Recovery Outline for the San Bernardino Springsnail

(*Pyrgulopsis bernardina*)

(Photo: Phoenix Zoo)

MAY 2025

Species Common Name: San Bernardino Springsnail
Species Scientific Name: *Pyrgulopsis bernardina*
ESA Listing Status: Threatened; April 17, 2012; 77 FR 23060
Lead Region: Southwest Region 2
Cooperating Region(s): N/A
Lead Office: Arizona Ecological Services Field Office
Cooperating Office(s): N/A
Lead Contact: Dr. Cassondra Walker, Fish and Wildlife Biologist
Species Range: Arizona, United States and Sonora, México

PURPOSE AND DISCLAIMER

The Recovery Outline is a succinct document that presents a preliminary recovery strategy and actions to direct a newly listed species' recovery efforts until a Recovery Plan is completed. Recommendations in the Recovery Outline are non-binding and are intended to guide (not require) regulatory (e.g., section 7 consultations and section 10 permitting) and conservation actions to be implemented by the U.S. Fish and Wildlife Service (USFWS) and our external partners.

This document lays out a preliminary course of action for the survival and recovery of the San Bernardino springsnail. Formal public participation for recovery planning will be invited upon the release of the draft Recovery Plan. However, we will consider any new information or comments that members of the public offer in response to this outline during the recovery planning process. For more information on Federal recovery efforts for the San Bernardino springsnail, or to provide additional comments, interested parties may contact the lead field office for this species at the above email address and telephone number.

1. BACKGROUND

The purpose of this Recovery Outline is to provide an interim strategy to guide the conservation and recovery of the San Bernardino springsnail until Draft and Final Recovery Plans are completed. The following sections include a summary of the biology, life history, and ecology of the San Bernardino springsnail. A complete discussion of the species' morphology, taxonomy, distribution, phenology, reproduction, life span, demographic trends, and habitat needs will be found in the upcoming Species Status Assessment for the San Bernardino springsnail (USFWS 2025 in prep). An electronic copy of the assessment report will become available at the USFWS Environmental Conservation Online System website for the San Bernardino Springsnail.

Important Information Gaps and Treatment of Uncertainties

A recovery strategy for the San Bernardino springsnail would be enhanced by addressing information gaps about the species. Currently, several information gaps exist, specifically concerning aspects of the species' distribution, biology, population demographics, habitat preferences, and long-term monitoring.

First, no full-range survey of springs has been conducted to identify potential additional populations of the San Bernardino springsnail. A full accounting of locations is critical in understanding the status of the species in terms of redundancy, resiliency, and representation.

Second, several species biology questions remain that would inform a recovery strategy, especially one that leverages captive breeding and reintroduction/translocation efforts. For example, the full range of water chemistry and quality parameters, to include an optimal range, is unknown; the information we currently have is based on a single occupied site and another extirpated site. In addition, we do not fully understand the food needs/preferences of the San Bernardino springsnail.

Third, little is known about population demographics, including population sizes, recruitment, and survival. Survey techniques have not yet been developed that reliably estimate population sizes of springsnails at occupied sites. Reproduction, recruitment, and survival rates, as well as the environmental parameters that may influence them, are not known explicitly for the San Bernardino springsnail.

In addition, while some research has been conducted on San Bernardino springsnail habitat, some parameters remain relatively unknown such as ideal flow, shading, vegetative cover, and structural complexity. These parameters would be important for translocation efforts.

Lastly, long-term monitoring and research on San Bernardino springsnail populations and the condition of their habitats are crucial for assessing their current status and tracking changes over time. Notably, abundance estimates for sites in the U.S. are not determinable from current monitoring efforts; in addition, abundance for the populations in México remains unknown. Monitoring efforts are vital for evaluating population health and the impacts of threats such as habitat destruction, contamination, and predation.

To effectively address these information gaps, it is essential to consider the treatment of uncertainties in the Recovery Outline. Assumptions are made based on the best available information, as explicitly defined in the SSA (USFWS 2025 in prep).

Limiting Ecological Traits

Hydrobiid springsnails in the southwestern U.S. and northern México are limited by their dependency on stable spring habitats that are increasingly threatened by rapid environmental changes, such as reduction and loss of springflows, or changes in water chemistry as a result of declining aquifers and water tables (Hershler et al. 2014 pp.694–695; Williams and Sada 2021 pp.90-91. 97-98; Stevens et al. 2022 p.2).

