

Northern leatherside chub - *Lepidomeda copei*

Abundance: Unknown

Status: NSSU

NatureServe: G1G2 S1

Population Status: Population distribution is reduced from historical and current populations are isolated. Population size is variable with populations in some locales declining while others appear stable. Greatly restricted in numbers and distribution and extirpation is possible in some portions of native range. Populations extremely limited, but trends unknown.

Limiting Factor: Habitat: Significant loss of habitat and population connectivity due to water development and diversion. Other habitat requirements and limiting factors largely unknown. Genetic status is largely unknown, but populations in the upper Bear River drainage were determined to be genetically pure in 2007. Genetic purity of some Wyoming stocks may be at risk due to coexistence with speckled dace and redbottom shiners since both species will readily hybridize with northern leatherside chub. Competition and predation from introduced non-native fish may also adversely affect populations in some locales.

Comment: Although recent surveys have helped define the distribution of this species in Wyoming, information on population status, limiting factors, genetic status, and life history requirements are lacking.

Introduction

The northern leatherside chub is one of two taxa formerly known as leatherside chub (*Gila copei* and *Snyderichthys copei*) that was recently split into two species: Northern (*Lepidomeda copei*) and Southern (*L. aliciae*) based upon genetic differences (Johnson et al. 2004). This small mid-elevation fish is endemic to streams within the northeastern portions of the Bonneville Basin and select drainages of the upper Snake River (Johnson and Jordan 2000). Within its natural range, populations of both leatherside chub species are declining relative to historical observations and now appear to be extirpated in some systems (Wilson 1996, Wilson and Belk 1996, Wilson and Belk 2001, Johnson et al. 2004). In response to the taxonomic split and declining populations, the states of Idaho, Nevada, Utah and Wyoming along with the U.S. Forest Service, Bureau of Land Management, Bureau of Reclamation, National Park Service, Fish and Wildlife Service, Trout Unlimited and The Nature Conservancy, signed a Rangewide Conservation Agreement and Strategy for Northern Leatherside (*Lepidomeda copei*) to jointly conserve, protect and restore northern leatherside chub populations within their historic range (UDWR 2009). Northern leatherside chub are historically rare in Wyoming and are native to the Bear River watershed (Baxter and Stone 1995). The species also occurs in isolated tributaries of the upper Snake River and upper Green River drainages but it remains unknown if they are endemic or introduced populations. The Bear River system supports two northern leatherside chub populations in Wyoming thought to be once continuous but now isolated by Woodruff Dam. Additional water development and habitat degradation has further fragmented remaining populations. Populations in the upper portion of the watershed (upstream of Woodruff Dam) are thought to be isolated, but stable and genetically pure (Amadio et al. 2009, Zafft et al. 2009). These upper Bear River populations appear to be relatively robust for northern leatherside chub within its current range and have high conservation value. Distribution, abundance and genetic status of northern leatherside chub in the lower Bear River system in Wyoming are not well understood. The maximum life span of northern leatherside chub is at least eight years and adults can grow to 6 inches (Johnson et al. 1995). Their diet consists of mainly aquatic invertebrates. Growth rate is rapid in early years but tends to slow at the onset of sexual maturity. Reproduction can begin at age 2 or at lengths greater than 2 inches (Johnson et al. 1995, Belk et al. 2005). Spawning typically occurs over gravel and cobble substrates in spring during high water, but some populations in Wyoming are thought to have a prolonged spawning period from April through August (Baxter and Stone 1995).

Habitat

The habitat needs of northern leatherside chub in Wyoming are poorly understood though they normally inhabit deep pools in medium sized streams with cool water temperatures. Water velocity, temperature and depth are all thought to be key habitat components and northern leatherside chub often occupy habitats with some form of cover (vegetation, woody debris, lateral banks). Across their native range, they require flowing water and generally do not persist in lakes or reservoirs (UDWR 2009). Information about habitat requirements for northern leatherside chub is lacking. Most research has involved southern leatherside chub that are thought to have similar habitat preferences to northern leatherside. Spawning occurs over cobble and gravel substrate during spring. Occupied systems have a broad range of physical conditions including high variability of elevation, gradient, stream flow, temperature, and water quality (Wilson 1996, Wilson and Belk 2001). The elevation range of observations for northern leatherside is approximately 4200 to 9000 feet. The summer temperature range has been reported from 50 to 75F, but they are thought to favor water temperatures between 60 and 68F (Sigler and Sigler 1987, Sigler and Sigler 1996). Microhabitat variables associated with northern leatherside chub include low water velocities (<1.5 ft/sec), intermediate water depths (1-3 ft), and low percent composition of sand-silt or gravel substrates (Wilson 1996, Wilson and Belk 2001). Adults and juveniles tend to utilize the main channel of streams more often than off channel habitats, but in the presence of nonnative predators like brook and brown trout, they often shift habitat use to off channel habitats (Walser et al. 1999; Olsen and Belk 2001).

