Bonneville Cutthroat Trout - Oncorhynchus clarkii

Abundance: Common within a limited range

Status: NSS3 (Bb) NatureServe: G4T4 S1

Population Status: Restricted in numbers and distribution, but relatively stable. Extirpation is not imminent. Population status is vulnerable.

Limiting Factor: Limiting factors are severe but not increasing significantly. Habitat: habitat availability is limited by land management activities (grazing, irrigation diversion, energy development, and municipal water diversion), but habitat conditions have not worsened over the past decade.

Comment: Changed from NSS2 in 2005 due solely to changes in the matrix. No change was made for the 2017 update

Introduction

Bonneville cutthroat trout (BRC) are native to the Bear River drainage in Wyoming. The distribution and abundance of BRC has declined from historical levels. It has been estimated that BRC occupied 6,758 miles of habitat within Utah, Idaho, Wyoming and Nevada. They currently occupy an estimated 2,380 miles of historical habitat (May and Albeke 2005). Interagency management plans have been developed for this species since 1993 which focused on population and habitat monitoring, increasing BRC range, watershed improvements, and developing public awareness (Remmick et al. 1993, Lentsch et al. 2000, May and Albeke 2005).

This cutthroat trout subspecies is distinguished from other subspecies by a more uniform distribution of spots. Life history information for BRC has been described by Baxter and Stone (1995), Binns (1981), and Remmick (1982). This subspecies primarily feeds on aquatic and terrestrial insects, but is an opportunistic feeder. Large BRC are piscivores. Maturity is typically reached around 3 years old. Spawning typically occurs after runoff which is usually during June. Both resident and fluvial populations of this subspecies still exist.

Several factors have contributed to the decline of BRC, including introductions of non-native species, and habitat modification and fragmentation. Bonneville cutthroat trout tend to tolerate and survive in degraded habitats with warmer water temperatures better than other cutthroat trout.

See the Bear River Basin aquatic basin chapter in the current SWAP for more information relative to this fish

Habitat

Cutthroat trout prefer gravel-bottomed creeks and rivers as well as lakes. The Bonneville cutthroat trout is well known for its ability to survive in harsh and often degraded (mostly anthropogenic impacts) habitats. In Wyoming, the Bonneville cutthroat is found in the Smith Fork, Thomas Fork and the Bear River watersheds. A lentic population is located in Lake Alice. Detailed information on life history, movement patterns, habitat requirements, and temperature requirements can be located in several thesis and peer reviewed professional publications (White 2003, Johnstone 2000, Robert 2004, Schrank 2002, Collier 2002, Carlson 2006). Though there has been efforts to decrease entrainment and improve fish passage, there are still some irrigation canals that are impacting BRC, particularly during low flows. This subspecies of cutthroat trout is also native to some drainages in Idaho, Utah and Nevada with the bulk of its historic range within Utah. The subspecies has been introduced as a sport fish to many waters outside its historic range.

Problems

- Entrainment in irrigation canals has been identified as a major source of mortality for BRC.
- Habitat fragmentation and degradation are major threats to the persistence of Bonneville cutthroat trout.
- Irrigation diversions have impacted migration patterns of Bonneville cutthroat trout, particularly during low flows.
- Competition and hybridization with nonnative trout are impacting some populations.
- Domestic grazing, roads, culverts, and removal of willows have negatively impacted Bonneville cutthroat trout.
- Potential development of impoundments (e.g., Sublette Reservoir and Dry Fork Reservoir) could impede migration of Bonneville cutthroat trout.

Conservation Actions

- Increase publics awareness and support for native fish species.
- 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.
- Continue efforts to maintain flows and connectivity.
- Continue to educate landowners and the public about the importance of maintaining habitat for native fish
- Continue to work towards meeting the goals and objectives as identified in the BRCT Conservation Agreement and Strategy.
- Continue to work with private landowners and other agencies to reduce entrainment issues.
- Represent the WGFD on the interagency Bonneville cutthroat trout conservation team and help implement the Range-wide Conservation Agreement and Strategy for Bonneville cutthroat trout (Lentsch et al. 2000).
- Implement a grazing regime that would be beneficial to the species.

Monitoring/Research

Continue monitoring populations and habitats every five years, or as needed based on project opportunities.

Evaluate fish passage problems throughout the Bear River, Thomas Fork and Smith Fork watersheds.

Continue to work with the federal agencies, trout unlimited and permittees with monitoring habitat condition. This includes but not limited to PFC and greenline monitoring.

Continue to monitor water temperature.

Recent Developments

Amplified fragment length polymorphism analyses were done on tissue samples from BRC populations in the Thomas Fork (Giraffe Creek), Twin Creek (Rock Creek), and Smiths Fork (Grade Creek) in 2009. Submitted additional tissue samples from Lake Alice in 2010. These three populations were determined to be genetically pure with no significant influence from rainbow trout, Yellowstone cutthroat trout or Colorado River cutthroat trout.

Submitted genetic samples from the mainstem Bear River for genetic analyses in 2010. Results indicated small amount of introgression with YCT in two samples.

