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**Draft Recovery Plan for the Chupadera springsnail
(*Pyrgulopsis chupadera*)**



U.S. Fish and Wildlife Service
Southwest Region
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PURPOSE AND DISCLAIMER

This document presents the U.S. Fish and Wildlife Service's (FWS) plan for the conservation of the Chupadera springsnail. The recovery plan is the second part of the FWS 3-part recovery planning framework and includes the statutorily required elements pursuant to section 4(f) of the Endangered Species Act (ESA). This recovery plan is informed by the first part of the framework, a Species Status Assessment (SSA). The SSA report delivers foundational science to inform decisions related to the ESA. It includes an analysis of the best available scientific and commercial information regarding a species' life history, biology, and current and future conditions that characterize the species' viability (i.e., ability to sustain populations in the wild over time) and extinction risk. We have also prepared a Recovery Implementation Strategy (RIS), the third part of the framework. The RIS is an operational plan that can be easily updated and is both separate and complementary to the recovery plan, detailing the on-the-ground recovery activities needed to complete the recovery actions outlined in the recovery plan.

Recovery plans describe the envisioned recovered state for a listed species (when it should no longer meet the ESA definitions of a threatened species or endangered species) and include a recovery strategy, recovery criteria, recovery actions, and the estimates of time and cost needed to achieve it. The FWS publishes plans and often prepares them in collaboration with recovery teams, contractors, state agencies, and other stakeholders. Recovery plans do not necessarily represent the views, official positions, or approval of any individuals or agencies involved in plan formulation, other than the FWS. They represent the official position of the FWS only after they have been signed by the Regional Director as approved. Recovery plans are guiding and planning documents only; identifying an action to be implemented by any public or private party does not create a legal obligation beyond existing legal requirements. Nothing in this plan should be construed as a commitment or requirement that any Federal agency obligate or pay funds in any one fiscal year in excess of appropriations made by Congress for that fiscal year in contravention of the Anti-Deficiency Act, 31 U.S.C. 1341, or any other law or regulation. Approved recovery plans are subject to modification as dictated by new findings, changes in species status, and completion of recovery actions.

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RECOMMENDED CITATION AND ELECTRONIC AVAILABILITY

U.S. Fish and Wildlife Service. 2025 Draft recovery plan for Chupadera springsnail (*Pyrgulopsis chupaderae*). U.S. Fish and Wildlife Service, Albuquerque, NM USA. 13pp.

An electronic copy of this Draft Recovery Plan will be made available at:

<https://ecos.fws.gov/ecp/species/6644>

INTRODUCTION

The Chupadera springsnail is a rare endemic mollusk that inhabits a single spring within the northern Chihuahuan Desert in central New Mexico. The species was previously known to occur in an additional, unnamed spring, but is now thought to be extirpated from that site. These two sites are colloquially known as Willow Spring and Unnamed Spring (Figure 1). The U.S. Fish and Wildlife Service (FWS) listed the Chupadera springsnail as endangered under the Endangered Species Act (ESA) on July 12, 2012, and designated critical habitat at its two native springs at the southern end of the Chupadera Mountains in Socorro County, New Mexico (77 FR 41088). Species listed as endangered are in danger of extinction throughout all or a significant portion of their range.

We conducted a Species Status Assessment (SSA) for the Chupadera springsnail and documented our analysis in an SSA report (USFWS 2024), which is an in-depth, scientific review of the species' biology and threats, an evaluation of its biological status, and an assessment of the resources and conditions needed to maintain populations over time. In our SSA, we identified two analysis units (including the extirpated unnamed spring), the species' requirements or needs, and the factors affecting the species' survival. We then evaluated the species' current and projected future condition to assess its current and future viability in terms of its resiliency, redundancy, and representation (the 3Rs). Resiliency is the ability of populations to sustain themselves in the face of stochastic demographic or environmental events. It is associated with population size, population growth rate, genetic diversity, and the quality and quantity of habitats. Redundancy refers to a species' ability to withstand catastrophic events, which is associated with the number and distribution of resilient populations. Representation is the ability of a species to adapt to changes in the environment and is associated with its diversity, whether ecological, genetic, behavioral, or morphological.