Problems

- h Population fragmentation resulting in the loss of extant populations and individuals within existing populations, limited opportunity for genetic exchange, and limited access to preferred habitats. These problems can ultimately threaten population viability and increase vulnerability to environmental or demographic stochasticity.
- h Habitat degradation from water development (diversions and dams) that has reduced or halted instream flows, fragmented populations and habitat, created movement barriers and caused fish entrainment. Several northern leatherside chub streams are completely dewatered for irrigation during periods of high water usage.
- h Manipulation of natural flood regimes that cause general habitat degradation or loss of spawning habitats.
- h Habitat degradation from stream channelization and other anthropogenic alterations including road and train track development.
- h Past and current livestock grazing practices have altered riparian habitat, water quality and sediment transport regimes. Ramifications of this practice includes loss of instream cover and channel complexity, increased water temperature, bank erosion and loss of preferred substrate.
- h Nonnative brook and brown trout likely impact some northern leatherside chub populations through predation.

Conservation Actions

- h Methods and strategies detailed in the Rangewide Conservation Agreement and Strategy for Northern Leatherside need to be implemented and evaluated.
- h Surveys of extant populations are needed to provide baseline data, develop monitoring protocols, and establish monitoring locations to assess distribution and population trends. These data are needed to identify specific threats and management priorities.
- h A better understanding of the basic biology, life history and habitat requirements is needed.
- h Initiate a northern leatherside chub SWG project in April 2010 to a) determine the current distribution of northern leatherside in the Bear and Snake River drainages of Wyoming, b) determine baseline abundance for major populations in Wyoming, c) identify species of fish sympatric with northern leatherside in Wyoming, d) identify relationships between northern leatherside distributions and habitat characteristics, and e) collect tissue samples from major northern leatherside populations in Wyoming for genetic analyses.
- h Conduct landscape-scale genetic analyses to assess genetic purity of native populations and determine if recently discovered populations in the upper Green River watershed are introduced or if the native range of the species should be expanded.
- h Collaborate with UDWR to assess and mitigate impacts of water development to the northern leatherside chub population in Yellow Creek.
- h Evaluate the potential to mechanically or chemically remove nonnative piscivores from some streams occupied by northern leatherside chub.
- h Continue ongoing watershed habitat programs aimed at overall ecosystem function and fish passage.
- h Actively coordinate with and assist federal land managers in developing and implementing management plans.
- h Increase public awareness and support for the conservation of northern leatherside chub.

Monitoring/Research

Most inventory data are not adequate to implement a population monitoring program. Establishment of baseline data is still needed.

Continue population monitoring at recently established abundance survey sites in two upper Bear River tributaries: LaChapelle Creek and Yellow Creek.

Estimate abundance and establish monitoring sites for populations in Mill Creek and Sulphur Creek.

Recent Developments

In 2009 the states of Idaho, Nevada, Utah and Wyoming along with the U.S. Forest Service, Bureau of Land Management, Bureau of Reclamation, National Park Service, Fish and Wildlife Service, Trout Unlimited and The Nature Conservancy, signed a Rangewide Conservation Agreement and Strategy for Northern Leatherside (Lepidomeda copei) to jointly conserve, protect and restore northern leatherside chub populations within their historic range (UDWR 2009).

Since 2006, the known range of northern leatherside chub in Wyoming has expanded to include LaChapelle Creek (tributary to Sulphur Creek) and the West Fork Hams Fork in the upper Green River watershed. Unconfirmed observations suggest that northern leatherside chub may also be found in Thomas Fork tributaries.

Genetic purity of four northern leatherside chub populations in the upper Bear River drainage was assessed in 2007 and all populations were determined to be genetically pure.

Northern leatherside chub monitoring stations were established in four tributary streams (LaChapelle, Mill, Sulphur, and Yellow creeks) of the upper Bear River drainage in 2006.

Northern leatherside chub abundance estimates were calculated for LaChapelle and Yellow Creek populations in 2006, marking the first time abundance was estimated in Wyoming populations.

Along with Trout Unlimited, the WGFD recently implemented fish passage and screening improvements in the Twin Creek, Thomas Fork, and Smiths Fork drainages.

The Huff Creek channel stabilization and riparian vegetation improvement project was implemented in 2009.

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SOURCE: Digital maps of ranges for Wyoming Species of Greatest Conservation Need: April 2010. Wyoming Game and Fish Department. Note that brown indicates the current known range of the species.