

Bonneville Cutthroat Trout (*Oncorhynchus clarki utah*)

Data: 2004 Range-wide Status Report (May and Albeke, 2005)

Partners: ID, NV, UT, WY, CTGR, URMCC

Species Status Review: The Bonneville cutthroat trout (BVCT) is listed as a “Tier I Conservation Species” by the State of Utah, as a “Sensitive Species” by the US Forest Service, as a “Range-wide Imperiled (Type 2) Species” by the Bureau of Land Management, and as a “Vulnerable Species” by the State of Idaho. This species has been petitioned for, but precluded for listing as Threatened or Endangered by the US Fish and Wildlife Service several times in the past decade. The most recent determination, that the species does not warrant listing as a threatened or endangered species under the Endangered Species Act was released on September 9, 2008.

The State of Utah Conservation Agreement and Strategy (CAS) for Bonneville cutthroat trout was completed and signed by all parties in 1997 (Lentsch et.al 1997). The Range-wide Conservation Agreement and Strategy was completed in 2000 (Lentch et. al 2000). In 2004, the Utah Conservation Team completed a Post Implementation Assessment to present progress and accomplishments in BVCT conservation in the State of Utah. Also during 2007, a comprehensive Range-wide Status Review was published. A Management Plan for Conservation of BVCT in Idaho was submitted during 2006. The Nevada Conservation Agreement and Strategy was also finalized during 2006.

Sportfishing Status of the BVCT: BVCT are considered a game fish by all state, federal, and tribal agencies that have management authority for this subspecies. Like other cutthroat subspecies, BVCT are generally easy to catch, and most populations are managed through the use of fishing regulations that protect population integrity and viability. In addition, many BVCT populations occur in remote locations and receive limited fishing pressure making special regulations unnecessary. Due to protective regulations and/or the occurrence

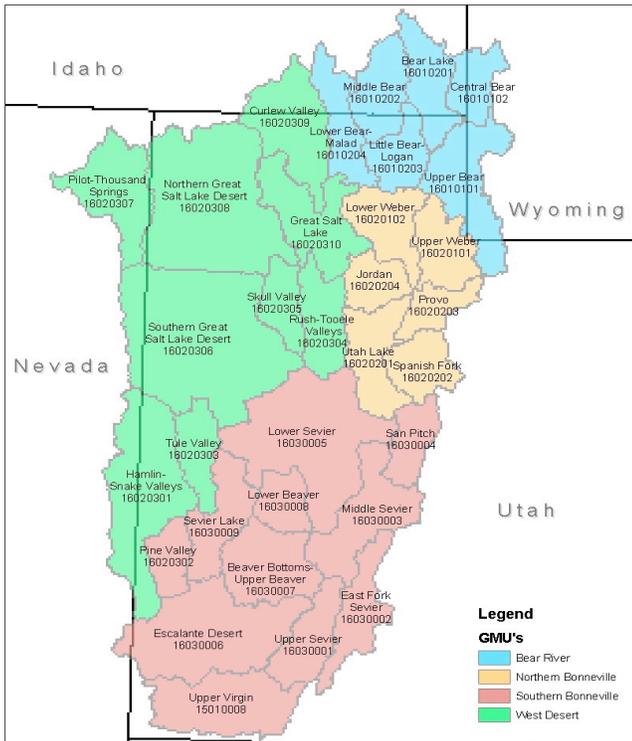
of BVCT in remote areas, over-fishing is not considered to be a problem at this time. Short-term fishing closures are often imposed to promote the development of recently re-introduced populations of BVCT. Spawning season closures are frequently used, particularly for brood populations. Other regulations requiring limited harvest, length restrictions (slot limits), catch-and-release, and terminal tackle restrictions have demonstrated effectiveness in maintaining populations of BVCT. Special regulations are very popular with some groups of anglers. BVCT (particularly the Bear Lake strain) are cultured extensively in the State of Utah, and used widely in sport fish management programs. Angler support for Bonneville Cutthroat conservation management programs is strong in all four states and is considered an important asset to conservation and management programs.