Before ESA listing, two populations of the Chupadera springsnail were located approximately one-half mile apart. According to our records, the population at the unnamed spring is now extirpated. Because of the species' extremely localized range, we assessed the stressors influencing the 3Rs in the population at Willow Spring. Population numbers in Willow Spring have fluctuated annually but appear to have declined slightly since the species' listing.

Unmanaged livestock grazing, groundwater pumping, spring modifications, and water pollution represent the most significant threats to the Chupadera springsnail. Increased frequency or intensity of drought associated with climate change could threaten the flow of groundwater at Willow Spring. Other influences that have been considered in previous listing documents include a small, reduced range, wildfire, and non-native vegetation.

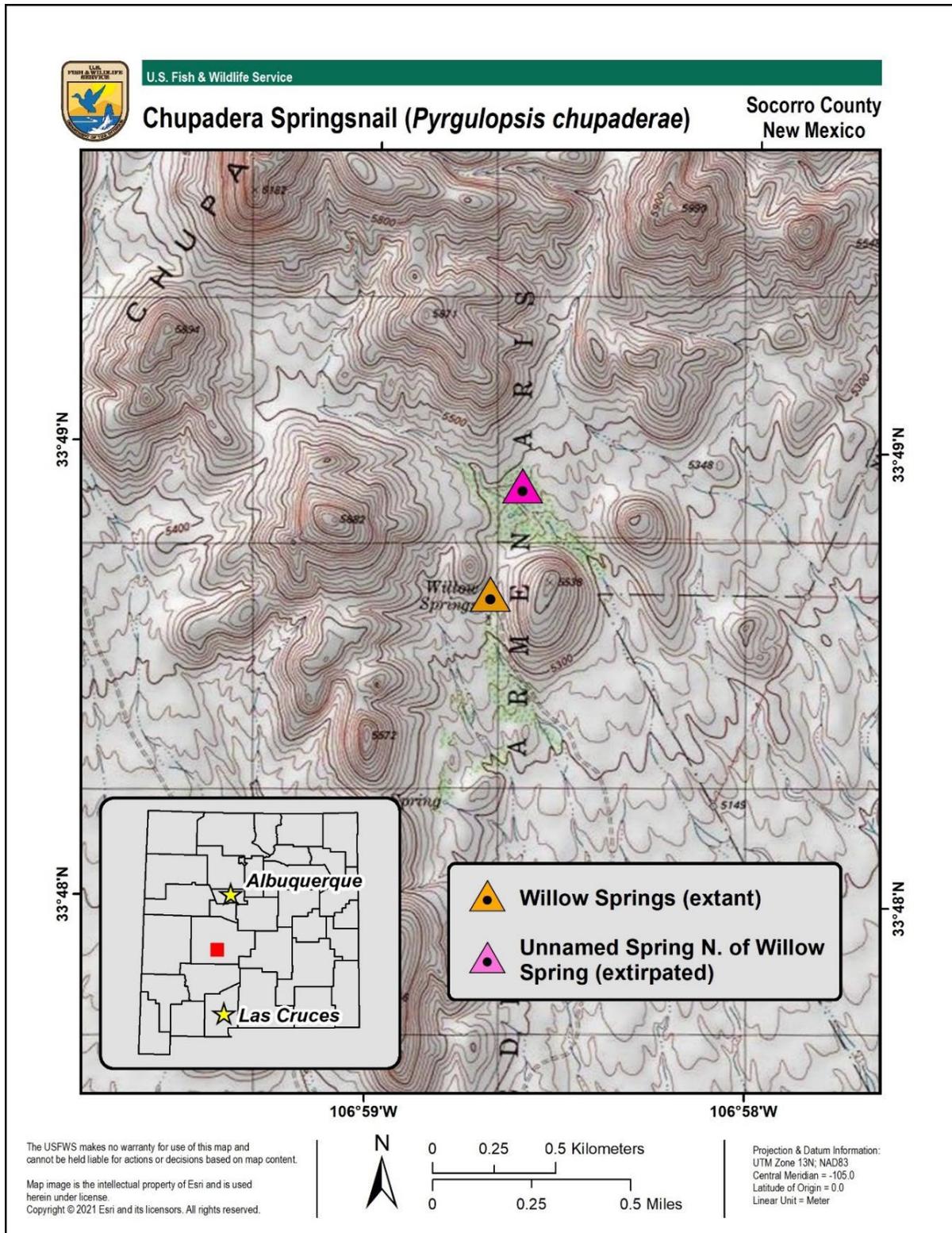


Figure 1. The range map of the Chupadera springsnail. While the species was once at two separate spring locations, it no longer exists at the unnamed spring.

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This recovery plan describes criteria for determining when Chupadera springsnail (*Pyrgulopsis chupadera*) should be considered for downlisting and delisting, lists site-specific actions necessary to meet those criteria, and estimates the time and cost to achieve recovery. Additionally, a summary of information on the species' biology and status is included, along with a brief discussion of factors limiting its population. The Species Status Assessment (USFWS 2024) contains detailed information on the aspects of the species' life history and biology pertinent to the Chupadera springsnail's recovery. The Chupadera springsnail Recovery Implementation Strategy (RIS) contains specific, on-the-ground activities needed to implement recovery actions. These supplemental documents are available at <https://ecos.fws.gov/ecp/species/6644>. The RIS and SSA are finalized separately from the Recovery Plan and can be updated routinely when necessary.

RECOVERY STRATEGY

