

Page Springsnail
Pyrgulopsis morrisoni

STATUS: Candidate (54 FR 554, January 6, 1989)

SPECIES DESCRIPTION: The Page springsnail is an aquatic springsnail of the family Hydrobiidae. It is a small sized species; shell 1.8 to 2.9 mm (.7 to .11 in); with ovate or ovate-conic shell characterized by slightly convex whorls. Sexual dimorphism is significant with females larger than males.

HABITAT: Hydrobiid snails occur in springs, seeps, marshes, spring pools, outflows, and diverse lotic waters. The most common habitat for *Pyrgulopsis* is a rheocrene, or a spring, emerging from the ground as a free-flowing stream. Page springsnail habitats are isolated, mid-elevational [approximately 1,066 m (3,500 ft)], permanently saturated, spring-fed aquatic climax communities commonly described as cienegas. Firm substrate such as cobble, gravel, woody debris, and aquatic vegetation are essential for egg-laying and grazing. Aquatic vegetation includes watercress, duckweed, water parsnip, water pennywort, water speedwell, dock, waterweed, pondweed, and algae.

RANGE: The species is locally endemic to the Upper Verde River drainage of central Arizona and all extant populations exist within a complex of springs located within an approximately one mile area along the west side of Oak Creek around the community of Page Springs, Yavapai County. The Oak Creek springs complex is currently known to include at least eight springs. Historically, a population was found at Tavasci Marsh just east of Clarkdale, Yavapai County, though that population is now believed to be extirpated.

REASONS FOR DECLINE/VULNERABILITY: Historical loss of natural rheocrene habitat conditions due to construction of impoundments, outflow restrictions, and an underground water collection gallery; potential loss of primary productivity due to exclusion of sunlight by artificial coverings of springs; potential modification of upland vegetation and aquatic environment by livestock; predicted changes to supportive aquifers due to local groundwater pumping; use of toxic substances such as chlorine, rotenone, and herbicides to eliminate undesirable aquatic organisms; recent detections of elevated levels of heavy metals such as mercury, arsenic, and chromium; introductions of non-native predators and competitors such as fish, crayfish, clams, snails, and waterfowl and; known susceptibility to catastrophic events and stochastic extinction due to geographic isolation and endemism.

LAND MANAGEMENT/OWNERSHIP: The springs and outflow channels of the Oak Creek springs complex and Shea Springs are owned by State, Federal, and private landowners.

NOTES: The U.S. Fish and Wildlife Service and the Arizona Game and Fish Department have made significant progress on development of a Candidate Conservation Agreement for the species. Tasks will likely include habitat restoration, reintroductions, and monitoring programs. Detailed information can be found in the Species Assessment Form posted on the U.S. Fish and Wildlife Service Environmental Conservation Online System at http://ecos.fws.gov/docs/candforms_pdf/r2/G059_I01.pdf.

Updated: December 2007