The narrow niche requirements of Hydrobiids make them highly susceptible to habitat alterations (Mehlhop and Vaughn 1993 entire). Like other *Pyrgulopsis* species, the San Bernardino springsnail requires perennial, shallow, low-velocity spring flow to maintain stable aquatic chemistry and essential dissolved minerals. *Pyrgulopsis* species are typically found in headwaters, springheads, and spring runs (Hurt 2004 p.1173; Hershler et al. 2014 pp.693–694). It is likely that limited dispersal capability or opportunities prevent many narrow endemic *Pyrgulopsis* springsnails from finding suitable habitats or escaping unsuitable ones, meaning that any perturbation, such as drought or water contamination, can lead to their extinction. Moreover, *Pyrgulopsis* springsnails, due to the combination of population isolation and limited passive dispersal, are believed to potentially suffer from the genetic effects of small population sizes such as genetic drift.

Furthermore, substrate composition (e.g., sand, cobble, silt) and structural complexity (e.g., due to vegetation density, impacts from livestock) are critical factors in their habitat selection, influencing the availability of food and shelter (Stewart and Garcia 2022 p.177). Diverse and stable substrate types support higher San Bernardino springsnail densities, while fine sediments like silt often reduce habitat suitability for the species (Malcom et al. 2005 pp.75–76). These microhabitat features are influenced by vegetation and physical disturbances, which contribute to the availability of these ecological niches favored by local endemic *Pyrgulopsis* springsnails (Abele 2011 p.19; Stevens et al. 2022 p.7).

These limiting ecological traits likely further compound the San Bernardino springsnail's vulnerability to extinction, as observed for other springsnails in Arizona (i.e*., Pyrgulopsis trivialis* and *Tryonia quitobaquitae*) (USFWS 2022 pp.7–13, 54, USFWS 2023a pp.9–12) and the Chihuahuan Desert of the southwestern U.S., as well as in northern México (Bogan et al. 2014 pp.2707, 2719; Holste et al. 2016 p.721; Walters et al. 2022 p.335).

Threats

The San Bernardino springsnail faces significant threats that exacerbate the limitations imposed by its ecological traits. These threats include the reduction of spring discharge, modifications to spring habitats, and impacts of environmental change (e.g., precipitation patterns, increased temperatures, reduced water availability). The interaction of these stressors, alongside additional minor threats (e.g., trampling by livestock, fire), leads to substantial habitat alterations that threaten the springsnail's survival. As a narrowly distributed species with low redundancy, it is

particularly at risk from both natural and anthropogenic stressors, which can lead to population declines since these species are more vulnerable to extinction than spatially-redundant, high-viability species for demographic, ecological, and genetic reasons (Lande 1993 pp.922–923; Fahrig and Merriam 1994 p.52; Frankham et al. 2002 pp.32–33; Jeppsson and Forslund 2012 pp.714–717; Wootton and Pfister 2013 pp.2117–2118).

Current Biological Status

The USFWS was petitioned in 2007 by Forest Guardians to list 475 species in the southwest, which included the San Bernardino springsnail, under the provision of the Endangered Species Act of 1973, as amended. The San Bernardino springsnail was proposed for listing as endangered with critical habitat on April 12, 2011 (USFWS 2011b pp.20464–20488). At that time, the threats identified to species included springhead inundation, groundwater depletion, pesticides, failure of regulatory mechanisms, broad impacts of environmental change, and high endemism. After review, a final rule was published on April 7, 2012 designating the species as threatened with critical habitat (USFWS 2012 pp.23060–23092).

Overview

The range of the San Bernardino springsnail (Figure 1) spans a transnational geographic area from the United States (southeastern Arizona) into México (northern Sonora). Endemic to ciénega ecosystems (i.e., desert wetlands) at elevations near 1,160 meters (3,806 feet) the species typically occupies sites with multiple springheads (Minckley and Brunelle 2007 pp.421–422; Varela-Romero and Myers 2010 pp.6–8).