The recovery strategy provides a concise overview of the envisioned recovered state for Chupadera springsnail, describes FWS's approach to achieve it, and includes the rationale for why the approach was chosen. Specifically, the recovery strategy articulates how the plan's statutory elements (e.g., recovery criteria, recovery actions, and estimates of time and cost) will work together to achieve the Chupadera springsnail's recovery.

The overall recovery strategy for the Chupadera springsnail involves preserving, restoring, and managing the aquatic habitat, along with the water resources necessary to support multiple resilient populations. Because of the Chupadera springsnail's restricted range, our initial recovery strategy will be to maintain, protect, expand, and monitor the known population within Willow Spring in Socorro, New Mexico. Ideally, these actions will continue while habitat restoration begins within other areas of the species' ecological niche. To effectively address the potential threats of habitat degradation, the strategy emphasizes the importance of collaboration and partnerships that can carry out recovery actions aimed at protecting the species for the foreseeable future. By working cooperatively with municipal, state, and federal agencies, land conservancies, landowners, universities, industry professionals, and other stakeholders, we aim to minimize or eliminate these threats and close knowledge gaps that are critical for informing recovery efforts. More specifically, the strategy involves:

1. Ensuring all extant populations have adequate water quantity and water quality;
2. Permanently protecting and managing habitat throughout the range to ensure that species needs are met;
3. Addressing threats to a level that the species is capable of enduring stressors;
4. Improving our understanding of the species' biology and determining the effectiveness of conservation management actions;
5. Collaborating with partners and stakeholders to achieve conservation goals by developing and implementing management strategies and plans to benefit the species in balance with future community water needs; and

6. Engaging in community outreach to promote the importance and value of desert spring systems and their diverse array of wildlife, including sensitive, rare aquatic invertebrates.