Monitored BRC movement in Twin Creek, Hobble Creek and Thomas Fork.

Monitored BRC populations and habitat in several watersheds, including but not limited to Dipper, Coal, Raymond, Giraffe, Huff, Thomas Fork, and Smiths Fork.

Constructed upstream bypass channels on several irrigation diversions (examples include Taylor, Peterson, Mumford).

Graduate project completed on BRC entrainment in canals (Carlson 2006), temperature tolerance (Johnstone et al 2000, 2002), effects of irrigation canals (Robert 2004), movement patterns (Schrank 2002), and habitat requirements (White 2003).

Constructed and maintained riparian exclosures.

Implemented fish passage projects (culverts primarily) throughout the Bear, Smiths Fork, and Thomas Fork watershed.

Worked with private landowners to improve fish passage issues in the Twin Creek watershed.

This species was petitioned for listing as threatened under the Endangered Species Act in 1998. A decision in 2001 showed this to be not warrented, and a series of subsequent decisions and lawsuits ultimately led to another not warrented finding in 2008 (U.S. Fish and Wildlife Service 2008)

Working with the BLM in monitoring water temperature in the Smithsfork Allotment. Streams include Coal, Little Muddy, Mill, Huff and Raymond creeks.

Coal Creek road and habitat improvements

References

Carlson, A.C. 2006. Watershed scale habitat use and canal entrainment by Bonneville cutthroat trout in the Smiths Fork – Bear River drainage. Doctoral dissertation. University of Wyoming, Laramie.

May, B. and S. Albeke. 2005. Range-wide Status of Bonneville Cutthroat Trout (Oncorhynchus clarki utah) 2004. Publication Number 05-02. Utah Division of Wildlife Resources, 1594 W. North Temple, Salt Lake City, UT.

Lentsch, L.D., C.A. Toline, J. Kershner, J.M. Hudson, and J. Mizzi. 2000. Range-wide conservation agreement and strategy for Bonneville cutthroat trout (Oncorhynchus clarki utah). Publication number 00-19. Utah Division of Wildlife Resources. Salt Lake City, Utah.

Remmick, R.L., K. Nelson, G. Walker, and J. Henderson. 1994. Bonneville cutthroat trout inter-agency five year management plan (1993 - 1997). Wyoming Game and Fish Department.

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

Binns, A. 1981. Bonneville cutthroat trout, Salmo clarki utah, in Wyoming. Fish Tech. Bull. No. 5. Wyoming Game and Fish Department, Cheyenne. 107pp.

Binns, N.A., and R. Remmick. 1994. Response of Bonneville cutthroat trout and their habitat to drainage-wide habitat management at Huff Creek, Wyoming. North American Journal of Fisheries Management 14:669-680.

Collier, W.C.. 2002. Seasonal movements of fluvial Bonneville cutthroat trout in the Thomas Fork of the Bear River, Idaho-Wyoming.. Utah State University, M.S. Thesis.

Johnstone, H.C., and F.J. Rahel. 2003. Assessing temperature tolerance of Bonneville cutthroat trout based on constant and cycling thermal regimes. Transactions of the American Fisheries Society 132:92-99.

Schrank, A.J., and F.J. Rahel. 2004. Movement patterns in inland cutthroat trout (Oncorhynchus clarki utah): management and conservation implications. Canadian Journal of Fisheries and Aquatic Sciences 61: 1528-1537.

Schrank, A.J., and F.J. Rahel. 2006. Factors influencing summer movement patterns of Bonneville cutthroat trout (Oncorhynchus clarkii utah). Canadian Journal of Fisheries and Aquatic Sciences 63: 660-669.

Schrank, A.J., F.J. Rahel, and H.C. Johnstone. 2003. Evaluating laboratory-derived thermal criteria in the field: an example onvolving Bonneville cutthroat trout. Transactions of the American Fisheries Society 132: 100-109.

Roberts, J.J.. 2004. Effects of irrigation canals on Bonneville cutthroat trout and other fishes in the Smiths Fork drainage of the Bear River, Wyoming. University of Wyoming, M.S. Thesis.

Johnstone, H.C.. 2000. Temperature tolerance and summer habitat conditions for Bonneville cutthroat trout in the Thomas Fork of the Bear River, Wyoming. University of Wyoming, M.S. Thesis.

Schrank, A.J.. 2002. Ecological significance of movement patterns of Bonneville cutthroat trout in a western Wyoming watershed. University of Wyoming, M.S. Thesis.

White, S.M. 2003. A watershed perspective on the distribution and habitat requirements of young Bonneville cutthroat trout in the Thomas Fork of the Bear River, Wyoming. University of Wyoming, M.S. Thesis.

Hickman, T.J.. 1978. Systematic study of the native trout of the Bonneville Basin. Colorado State University, M.S. Thesis.

U.S. Fish and Wildlife Service. 2008. 12-Month Finding on a Petition To List the Bonneville Cutthroat Trout as Threatened or Endangered. Federal Register Vol. 73, No. 175.

Bonneville Cutthroat Trout (*Oncorhynchus clarkii utah*)

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.