Plain Pocketbook - Lampsilis cardium

Abundance: Unknown

Status: NSS1 (Aa) NatureServe: G5 SNR

Population Status: In Wyoming, plain pocketbook are only native to the North Platte River drainage. No live plain pocketbook have been found since 2008, even after extensive surveys near the site of the last known live individual. It is assumed that the plain pocketbook has been extirpated from the mainstem North Platte River (Mathias 2015).

Limiting Factor: Installation of bottom release dam, historically unregulated flows that caused portions of the river to go completely dry, and numerous oil and gasoline spills have been detrimental to plain pocketbook populations. Populations may still exist in tributaries such as Deer Creek near Glenrock, WY. The Laramie River has potential for a surviving population, but the Arapaho Fire in the Laramie Range in 2012 may have caused plain pocketbook's extirpation above Grayrocks Reservoir. In addition, no recently dead plain pocketbook shells were found downstream of Grayrocks Reservoir and flash flooding and persistent drought may have negatively impacted these populations (Mathias 2015).

Comment: NSSU to NSS1(Aa)

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 plain pocketbook (Lampsilis cardium) are up to 17.8 cm (7 inches) in length, smooth with yellow or yellow-green color, and dark green rays. These mussels display external sexual dimorphism (Cummings and Mayer 1992). Plain pocketbook lives in the upper Mississippi River drainage, St. Lawrence River, and Great Lakes region of the United States, and the Winnipeg, Red and Nelson River drainages of Canada (NatureServe 2015). These bivalves are considered critically imperiled (South Dakota and Louisiana) to secure (Indiana and Ohio) and critically imperiled in Wyoming, but exotic in Virginia and Maryland (NatureServe 2015). In general, plain pocketbook is widespread and fairly common throughout most of its range (Cummings and Mayer 1992). In Wyoming, the native range of the plain pocketbook includes the North Platte River drainage downstream of Grey Reef Reservoir and the lower Laramie River drainage (Cvancara 2005). Live plain pocketbook is extremely rare in Wyoming. Empty shells are common in the North Platte River below Grey Reef Dam, but live specimens have never been collected there. Empty shells are also common in the Lower Laramie River above Grayrocks Reservoir, where a live mussel was found in 1917 (Henderson 1924) and 2008 (Mathias 2015). 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 or amphibian during the larval stage. Female plain pocketbooks attract potential hosts with an extension of the mantle that acts as a lure (Cummings and Mayer 1992). Larval mussels (glochidia) disperse while attached to their host and develop into adults if released on suitable substrate. Natural hosts that are known for the plain pocketbook and found in Wyoming include Sauger (Sander canadensis) and Tiger Salamander (Ambystoma tigrinum), Walleye (Sander vitreus), Pumpkinseed (Lepomis gibbosus), Black crappie (Pomoxis nigromaculatus), White Crappie (Pomoxis annularis), Green Sunfish (Lepomis cyanellus), Bluegill (Lepomis macrochirus), Largemouth Bass (Macropterus salmoides), Smallmouth Bass (Micropterus dolomieu) and Yellow Perch (Perca flavescens; Watters 1997,Watters et al. 2009, 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

Plain pocketbook inhabits small streams to large rivers, and prefers mud, sand and gravel substrates (Cummings and Mayer 1992; Whaley et al. 2004).

Problems

- Pollution, changes in flow regime, extremely low flows, siltation, changes in substrate, and interrupting glochidial host fish relationships.

Conservation Actions

- Baseline population data was collected using Governor's ESA and State Wildlife Grant funding during the 2013 and 2014 field seasons in the North Platte River drainage. Using WGFD's 2010 SWAP NSS Matrix and with the current populations surveyed in the North Platte River drainage plain pocketbook has been assigned a rank of NSS1. Continued surveys throughout the North Platte River drainage, especially in the Laramie River drainage, would help determine a more refined NSS rank. Mussel surveys should be done every several years with more intensive surveys for PPM occurring more often to document its existence or possible extirpation.

Monitoring/Research

More live records of the plain pocketbook in the North Platter River drainage would be extremely valuable. If time allows and resources are available, additional thorough systematic surveys should be performed. Any new sites within their Wyoming range would be critical in determining a more refined NSS ranking. Live individuals appear to be rare in Wyoming. Stable populations of this mussel were once common in the North Platte drainage, given that empty shells are common in certain locations. Fossil specimens of this species were also documented in relatively recent strata of the North Platte River's floodplain. Mussel surveys should be done every several years with more intensive surveys for PPM occurring more often to document its existence or possible extirpation.

Recent Developments

Governor's ESA and State Wildlife Grant funded systematic surveys using techniques developed in 2011 were performed in southeastern Wyoming during the 2013 and 2014 field seasons. No live individuals were found. An administrative report is available that summarizes the data that were collected during systematic surveys (Mathias 2015).

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Plain Pocketbook (*Lampsilis cardium*)

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.