RECOVERY CRITERIA

Recovery criteria are statutorily required, objective, measurable descriptions of a recovered state for Chupadera springsnail, as described in [4\(f\)\(1\)\(b\)\(ii\)](#) of the ESA. Recovery criteria describe the conditions of resiliency, redundancy, representation, and threat abatement that indicate when Chupadera springsnail may no longer meet the ESA definitions of an endangered species or threatened species. Recovery criteria present our best understanding of a species' recovered condition at the time of recovery plan development. Changes in available information, technologies, and our understanding of the species over time might mean that the recovered state envisioned by the recovery criteria differs from our assessment in a later status determination.

Downlisting Criteria

The following downlisting criteria, when met collectively, would indicate that Chupadera springsnail may be reclassified as a threatened species.

Downlisting Criterion 1: Maintain Willow Spring at a stable or increasing population trend for at least 20 years with habitat protections in place.

Rationale for Criterion 1: Currently, there is only one population of the Chupadera springsnail, which exists in a small habitat area at Willow Spring. Due to its limited distribution and specialized aquatic habitat needs, this population is highly vulnerable to habitat disturbances and environmental changes. As a narrow endemic, the species faces an increased risk of population decline or extinction, as well as decreases in aquatic habitat suitability, due to its limited redundancy and resiliency resulting from having a single extant population. Therefore, protecting the one remaining population is imperative to species viability. We believe 20 years is a sufficient timeframe to allow for multiple snail generations, and to encompass environmental perturbations that can also affect this population.

Downlisting Criterion 2: At least one additional population is established and is self-sustaining for at least 5 years.

Rationale for Criterion 2: To ensure viability for the Chupadera springsnail, an additional self-sustaining population in the wild must be established outside of Willow Spring to increase redundancy, which currently does not exist for the Chupadera springsnail. Ideally, this could be within the species' critical habitat at the unnamed spring. However, for this criterion, additional populations outside of the unnamed spring will also be considered valid conservation options. These could be other areas within the northern Chihuahuan Desert. Captive populations might support these efforts by creating a refugium for introductions and supporting genetic diversity. Having multiple populations helps the species persist during potential catastrophic events that could affect one population but not both. We chose 5 years for this criterion because it is long enough to ascertain if a new population is self-sustaining.

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Downlisting Criterion 3: Maintain surface water availability of appropriate quality and quantity to support all populations of Chupadera springsnail long-term.

Rationale for Criterion 3: Water quantity and quality are needed for all *Pyrgulopsis* springsnails to thrive. The Chupadera springsnail is confined to a limited geographical area and, without the ability to disperse, is highly vulnerable to environmental disturbances, including water depletion or contamination. Some threats, such as potential groundwater pumping, surface water conversions, or the introduction of contaminants, can impact habitat resiliency. These factors can be conflated, particularly during periods of natural variability in dry-wet cycles and in the context of climate change-induced drought. To ensure the viability of the Chupadera springsnail, spring flows must not fall below levels that sustain the snail population during droughts, as this would reduce the overall population size and compromise ecological and genetic representation. Research is needed to determine the critical levels of water necessary to ensure the survival of Chupadera springsnail populations. The achievement of this criterion will be measured by monitoring results and trends for both water quantity and water quality.

Delisting Criteria

The following delisting criteria, when met collectively, may indicate that Chupadera springsnail no longer meets the ESA definitions of either a threatened species or endangered species, and may be able to be removed from the Federal Lists of Endangered and Threatened Wildlife and Plants:

Delisting Criterion 1: Multiple populations are established and maintained in the Chihuahuan Desert in high resiliency over a 35-year timespan.

Rationale for Criterion 1: Establishing multiple self-sustaining populations is expected to increase the representation (genetic and ecological diversity) as well as the redundancy of the species. Having more than one population will increase the species' ability to withstand adverse conditions or sudden catastrophic events that might impact one, but not all, populations, thus increasing overall viability for the Chupadera springsnail. Given that droughts significantly influence ecosystem dynamics in the Chihuahuan Desert, the population must demonstrate viability under such conditions to be considered recovered. These populations could exist within or outside of critical habitat boundaries due to shifting conditions of the current habitat caused by human activity, drought, and/or climate change. A 35-year timeframe can encompass multiple generations of springsnails past downlisting, and natural cycles of wet and dry periods characteristic of the Chihuahuan Desert, allowing for the assessment of long-term population stability and growth within a range of environmental conditions, and ensuring that observed trends are not short-term anomalies but reflective of genuine resiliency over time.

