ARIZONA GAME AND FISH DEPARTMENT
HERITAGE DATA MANAGEMENT SYSTEM

Invertebrate Abstract **Element Code:** IMGASJ0560
Data Sensitivity: Yes

CLASSIFICATION, NOMENCLATURE, DESCRIPTION, RANGE

NAME: *Pyrgulopsis trivialis*
COMMON NAME: Three Forks Springsnail, Black River Springsnail
SYNONYMS: *Fontelicella trivialis, Pyrgulopsis confluentis*
FAMILY: Hydrobiidae

AUTHOR, PLACE OF PUBLICATION: D.W. Taylor. 1987. Fresh-water molluscs from New Mexico and vicinity. Bulletin 116 New Mexico Bureau of Mines & Mineral Resources. Socorro, New Mexico. P. 34-36.

TYPE LOCALITY: Spring on north side of Blanket Creek at Three Forks, Apache County, Arizona.

TYPE SPECIMEN: Holotype: USNM 859053. J.J. Landye, 7 October 1973. Another Holotype is also listed: Holotype, LACM 2225. D.W. Taylor, 11 May 1980.

TAXONOMIC UNIQUENESS: There are 35 described species of *Pyrgulopsis* (synonymous with *Fontelicella*) as well as an additional 20 to 25 undescribed species from the Southwest, according to Hershler and Landye, 1988.

DESCRIPTION: Shell narrowly elongate with relatively long spire. Shell height (from top of shell to bottom of shell) is 1.5 to 4.8 mm. The shell has 3.5-4.75 unshouldered and well-rounded whorls. The shell size and shape is different between the two populations. Periostracum, a layer of chitin surrounding the outer shell, is tan. There are dark pigments on snout and tentacles; pigment is somewhat lighter on sides of head/foot. The operculum, a door-like flap that is closed by the withdrawal of the head/foot, is amber. The proximal half of the penial filament darkly pigmented, with the pigment sometimes extending into the penis as well. The penial accessory crests on the ventral surface are swollen. Sexual dimorphism is significant with the females being larger than the males in one population.

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 springsnail species is specific to a particular spring and location, and therefore may be used as a means of identification. This species links with the *P. glandulosus* group on the basis of penial morphology but differs in lacking accessory crests.

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ILLUSTRATIONS:
Line drawings (Taylor, 1987)
Line drawings (Hershler and Landye, 1988)
Scanning electron microscope micrographs of radula (Hershler and Landye, 1988)
Line drawings (Hershler and Ponder, 1998)

TOTAL RANGE: Several springs at Three Forks on the Black River on the southern slopes of the White Mountains, Apache County, Arizona.

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

SPECIES BIOLOGY AND POPULATION TRENDS

BIOLOGY: The Three Forks Springsnail is strictly aquatic and respiration occurs through an internal gill known as a ctenidium. 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 cuspate 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: Breeding rate in the wild and in captivity unknown. 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: The primary food of springsnails is believed to be periphytic diatoms, which are scraped from hard surfaces with the radula.

HABITAT: Found in springs and spring-fed creeks over area of about 0.1 km^2 (Taylor 1987). Species restricted to single spring complex consisting of approximately 4 spring sources in a one acre area, with habitat restricted to the upper 5 meters of each of the spring runs (Landye 1981). Firm substrate such as cobble, gravel, woody debris, and aquatic vegetation are essential for egg laying and grazing.

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ELEVATION: 8,220 - 8,459 ft. (2505 - 2578 m) according to AGFD HDMS unpublished records, accessed 2003.

PLANT COMMUNITY: Aquatic vegetation includes *Nasturtium* sp. (watercress), *Ranunculus* (crowfoot), and algae.

POPULATION TRENDS: The extirpation of this springsnail from at least two concrete boxed springheads at Three Forks Springs, has been confirmed.

SPECIES PROTECTION AND CONSERVATION

ENDANGERED SPECIES ACT STATUS: C (USDI, FWS 2009)
[C USDI, FWS 2001, 2002, 2004-2008]
[SC USDI, FWS 1996]
[C2 USDI, FWS 1991, 1994]
[C2 USDI, FWS 1989]

STATE STATUS: None

OTHER STATUS: Bureau of Land Management Sensitive (USDI, BLM AZ 2000, 2005, 2008, 2010)
Forest Service Sensitive (USDA, FS Region 3 1999, 2007)

MANAGEMENT FACTORS: **Threats:** highly restricted distribution with associated potential for extinction due to chance events. The degradation of spring run banks due to excessive ungulate trampling and crayfish burrowing, contributes to accelerated sedimentation and high turbidity, resulting in changes to microhabitat conditions such as shifts in substrate composition. Habitat invasion by non-native crayfish contributes to unnatural predatory pressure. Unauthorized bait bucket releases and dish washing by recreationists potentially contributes to introduction of non-native organisms and/or pollutants. **Management needs:** fencing of spring source to exclude livestock and protect spring source; periodic monitoring of snail population and its habitat; research on ecology and systematics.

PROTECTIVE MEASURES TAKEN: A permit from the Forest Service is now required for access to the Three Forks Springs area. The Forest Service has expressed a desire to develop a conservation agreement.

SUGGESTED PROJECTS: "The species should be carefully monitored ... the U.S. Forest Service should be informed of the existence of this species and placed on the appropriate documents such as inventory and management plans." (Landye 1981).

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LAND MANAGEMENT/OWNERSHIP: USFS Apache-Sitgreaves National Forest.

SOURCES OF FURTHER INFORMATION

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MAJOR KNOWLEDGEABLE INDIVIDUALS:

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ADDITIONAL INFORMATION:

"There are no published, modern comprehensive systematics of treatments of these faunas and what little work has been done largely consists of isolated, single species descriptions based

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on studies of empty shell...To date (1988) not a single hydrobioid species has been described from the state...Only brief habitat description is provided as a separate paper treating ecological and biogeographical aspects of the fauna will be published elsewhere" (Hershler and Landye, 1988).

Independently described by Hershler and Landye, 1988, Taylor takes precedence as his data was published one month earlier according to Sally Stefferud, USDI, FWS. Pers. comm. from Hershler to Stefferud, 1991, indicated that Hershler believes his species to be separate and distinct from those described by Taylor and is in the process of writing a manuscript stating that the species he (Hershler) described is indeed *Pyrgulopsis*.

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