Hornyhead Chub - Nocomis biguttatus

Abundance: Extremely rare

Status: NSS1 (Aa) NatureServe: G5 S1

Population Status: Imperiled because of greatly restricted distribution. Found only in Laramie and North Laramie Rivers and is at periphery of range in Wyoming.

Limiting Factor: Habitat: severe due to limited habitat in Wyoming.

Comment: Changed to NSS1 from NSS2 in 2017 due to population loss in North Laramie River drainage following 2012 wildfire. NSS Ranks are reviewed and revised with each SWAP revision.

Introduction

Core hornyhead chub distribution creates a loose triangle stretching from extreme eastern North Dakota to western New York, southwesterly to northern Arkansas, then northwesterly back to North Dakota. Isolated populations are either currently or were historically present in Nebraska, Colorado and Wyoming. In Wyoming, they are found in a small section of the lower Laramie River and North Laramie River as they pass through the Laramie Mountains.

Hornyhead chub are a visual feeder, actively feeding during the daylight. Younger fish consume aquatic larvae, while adults consume more aquatic insects and fish. Sexual maturity is reached at 2 or 3 years and spawning generally occurs from April to June (Lachneri 1952). Males build spawning nests with gravel and will cover the eggs with gravel after spawning occurs. Females can carry both mature and immature eggs, with the amount of mature eggs ranging from 460 to 995.

In 2010, hornyhead chub occupied about 24 mi of stream habitat in the lower Laramie (16 mi) and North Laramie (8 mi) rivers (Bestgen 2013). This was effectively reduced to 0 miles in the North Laramie River by the Arapaho Fire and debris flows that followed. Hornyhead chub were reintroduced to approximately 1 mile of the river in 2014-15.

Hornyhead chub have been found in association with 16 native fish species and 5 introduced species. Hornyhead chub are found most commonly with creek chub, common shiner, stonecat and introduced brook trout. Exotic carp, green sunfish, rainbow trout and brown trout also inhabit some sites containing hornyhead chub (Bear and Barrineau 2007, Moan et al. 2010).

Habitat

Hornyhead chub are typically found in clear streams, with riffle habitat and gravel substrate. In the Lower Laramie River drainage, they were collected at sites above 4,750 ft in elevation and most sites had a slope greater than 1.1%. Riffle habitat was present at each site. Boulder and cobble made up 42% to 66% of substrates found, minimal aquatic vegetation was encountered, and average thalweg depths were greater than 1.5 ft (Moan et al. 2010).

Occupied reaches in the Laramie and North Laramie were mainly upstream of diversions, where streams had relatively stable summer baseflow, cool, clear water that was relatively deep, sand and gravel substrate with little silt, cover, and few non-native piscivores, especially in the Laramie River. In addition, occupied reaches of stream had stable banks relatively free of disturbance from road crossings or grazing animals. Downstream of diversions, flows were lower and less reliable, warmer, shallower, stream banks were less stable, silt common, and few hornyhead chubs were present (Bestgen 2013).

Problems

- Siltation and other habitat alterations associated with wildfire.
- Restricted population, making them susceptible to extirpation from disease and habitat alterations.
- Introduced non-native piscivores.

Conservation Actions

- Investigate entrainment of hornyhead chub in the North Laramie Canal.
- Continue to work with private landowners and other agencies to reduce entrainment issues.
- Work with private landowner, irrigators, and WGFD Fish Passage Program Coordinator on North Laramie Canal Diversion to discuss nongame passage issues. Work with State Land Board to develop a grazing approach on the Tunnel Road State Land parcel to promote stable banks and healthy riparian area
- Evaluate the potential for restoring populations within suitable portions of historic range that are currently uninhabited or where competing species can be removed.
- Prevent stocking with non-native species that are likely to negatively influence populations.
- Protect and manage riparian areas for native riparian vegetation, that will filter runoff, maintain a higher water table, provide late season stream recharge, and stabilize stream banks. Use riparian fencing, grazing management, fire management, and invasive species control to promote native vegetation.
- Surveys of extant populations are needed to provide baseline data, develop monitoring protocols, and establish monitoring locations to assess distribution and population trends.
- File for instream flow water rights to protect habitat of conservation populations.

Monitoring/Research

Develop a monitoring plan to monitor extant populations of hornyhead chub within the Laramie and North Laramie rivers. Investigate entrainment of hornyhead chub in the North Laramie Canal. Work with private landowner, irrigators, and WGFD Fish Passage Program Coordinator on North Laramie Canal Diversion to discuss nongame passage issues. Work with State Land Board to develop a grazing approach on the Tunnel Road State Land parcel to promote stable banks and healthy riparian area, this project could serve as a model for others. Provide support to ongoing hornyhead chub project looking a potential refugia sites within and outside of native range in Wyoming and salmonid predation on hornyhead chub in the Laramie River.

Recent Developments

From 2004 through 2009, detailed fish and habitat surveys were conducted to establish a baseline for future trend analysis and guide conservation efforts on the Lower Laramie River (Bear and Barrineau 2007; Moan et al. 2010).

