Northern leatherside chub - Lepidomeda copei

Abundance: Rare

Status: NSS3 (Bb) NatureServe: G3 S1

Population Status: Distribution is reduced from historical distribution and current populations are isolated. Population size is variable with populations in some locales declining or vunerable, while others appear stable. Greatly restricted in numbers and distribution and extirpation is possible in some portions of its 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 are largely unknown. Although habitat has been historically degraded and the carrying capacity of most streams has been compromised across the range of northern leatherside, habitat conditions are not likely to deteriorate into the future. Populations in the upper Bear River drainage were determined to be genetically pure in 2007 (Amadio 2009), and populations in the Bear River, Green River, and Snake River drainages appear to have been historically connected (Blakney 2012). Competition and predation from native and non-native fish may also adversely affect populations in some locales.

Comment: Changed from NSSU to NSS3 in 2017 due to results of rangewide inventory and population assesments. NSS Ranks are reviewed and revised with each SWAP revision.

Introduction

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, morphological, and ecological 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 their natural range, populations of both leatherside chub species have declined 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, Belk and Johnson 2007). In response to the taxanomic 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 populations within historic range (UDWR 2009). Northern leatherside are native to the Bear and Snake River drainages in Wyoming (Baxter and Stone 1995). The species is widely distributed across the Bear River drainage, and is found in Pacific Creek, Triangle X Spring, the Gros Ventre River, and the Salt River watershed (Idaho portion) in the Snake River drainage (Quist et al. 2004, Schultz and Cavalli 2012, WGFD 2015). Northern leatherside also occur in isolated tributaries of the upper Green River drainages, and Blakney (2012) found mitochondrial evidence suggesting that those populations may be endemic. Populations of northern leatherside in Wyoming represent the core of the species' range. The Bear River system supports two northern leatherside 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 above and below this barrier. 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). Above and below Woodruff Dam, populations of northern leatherside are relatively robust and multiple populations of high conservation value exist. The population of northern leatherside in Pacific Creek is also of high conservation value. The maximum life span of northern leatherside chub is at least eight years and adults can grow to 6 inches (Johnson et al. 1995). Its 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 (Billman et al. 2008) during spring high water periods, and spawning may occasionally occur in intermittent stream reaches (Schultz 2012). Some populations in Wyoming are thought to have a prolonged spawning period from April through August (Baxter and Stone 1995).

Habitat

Northern leatherside in Wyoming normally inhabit deep pools in medium-sized streams with cool water temperatures, but are also frequently found in streams with mostly riffle habitat. 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). In the Snake River drainage, northern leatherside occupy lateral habitats almost exclusively, usually with some type of cover (Schultz and Cavalli 2012). Across its native range, northern leatherside requires flowing water and generally does not persist in lakes or reservoirs (UDWR 2009). Its habitat preferences are thought to be similar to those of southern leatherside (Belk and Johnson 2007). Like southern leatherside, northern leatherside are found in stream reaches with abundant deep pools (Quist et al. 2004) and in systems that contain a high degree of depth variability (Wesner and Belk 2011, Schultz and Cavalli 2012). It is also positively associated with other native fishes (Schultz and Cavalli 2012). Spawning occurs over cobble and gravel substrate (Billman et al. 2008) during spring, and the availability of coarse substrate is an important habitat component (Wesner and Belk 2011). Northern leatherside will also use seasonally-available habitats, probably for spawning (Schultz 2012). Stream systems occupied by leatherside chub 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). They may also persist in systems composed mostly of isolated pools (Belk and Johnson 2007). The elevation range 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 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). Northern leatherside tend to be found with other native fishes in the Bear River drainage (Wesner and Belk 2011, Schultz and Cavalli 2012). In most systems, 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). Recent evidence suggests that northern leatherside may be highly mobile and utilize a variety of habitats to complete its life history (Schultz 2012), and connectivity to other populations is likely influential to its occurrence (Wesner and Belk 2007).

Problems

- 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.
- 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.
- Manipulation of natural flood regimes that cause general habitat degradation or loss of spawning habitats.
- Habitat degradation from stream channelization and other anthropogenic alterations including road and train track development.
- Past and current livestock grazing practices have altered riparian and in-stream 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.

Conservation Actions

- Methods and strategies for conservation are detailed in the Rangewide Conservation Agreement and Strategy for Northern Leatherside.
- Continue efforts to maintain flows and connectivity.
- A better understanding of the basic biology, life history and habitat requirements is needed.
- Collaborate with UDWR and Trout Unlimited to assess and mitigate impacts of water development to the northern leatherside chub population in Yellow Creek.
- Evaluate the potential to mechanically or chemically remove nonnative fishes from some streams occupied by northern leatherside chub.
- Continue to educate landowners and the public about the importance of maintaining habitat for native fish
- Implement a grazing regime that would be beneficial to the species.
- Prevent stocking of public or private waters with non-native species that may impact conservation populations.
- Continue ongoing watershed habitat programs aimed at overall ecosystem function and fish passage.
- Actively coordinate with and assist federal land managers in developing and implementing management plans.

