

ARIZONA GAME AND FISH DEPARTMENT  
HERITAGE DATA MANAGEMENT SYSTEM

Invertebrate Abstract

Element Code: IMGASC9240  
Data Sensitivity: Yes

**CLASSIFICATION, NOMENCLATURE, DESCRIPTION, RANGE**

**NAME:** *Sonorella eremita*  
**COMMON NAME:** San Xavier Talussnail  
**SYNONYMS:** Arizona Twin Peaks Snail  
**FAMILY:** Helminthoglyptidae

**AUTHOR, PLACE OF PUBLICATION:** Pilsbry, H.A. Land Mollusca of North America (North of Mexico). Philadelphia 1939.

**TYPE LOCALITY:** West end of White Hill (formerly called San Xavier Hill), the most southwestern hill of the Mineral Hills group, Pima County, Arizona.

**TYPE SPECIMEN:** 112161 A.N.S.P. Pilsbry and Daniels 1910.

**TAXONOMIC UNIQUENESS:** Genus *Sonorella* is divided into four complexes by Miller (1967). Within these complexes there are about 60 species and subspecies of *Sonorella* within Arizona. *Sonorella eremita* is 1 of 26 species in the *S. hachitana* complex. Species in this complex distinguished by a penis with a usually long, slender, narrowly pointed verge; in extreme forms, verge thick and club-shaped. The shell is relatively large and capacious, with smooth, silky-lustrous periostracum, usually with apical spirally descending threads. (Bequaert and Miller 1973).

**DESCRIPTION:** Shell is globose-depressed, umbilicate, the width of umbilicus contained 5.5 to 6.5 times in the diameter; more solid than other species of the same region, glossy, opaque pinkish buff, fading to nearly white around the umbilicus, and having a chestnut-brown shoulder band without noticeable light borders. The spire is very low, conoidal. Four and a half whorls, moderately convex, the last slowly descending in front. The oblique aperture is rounded, but slightly wider than high. Peristome slightly expanded above, the outer and basal margins expanding more, slightly thickened, the margins converging connected by a very thin parietal film. The top of the head is gray, integument elsewhere cream-tinted. The median area of the sole is whitish, twice as wide as either side area, the latter flesh-tinted.

Type: Height 11.4 mm; diameter 19.4 mm; umbilicus 3 mm.  
Paratype: Height 10.5 mm; diameter 18.6 mm.

**AIDS TO IDENTIFICATION:** Unique reproduction organs and highly restricted range/location.

**ILLUSTRATIONS:** (Pilsbry and Ferriss 1915)  
(Pilsbry 1939)

**PHOTOGRAPHS:** (Waters 2017)  
(Sorensen 2018)

**TOTAL RANGE:** White Hill (formerly called “San Xavier Hill”), Pima County, Arizona.

**RANGE WITHIN ARIZONA:** See “**Total Range.**”

### **SPECIES BIOLOGY AND POPULATION TRENDS**

**BIOLOGY:** Desert adapted, spending a large portion of their lives in estivation; attached to rocks by mucus apertural seals. May remain in estivation for up to 3 years and in most years is only active for several days when moisture conditions are suitable (Hoffman 1990). Lifespan probably 7-10 years. Talussnails require calcium carbonate found in the limestone rock to neutralize the carbonic acid produced in respiration while they estivate (Hoffman 1990).

**REPRODUCTION:** *S. eremita* is hermaphroditic. After a rain, snails lay eggs, feed, and when they meet, mate. Fertilization and production of eggs takes several days. If rains are short-lived, eggs must be held until next rain. Development in shell takes approximately a month but eggs do not hatch until a soaking rain has occurred after their development is completed. In wild, it probably takes three or four years to mature, depending on how often it rains. *S. eremita* has a reproductive life of approximately four to six years depending on the number of days it can remain active (Hoffman 1990).

**FOOD HABITS:** Fungus and decaying plant material with some young green shoots when available.

**HABITAT:** Rocky hillside on northwest aspect of White Hill.

**ELEVATION:** 3,850 - 3,920 ft. (1,174 - 1,196 m).

**PLANT COMMUNITY:** Plants found in association with *S. eremita* include *Prosopis juliflora*, *Acacia greggii*, *Cercidium microphyllum*, *Lycium pallidum*, *Larrea tridentata*, and *Opuntia engelmanni* (Hoffman 1990).

**POPULATION TRENDS:** Unknown, but at least 47 live individuals were observed active following a monsoon rainstorm in August 2001 (B. Terkanian pers. obs.; Sorensen 2018). Over a 20-year timeframe (1998-2017), a total of 90 live San Xavier talussnails have been observed among 35 surveys at White Hill—all of these observations of live snails were during warm, wet weather or following soaking rain. Catch-Per-Unit-Effort (CPUE) estimates of live

snails (counts divided by total search time, for survey dates of live snails only) for that 20-year timeframe had ranged between 0.01 to 3.92 snails per 10 minute search. The average CPUE was 0.76 snails per 10 minutes (Sorensen 2018).