In the United States, the historical range included multiple springs along the Río San Bernardino (also known as San Bernardino Creek or Black Draw), located in the headwaters of the Río Yaqui within Cochise County, Arizona. These springs are situated on lands now managed as the San Bernardino National Wildlife Refuge (SBNWR), and the privately-owned John Slaughter Ranch Museum (Velasco 2000 p.1; Malcom et al. 2003 p.2; Cox 2007 pp.1–2; U.S. Fish and Wildlife Service 2007 pp.66–67). Historically, the springsnail was found in several springs at Slaughter Ranch (Landye 1995 pp.1–3). However, by 2012 it was largely extirpated from these locations, with populations limited to the Goat Tank springbox and nearby minor seeps (Myers 2012 pp.20–21). Today, this species exists in the United States exclusively within a 0.9-meter (3-foot) concrete springbox surrounding Goat Tank Spring on the John Slaughter Historical Ranch (USFWS 2023b p.159).

In México, the range encompasses multiple transnational basins associated with the Rio San Bernardino Basin to include the Cajón Bonito Sub-basin in Sonora, as delineated by Lehner et al. (2008). The San Bernardino springsnail occurs within approximately nine sites across five spring complexes (i.e., hydrologically-connected cluster of springs). The spring sites occupied by the San Bernardino springsnail occur on conservation lands in Sonora owned by Cuenca los Ojos (Cuenca Los Ojos 2025). Given the close association of the San Bernardino springsnail with both shallow and deep aquifer water from multiple aquifers (i.e., San Bernardino and Guadalupe Mountain aquifers), the species is unlikely to occur beyond the basins that overlap these aquifers (Sanchez and Rodriguez 2021).

The species' distribution is spatially bimodal, with five populations existing across two small regions (i.e., San Bernardino Valley and Cajón Bonito) without any currently or historically known occurrences located between. Dispersal within regions is supported by shared haplotypes, but dispersal across the two regions appears negligible, if it occurs at all (Myers and Varela-Romero 2013). Systematic surveys of springs in the U.S. have not been conducted to ascertain the full occupancy of the species across its range; limited surveys in Sonora have not documented occupied sites between the two regions (San Bernardino Basin and Cajón Bonito Sub-Basin). While the historical range of the species has never been documented, known loss of occupancy has occurred at one site to date.

