM Zone 12 with the units in meters using North American Datum of 1983 (NAD 83): 655708, 3747262; 655714, 3747269; 655746, 3747258; 655777, 3747256; 655802, 3747270; 655808, 3747288; 655815, 3747304; 655877, 3747299; 655898, 3747291; 655911, 3747271; 655922, 3747253; 655932,

3747227; 655932, 3747209; 655939, 3747196; 655948, 3747186; 655958, 3747165; 655969, 3747142; 655979, 3747116; 655998, 3747094; 656013, 3747078; 656022, 3747061; 656023, 3747050; 656013, 3747052; 656001, 3747065; 655991, 3747086; 655973, 3747112; 655963, 3747133; 655951, 3747166; 655931, 3747191; 655906, 3747198; 655886, 3747201; 655869, 3747198; 655836, 3747179; 655826, 3747158; 655830, 3747123; 655841,

3747098; 655838, 3747083; 655818, 3747085; 655785, 3747097; 655771, 3747122; 655782, 3747144; 655784, 3747170; 655752, 3747216; 655715, 3747232; 655707, 3747242; Thence returning to 655708, 3747262.

(7) Boneyard Bog Springs Unit (2.0 ha; 5.0 ac). The Boneyard Bog Spring Unit consists of all areas within boundary points with the following coordinates in UTM Zone 12 with the units in meters using North American Datum of 1983

(NAD 83): 659968, 3750753; 659990,
3750731; 660021, 3750713; 660060,
3750717; 660070, 3750742; 660176,
3750787; 660190, 3750781; 660199,
3750758; 660208, 3750744; 660159,
3750685; 660125, 3750680; 660088,
3750684; 660081, 3750690; 660072,
3750691; 660072, 3750676; 660076,
3750675; 660076, 3750664; 660069,

3750664; 660067, 3750663; 660060,
3750654; 660052, 3750648; 660034,
3750649; 660029, 3750654; 660027,
3750663; 660008, 3750659; 659997,
3750649; 659997, 3750639; 659988,
3750639; 659982, 3750641; 659958,
3750660; 659954, 3750671; 659945,
3750675; 659942, 3750688; 659933,
3750685; 659921, 3750691; 659910,

3750693; 659919, 3750712; Thence
returning to 659968, 3750753.

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Dated: March 11, 2011.

Will Shafroth,

*Acting Assistant Secretary for Fish and
Wildlife and Parks.*

[FR Doc. 2011-8176 Filed 4-11-11; 8:45 am]

BILLING CODE 4310-55-C