## **SPECIES PROTECTION AND CONSERVATION**

<b>ENDANGERED SPECIES ACT STATUS:</b>	CCA (USDI FWS 1998, renewed 2008) [SC USDI, FWS 1999] [PE USDI, FWS 1997] [PE USDI, FWS 1996] [PE USDI, FWS 1994] [C1 USDI, FWS 1991]
<b>STATE STATUS:</b>	1 (AZGFD, AWCS 2022) [1A (AGFD SWAP 2012, 2005)]
<b>OTHER STATUS:</b>	Pima County HCP-Covered Species (2016)

### **MANAGEMENT FACTORS:**

**Threats:** The species has a highly restricted distribution with associated potential for extinction due to chance events. Primary threats include: urban development, vandalism, and road construction or maintenance. Additional threats include: loss or degradation of habitat due to expansion of mining and prospecting activities, sedimentation and filling in of talus interstitial spaces from trespass recreational users, and residues from herbicide use upslope of or within the snail's habitat. Another potential threat is predation by rodents, but Hoffman (1990) considered rodent predation on the snail to be random, sporadic, and not a significant threat to the San Xavier talussnail population.

**Management needs:** protection of habitat from direct and indirect effects of development, vandalism, soil erosion and sedimentation from the hilltop access road, mining and prospecting encroachment, trespass, and residues from herbicide use around the hilltop communication towers. Most of these threats are addressed and managed for in the 1998 conservation agreement, and the 2008 renewal of that agreement (EPNG 1998; 2008). Periodic monitoring of snail population and its habitat should be conducted, ideally coinciding with warm, wet weather in the area. Surveys are coordinated with conservation agreement signatories.

**PROTECTIVE MEASURES TAKEN:** In 1998, the Arizona Game and Fish Department partnered with the U.S. Fish and Wildlife Service, El Paso Natural Gas Company, and Arizona Electric Power Cooperative to develop a Candidate Conservation Agreement (CCA) to ensure the long term viability of the San Xavier talussnail and its habitat. The San Xavier Talussnail CCA was finalized in September 1998, and renewed by the partners in 2008 (note: Kinder Morgan is now the parent company of El Paso Natural Gas Company, and the Arizona Electric Power Cooperative is now part of the Arizona G&T Cooperatives). The partners signed a new Strategic Conservation Plan based on the CCA template in 2019, continuing the monitoring and management commitments for the next 25 years (SXTWG 2019). In 1997, the State of Arizona placed the San Xavier talussnail on the list of closed season species under Commission Order 42 (Crustaceans and Mollusks), where it continues to retain that

prohibition from take (except under an approved State Scientific Collecting License). Pima County has included the San Xavier talussnail as a covered species in its USFWS-approved Habitat Conservation Plan (HCP) associated with the Pima County Multi-Species Conservation Plan (USFWS 2016).

**SUGGESTED PROJECTS:** Live trapping to determine rodent densities at the site was conducted briefly in 2003, but no mice were captured in this effort. More information is needed on the population size, life history, reproduction, activity patterns, and survivorship of the San Xavier talussnail. Many of the other hills in the Mineral Hills group were searched by Pilsbry and Daniels in 1910 and Hoffman in 1988-1989, without finding additional talussnail populations. Waters (2017) suggests that further searching in the Mineral Hills group and Twin Buttes may be worthwhile, prioritizing search effort using terrain ruggedness analysis that he described in his technical report on San Xavier talussnail habitat assessment.

**LAND MANAGEMENT/OWNERSHIP:** Private. The hill has a microwave communications tower at its peak that is used by the power utilities (landowner and affiliates). Access is restricted by the landowner, and the unpaved road to the tower is gated and locked to prevent unauthorized vehicle traffic.

### **SOURCES OF FURTHER INFORMATION**

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#### ADDITIONAL INFORMATION:

In June 2007, Forest Guardians (now WildEarth Guardians) petitioned the USFWS to list the San Xavier talussnail as threatened or endangered with critical habitat under the ESA. The USFWS issued a positive 90-day finding that the petition presented substantial scientific information indicating that listing the San Xavier talussnail may be warranted (USFWS 2009). The San Xavier talussnail is identified as a species for further evaluation by the USFWS as part of a joint effort to address data and conservation needs of potentially at-risk native species through coordination with the Western Association of Fish and Wildlife Agencies. Under the USFWS draft 7-year listing plan (USFWS 2017), the San Xavier talussnail is scheduled to be evaluated for potential ESA listing or not in federal fiscal year 2020.

<b>Revised:</b>	1992-03-13 (DBI)
	1992-07-23 (DBI)
	1997-02-28 (SMS)
	1997-11-13 (SMS)
	1999-12-20 (DJG)
	2003-07-31 (JAS)
	2003-07-31 (AMS)
	2019-05-03 (JAS)
	2023-02-08 (MBL)

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