

ENVIRONMENTAL ASSESSMENT
WESTSLOPE CUTTHROAT TROUT RECOVERY
INTRODUCTION OF WESTSLOPE CUTTHROAT TROUT
INTO UPPER FOURMILE CREEK

I. Description of proposed action

A. Description of water body and action.

Name: Fourmile Creek Location: T9N R8E S33
Water Code: 17-2816
County: Meagher

Westslope cutthroat trout (WCT) *Onchorhynchus clarki lewisi* will be introduced into a fishless area above waterfall barriers on Fourmile Creek, a tributary to the Smith River. Genetically pure WCT from Richardson Creek, a tributary to Fourmile Creek, are proposed as the donor source for introduction above the falls.

Fourmile Creek flows into the North Fork of the Smith River. Trout species in the North Fork of the Smith River include brown trout *Salmo trutta*, eastern brook trout *Salvelinus fontinalis* (EB) and rainbow trout *Oncorhynchus mykiss* (Montana Rivers Information System, Internet, February 3, 2000). Fourmile Creek is typically isolated from the North Fork of the Smith River by a dry reach approximately 4 miles long. During spring flood events Fourmile Creek may flow all the way to the North Fork. WCT and EB are found in Fourmile Creek. The WCT are a hybridized population (N=32) of 96% WCT and 4% Yellowstone cutthroat trout *Oncorhynchus clarki bowieri* (Kanda and Leary 1999). Richardson Creek contains genetically pure WCT, N=50 (Kanda 2000) and EB in about 2 miles of habitat. Richardson Creek trout habitat is very limited due to small stream size and grazing impacts in the upper reach. Richardson Creek is separated from Fourmile Creek by a series of cascades that are probably not complete fish barriers at high flows.

Surveys conducted by the USFS have identified a 5 foot high barrier falls located on Fourmile Creek on National Forest System Lands about 4 miles above the dry barrier (Michael Enk 2000, personnel communications). About 3 miles of suitable, but currently fishless, WCT habitat exists above the barrier (Michael Enk 2000, personnel communication). A second falls is located a few hundred yards above the first barrier falls. Forty to 50 WCT will be transferred annually from Richardson Creek to Fourmile Creek in 2000 and 2001. These numbers should be sufficient to prevent a genetic founder effect, which requires a minimum total transfer of 25 males and 25 females (Allendorf and Ryman 1987, Leary et al. 1998). Sex ratios and mortality of the transferred WCT will not be determined so a total of 80 - 100 WCT will be transplanted.

B. Need for Action

The decline of the WCT is well documented. It is a Class A Species of Special Concern in Montana and has been petitioned for listing as a federally threatened species. Genetically pure WCT are thought to occupy about 5 - 13% of their aboriginal range in the Missouri River system and most

populations occupy less than 6 miles of habitat (Shepard et al. 1997). Land use practices and non-native trout are major factors influencing WCT decline (Shepard et al. 1997). A model of 144 populations found 71% had a very high risk of extinction. In the model, very high extinction risk meant the probability of a population lasting 100 years was less than 50% (Shepard et al. 1997). To expedite WCT conservation the State of Montana has developed a Memorandum of Understanding and Conservation Agreement for WCT (MOUWCT) with several other groups and agencies to provide direction in conserving WCT populations (MFWP 1999). The Richardson Creek population is one of six known pure WCT populations remaining in the Smith drainage (Lewistown, MFWP, data files, Tews et al. in preparation). One of these populations (Deadman Creek) is thought to have become extinct in the past 10 years. Each population occupies less than 5 miles of habitat. The Richardson Creek WCT population occupies only 2 miles of limited habitat. One objective of the MOUWCT is to protect all existing genetically pure populations (MFWP 1999). The extinction risk for the Richardson Creek WCT population is very high, due to extremely limited habitat, likely connectivity with slightly hybridized WCT, EB competition and grazing impacts. Transfer of Richardson Creek WCT into upper Fourmile Creek will decrease the likelihood of extinction of the Richardson Creek population because habitat quality and quantity are much better in upper Fourmile Creek than in Richardson Creek. Even more importantly, the waterfall barriers will protect WCT in upper Fourmile Creek from introgression and non-native trout competition. The Richardson Creek population will also be duplicated. Replication of WCT populations is a recommended method to reduce extinction risk for individual populations (MFWP 1999).

