ARIZONA GAME AND FISH DEPARTMENT
HERITAGE DATA MANAGEMENT SYSTEM

Invertebrate Abstract **Element Code:** IMGASJ7130
Data Sensitivity: No

CLASSIFICATION, NOMENCLATURE, DESCRIPTION, RANGE

NAME: *Tryonia quitobaquitae*
COMMON NAME: Quitobaquito Tryonia
SYNONYMS:
FAMILY: Cochliopidae (formerly Hydrobiidae)

AUTHOR, PLACE OF PUBLICATION: Hershler, R. and J.J. Landye. 1988. Arizona Hydrobiidae (Prosobranchia: Rissoacea). Smithsonian Contributions to Zoology. Number 459: 50, 52, 54, 57-58.

TYPE LOCALITY: Quitobaquito Springs, Pima County, Arizona

TYPE SPECIMEN: Holotype: USNM 859061. J.J. Landye, 13 March 1971.

TAXONOMIC UNIQUENESS:

DESCRIPTION: Adult shell height (height from top of shell to bottom of shell) 1.4-1.8 mm. Shell has 3.5 to 4.5 highly convex whorls with deep sutures (point at which whorls meet). The snout and lobe which contains the operculum is usually darkly pigmented, while elsewhere on the head and foot there is a light dusting of melanin. A distinctive light coating exists on a broad central section on the sides of the head and foot. All hydrobioids have a foot with a rounded posterior end. The cephalic tentacles are without well-defined ciliary tracts. Penis with two lobes on inner curvature, a small one just distal to midpoint and a somewhat larger one near the base. Much of the distal portion of the penis is a dense cover of cilia.

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. A rule of thumb is that a springsnail species is specific to a particular spring and location may therefore be used as a means of identification.

ILLUSTRATIONS: SEM micrographs of shell (Hershler and Landye 1988) SEM micrographs of radula (Hershler and Landye 1988) Line drawings (Hershler and Landye 1988)
Line drawings (Hershler and Ponder 1998)

TOTAL RANGE: Three spring complexes (Quitobaquito Springs, Burro Spring, and William's Spring—the latter two are considered extirpated sites) within Organ Pipe Cactus National Monument, Pima County, Arizona.

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

SPECIES BIOLOGY AND POPULATION TRENDS

BIOLOGY: The Cochliopidae (formerly a Hydrobiidae subfamily; Wilke et al. 2001, 2013) is a large (>250 species), predominantly New World family of caenogastropods that occurs in a wide variety of brackish-coastal and inland aquatic habitats (Hershler and Thompson 1992). These tiny snails do not tolerate desiccation. Inland species typically have an entirely benthic life cycle, although several estuarine species have a free swimming larval stage of short (e.g., *Heleobia australis* [d'Orbigny, 1835]; Neves *et al*. 2010) or long (*Spurwinkia salsa* [Pilsbry, 1905]; Mazurkiewicz 1972) duration (Hershler *et al*. 2015).

REPRODUCTION: This species has recently been changed from its consideration as part of the Hydrobiidae subfamily to the Cochliopidae (Wilke *et al*. 2001). However, reproductive aspects are similar to those of hydrobioid snails. For reference: 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: Unknown, but presumably similar to other springsnails, which eat periphytic diatoms (AGFD 2015).

HABITAT: Spring complex in the Sonoran Desert. The spring run channel between the spring head and pond was cement-lined prior to 2001 with rough texture hard substrate and has run, riffle, and pooled habitat features. Aquatic vegetation grows within the spring run channel.

ELEVATION: 1,060 - 1,160 ft. (323 - 354 m).

PLANT COMMUNITY: Riparian and wetland vegetation within the Sonoran Desert; notably *Juncus* sp., *Scirpus* sp. and *Eleocharis* sp.

POPULATION TRENDS: Unknown, but baseline population surveys conducted in 2002 through 2004 by Arizona Game and Fish Department (Department) and National Park Service (NPS) indicate that springsnail numbers are robust—with a mean of 702 springsnails (SD ± 311) after considering all quadrat sampling efforts along the spring run channel. Unpublished data analysis from the 2002 surveys, by the Department, indicated the springsnail population

exhibited "clumped" distributions throughout the spring and suggested this pattern may be associated with microhabitat preferences such as substrate, flow, food availability, temperature, among others factors (AGFD 2003; Nelson and Allison 2003; Martinez and Sorensen 2016). Recent surveys in 2016 through 2018 also indicate the Quitobaquito Spring population is very abundant throughout most of the 200-m long spring run. The overall Catch-Per-Unit-Effort estimate for November 2018 was 556.26 snails per ten minute search (a total count of 6397 tryonia among ten transects in 115 minutes of searching) (Williams and Sorensen 2019). In 2018, both Burro and William springs were confirmed as dry with no tryonia present (Williams and Sorensen 2019).

SPECIES PROTECTION AND CONSERVATION

ENDANGERED SPECIES ACT STATUS: None (USDI, FWS 1996)
[C2 USDI, FWS 1994]
[C2 USDI, FWS 1991]

STATE STATUS: 1A (AGFD SWAP 2012)

OTHER STATUS: Not Forest Service Sensitive (USDA FS Region 3, 2013)
[Forest Service Sensitive, USDA, FS Region 3 1999]

MANAGEMENT FACTORS:

Threats: highly restricted distribution with associated potential for extinction due to chance events; groundwater pumping and depletion; growth of thick vegetation that inhibits free-flowing water.

Management needs: restoration of previously occupied habitat and repatriation; protection of spring sources; periodic monitoring of snail populations and their habitats; research on ecology and systematics.

PROTECTIVE MEASURES TAKEN: Quitobaquito Springs is managed and protected under the Monument's natural resource management plan. Livestock grazing and off-highway vehicle recreation is prohibited on the Monument. The NPS is one of the partners to a multi-species conservation agreement being finalized to help manage and monitor aquatic wildlife species at Quitobaquito Springs. The U.S. Fish and Wildlife Service and Arizona Game and Fish Department are also partners to this draft conservation agreement.

SUGGESTED PROJECTS: Monitor the springsnail population at Quitobaquito Springs on an annual or every other year schedule using the Department's standard springsnail sampling protocol (that is: timed presence/absence counts and artificial substrate sampling tiles). Establish one or more self-sustaining refuge populations in captive settings or establish another wild population in suitable habitat on or in the vicinity of Organ Pipe Cactus National Monument.

LAND MANAGEMENT/OWNERSHIP: NPS - Organ Pipe Cactus National Monument.

SOURCES OF FURTHER INFORMATION

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MAJOR KNOWLEDGEABLE INDIVIDUALS:

Bob Hershler – retired (Department of Invertebrate Zoology, National Museum of Natural History, Smithsonian Institution)
Jerry Landye – retired (USDI, Fish and Wildlife Service)
Jeff Sorensen – Arizona Game and Fish Department, Phoenix, Arizona

ADDITIONAL INFORMATION: A multi-species conservation agreement is being finalized to help manage and monitor native aquatic wildlife species at Quitobaquito Springs.

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1993-06-28 (DBI)
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2003-12-02 (AMS)
2016-02-14 (AJM)
2019-05-03 (JAS)

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