

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

Invertebrate Abstract

Element Code: IMGASJ0200
Data Sensitivity: No

CLASSIFICATION, NOMENCLATURE, DESCRIPTION, RANGE

NAME: *Pyrgulopsis morrisoni*
COMMON NAME: Page Springsnail
SYNONYMS: *Fonticella morrisoni*
FAMILY: Hydrobiidae

AUTHOR, PLACE OF PUBLICATION: Hershler, R. and J.J. Landye, 1988. Arizona Hydrobiidae (Prosobranchia:Rissoacea). Smithsonian Contributions to Zoology. Number 459:21,23

TYPE LOCALITY: Page Springs, Yavapai County, Arizona

TYPE SPECIMEN: Holotype, USNM 859041. Landye and Belk. 2 October 1973.

TAXONOMIC UNIQUENESS: There are 12 species in the genus *Pyrgulopsis* in Arizona.

DESCRIPTION: A medium size species with shell height (height from top of shell to bottom of shell) of 1.8 to 2.9 mm (0.08-0.12 in.) with ovate or ovate-conic shell characterized by 3.75-4.5 slightly convex whorls. Inner lip is thin and usually adnate to body whorl. Aperature is less than half of the body whorl height. Umbilicus is open. Sexual dimorphism is significant (females larger than males). Pigment either absent from head-foot or consisting of light to moderate dusting throughout. Penial filament is either pigmented along the entire length or unpigmented. The penis has a large lobe, slender filament, and singular glandular ridge.

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 obtain specimens sift sand believed to contain the snail through an ordinary kitchen strainer. The rule of thumb, that spring snail 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. The penis has a large lobe, slender filament, and singular glandular ridge.

ILLUSTRATIONS:

Line drawings of pallial oviducts (Hershler and Landye 1988)
Photographs of shell (Hershler and Landye 1988)
Scanning electron microscope micrographs of radula (Hershler and Landye 1988)
Line drawings of penial (penis) variations (Hershler and Landye 1988)

TOTAL RANGE: Page Spring and several nearby springs in Verde Valley, Yavapai County, and central 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 open 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: They eat the periphyton attached to the algae and aquatic macrophytes. Their diet consists primarily of diatoms.

HABITAT: *Pyrgulopsis morrisoni* "typically occurs on firm substrates such as rocks, vegetation, floating algal mats and submerged woody debris in association with slow to moderate flows of head springs, seeps and lateral spring runs. Populations appear to decline with increasing distance from the springs source (Palmer 1991)."

ELEVATION: 3,300 - 3,600 ft. (1,007 - 1,098 m)

PLANT COMMUNITY: Throughout the southwest *Pyrgulopsis* is found associated with *Hyaella azteca* and *Physella virgata*. In Bubbling Springs it was found to also be associated with *Crangonyx gracilis* and *Planorbella duryi*.

POPULATION TRENDS: The population at Page Springs was greatly reduced when the hatchery nearby was renovated and one population is now extirpated. The population at Tavasci Spring was lost when ditch digging resulted in increased flow velocity. (NatureServe, 2004).

SPECIES PROTECTION AND CONSERVATION

ENDANGERED SPECIES ACT STATUS: C (USDI, FWS 2009)
[C USDI, FWS 2006, 2007, 2008]
[C USDI, FWS 1996, 1997, 1999]
[C2 USDI, FWS 1989, 1991, 1994]

STATE STATUS:
OTHER STATUS:

None
Forest Service Sensitive (USDA, FS Region
3 1999, 2007)
Bureau of Land Management Sensitive
(USDI, BLM AZ 2000, 2005, 2008,
2010)

MANAGEMENT FACTORS: According to Palmer (1991) the head springs at Bubbling Ponds should remain an intact system. The practice of water chlorination during draw downs should also be re-evaluated. In addition, "the total habitat area for the snail should not be reduced from current levels."

Threats: restricted geographic distribution with associated potential for extinction due to chance events; loss of habitat due to water development activities, including drawdowns and (at fish hatchery) water chlorination. **Management needs:** development of conservation agreement to define management actions that will preclude need for federal listing; periodic monitoring of snail populations and their habitats.

PROTECTIVE MEASURES TAKEN:

SUGGESTED PROJECTS: Acquisition of Turtle Springs. Provide additional snail habitat disjunct from Bubbling Ponds and Page Springs, as well as formulating a long-term management plan, which would address the possibility of continuing hatchery operations concurrent with the management of a federal listed species in the event that this snail becomes a listed species under the Endangered Species Act (Palmer 1991). Population estimates and regular monitoring are needed.

LAND MANAGEMENT/OWNERSHIP: Arizona Game and Fish Department and private.

SOURCES OF FURTHER INFORMATION**REFERENCES:**

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ADDITIONAL INFORMATION:

Revised: 1992-03-24 (DBI)
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1997-11-13 (SMS)
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2004-07-23 (AMS)

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