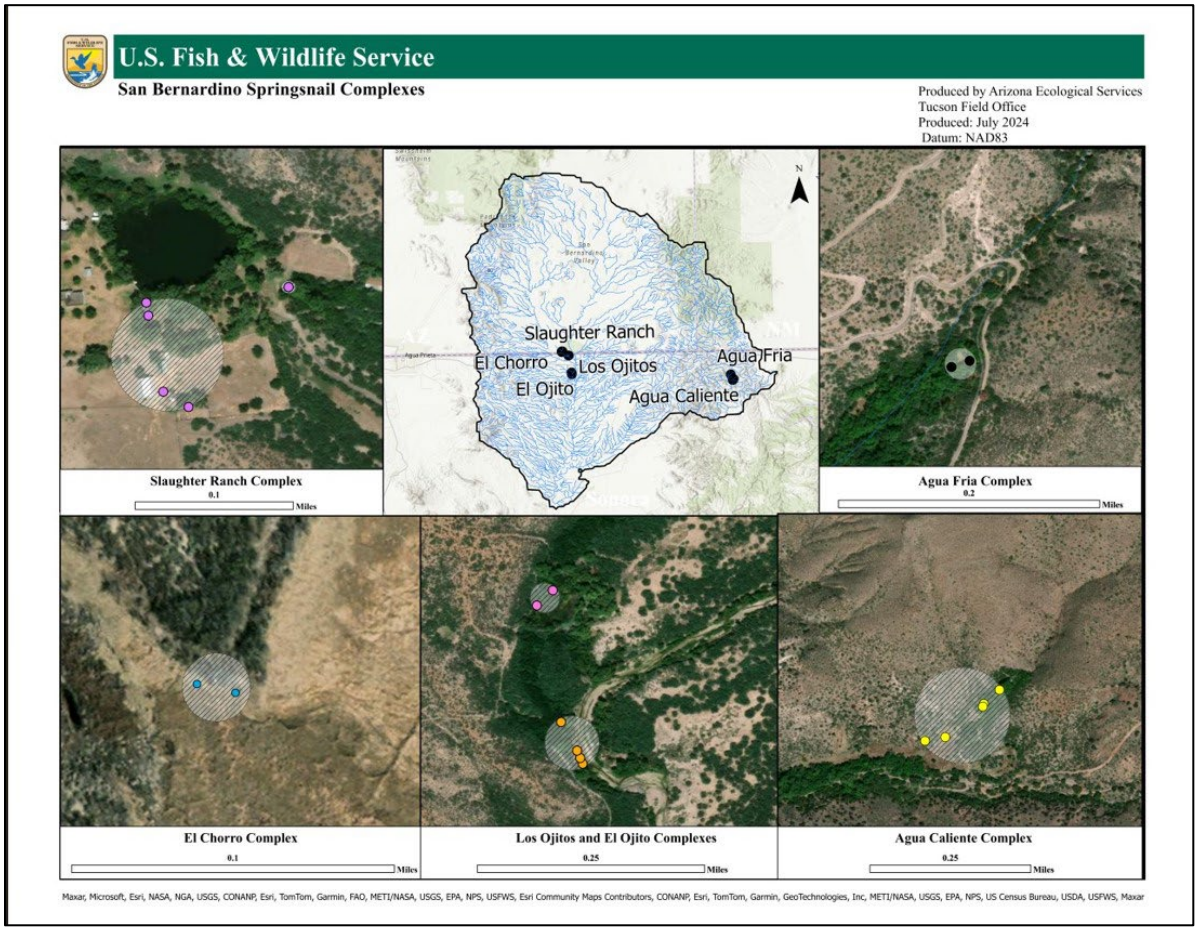

Figure 1. The distribution of the San Bernardino springsnail (*Pyrgulopsis bernardina*) with known occupied complexes (black circles) across the range (black outline) of the species in the United States and México, with references to the associated drainages and streams (blue) from the National Hydrography Dataset (Moore et al. 2019 entire).

3 Rs

Using the SSA framework (USFWS 2016a entire; Smith et al. 2018 entire), we consider what a species needs to maintain its viability by characterizing the biological status of the species in terms of its resiliency, redundancy, and representation (3 Rs) (adapted from Shaffer and

Stein 2000 pp.308–311). The following provides a summary of our assessment of the current condition of the San Bernardino springsnail (USFWS 2025 in prep).

Resiliency: Despite lacking survey data and robust monitoring efforts, information about the San Bernardino springsnail's relatively long-term occupation of the springs in northern Sonora suggests that the species may be highly resilient in natural settings and under baseline stochastic disturbances. In the U.S., the remaining population at Goat Tank has persisted for at least 50 years, although the non-natural site (enclosed springbox) likely mediates environmental stochasticity. In addition, the *Pyrgulopsis* genus is assumed to be relatively resilient to disturbance and localized reductions in abundance given its persistence over geological time. This resilience has been attributed to high reproductive and recruitment rates within populations and a resistance to the adverse effects of genetic bottlenecking and genetic drift following population dips (Martinez and Sorensen 2007 p.31). Therefore, resiliency at this time can be characterized as moderate, until more or different information becomes available.

Redundancy: Currently known occupied sites for the San Bernardino springsnail occur within two small, disjunct localities consisting of multiple spring complexes. The limited spatial extent of these known sites combined with a lack of facilitated passive dispersal increases the risk of extirpation or even extinction should a catastrophic event (i.e., environmental, anthropogenic, demographic) occur. Furthermore, the lack of shared haplotypes between the localities supports a lack of dispersal capability across the species' range, such that a single event (i.e., wildlife, aquifer depletion) could ultimately remove half (with unique haplotypes) of the known occupied sites of the species resulting in no natural rebound from dispersing individuals. Therefore, redundancy at this time can be characterized as low, until more or different information becomes available.

Representation: Across the range of the San Bernardino springsnail, ecological diversity is relatively high, as the species occupies sites that show heterogeneity in water source, water chemistry and quality, substrate type, and other microhabitat components. Given this, the San Bernardino springsnail is thought to exhibit a high degree of plasticity in habitat suitability. Further, documented genetic variation (as measured by shared haplotypes) shows a combination of shared and distinct haplotypes that may contribute to the species' ability to persist across a wide range of habitat conditions. Although considered a narrow endemic like many other *Pyrgulopsis* species, the San Bernardino springsnail occupies a breadth of suitable habitat across its range, suggesting some degree of adaptive capacity to mitigate environmental stochasticity. Therefore, representation at this time can be characterized as high, until more or different information becomes available.

