Giant Floater - Pyganodon grandis

Abundance: Unknown

Status: NSSU NatureServe: G5 S3

Population Status: More research and surveys are needed to determine the NSS Rank of GFM in Wyoming. It is recommended that GFM remain a rank of NSSU until more field work can be performed above Keyhole Reservoir in the Belle Fourche River, in the Cheyenne River drainage, and in the Little Powder River and Little Missouri River drainages.

Limiting Factor: Unknown

Comment: None

Introduction

North America hosts the world's highest diversity of freshwater mussels (over 300 species), but more than 70% of the mussels in North America are imperiled or critically imperiled (Williams et al. 1993). Shells of the giant floater (Pyganodon grandis) are up to 25.4 cm (10 inches) in length and color is light yellow or yellow-green with green or brown rays. These mussels do not display external sexual dimorphism. Giant floaters live in much of Canada and United States in the Great Lakes, Mississippi and Gulf of Mexico drainages, and are not found in the Atlantic Slope drainages or peninsular Florida (NatureServe 2015). These bivalves are considered imperiled (Colorado, Iowa and Vermont) to secure (13 states and provinces), but exotic in North Carolina and Arizona (NatureServe 2015). The giant floater is widespread and common throughout nearly all of its range (Cummings and Mayer 1992). In Wyoming, giant floaters were first discovered in the Belle Fourche and Little Missouri River drainages (Cvancara 2005), and subsequently found in the Little Powder and Cheyenne River drainages. Giant floaters appear to be common where the species is found in Wyoming. Freshwater mussels are filter feeders that remove fine organic matter from the water column (Smith 2001). The life cycle of aquatic mussels requires a host fish during the larval stage. Larval mussels (glochidia) disperse while attached to their host and develop into adults if released on suitable substrate. Giant floaters are a habitat and host-generalist, which make the species fairly adaptable to ecological disturbances (Cummings and Mayer 1992). Natural hosts that are known for the giant floater and found in Wyoming include River Carpsucker (Carpiodes carpio), White Sucker (Catostomus commersoni), Central Stoneroller (Campostoma anomalum), Pearl Dace (Margariscus margarita), Common Shiner (Luxilus cornutus), Creek Chub (Semotilus atromaculatus), Iowa Darter (Etheostoma exile), Johnny Darter (Etheostoma nigrum), Channel Catfish (Ictalurus punctatus), Rock Bass (Ambloplites rupestris), Green Sunfish (Lepomis cyanellus), Pumpkinseed (Lepomis gibbosus), Bluegill (Lepomis macrochirus), Largemouth Bass (Macropterus salmoides), Yellow Perch (Perca flavescens), Black Crappie (Pomoxis nigromaculatus), White Crappie (Pomoxis annularis), Freshwater Drum (Aplodinotus grunniens), Brook Stickleback (Culaea inconstans), Goldfish (Carassius auratus), Common Carp (Cyprinus carpio), Gizzard Shad (Dorosoma cepedianum) and Golden Shiner (Notemigonus crysoleucas; OSUMD 2010). Raccoons, muskrats, otters, fishes, turtles, and birds all feed on mussels (Grabarkiewicz and Davis 2008). Wyoming's native mussel diversity is naturally low (seven species known), owing to the generally high elevation, headwater character of Wyoming's aquatic ecosystems.

Habitat

The giant floater mussel inhabits low velocity habitats in streams, rivers, lakes and reservoirs, and is most often found in fine substrates such as silt and sand (Cummings and Mayer 1992; Downing et al. 2000; Whaley et al. 2004; NatureServe 2015). This species is tolerant of lower oxygen concentrations than most other mussels (NatureServe 2015).

Problems

- Water quality degradation, chemical pollution, silt, and interrupting glochidial host fish relationships.

Conservation Actions

- Baseline population distribution, abundance, and structure data for the giant floater are needed throughout its range in Wyoming to evaluate the need for and to help guide potential conservation actions. The viability of populations of this mussel in Wyoming is unknown.

Monitoring/Research

A population monitoring plan needs to be developed following a thorough baseline inventory of abundance and population structure. Surveys for live individuals throughout the giant floater's range are crucial to determine an NSS rank. This species lives around 10 years, so monitoring known populations at least every five years would help determine a more refined population status and rank.

Recent Developments

State Wildlife Grant funded survey efforts during the 2014 and 2015 field seasons using survey designs from 2011 returned very little data on the giant floater in Wyoming. Very few individuals were found and those that were found were below Keyhole Reservoir in the Belle Fourche River. These records are considered a range expansion since giant flaoters had not been documented in the Belle Fourche River below Keyhole Dam. Weathered shells were found during shoreline snorkel surveys at Keyhole Reservoir in 2015. An administrative report is in review that summarizes the data that were collected during systematic surveys.

References

Cummings, K. S. and C. A. Mayer. 1992. Field guide to freshwater mussels of the Midwest. Illinois Natural History Survey Manual 5.

Cvancara, A. M. 2005. Illustrated key to Wyoming's freshwater mussels. Alan M. Cvancara, Casper, WY.

NatureServe. 2015. NatureServe Explorer: An online encyclopedia of life [web application] Version 7.1. NatureServe, Arlington, Virginia. Available http://www.natureserve.org/explorer. (Accessed: December 31, 2015).

OSUMD. 2010. Mussel host database [web application]. Molluscs Division of the Museum of Biologicial Diversity, Ohio State University, Columbus, OH. Available: http://128.146.250.235/MusselHost/ (Accessed January 14, 2010).

Whaley, R. A., A. M. Cvancara, and K. A. Lippincott. 2004. House of Pearl. Wyoming Wildlife. 68:12-17.

Grabarkiewicz, J. and W. Davis. 2008. An introduction to freshwater mussels as biological indicators. EPA-260-R08-015. U.S. Environmental Protection Agency, Office of Environmental Information, Washington, DC.

Smith, D. G. 2001. Pennak's Freshwater Invertebrates of the United States. John Wiley and Sons, Inc., New York. Pp. 638.

Downing, J. A., H. Van Leeuwen and L. A. Di Paolo. 2000. Substratum patch selection in lacustrine mussels Elliptio complanata and Pyganodon grandis grandis. Freshwater Biology 44: 641-648.

Williams J. D., M.L. Warren, K.S. Cummings, J.L. Harris and R.J. Neves. 1993. Conservation status of freshwater mussels of the United States and Canada. Fisheries 18: 6-22.

Giant Floater (*Pyganodon grandis*)

SOURCE: Digital maps of ranges for Wyoming Species of Greatest Conservation Need: February 2016. Wyoming Game and Fish Department. Note that brown indicates the current known range of the species.