BVCT Distribution: Based on the 2007 Range-wide Status Update, At least 153 Bonneville cutthroat trout populations collectively occupy about 2,061 miles of stream habitat in 21 watersheds in Utah, Idaho, Nevada, and Wyoming. These populations qualify as conservation populations under standards developed by the States. Of the 153 conservation populations, 46 percent are considered core populations. Conservation populations have at least 90 percent cutthroat trout genes and core populations have at least 99 percent cutthroat trout genes. Of the 2,061 miles of occupied habitat, 1,160 miles (49%) are associated with lands administered by the Federal Government. Almost 51% of BVCT habitat occurs on land with non-federal administration, including Goshute Tribal lands (12 miles).

Range of Bonneville cutthroat trout

A total of 153 separate BVCT populations currently occupying 2,061 miles of habitat were designated as “conservation populations” (87% of currently occupied habitat). These conservation

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populations were spread throughout the historical range, occurring in 19 of the 23 hydrologic units historically occupied by BVCT. Twenty-seven of these populations representing 1,444 miles existed in drainages with strong or moderate connectivity.

BVCT Habitat Requirements: Typical of most trout, Bonneville cutthroat trout thrive in lotic habitats characterized by relatively cool, well

oxygenated water; the presence of clean, well sorted gravels with minimal fine sediments for successful spawning; and habitat complexity composed of large woody debris and overhanging banks. However, BVCT have been found to tolerate marginal habitat conditions as well (i.e. widely variable flows, high temperatures, poor instream structure, and high turbidity) due to the fact that they evolved in a desert environment. One study (Kershner, 1995) found spawning substrate size to be proportional to body size. For example, large adfluvial Bonneville cutthroat

trout typically spawn in large gravels or cobbles, while smaller, stream resident Bonneville cutthroat trout spawn over coarse sand or small gravels.

Concerns, Issues, or Obstacles relative to the Conservation and Improvement of the status of Bonneville Cutthroat Trout:

Population Viability Concerns:

For the purposes of conservation and recovery, Bonneville cutthroat trout populations in the four states have been partitioned into a hierarchical classification system. A sub-basin or basin where a group of genetically pure local populations may share common foraging, spawning, migrating, or over-wintering habitat and function as a meta-population are termed “Core populations”. Populations were also designated as “conservation populations” based on whether they represent a core conservation population having no genetic alteration, or there were identified unique attributes such as expression of unique or multiple life-history strategies, adaptation to specific environmental habitat conditions, and geographic location. These populations can be further aggregated into “Geographical Management Units” –GMU’s that may cross jurisdictional boundaries. Although Bonneville Cutthroat trout are widely distributed over a large geographic area, the effects of human activities over the past century have reduced their overall distribution and abundance. Increased habitat fragmentation from dams, diversions, land and water management

practices, and human development has reduced the amount of available well-connected habitat. Increased isolation of local populations and the occurrence of non-native salmonids increase the risk of losing genetically pure populations.

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Genetic Considerations:

Most of the western states that have management and conservation authority for cutthroat trout

participated in the development of a position paper on genetic management (Utah, 2000). This position paper describes a hierarchical classification for conserving cutthroat trout that includes: 1) a core component of genetically unaltered populations or individuals; 2) designated conservation populations that may be either genetically unaltered or slightly introgressed and have attributes worthy of conservation; and 3) populations that are managed primarily for their recreational fishery value. Core populations are recognized as having important genetic value and could serve as donor sources for developing either captive or wild broods or for re-founding additional populations from existing BVCT populations. Management of conservation populations will emphasize conservation, including potential conservation populations.

The Range-wide BVCT Status Report provided a generalized population health assessment for each conservation population based on population demographics/productivity, temporal variability, connectivity, and size. Seventy-one BVCT populations (46%) were rated as having either high general health (11 populations) or moderately high general health (60 populations). Fifty-six populations (37%) were rated as having moderately low general health and 26 populations (17%) were rated as having low general health.