Conservation Actions to Date

The conservation efforts for the San Bernardino springsnail in the United States have been largely led by the USFWS, SBNWR, John Slaughter Historical Ranch, Arizona Game and Fish Department (AZGFD), Phoenix Zoo, and the Malpai Borderlands Group, while in México, conservation has been led on privately-owned ranch lands managed by Cuenca los Ojos, a non-profit conservation group.

In the summer of 2002, Snail Spring (the type locality for the species) experienced dewatering, prompting land managers to use a garden hose to maintain aquatic habitat for the species; however, the last documentation of springsnails at this site was in 2006 (U.S. Fish and Wildlife Service 2006 p.1, 2008 p.83). The causes for the dewatering of Snail Spring have not been documented, highlighting a gap in understanding the stressors affecting reliable aquatic habitat. To rehabilitate this site for San Bernardino springsnails, the USFWS installed a well (113 ft; 34 m) in January 2012, to supply water to Snail Spring from the shallow aquifer (USFWS 2013 p.3), but in 2015 the pump failed, dewatering the site for a second time. Currently, permanent water availability at Snail Spring remains unsuitable for reintroduction (USFWS 2023b p.159).

The San Bernardino springsnail was originally documented as "abundant" in 1973 (Landye 1995 pp.1–2), with additional surveys in the early 2010's noting the continued presence of the species in the Slaughter Ranch Goat Tank springbox. However, decreased water levels resulted in reduced numbers, prompting an assessment of the springbox, which resulted in flow modification to increase water levels. In addition, the metal cover on the springbox was modified to allow for more sunlight to penetrate the springbox to increase periphyton production (Radke 2010 p.1; U.S. Fish and Wildlife Service 2011a pp.117–118). Subsequent visits indicated a rebound in the population to around 600 individuals (Myers 2015 p.40) after these conservation efforts.

Several translocations have been attempted. In 2014, the SBNWR reintroduced 500 springsnails collected from Goat Tank into Snail Spring. Unfortunately, this effort was undermined by a pump failure in 2015, which led to the extirpation of the newly established population (USFWS 2016b p.97). Following the replacement of the pump in June 2015, habitat conditions have been regularly monitored for potential future translocations (USFWS 2016b p.97, USFWS 2023b pp.71–74, 159). Although translocations and reintroductions to Snail Spring were ultimately ineffective due to habitat loss, fluctuations in groundwater levels, and equipment failures, this history illustrates both the successes and challenges in the conservation efforts for the San Bernardino springsnail.

Regular monitoring of San Bernardino springsnail populations in the U.S. has been sporadic since the species was first described. AZGFD began conducting surveys at John Slaughter Historical Ranch and at the SBNWR with Refuge staff in 2007 and 2010, after which the agencies coordinated annual monitoring efforts starting in 2020. Further, AZGFD began eDNA sampling at several springs in the U.S. to detect the potential occurrence of springsnails. Due to funding insecurity, a majority of those eDNA samples have not been analyzed to inform potential occupation of additional sites. Since 2020, SBNWR staff have conducted regular, frequent monitoring (monthly) of Goat Tank using the AZGFD-established protocol to collect long-term data on this population of San Bernardino springsnail.

Documented visits to springs in the upper San Bernardino Basin of Sonora where the springsnail occurs took place in coordination with Cuenca los Ojos and species expert, Terry Myers, in 2010, 2017, and 2022. These visits included surveys for individuals and in some cases included physical collections for further genetic analysis, detailed habitat condition narratives, photographs, and precise plotting of geographical coordinates (Myers 2022 entire). These efforts have greatly improved our understanding of the current condition of the San Bernardino springsnail in México. More thorough and systematic surveys are needed throughout the ciénega

to determine connectivity between sites and identify suitable, unoccupied habitat for improving the viability of the species (Myers 2022 p.1).

Researchers from the University of Sonora in Hermosillo, Sonora, México have worked with the species in multiple capacities, from assessing its taxonomic status (Varela-Romero et al. 2013 entire) to partnering with Cuenca los Ojos to characterize springs (Harris 2025 pers. comm.). Efforts from individuals in México support a better understanding of the San Bernardino springsnail across its range.

Other ongoing conservation actions within the species' range include the Malpai Borderlands Habitat Conservation Plan. While this plan does not specifically cover the San Bernardino springsnail, it outlines habitat protection measures aimed at minimizing impacts and improving aquatic habitats within the range of the San Bernardino springsnail in the U.S. (Malpai Borderlands Habitat Conservation Plan Technical Working Group and Lehman 2008 pp.44–147).