A project was completed by Colorado State University and WGFD to refine our understanding of HHC abundance, movement, and habitat utilization within Wyoming in 2009-2010 (Bestgen 2013) .

In June of 2012, the Arapaho Fire burned over 100,000 acres in Albany, Platte and Converse counties. One drainage impacted was the North Laramie River in Albany and Platte County. Large debris flows, high water, and ash flow affected roughly 46 miles of the river. HHC previously occupied around 8 miles of the North Laramie River in the area affected by the fire.

North Laramie River sampling post-fire:

In 2013, sampling stations above the known upstream distribution and within known distribution of HHC were sampled in and no HHC were found. Other nongame native fish were collected, most directly below the North Laramie Canal Diversion and in low numbers. In 2014 10,400 feet of the North Laramie River was sampled and no HHC were captured or observed. In October, 209 HHC were transplanted from the Laramie River at Tunnel Road to the North Laramie River. An additional 203 HHC were transplanted in August of 2015.

Laramie River sampling 2013 through 2015:

In 2013, the Laramie River was sampled upstream from the Tunnel Road crossing to the gauging station below Tunnel Diversion. The purpose was to confirm the presence of HHC at this site. HHC likely expanded into this section of the Laramie River in 2010, when high flows allowed HHC to ascend a low-flow barrier (Bestgen 2013). A total of 33 HHC were captured. Most were small with a mean length of 3.9 inches, indicating successful reproduction since 2010.
In 2014 two sampling events occurred at the Tunnel Road section of the Laramie River in 2014. The first event was to determine the abundance of HHC prior to a possible transplant to the North Laramie River. 81 HHC were captured despite poor capture efficiency. A second event in October captured 209 HHC for transplant. Additional sampling in 2015 was conducted to again assess abundance and capture 203 HHC for transplant.

A UW Coop research project was initiated in 2015. The project objectives are to exam potential refugia sites within and outside of native range in Wyoming. In addition, the project will attempt to assess impacts of salmonid predation on HHC within the Laramie River.

References

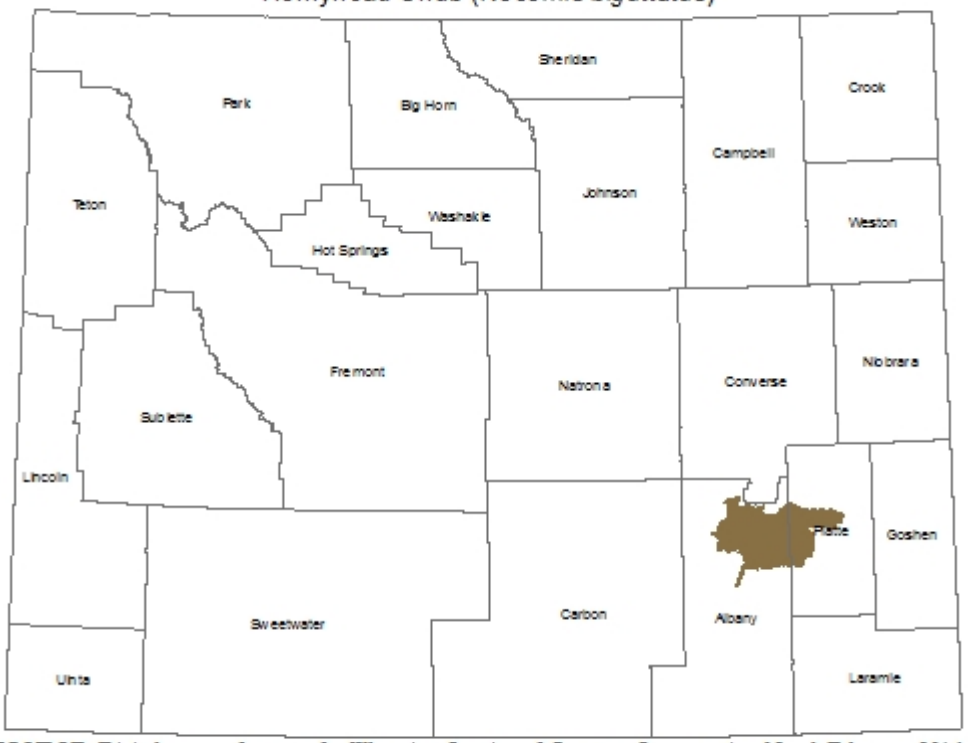
Moan, C. A., M. M. McGree, and G. P. Edwards, Jr. 2011. Prairie stream conservation in southeast Wyoming. Wyoming Game and Fish Department Administrative Report, Cheyenne, WY.

Lachner, E.A. 1952. Studies of the biology of the Cyprinid fishes of the chub genus Nocomis of northeastern United States. American Midland Naturalist 48(2):435-436.

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.

Bestgen, K.R.. 2013. Distribution, habitat, and ecology of hornyhead chub Nocomis biggutatus in southeastern Wyoming. . Final Report to Wyoming Game and Fish Department, Laramie. Larval Fish Laboratory Contribution 174.
.

Hornyhead Chub (*Nocomis biguttatus*)



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.