Disease Concerns

A disease risk assessment was made for each conservation population using a ranking of 1 to 5 based on the level of risk with a ranking of 1 being the lowest level and 5 being the highest level. Population isolation and security were important considerations, but they were not

viewed as absolutes. Diseases of concern included, but were not limited to, whirling disease, furunculosis and infectious pancreatic necrosis virus. Other concerns are invasive species such as New Zealand mud snails and parasites such as pleistophora and epitheliocystis. A new and very serious invasive threat is the quagga mussel, a close relative of the zebra mussel that appears to have no elevational limit. With regard to risks associated with catastrophic diseases, 97 (63%) of the conservation populations were considered to be at limited risk, 16 (10%) were at moderate risk, and 14 (9%) were already infected with significant disease. No un-infected populations were considered at high present risk for disease.

Habitat Concerns

Continued habitat degradation is one of the major threats to the continued improvement of BVCT status and abundance. Loss of habitat quality has been recognized as one of the two major human induced influences in the loss of BVCT populations. Major habitat concerns typically relate to:

- Modification and fragmentation of habitat from barriers to fish passage, entrainment, and thermal barriers due to dams and water diversions
- Aquatic habitat degradation and alteration from mining, forestry and agricultural land use practices that result in sediment loading, elevated temperatures, changes to stream structure and morphometry, and changes in water quality.
- Flow depletion and water quality degradation due to water diversions for hydropower, municipal and agricultural uses, and groundwater pumping for urban, mining, and power production.
- Secondary impacts of dams from reservoir pools in large river systems (i.e. hydro-power entrainment, gas supersaturation, modification of flow patterns, creation of nonnative fish

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habitat, and changes in tailwater water temperatures).

The accumulation of these detrimental habitat influences over time has led to isolation and

fragmentation of habitat and reductions in range, which adversely impact the stability and viability of BVCT populations.

Introduced Species Concerns

Competition, predation, and hybridization from introduced salmonids including rainbow, brook and brown trout, as well as genetically compromised cutthroat trout, continue to pose a threat to the expansion and conservation of BVCT. Genetic risk is defined by the nature of the potential for future introgression of a non-native genome into a conservation population. The 2004 Range-Wide Status Review provided a genetic risk assessment for BVCT conservation populations. A total of 94 populations (61%) were ranked as being at low risk of genetic contamination. Thirty-two populations (21%) were rated as being at high genetic risk.

Overutilization Concerns

There are numerous federal and state regulatory mechanisms that, if properly administered and implemented, protect BVCT and their habitats throughout the range of the subspecies, such as 404 and water quality discharge permitting. However, effective implementation of these regulatory mechanisms depends largely upon the appropriation of adequate funding and, ultimately, commitment on the part of the

management or regulatory agencies to fulfill their respective responsibilities.

Adequate angling regulations appear to be in

place to protect BVCT populations from impacts due to fishing by recreational anglers, minimizing concerns that recreational harvest is a problem. In addition, controls governing collections for scientific purposes and genetic testing have helped to reduce the risk that

monitoring and sampling programs may result in a reduction of BVCT populations

Oil and Gas development threats:

There may be increased pressure on BVCT habitats from energy exploration in the near future. The potential for development is most likely to occur in Utah and Wyoming, with habitat degradation and loss of water constituting the greatest concerns.

Opportunities for Improvement of the Status of BVCT:

The objective of Bonneville Cutthroat trout conservation and restoration is to ensure the long-term persistence of self-sustaining populations across the species native range. To meet this objective, managers will need to maintain multiple inter-connected populations of BVCT across the diverse habitats of their native range, and preserve the diversity of their life-history strategies. Specific conservation measures to improve the status of BVCT can be grouped into several major categories, including:

- fish population surveys and analysis
- genetic analysis
- fish population manipulation (non-native removal, re-introduction, supplemental stocking, spawn-taking, etc.)
- habitat manipulation (barrier placement or removal, in-stream structure, flow enhancement, increasing connectivity, isolation of fragments, etc.)
- regulatory actions (fishing regulations, water use, land management, etc.)

