Northern plains Killifish - Fundulus kansae

Abundance: Common

Status: NSS3 (Bb) NatureServe: G5 S5

Population Status: Stable. Distribution and abundance appears stable over last decade.

Limiting Factor: Habitat: severe due to limited availability of shallow, sandy habitats.

Comment: Changed from NSS4 to NSS3 in 2017 due to recent surveys indicating that the distribution of this species is more restricted than previously believed within native range.

Introduction

The northern plains killifish is native to the Great Plains region of central North America, where it ranges from southeast Montana, South Dakota, and Missouri south to Texas (Rahel and Thel 2004). Populations have been introduced in Colorado, Utah, Arizona, New Mexico, Montana, Wyoming, Texas, and South Dakota (Rahel and Thel 2004). In Wyoming, northern plains killifish are indigenous to the North Platte and South Platte drainages, but are also found outside their range in the Big Horn and Cheyenne river drainages (Baxter and Stone 1995), possibly introduced by bait fisherman (Baxter and Simon 1970). Baxter and Simon (1970) reported no findings of northern plains killifish within the Powder River basin during 1964 sampling. Patton (1997) was the first to record the presence of this species in the Powder River system. Given this, they are likely not native to the Powder River drainage. Northern plains killifish are typically carnivorous, consuming a variety of insects and other aquatic invertebrates, and occasionally eat plant material and diatoms (Minckley and Klaassen 1969; Pflieger 1997; Rahel and Thel 2004). They feed at the surface, in the water column, and from the bottom substrate (Baxter and Stone 1995). Spawning takes place from May to August and may be stimulated by temperature and flow cues (Pflieger 1997; Rahel and Thel 2004). Males do not establish territories but they are aggressive and competitive when in pursuit of females (Pflieger 1997). One male and one female contribute to spawning, and eggs are buried in the sand (Baxter and Stone 1995; Pflieger 1997). Little is known about the movement and activity patterns of the northern plains killifish (Rahel and Thel 2004). In Wyoming, this species was formerly referred to as plains killifish, F. zebrinus, but has been recognized as a separate species (Kreiser 2001; Kreiser et al. 2001; Nelson et al. 2004).

Habitat

Northern plains killifish prefer shallow streams with sand or gravel substrate (Baxter and Stone 1995) but are generalists and can be found in a wide variety of habitats (Pflieger 1997; Senecal 2009). They can survive in rapid or sluggish current or pools (Minckley and Klaassen 1969), but prefer slower waters and are often found in backwater and shoal areas (Senecal 2009). They are often found in alkaline streams with high salinity (Baxter and Stone 1995; Pflieger 1997), are tolerant of intermittency, and can survive in isolated pools (Baxter and Stone 1995).

Problems

- Abundance and distribution has declined compared to previous surveys.
- Lack of connectivity resulting from low flows or other physical barriers (natural and man made) may significantly limit access to upstream habitats.
- Altered flow regimes, habitat fragmentation, and impacts to aquatic and riparian habitat associated with agricultural practices.

Conservation Actions

- Continue efforts to educate landowners and the public about the importance of native fish and their habitats.
- Continue efforts to maintain flows and connectivity.

Monitoring/Research

Continue to identify and record observations while conducting fisheries management sampling.

Recent Developments

Prairie stream surveys were completed in 2004-2005 (Barrineau et al. 2007; Bear and Barrineau 2007) and 2008-2009 (McGree et al. 2010; Moan et al. 2010) to assess the distribution of this species in eastern Wyoming and to determine potential conservation actions. Additionally, recent studies have documented the expansion of northern plains killifish in the Powder River from comprising less than 1% of the total fish assemblage in 1995 (Patton 1997), to 2-4% in 2009 (Peterson et al. 2009; Senecal 2009).

Intensive surveys were completed on Horse Creek, Lodgepole Creek, and Laramie River in 2015 (Compton and Hogberg: In Draft). Northern plains killifsh were found at 12 of 40 sites on Horse Creek, 6 of 22 sites on Lodgepole Creek, and 0 of 29 sites on the Laramie River.

References

Barrineau, C., B. Bear, and L. Tooker. 2007. Status of habitat and native species in northeastern Wyoming prairie streams. Wyoming Game and Fish Department Administrative Report, Cheyenne.

Baxter, G. T., and J. R. Simon. 1970. Wyoming Fishes. Wyoming Game and Fish Department, Cheyenne.

Baxter, G.T., and M.D. Stone. 1995. Fishes of Wyoming. Wyoming Game and Fish Department, Cheyenne.

Bear, B., and C. Barrineau. 2007. Status of habitat and native fish in southeast Wyoming prairie streams. Wyoming Game and Fish Department Administrative Report, Cheyenne.

McGree, M. M., C. A. Moan, A. Litckteig, and G. Edwards, Jr. 2010. Prairie stream conservation in northeast Wyoming. Wyoming Game and Fish Department Administrative Report, Cheyenne.