The Phoenix Zoo is an established authority on springsnail husbandry and captive population management. In 2021, the Zoo established a San Bernardino springsnail captive population, serving as *ex situ* habitat (USFWS 2024a pp.3–5). While the captive population is currently undergoing husbandry and management, the Zoo is actively refining its techniques to enhance the conditions for these springsnails. Despite receiving similar care developed by the Zoo for successfully rearing Huachuca springsnails (*Pyrgulopsis thompsoni*), the San Bernardino springsnail captive population has not established as expected, suggesting specialized conditions not yet discovered. To support this initiative, the USFWS has collaborated with the AZGFD and the Zoo to organize new collections of San Bernardino springsnail individuals, with an emphasis on juveniles. Additionally, the Zoo is collaborating with the USFWS, AZGFD, and the U.S. Geological Survey to conduct a genetic analysis of the algal/periphyton community that comprises the food source for the San Bernardino springsnail. These collaborative efforts aim to improve the care and management of this important conservation project. Establishment of a successful population of San Bernardino springsnails at the Phoenix Zoo will enable future reintroductions in coordination with habitat restoration across the range of the species, as informed by future survey efforts.

2. PRELIMINARY RECOVERY PROGRAM

Recovery Priority Number

Number: 2

Rationale: The San Bernardino springsnail was assigned a recovery priority number of 8 in the 2024 5-Year Status Review (USFWS 2024b p.8), but was revised in 2025 to a priority number 2 after further analysis of threats within the SSA. Priority level 2 species face a high degree of threats but also exhibit a high recovery potential (48 FR 43098 as corrected in 48 FR 51985). The threats to the species are high given the considerable uncertainty in water availability to provide appropriate habitat for the San Bernardino springsnail. Multiple stressors influence water availability which include reduction in spring discharge, spring modification, and environmental change (e.g., precipitation patterns, increased temperatures, reduced water availability). The recovery potential of the San Bernardino springsnail is relatively high given the extent of federal land management partners in addition to conservation agreements that exist across the species' range.

Preliminary Recovery Strategy

The envisioned recovery of the San Bernardino springsnail includes self-sustaining populations in both the United States and México. This recovery will be marked by stable or increasing population trends, diverse genetic representation, and multiple viable habitats that support robust populations. Stable habitats correlate with stable populations of the San Bernardino springsnail, indicating that a habitat-focused recovery strategy is likely to succeed. Once this is achieved, the species may no longer meet the definitions of a threatened or endangered species under the Endangered Species Act (ESA), allowing for its removal from the Federal Lists of Endangered and Threatened Wildlife and Plants.

The overall recovery strategy for the San Bernardino springsnail is to improve population viability in the wild in terms of the 3 Rs, such that the following are met:

Resiliency: There are sufficient numbers of individuals within populations to support recovery from demographic stochasticity (e.g., random fluctuations in reproductive rates and survivorship) and environmental stochasticity (e.g., normal variation in rainfall and temperature and small-scale fire).

Redundancy: Populations occur in sufficient number and distribution to guard against catastrophic events (e.g., catastrophic fire, flooding, prolonged exceptional drought, and disease) which could lead to extirpation in portions of the species' current range or lead to extinction of the species as a whole. In addition, robust captive populations maintaining the genetic diversity of the species would increase the redundancy of the San Bernardino springsnail as assurance populations against potential future catastrophic events.

Representation: Populations occur across the species' historical range to maintain the existing genetic and ecological diversity of San Bernardino springsnail populations, conserving the species' ability to adapt to future changes in its physical (e.g., habitat and climate) and biological (e.g., herbivores, competitors, and diseases) environment.

Improved groundwater security and better management and monitoring may be needed to recover the species, which may not require the potential creation of additional populations if existing populations can be made more secure and resilient. This recovery strategy will involve collaboration with local, county, state, and federal agencies, tribes, private landowners, and communities. The goal is to address stressors that threaten viable populations and protect their habitats from further degradation. Additionally, the strategy aims to restore habitats and support the augmentation, reintroduction, and introduction of species to enhance resiliency. This can be achieved through the following and potentially additional recovery actions.

