

**ARIZONA GAME AND FISH DEPARTMENT  
HERITAGE DATA MANAGEMENT SYSTEM**

**Invertebrate Abstract**

**Element Code:** IMGASJ0190

**Data Sensitivity:** No

**CLASSIFICATION, NOMENCLATURE, DESCRIPTION, RANGE**

**NAME:** *Pyrgulopsis montezumensis*  
**COMMON NAME:** Montezuma Well Springsnail  
**SYNONYMS:**  
**FAMILY:** Hydrobiidae

**AUTHOR, PLACE OF PUBLICATION:** R. Hershler, and J.J. Landye. 1988. Arizona Hydrobiidae (Prosobranchia: Rissoacea). Smithsonian Contributions to Zoology. Number 459. Smithsonian Institution Press. Washington, D.C.

**TYPE LOCALITY:** Montezuma Well, Yavapai County, Arizona.

**TYPE SPECIMEN:** Holotype: USNM 859043. Landye and Edwards, 10 May 1970.

**TAXONOMIC UNIQUENESS:** This genus comprises 35 described species and an additional 20-25 undescribed species in the Southwest.

**DESCRIPTION:** Moderate size species, shell height (height from top of shell to bottom of shell) 1.7 to 2.7 mm. Shell ovate to ovate-conic with slightly loosened whorls. The shell has 3.4-4.5 highly convex whorls, with indented sutures. Sexual dimorphism is significant, in one of two populations studies. The operculum is ovate. The penial filament is short and the lobe is enlarged. The dorsal penial surface has two elongated glandular ridges (one on base of filament), one or two additional ridges present on tip of lobe and on ventral surface. Distinctive dark pigmentation on snout. All hydrobioids have a foot with a rounded posterior end.

**AIDS TO IDENTIFICATION:** Due to the small size of this animal, it cannot be identified to species in the field but must be identified in a laboratory by a qualified authority. Therefore, to trap specimens, sand believed to contain the snail must be put through an ordinary kitchen strainer. A rule of thumb is that a spring snail species is specific to a particular spring and location and therefore, may be used as a means of identification. The characteristic slight loosening of shell coiling in this species is unique among Arizona *Pyrgulopsis*.

**ILLUSTRATIONS:**

Line drawings (Hershler and Landye, 1988)

SEM micrographs of protoconch (Hershler and Landye, 1988)

SEM micrographs of operculum (Hershler and Landye, 1988)  
Photographs of shells (Hershler and Landye, 1988)  
SEM micrographs of radula (Hershler and Landye, 1988)  
Line drawings (Hershler and Ponder, 1998)

**TOTAL RANGE:** Montezuma Well, Yavapai County, Arizona.

**RANGE WITHIN ARIZONA:** See "Total Range."

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

**BIOLOGY:** The hydrobioid digestive system is typical of style-bearing neotaenioglossans.

The mouth opens to a short oral area containing a pair of dorsolateral chitinous jaws composed of small, simple rodlets, immediately behind which is a well-developed buccal mass (situated within the snout). A pair of simple, unbranched, tubular salivary glands opens anterodorsally to the buccal cavity and (almost always) pass posteriorly over the nerve ring, rarely stopping short of the ring, but never passing through it in hydrobioids. Hydrobioids have a taenioglossate radula (i.e., seven teeth per row) comprising numerous rows of cusped teeth, each of which includes a typically squarish or trapezoidal central tooth flanked on each side by lateral, inner marginal, and outer marginal teeth. Teeth near the anterior end of the radula are often worn or broken, whereas the proximal portion of the ribbon has several to many rows of poorly differentiated or incompletely formed teeth. (Hershler and Ponder, 1998).

**REPRODUCTION:** Most hydrobioids are oviparous, with females depositing small egg capsules, either singly or (rarely) in strings, on the substrate. A small number of hydrobioids are ovoviviparous, in which female's brood shelled young in the pallial gonoduct. Hydrobioid egg capsules are typically hemispherical to spherical. Copulation in hydrobioids is usually via an anterior opening to the glandular oviduct. The ventral channel may be traversed at least in part by the penis, but it is more likely that the penis only enters the anterior most section. (Hershler and Ponder, 1998).