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Population Surveys, genetic analyses, and fish population manipulation:

The 2004 status update evaluated the potential of restoration or expansion of BVCT and found that 4,697 miles of historical habitat did not support

conservation populations of BVCT. An evaluation of the restoration or expansion potential for this habitat indicated that 1,696 miles (36%) were currently available for restoration of BVCT. Further analysis indicated that 44 miles had a high restoration potential, 50 miles had an intermediate potential, 753 miles had low potential, and 198 miles of stream had very low restoration or expansion potential. The restoration or expansion potential for 652 miles of habitat was unknown.

The reestablishment of population connectivity will be a primary focus of future restoration if the risks to BVCT are to be minimized over the long-term. Conservation population designations suggest that two different conservation strategies are needed to conserve BVCT. One strategy concentrates on preventing introgression, disease and competition from other salmonids; the second concentrates on preserving local population networks of various sizes that maintain meta-population function, multiple life-history strategies and expand the amount of occupied habitat by increasing the amount of connected habitat. The CAS calls for the management of 191 conservation populations of Bonneville cutthroat trout.

Key Population Management Actions include:

Maintain and improve the connectivity and genetic integrity of BVCT populations in

designated sub-basins (GMU's).
Maintain current distribution of BVCT within core areas as described in recovery r conservation plans, and restore distribution where recommended in sub-basins.
Characterize, conserve, and monitor genetic diversity and gene flow among local populations of BVCT.
Control or eradicate nonnative species (i.e. rainbow, brook, non-native strains of cutthroat and hybrid BVCT) where feasible and appropriate.
Develop and implement consistent methods for fish population status and trend analyses.
Locate and assess BVCT populations.
Conduct standardized surveys and genetic analyses.
Expand BVCT populations through restoration, reintroductions, and non-native fish control in priority watersheds.
Maintain BVCT broodstock sources and adequate hatchery production to meet sport fish and conservation needs in each GMU.

BVCT Habitat Manipulations:

Restoration of Bonneville cutthroat trout habitat will have to address both habitat quality issues and issues of spatial limitations. Current efforts to recover Bonneville cutthroat trout have been directed towards improving in-stream conditions, restoring limited stream fragments, and removing or placing in-stream barriers to improve connectivity or protect populations from intrusion by non-native salmonids respectively.

Key Habitat Actions Include:

Restore and improve altered channel and riparian zone habitats.
Restore and enhance water flow, water quality, natural sediment regimes, and physical integrity of channels where

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feasible.
Expand small, isolated populations where possible, and maintain or enhance high quality habitats to prevent extirpation due to small population size or stochastic events.
Monitor and evaluate natural catastrophic impacts like fire and drought.
Identify and implement BMP's on FS, BLM, and private lands to benefit BVCT habitats.

Regulatory and Administrative Actions to enhance BVCT status:

Maintaining the sportfish status of the BVCT and utilizing regulations to control over-utilization will be an important component of maintaining the health of BVCT populations. In addition, working with others to maintain appropriate regulations for prevention of disease, water quality impairment, and habitat disturbance are important considerations.

Key Actions to be addressed:

Provide technical information, administrative assistance, and financial resources to assure compliance with the listed objectives and encourage conservation of BVCT on private lands.
Maintain and protect BVCT habitat from degradation by achieving compliance with existing habitat protection laws, policies, and guidelines.
Enforce regulatory mechanisms that prevent impacts associated with recreational angling.
Enhance and maintain regulatory mechanisms that prevent diseases or illegal introduction of nuisance species.
Work through the FERC re-licensing process to require impoundment operators to operate dams to minimize impacts where necessary to meet cooperative agreement objectives.

Recommended Actions to improve the status of the Bonneville Cutthroat Trout:

Highest Priority Actions for the Bonneville Cutthroat Trout include the following actions:

1. Bear River GMU (not necessarily in priority order)

Continue to monitor core and high priority conservation populations on a regular rotation based on monitoring schedule.

Conduct whirling disease (WD) monitoring and public outreach to inform the public and prevent the spread of WD.

Continue surveys for potential new BVCT populations and conduct genetic analysis to determine purity and/or assess any possible introgression from non-native salmonids.

Identify habitat improvement opportunities for BVCT. Work with private landowners and management agencies to protect and improve habitat for BVCT.

