

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

**Invertebrate Abstract**

**Element Code:** IMGASJ7160

**Data Sensitivity:**           No          

**CLASSIFICATION, NOMENCLATURE, DESCRIPTION, RANGE**

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**NAME:** *Tryonia gilae*

**COMMON NAME:** Gila Tryonia

**SYNONYMS:**

**FAMILY:** Littoridinidae (According to Taylor, 1987)

Hydrobiidae (According to Hershler, 1988)

**AUTHOR, PLACE OF PUBLICATION:** D.W. Taylor. 1987. Fresh-water molluscs from New Mexico and vicinity. New Mexico Bureau of Mines and Mineral Resources. Bulletin 116: 36-37.

**TYPE LOCALITY:** Unnamed spring on north side of river about 2 miles north of Bylas, Graham County, Arizona.

**TYPE SPECIMEN:** Holotype: LACM 2187. D.W. Taylor, 20 April 1971. Paratype: UTEP 10,063.

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

**DESCRIPTION:** An elongate species attaining a shell length (length from mantle collar to posterior tip of digestive gland) of 3.4 mm. Whorls number 4-5 in larger males and 5-6 in larger females, regularly convex and separated by an incised suture (area where whorls touch). Shell is narrowly conical and broadly rounded anterior end. Adult shell height 1.9-3.3 mm. The shell is clear, transparent, and without periostracum. Protoconch smooth and flat (sometimes slightly depressed), with 1.0-1.25 whorls. Inner lip is fairly straight, slightly thickened and reflected; outer lip is rounded and thin. The operculum is amber, paucispiral, over one and a half times longer than wide, and with three whorls. Snout is longer than wide, terminating with fleshy lips. Cephalic tentacles are narrow, slightly expanded at the tips, and moderately elongate. The head/foot is lightly dusted with epithelial melanin throughout, except for tentacles. All hydrobioids have a foot with a rounded posterior end. Penis is flattened, elongate, and large relative to snout, extending forward from attachment without coiling. Penis also has two lobes on inner curvature near distal tip and single, enlarged lobe on outer curvature at base.

**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. Perhaps not always, but at Porter Wash and Cold Spring we have observed that they co-exist with the Bylas springsnail due to the similar appearance of both snails,

further identification must be done in the lab.

**ILLUSTRATIONS:** Line drawings (Taylor, 1987)  
Scanning electron microscope (SEM) micrograph of protoconch (Hershler and Landye, 1988)  
SEM micrograph of operculum (Hershler and Landye, 1988)  
Photographs of shell (Hershler and Landye, 1988)  
Line drawings (Hershler and Landye, 1988)  
SEM micrographs of cephalic tentacles (Hershler and Landye, 1988)  
SEM micrographs of radula (Hershler and Landye, 1988)  
SEM micrographs of penis (Hershler and Landye, 1988)  
Line drawings (Hershler and Ponder, 1998)  
Photograph (Sorensen, 2013)

**TOTAL RANGE:** Unnamed spring north of Bylas, Graham County, Arizona (same as type locality). Populations at Cold Springs and Porter Wash need to be verified genetically, but are obviously hydrobiid 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 *Tryonia gilae* 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*. Found on dead wood, leaves, or stones in spring or brooks.

**ELEVATION:** 2,600 - 2,800 ft. (793 - 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:** 1 (AZGFD, AWCS 2022)  
[1A (AGFD SWAP 2012)]

**OTHER STATUS:** Forest Service Sensitive (USDA, FS Region  
3 1999, 2013)

### **MANAGEMENT FACTORS:**

**Threats:** restricted distribution with associated potential for extinction due to chance events; groundwater depletion, reduction of spring flow.

**Management needs:** protection of spring sources; periodic monitoring of snail populations and their habitats; research on ecology and systematics.

**PROTECTIVE MEASURES TAKEN:** Bureau of Land Management has installed livestock exclusion fencing around Porter Wash and Cold Spring sites, to protect the spring runs, pools, wetland vegetation, and native wildlife that reside that 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 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

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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****REFERENCES:**

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**ADDITIONAL INFORMATION:**

Hershler and Landye list holotype (USNM 859059. J.J. Landye. 30 January 1971) and four paratypes (unnumbered) that are different from those listed by Taylor (1987).

**Revised:** 1992-03-23 (DBI)  
1993-06-15 (DBI)  
1997-03-03 (SMS)  
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2015-08-07 (RMF)  
2023-02-05 (MBL)

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