

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

Invertebrate Abstract

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CLASSIFICATION, NOMENCLATURE, DESCRIPTION, RANGE

NAME: *Pyrgulopsis arizonae*
COMMON NAME: Bylas Springsnail
SYNONYMS: *Pyrgulopsis sancarlosensis*, *Apachecoccus arizonae*
FAMILY: Hydrobiidae

AUTHOR, PLACE OF PUBLICATION: D.W. Taylor. 1987. Fresh-water molluscs from New Mexico and vicinity. Bulletin 116: 32-34.

TYPE LOCALITY: Unnamed spring on north side of Gila River, north of Bylas, Graham County, Arizona.

TYPE SPECIMEN: Holotype: LACM 2203. D.W. Taylor, 20 April 1971.

TAXONOMIC UNIQUENESS: The *Pyrgulopsis* genus comprises of 137 species (Hershler et al. 2014), 12 of which can be found in Arizona.

DESCRIPTION: Shell elongately ovate with blunt apex, spire with convex outline. The shell height (from top of shell to bottom of shell) is 1.1 to 2.4 mm; whorls 3.25 to 4.25 in number, moderately rounded. The operculum is plane, ovate, pale amber, with an amber internal callus. Attachment scar bordered by a narrow but discrete thickening that leaves no conspicuous trace. Male and female are approximately the same size. Snout darkly pigmented, tentacles and sides of head/foot with lighter pigment, central section of latter sometimes unpigmented. The penis has a large accessory lobe bearing an oval glandular patch on dorsal and ventral surfaces, and a free portion at right angle to long axis on penis. 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. The rule of thumb that springsnail species are specific to a particular location (i.e. a single spring or group of springs connected or close to each other), may be used as a means of preliminary identification. With this springsnail being found at Porter Wash and Cold Springs along with the Gila Tryonia, it can be difficult to distinguish if one or both species is present in the field.

ILLUSTRATIONS: Line drawings (Taylor, 1987)
Micrographs of operculum (Hershler and Landye, 1988)
Line drawings (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)

Photograph (Sorensen, 2013)

TOTAL RANGE: Three springs on the north bank of the Gila River between Bylas and Pima, Graham County, southeastern Arizona: Tom Niece Spring Complex, Cold Springs, and Bylas Spring. Populations at Porter Wash and Cold Spring need to be verified genetically, but they are obviously hydrobioid snails. Porter Wash has six spring runs and pools that are occupied, while Cold Spring has three spring runs that are occupied by springsnails.

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: While the specific food habits of *Pyrgulopsis arizonae* have yet to be identified, “hydrobioid snails primarily feed on periphyton, which is a complex mixture of algae, bacteria, microbes, and detritus that live upon submerged surfaces in aquatic environments” (Mladenka, 1992).

HABITAT: Spring sources are all mildly thermal, ranging from 26 to 32°C. The most abundant submergent vegetation is *Chara*, with marginal sedges and *Distichlis*. *Pyrgulopsis arizonae* is most common on firm substratum in the springbrooks, on dead wood, gravel, and pebbles.

ELEVATION: 2,580 - 2,800 ft. (787 - 854 m).

PLANT COMMUNITY: *Chara*, Watercress (*Rorippa nasturtium-aquaticum*), Yerba Mansa (*Anemopsis californica*), Rushes (*Juncus* spp.), and Mesquite (*Prosopis* spp.).

POPULATION TRENDS: Unknown, but recent timed presence/absence counts from July 2013 and August 2015 indicate that the populations at Porter Wash and Cold Spring appear fairly robust overall. All of the sites surveyed in both years had springsnails present, although counts at some of the spring runs at Porter Wash and Cold Spring were lower in 2015 than 2013 (Sorensen, 2013; Sorensen and Fadlovich, 2015).

SPECIES PROTECTION AND CONSERVATION

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

STATE STATUS: SGCN Tier 1A (AGFD 2012)

OTHER STATUS: Forest Service Sensitive (USDA, FS Region 3 1999, 2013)
Bureau of Land Management Sensitive (USDI, BLM AZ 2000, 2005, 2010)

MANAGEMENT FACTORS: Threats: restricted geographic distribution with associated potential for extinction due to chance events; water developments, including pond construction; habitat degradation due to livestock grazing. Management needs: fencing to protect springs from effects of livestock and periodic monitoring of populations and habitats.

PROTECTIVE MEASURES TAKEN: Bureau of Land Management has installed fencing to exclude livestock around Porter Wash and Cold Spring sites, to protect the spring runs, pools, wetland vegetation, and native wildlife that reside in those springs. BLM also maintains the spring habitat at those sites with periodic removal of invasive weeds and tamarisk. Since 2012, Arizona Game and Fish Department and U.S. Fish and Wildlife Service have held training workshops for agency partners and contractors about Arizona springsnails.

SUGGESTED PROJECTS: Further study of springsnail ecology, life history, and population dynamics. Maintenance and improvement of spring run habitat for springsnails is needed; some spring run habitat is overgrown with rushes and Yerba Mansa with little open water habitat other than in the spring-fed pools. Surveys to see if species is present in any other suitable habitats that may not have previously been studied.

LAND MANAGEMENT/OWNERSHIP: BIA - San Carlos Reservation; BLM - Safford Field Office; Private.

SOURCES OF FURTHER INFORMATION

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ADDITIONAL INFORMATION:

Independently described by Hershler and Landye, 1988. Taylor (1987) takes precedence as his data was published one month earlier (Sally Stefferud, US Fish and Wildlife Service pers comm. 1992). Hershler (pers comm. to S. Stefferud, 1991) indicated that Hershler believes the species he described, *Pyrgulopsis sancarlosensis*, holotype USNM 859051, J.J. Landye. 29 June 1973, to be separate and distinct from *A. arizonae* described by Taylor (1987).

Revised: 1992-03-27 (DBI)
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