Delisting Criterion 2: Ensure habitat resiliency metrics are maintained in high resiliency at all sites where snails are present over a 35-year timeframe.

Rationale for Criterion 2: Chupadera springsnails need flowing water, adequate water quality, rigid substrates, and aquatic vegetation to survive and complete their life cycles. Therefore, each of these needs must be available to them in the habitat. We chose a 35-year time horizon for this criterion because we acknowledge the need for sustained conservation efforts to ensure viability

for delisting. For a population to be self-sustaining, we believe these needs must all be sustained over time at high resiliency levels. We believe 35 years is an adequate timeframe to determine if the habitat can resist perturbations that might be caused by periods of high or low precipitation.

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 FWS assigns recovery action priority numbers (1-3) to rank recovery actions. The assignment of priorities does not imply that some recovery actions are of low importance; instead, it implies that lower-priority items may be deferred while higher-priority items are being implemented. Recovery action priority numbers are based on the following:

Priority 1: An action that must be taken to prevent extinction or to prevent the species from declining irreversibly.

Priority 2: An action that must be taken to prevent a significant decline in species population/habitat quality, or some other significant negative impact short of extinction.

Priority 3: All other actions necessary to provide for full recovery of the species.

Recovery Action 1. *Ensure adequate water quantity and quality within occupied habitat and contributing aquifer(s).* *Priority 1:* Key goals of this action include determining species-specific water quality needs, preventing declines in spring flows and water quality degradation, mitigating contamination sources, and implementing conservation water management agreements. Additionally, understanding groundwater flow and its impact on springflows, alongside regular water quality monitoring, is crucial for detecting and addressing potential contamination. Assessing the range of water quality parameters under which the Chupadera springsnail can thrive will also help inform management decisions.

Recovery Action 2. *Protect and restore habitat in waters and on lands within and connected to occupied habitat.* *Priority 2:* This action focuses on preserving and enhancing the habitat within the occupied spring sites. Key objectives include protecting springs, spring runs, and upland habitats, maintaining grassland and emergent vegetation, and mitigating the impacts of any non-native species within occupied habitat.

Recovery Action 3. *Conduct species research and monitoring within occupied habitat and the surrounding landscape to inform adaptive management.* *Priority 3:* This action aims to gain a comprehensive understanding of the Chupadera springsnail's needs and habitat requirements, as well as the potential impacts of various stressors. The goal is to enhance species resiliency, redundancy, and representation through targeted research and long-term monitoring. This effort will inform management decisions, assess recovery progress, and establish priorities for future recovery actions, ensuring collaboration with partners for effective implementation.

Recovery Action 4. *Establish and maintain captive propagation and contingency plans for the Chupadera springsnail.* *Priority 1:* This action aims to safeguard the Chupadera springsnail from extinction due to catastrophic events by developing emergency propagation and contingency plans that will maintain population and genetic diversity. Key objectives include understanding the captivity needs of species, securing propagation facilities and financial resources, and

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preparing for potential habitat loss. The plan involves strategies to assess sites for potential species translocation, augmentation, or reintroduction to ensure genetic diversity and population stability, enhancing the species' resiliency and representation.

Recovery Action 5. *Introductions, or reintroductions, and population augmentation. Priority 2.* This action includes studying and implementing methods for the successful establishment of new populations in currently unoccupied areas, or augmentations of existing populations, using captively reared individuals. This action aims to increase redundancy and address representation within the population.