Preliminary Recovery Actions

Recovery actions are the statutorily required, site-specific management actions needed to achieve recovery criteria, as described in section 4(f)(1)(B)(i) of the ESA. The USFWS assigns recovery action priority numbers (1-3) to rank recovery actions within Recovery Plans. While prioritizing preliminary recovery actions is not required within Recovery Outlines, we have included preliminary recovery action and their preliminary priority numbers to enhance clarity and facilitate a more structured approach to implementation (Table 1).

The assignment of priorities does not imply that some preliminary recovery actions are of low importance, but instead implies that lower priority items may be deferred while higher priority items are being implemented. Recovery action priority numbers are assigned using the following guidelines (82 FR 24944):

> Priority 1: An action that must be taken to prevent extinction or to prevent the species from declining irreversibly in the foreseeable future.
>
> Priority 2: An action that must be taken to prevent a substantial decline in species population/habitat quality or some other substantial negative effect short of extinction.
>
> Priority 3: All other actions necessary to meet the recovery objectives. The assignment of these priorities does not imply that some recovery actions are of low importance, but instead implies that lower priority items may be deferred while higher priority items are being implemented.

Table 1. Preliminary Recovery Actions – prioritized for San Bernardino springsnail recovery.

Preliminary Recovery Actions	**Threat(s) Addressed**	**Preliminary Recovery Action Priority Number**
1. Conserve and Restore Occupied Habitat Throughout the Species' Range	Habitat Degradation; Resource and Livestock Management; Spring Modification; Spring Discharge Reduction	1
2. Restore and Protect Unoccupied Suitable Habitat Throughout the Species' Range, Including the Identification of Important Habitat Components that Support Reproduction	Habitat Degradation; Small, Isolated Population Effects	2
3. Maintain the *ex-situ* Captive Population at Partnering AZA Institutions and Implement a Captive Population Management Plan and Reintroduction Plan	Habitat Degradation; Small, Isolated Population Effects	2
4. Develop and Conduct Surveys and Genetic Assessments to Manage Existing and Identify New San Bernardino Springsnail Populations and Translocation Sites Throughout the Species' Range	Habitat Degradation; Resource and Livestock Management; Spring Modification; Spring Discharge Reduction	3
5. Reintroduce the San Bernardino Springsnail to Historically Occupied Springs Throughout the Species' Range, Based on Assessments of Suitable Habitat	Habitat Degradation; Small, Isolated Population Effects	2
6. Enhance Habitat Stability by Reducing Water Availability Stressors	Habitat Degradation; Resource and Livestock Management; Spring Modification; Spring Discharge Reduction; Wildfire; Earthquakes; Inadequate Regulatory Mechanisms	1
7. Develop a Strategy for Securing San Bernardino Springsnail Habitat Through a Changing Environment	Habitat Degradation; Spring Modification; Spring Discharge Reduction	2
8. Promote Education for Landowners and Management Agencies on Integrating Springsnail Conservation with Land-Use Practices Throughout the Species' Range	Habitat Degradation; Resource and Livestock Management; Spring Modification; Spring Discharge Reduction; Wildfire; Earthquakes	3
9. Conduct Research to Inform Our Understanding of San Bernardino Springsnail Biology, Ecology, and Impacts from Stressors.	Habitat Degradation; Spring Discharge Reduction; Resource and Livestock Management; Small, Isolated Population Effects; Spring Modification; Wildfire; Earthquakes	2

3. RECOVERY PRE-PLANNING CONSIDERATIONS

The Biological Scope of the Recovery Plan

Single species Recovery Plan.

Who Will Develop the Recovery Plan

USFWS and AZGFD biologists in cooperation with other interested U.S. and México partners.

Plan for Stakeholder Involvement in Recovery Planning

The USFWS in cooperation with interested partners and stakeholders will be involved in the recovery planning process for the San Bernardino springsnail Recovery Plan. These could include State and Federal agencies, research institutions, and species experts within the United States and México. In accordance with the requirement of the ESA, we will solicit independent peer reviews of the Draft Recovery Plan.

Recovery Planning Milestones

We anticipate completing a Draft Recovery Plan in 2026 and a Final Recovery Plan in 2027. These dates may change depending upon available resources, staffing, and regional priorities.

Signed: SETH WILLEY Digitally signed by SETH WILLEY Date: 2025.06.17 11:49:21 -06'00'

Assistant Regional Director, Ecological Services
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