Pursue conservation easements to protect habitat from development and other impacts.

Explore opportunities for treatment to remove non-native species for reintroduction and/or expansion of BVCT into presently unoccupied historical habitat. Conduct NEPA analysis as necessary.

Explore opportunities for removing or installing barriers for fish passage issues, and conduct barrier monitoring.

Expand the range of isolated populations by increasing connectivity between headwater streams and river systems.

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Review current stocking of sportfish, and if necessary and feasible, change stocking programs to protect current BVCT populations.

Pursue appropriate BVCT conservations outreach opportunities.

Monitor oil and gas exploration, timber harvest, grazing, and recreation activities on the Wasatch-Cache National Forest.

Review and analyze all culverts on the Wasatch-Cache National Forest for fish passage.

Accomplish non-native fish eradication (rainbow trout) in Swan Creek and re-introduce BVCT.

Monitor North Eden and Laketown Creeks to determine status of BVCT populations.

Mechanical removal of rainbow trout (electrofishing techniques) from St. Charles Creek. Continue to promote harvest of non-native brook trout through liberal limits and bait fishing.

Continue to explore ways to improve Bear Lake tributaries through habitat manipulations designed to maximize natural reproduction of BVCT.

Monitor the effectiveness of fish passage projects and reconnect tributaries on the Thomas Fork.

Work to address unscreened irrigation diversions and migration barriers on St. Charles Creek and Fish Haven Creek.

Work to restore BVCT populations in Bloomington Creek, Paris Creek, Georgetown

Creek, Bailey Creek, Cottonwood Creek, Williams Creek, and Trout Creek.

Monitor existing populations in First, Second and Third Creeks and evaluate opportunities to enhance habitat.

Complete BVCT surveys of the Nounan reach of the Bear River.

Investigate fish passage opportunities on FERC re-licensing of Bear River hydroelectric facilities.

Work to improve connectivity in Stauffer Creek.

Develop a brood source for the Upper Bear River Subunit.

2. Northern GMU (not necessarily in priority order)

Continue to monitor core and high priority conservation populations on a regular rotation based on monitoring schedule.

Conduct whirling disease (WD) monitoring and public outreach to inform the public and prevent the spread of WD.

Continue surveys for potential new BVCT populations and conduct genetic analysis to determine purity and/or assess any possible introgression from non-native salmonids.

Identify habitat improvement opportunities for BVCT. Work with private landowners and management agencies to protect and improve habitat for BVCT.

Pursue conservation easements to protect habitat from development and other impacts.

Explore opportunities for treatment to remove non-native species for reintroduction and/or expansion of BVCT into presently unoccupied

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historical habitat. Conduct NEPA analysis as necessary.

Explore opportunities for removing or installing barriers for fish passage issues, and conduct barrier monitoring.

Expand the range of isolated populations by increasing connectivity between headwater streams and river systems.

Review current stocking of sportfish, and if necessary and feasible, change stocking programs to protect current BVCT populations.

Pursue appropriate BVCT conservations outreach opportunities.

Accomplish Chalk Creek BVCT Fish Passage Improvement Project (Phase II). The BVCT population in Chalk Creek constitutes the largest metapopulations within the Bonneville Basin.

Monitor streams in Tooele, Davis and Salt Lake Counties on the Wasatch-Cache National Forest.

Review and analyze all culverts on the Wasatch-Cache National Forest for fish passage.

Maintain existing Little Dell Brood Source for re-establishment and maintenance of other Northern BVCT populations. Conduct annual egg taking operations.

Stock mountain lakes on the GMU with fish derived from Little Dell brood stock.

Conduct fish population surveys in Tie Fork, Little Deer Creek, North Fork American Fork, Dairy Fork, and Spencer Fork.

Monitor existing BVCT populations in Red Butte Reservoir and City Creek.

Evaluate the restoration potential of Little South Fork Provo River below Deer Creek Reservoir.

Conduct fish population surveys in Lost Creek and East Canyon Creek Drainage.

Monitor existing BVCT populations in Strawberry Creek, Gordon Creek, Hardscrabble Creek, Arthur Creek, and Lost Creek.