Monitoring/Research

Continue population monitoring at recently established abundance survey sites in LaChapelle Creek, Yellow Creek, Dry Fork, Muddy Creek, and Twin Creek.

Continue to monitor distribution of northern leatherside in Pacific Creek, Triangle X Spring, Gros Ventre River drainage, and similar habitats within the Upper Snake River drainage.

Examine the response of northern leatherside to habitat restoration or degradation

Monitor the success of any translocations of northern leatherside to currently unoccupied habitat

Assess the thermal tolerance and thermal preference of northern leatherside

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).

A northern leatherside chub State Wildlife Grant project was completed (Schultz and Cavalli 2012) to a) document the current distribution of northern leatherside in the Bear and Snake River drainages of Wyoming, b) assess baseline abundance for major populations in Wyoming, c) identify species of fish sympatric with northern leatherside in Wyoming, d) identify habitat associations of northern leatherside, e) examine its seasonal habitat use patterns, and f) collect tissue samples from major northern leatherside populations in Wyoming for genetic analyses.

Surveys of extant populations were completed to provide baseline data, develop monitoring protocols, establish monitoring locations, and identify specific threats and management priorities for northern leatherside in Wyoming.

A landscape-scale genetic analyses was conducted in 2010-2011 (Blakney 2012) to assess genetic diversity across the range of northern leatherside. This work found mitochondrial evidence suggesting that populations in the Green River basin are endemic.

Genetic characteristics 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 (Amadio et al. 2009).

Northern leatherside chub monitoring stations were established throughout the Bear River drainage in 2010-2011, and its distribution in the Upper Snake River was delineated in 2011. Northern leatherside were identified in the Gros Ventre River for the first time in 2014.

Northern leatherside chub abundance estimates were calculated for LaChapelle and Yellow Creek populations in 2006 and 2011, and Mill Creek (tributary to Muddy, Smiths Fork), Muddy Creek, Twin Creek, and Dry Fork in 2010-2011.

Along with Trout Unlimited, WGFD recently implemented fish passage and screening improvements in the Twin Creek and Smiths Fork drainages. A barrier assessment in Yellow Creek was initiated by Trout unlimited in 2011.

Priority conservation areas for northern leatherside were identified in the Snake and Bear River drainages in 2011.

A petition to list northern leatherside as threatened or endangered under the Endangered Species Act was found to be not warrented (United States Fish and Wildlife Service 2011).

Schultz (2012) found spawning may occasionally occur in intermittent stream reaches

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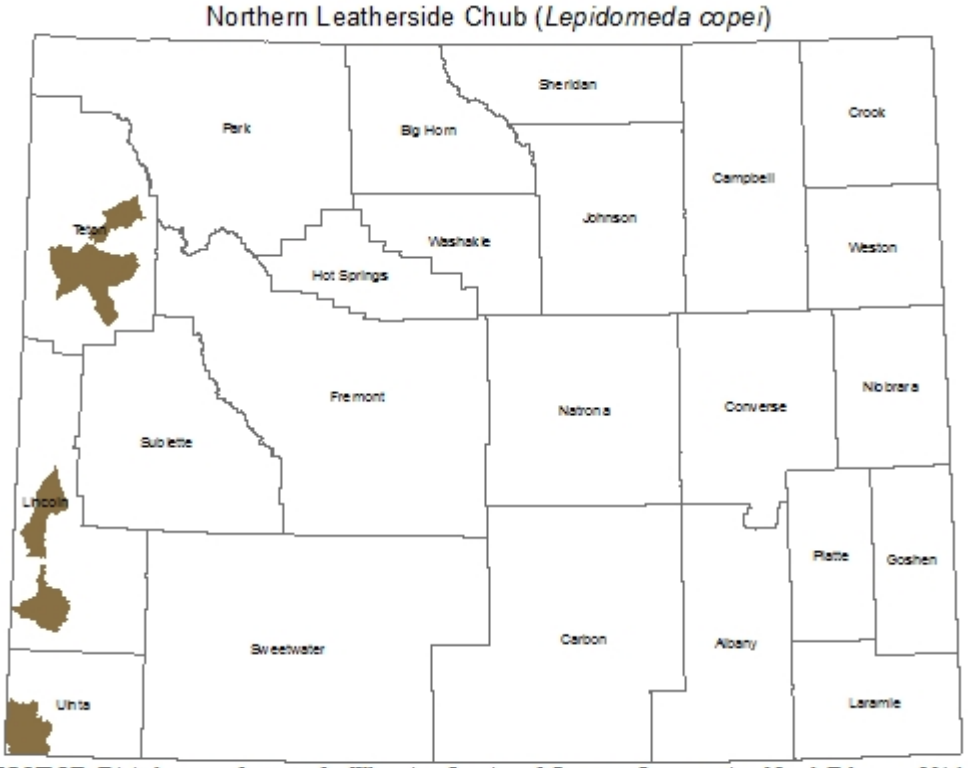

SOURCE: Digital maps of ranges for Wyoming Species of Greatest Conservation Need: February 2016. Wyoming Game and Fish Department. Note that brown indicates the current known range of the species.