**FOOD HABITS:**

**HABITAT:** Freshwater, bethnic, spring.

**ELEVATION:** 3,600 ft. (1,098 m).

**PLANT COMMUNITY:** Unknown.

**POPULATION TRENDS:** Unknown.

**SPECIES PROTECTION AND CONSERVATION**

**ENDANGERED SPECIES ACT STATUS:** SC (USDI, FWS 1996)  
[C2 USDI, FWS 1991, 1994]

**STATE STATUS:** 1A (AGFD SWAP 2012)

**OTHER STATUS:** Not Forest Service Sensitive (USDA, FS  
Region 3 2007)  
[Forest Service Sensitive (USDA, FS  
Region 3 1999)]  
Bureau of Land Management Sensitive  
(USDI, BLM AZ 2000, 2005, 2008,  
2010)

**MANAGEMENT FACTORS:** Threats: restricted geographic distribution with associated potential for extinction due to chance events.

**PROTECTIVE MEASURES TAKEN:**

**SUGGESTED PROJECTS:** Further study is essential. "To date, (1988), not a single hydrobioid species has been described from the state" (Landye 1988).

**LAND MANAGEMENT/OWNERSHIP:** NPS - Montezuma Castle National Monument.

**SOURCES OF FURTHER INFORMATION****REFERENCES:**

- Arizona Game and Fish Department. 2012. Arizona's State Wildlife Action Plan 2012-2022. Phoenix, AZ.
- Hershler, R. and J.J. Landye. 1988. Arizona Hydrobiidae (Prosobranchia: Rissoacea). Smithsonian contributions to zoology. Number 459. Smithsonian Institution Press, Washington, D.C. Pp. 23, 28 and 30.
- Hershler, R. and W.F. Ponder. 1998. A Review of Morphological Characters of Hydrobioid Snails. Smithsonian Institution Press, Washington D.C.
- NatureServe Explorer: An online encyclopedia of life [web application]. 2003. Version 1.6. Arlington, Virginia, USA: NatureServe. Available: <http://www.natureserve.org/explorer>. (Accessed: November 18, 2003).
- USDA, Forest Service Region 3. 1999. Regional Forester's Sensitive Species List.
- USDA, Forest Service Region 3. 2007. Regional Forester's List of Sensitive Animals.
- USDI, Bureau of Land Management. 2000. Arizona BLM Sensitive Species List. Instruction Memorandum No. AZ-2000-018.
- USDI, Bureau of Land Management. 2005. Arizona BLM Sensitive Species List.
- USDI, Bureau of Land Management Region 2. 2008. Arizona BLM Sensitive Species List.
- USDI, Bureau of Land Management Region 2. 2010. Arizona BLM Sensitive Species List.

- USDI, Fish and Wildlife Service. 1991. Endangered and Threatened Wildlife and Plants; Animal Candidate Review for Listing as Endangered or Threatened Species, Proposed Rule. Federal Register 56(225): 58821.
- USDI, Fish and Wildlife Service. 1994. Endangered and Threatened Wildlife and Plants; Animal Candidate Review for Listing as Endangered or Threatened Species, Proposed Rule. Federal Register 59(219): 59006.
- USDI, Fish and Wildlife Service. 1996. Endangered and Threatened Wildlife and Plants; Review of Plant and Animal Taxa that are Candidates for Listing as Endangered or Threatened Species. Federal Register 61(40): 7596-7613.

**MAJOR KNOWLEDGEABLE INDIVIDUALS:**

- Bob Hershler - Department of Invertebrate Zoology, National Museum of Natural History, Smithsonian Institution, Washington, D.C., Arizona Game and Fish Department, Cornville, Arizona
- Jerry Landye - USDI, Fish and Wildlife Service, Pinetop, Arizona.

**ADDITIONAL INFORMATION:**

**Revised:** 1992-03-24 (DBI)  
1993-06-14 (DBI)  
1997-03-03 (SMS)  
2003-12-02 (AMS)

To the user of this abstract: you may use the entire abstract or any part of it. We do request, however, that if you make use of this abstract in plans, reports, publications, etc. that you credit the Arizona Game and Fish Department. Please use the following citation:

Arizona Game and Fish Department. 20XX (= **year of last revision as indicated at end of abstract**). X...X (= **taxon of animal or plant**). Unpublished abstract compiled and edited by the Heritage Data Management System, Arizona Game and Fish Department, Phoenix, AZ. X pp.