3. West Desert GMU (not necessarily in priority order)

Continue to monitor core and high priority conservation populations on a regular rotation based on monitoring schedule.

Conduct whirling disease (WD) monitoring and public outreach to inform the public and prevent the spread of WD.

Continue surveys for potential new BVCT populations and conduct genetic analysis to determine purity and/or assess any possible introgression from non-native salmonids.

Identify habitat improvement opportunities for BVCT. Work with private landowners and management agencies to protect and improve habitat for BVCT.

Explore opportunities for treatment to remove non-native species for reintroduction and/or expansion of BVCT into presently unoccupied historical habitat. Conduct NEPA analysis as necessary.

Explore opportunities for removing or installing barriers for fish passage issues, and conduct barrier monitoring.

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Expand the range of isolated populations by increasing connectivity between headwater streams and river systems.

Pursue appropriate BVCT conservations outreach opportunities.

Accomplish genetic verification for BVCT populations on Goshute Tribal Lands.

Monitor restored populations of BVCT to evaluate needs for supplemental stocking on Goshute Tribal Lands.

Survey BVCT restored reaches to determine genetic risks and install barriers as necessary on Goshute Tribal Lands.

Protect and maintain stream habitat conditions, with a focus on flow maintenance on Goshute Tribal Lands.

Enhance and restore habitat where feasible on Goshute Tribal Lands including fencing and instream habitat improvements.

Maintain existing brood ponds and spawning channels at Douglas Ranch (UT), Goshute Tribal Lands, and Hidden Canyon Ranch (NV) for supplemental stocking and reintroduction of BVCT.

Monitor and evaluate habitat/water quality conditions due to drought, groundwater extraction, and fire in Deep Creek Range (UT), North and South Snake Range (NV), Cherry Creek Range (NV), and Quinn Range (NV).

Conduct habitat restoration of the flood damaged reach of Big Wash.

Accomplish non-native fish eradication, barrier placement, and re-establishment of BVCT in Silver Creek on the North Snake

Range (NV). (Silver Creek is the last remaining stream on the North Snake Range to be restored).

Monitor BVCT populations in Basin Creek, Birch Creek, Trout Creek, Toms Creek, Red Cedar Creek, Indian Farms Creek, and Granite Creek. Accomplish supplemental stocking of BVCT as needed.

4. Southern GMU (not necessarily in priority order)

Continue to monitor core and high priority conservation populations on a regular rotation based on monitoring schedule.

Conduct whirling disease (WD) monitoring and public outreach to inform the public and prevent the spread of WD.

Continue surveys for potential new BVCT populations and conduct genetic analysis to determine purity and/or assess any possible introgression from non-native salmonids.

Identify habitat improvement opportunities for BVCT. Work with private landowners and management agencies to protect and improve habitat for BVCT.

Pursue conservation easements to protect habitat from development and other impacts.

Explore opportunities for treatment to remove non-native species for reintroduction and/or expansion of BVCT into presently unoccupied historical habitat. Conduct NEPA analysis as necessary.

Explore opportunities for removing or installing barriers for fish passage issues, and conduct barrier monitoring.

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Expand the range of isolated populations by increasing connectivity between headwater streams and river systems.

Pursue appropriate BVCT conservations outreach opportunities.

Reintroduce BVCT into Cottonwood Creek (Garfield County) (Impacted by fire).

Non-native fish eradication, barrier placement, and re-establishment of BVCT in Deer Creek (Garfield County), Fish Creek (Piute & Sevier County), North Creek (Beaver County), Pine Creek (Piute County), Pole Canyon/Three Creeks (Sevier County), and Shingle Creek/Upper Clear Creek (Piute & Sevier County).

Monitor BVCT populations in Oak Creek and Pleasant Creek.

Monitor BVCT populations on Pine Valley Mountain, Deep Creek, Center Creek, North Fork North Creek, and Birch Creek.

Brood stock maintenance and disease certification at Manning Meadow.

Accomplish NEPA compliance, non-native fish eradication, old barrier removal, barrier construction and re-establishment of BVCT in Upper Clear Creek (Sevier County).

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