Table 1. Recovery action summary table

Recovery Action Priority Number	Recovery Action ID Number	Recovery Action	Threat Being Addressed	Additional Information (As Needed)	Potential Partners
1	1	<i>Ensure adequate water quantity and quality</i>	Spring modifications, potential water pollution	Water is necessary for the viability of the Chupadera springsnail, as it is a fully aquatic species that uses gills to breathe. Water must be of suitable quality and quantity to ensure the existence of the species. Water contamination can occur through various hydrological pathways. Previously, waste from livestock has also caused water contamination in Chupadera springsnail habitat.	Local municipalities, local land stewards
2	2	<i>Protect and restore habitat in waters and on lands within and connected to occupied habitat</i>	Habitat alteration, livestock grazing, and water depletion	The Chupadera springsnail needs springs, spring runs, and upland habitats, grassland and emergent vegetation, and minimal impacts from non-native species.	NMDGF, local land stewards

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3	3	<i>Conduct species research and monitoring within occupied habitat and the surrounding landscape</i>	Future changes in resiliency	There are data gaps concerning the species' biology and ecological needs. Research will help inform thresholds for water quality, quantity, and other aspects of the species' ecology not currently well understood. Then, management can focus on maintaining conditions conducive to species persistence.	NMDGF, Academia, USGS
1	4	<i>Establish and maintain captive propagation and contingency plan</i>	Limited distribution	The species currently displays no redundancy, such that its ability to overcome a catastrophic event is limited. Establishing a captive population containing adequate genetic variation will help inform current data gaps, leading to enhanced management while also improving the redundancy of the species.	TESF, Academia, Zoos, Biopark
2	5	<i>Introductions, reintroductions, and population augmentation</i>	Limited distribution, and lack of redundancy and representation	The species needs more redundancy in the form of multiple populations. This might be at the previously occupied unnamed spring, or at another site deemed adequate for recovery purposes.	NMDGF, BioPark, Zoos, TEF

ESTIMATED TIME AND COSTS TO ACHIEVE RECOVERY

Estimates of time and cost, as defined in section [4\(f\)\(1\)\(B\)\(iii\)](#) of the ESA, must reflect, to the maximum extent practicable, the total amount of time and costs it will take to achieve the recovery (delisting) of Chupadera springsnail. The cost estimates provided do not account for possible future inflation.

Table 2. Estimated costs of Recovery Actions necessary to recover the Chupadera springsnail. Costs are based on a time estimate of 35 years to achieve recovery.

Recovery Actions	Time to Complete Action	Implementation Time Needed	Total Time	Estimated Cost (in thousands)
1. Ensure adequate water quantity and quality within occupied habitat and supporting aquifer(s)	10 years	25 years	35 years	\$390
2. Protect and restore habitat in waters and on lands within and connected to occupied habitat	10 years	20 years	30 years	\$280
3. Conduct research and monitoring of habitat and water quality in occupied habitat and the surrounding landscape	12 years		Does not affect recovery timeline; continue until 5 years post-delisting	\$370
4. Establish and maintain captive propagation and contingency plans for the Chupadera springsnail	10-15 years		Does not affect recovery timeline; continue until 5 years post-delisting	\$2,000
5. Introductions, or Reintroductions, and		45 years		\$100

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Population Augmentation.				
Total estimated cost of recovery actions:				\$3,140

We estimate that the full implementation of the recovery actions would improve the status of Chupadera springsnail so that it could be delisted within 35 years following the adoption of this recovery plan and cost \$3,140,000. Note that the recovery program may change over time, or the timeframe estimated to implement the recovery actions to achieve recovery of the species may take longer than expected. The recovery of Chupadera springsnail will depend largely on the commitment and ability of FWS and partners to implement the recovery actions necessary to achieve the recovery criteria.

LITERATURE CITED

U.S. Fish and Wildlife Service. 2024. Species Status Assessment for the Chupadera Springsnail (*Pyrgulopsis Chupaderae*). Version 1.0. Albuquerque, New Mexico: New Mexico Ecological Services Field Office.