Moan, C. A., M. M. McGree, and G. P. Edwards, Jr. 2011. Prairie stream conservation in southeast Wyoming. Wyoming Game and Fish Department Administrative Report, Cheyenne, WY.

Patton, T. M. 1997. Distribution and status of fishes in the Missouri River drainage in Wyoming: implications for identifying conservation areas. Doctoral Dissertation. University of Wyoming, Laramie.

Peterson, D. A., P. R. Wright, G. P. Edwards, Jr., E. G. Hargett, D. L. Feldman, J. R. Zumberge, and P. Dey. 2009. Ecological assessment of streams in the Powder River Structural basin, Wyoming and Montana, 2005-2006. U.S. Geological Survey Scientific Investigations Report 2009-5023.

Pflieger, W. L. 1997. The Fishes of Missouri, revised edition. Missouri Department of Conservation, Jefferson City.

Senecal, A. C. 2009. Fish assemblage structure and flow regime of the Powder River, Wyoming: an assessment of the potential effects of flow augmentation related to energy development. Master's thesis. University of Wyoming, Laramie.

Kreiser, B. R. 2001. Mitochondrial cytochrome b sequences support recognition of two cryptic species of plains killifish, Fundulus zebrinus and Fundulus kansae. The American Midland Naturalist 146:199-209.

Kreiser, B. R., J. B. Mitton, and J. D. Woodling. 2001. Phylogeography of the plains killifish, Fundulus zebrinus. Evolution 55(2):339-350.

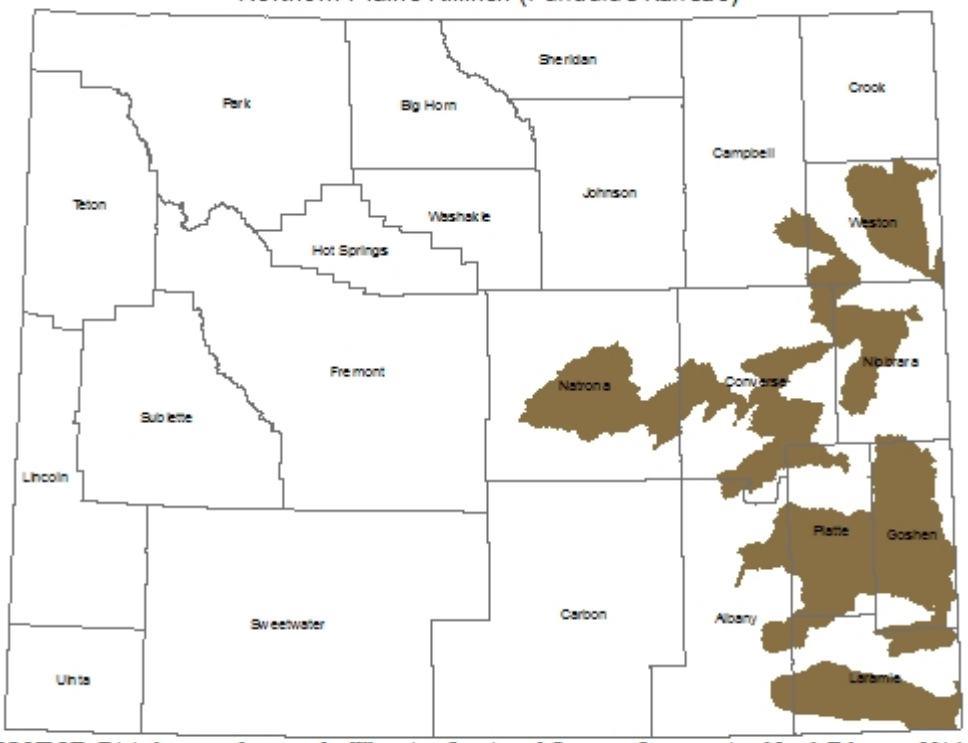
Minckley, C. O. and H. E. Klaassen. 1969. Life history of the plains killifish, Fundulus kansae (Garman), in the Smoky Hill River, Kansas. Transactions of the American Fisheries Society 3:460-465.

Nelson, J. S., E. J. Crossman, H. Espinosa-Perez, L. T. Findley, C. R. Gilbert, R. N. Lea, and J. D. Williams. 2004. Common and scientific names of fishes from the United States, Canada, and Mexico, 6th edition. American Fisheries Society, Special Publication 29, Bethesda, Maryland.

Rahel, F. J. and L. A. Thel. 2004. Plains killifish (Fundulus zebrinus): a technical conservation assessment. USDA Forest Service, Rocky Mountain Region, Laramie, Wyoming.

Compton, R.I., and N.P. Hogberg. 2016. Assessment of stream intermittency on fishes of greatest conservation need in the Niobrara River, lower Laramie River, Horse Creek, and Lodgepole Creek in eatern Wyoming. Wyoming Game and Fish Department Administrative Report, Cheyenne..

Northern Plains Killifish (*Fundulus kansae*)



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.