Reintroduction of Bonneville Cutthroat Trout in Great Basin National Park

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Background

Bonneville cutthroat trout (*Oncorhyncus clarki utah*; BCT) are the only trout native to the east-central Great Basin and to Great Basin National Park. These trout lived in the extensive Lake Bonneville during the Pleistocene, but as water levels dropped, they moved into mountain streams to survive. During European settlement, intensive stocking of non-native salmonids, coupled with habitat degradation due to livestock overgrazing and water diversions, created harsh conditions for the native trout. Approximately 94% of the western populations were extirpated.

In 1999, a Bonneville Cutthroat Trout Reintroduction Management Plan was written to restore this native fish back into 18 of the 25 miles of historic habitat in Great Basin National Park streams, leaving the other miles as non-native recreational fishing areas.

Reintroduction Steps

1. Survey streams. Each potential stream is surveyed for macroinvertebrates, mollusks, amphibians, fish, physical habitat, and water quality to determine if any sensitive species or habitats are present that might need special attention.

2. Treatment. If the stream is deemed to be good habitat for BCT, the non-native fish are removed either using electrofishing or a piscicide (antimycin or rotenone).

3. Monitor. The effects of the treatment are monitored, in particular the recovery of macroinvertebrates.

4. Reintroduce BCT. Once macroinvertebrate populations have recovered to 75% of pre-treatment numbers and diversity, BCT are reintroduced.

5. Monitor. The new BCT populations are monitored to determine if subsequent reintroductions are needed and when the populations are sustainable.

Survey Streams

Before treatments could be completed, stream surveys were essential to document what species were present. Of particular interest was the Great Basin springsnail; the park had entered into a memorandum of understanding with several agencies to prevent Endangered Species Act listing of this species. Also, the presence of amphibians would necessitate careful scheduling of treatment to minimize any disturbance.

Highlights of the surveys include:

- A high diversity of macroinvertebrates from stream to stream and seasonally within streams.
- No amphibians found in the park.
- No sensitive mollusk species in the streams, including Great Basin springsnails. To date, four populations of Great Basin springsnails have been found in springs near the park boundary.
- Spawning period of BCT documented for the first time in the South Snake Range in 2002, with spawning occurring about 26 June–3 July when the average daily stream temperature reached nearly 12°C, with maximums near 14°C and minimums near 8°C. Spawning information was used in an attempt to boost BCT populations using streamside incubators. However, due to low streamflow, high sedimentation, and fungus growth, the streamside incubators were unsuccessful in 2002.

Treatment

Staff treated Strawberry Creek in 2002 with rotenone and Snake Creek in 2002 with antimycin. The park plans to treat the South Fork of Baker Creek in 2002–2004 by electrofishing.

Reintroduction

BCT have now been reintroduced into two streams: in 2000, the South Fork of Big Wash (three miles of habitat), and in 2002, Strawberry Creek (five miles of habitat in park, plus two miles outside park). BCT are expected to be reintroduced into four miles of Snake Creek in 2003. Anglers may fish for BCT, but are strongly encouraged to use catch-and-release techniques until the BCT populations become sustainable.

Monitoring

BCT monitoring first started in 2002 on the South Fork of Big Wash, where 56 BCT had been reintroduced in July 2000. This location was chosen because it had been fishless for at least 50 years, and aquatic surveys indicated plentiful nutrients and macroinvertebrates to support BCT.

A population survey found 31 BCT in an 85-m two-pass depletion survey. Two groups of fish were found: those longer than 160 mm, and those between 60–110 mm. The lack of fish in the 110–160 mm range is not fully understood, but could indicate that the smallest reintroduced fish did not survive, or that they grew very quickly and are part of the larger size classes. Young-of-the-year (YOY) had not yet emerged from spawning gravels, so were not identified. A flood in late September with excessive sedimentation may have eliminated the year's YOY. A spring population survey will be conducted to determine how the YOY fared.

Future Work

Future work includes continued monitoring of BCT populations to determine if supplemental reintroductions are needed and comparison of macroinvertebrate recovery rates after rotenone and antimycin treatments.

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