Michael Enk (USFS) and crew have conducted 4 sampling trips of Richardson Creek from 1996 - 1999 (USFS files). About 25 to 60 WCT per 1000 feet were sampled during these one-pass electrofishing efforts. In September 1999, captured WCT ranged from 1.6 inches (YOY) to almost 9 inches in total length. There were about 25 WCT greater than 3.5 inches long (age 1 or older) per 1000 feet of stream. Shocking at base flow in clear water in a stream of this size with good instream cover is probably about 70% effective. That assumption results in an estimated population of about 35 age 1 or older WCT per 1000 feet. Richardson Creek has about 2 miles of WCT habitat and therefore approximately 370 WCT in the population. This number assumes that WCT are distributed evenly throughout Richardson Creek, and overlooks the variability found during recent sampling efforts when fish densities often varied by a factor of 2. Therefore, a reasonable general estimate would be about 200 – 700 WCT. As an interim measure to protect the Richardson WCT population, EB were removed by electrofishing in Richardson Creek in 1999. Continued EB removal is planned for at least two years after the transfer is completed to allow the Richardson Creek WCT population to rebuild itself with less EB competition and predation.

II. Impacts of the proposed action

Please review the attached checklist. The impacts of this action are included in the Environmental Assessment checklist. The following text addresses the impacts.

A. Impacts to the Physical Environment

1) Terrestrial and Aquatic Habitat

The proposed project will transfer WCT from Richardson Creek to upper Fourmile Creek. Richardson Creek is a tributary of Fourmile Creek. Several mitigation measures have been

taken to reduce potential impacts to the aquatic habitat. These include disease and genetic testing and amphibian and aquatic insect surveys. The MFWP wild fish transfer policy will be followed and WCT will not be transferred until approved by the MFWP Fish Health Committee.

Disease testing: Disease testing of 10 WCT and 25 EB collected from Richardson Creek on May 4, 1999 was recently completed. Fourmile Creek trout already have the potential to be exposed to diseases found in Richardson Creek trout. All disease tests were negative except for bacterial kidney disease (BKD) which was positive by Elisa. A positive Elisa result for BKD was also found in trout from Fourmile Creek sampled on August 20, 1998 (Jim Peterson 2000, personal communications). Positive BKD Elisa readings have been found on several Montana streams (Jim Peterson 2000, personal communications).

Genetic Purity: Fifty WCT sampled on 5/4/1999 and 9/28/1999 from Richardson Creek were tested for genetic purity using PINEs PCR tests. Kanda (2000) concluded that the Richardson Creek population is pure. Fifty fish were sampled based on the recommendations of the WCT technical committee (Leary et al. 1998).

Aquatic Invertebrates: On October 20, 1998 Dr. Dan Gustafson and Michael Enk collected aquatic insects from Fourmile Creek, above and below the fish barrier. Dr. Gustafson found that the samples were very similar above and below the barrier, found no endangered species and found no reason why the fish introduction should not occur. The aquatic insects sampled are listed in Table 1.

Amphibians: On July 1, 1999, a Forest Service crew conducted an amphibian survey of upper Fourmile Creek. No amphibians or amphibian breeding sites were found (Enk 2000). In the headwaters region, the riparian zone is limited to a very narrow valley bottom with low habitat value for amphibians. Furthermore, the only species of amphibian known to occur in this part of the Castle Mountains, the Columbia spotted frog, has co-evolved with native cutthroat trout and commonly occurs along other westslope cutthroat trout streams (Michael Enk 2000, personnel communication).

Based on the above surveys it is very unlikely that disease will be transferred, that the genetic integrity of the 96% pure WCT population in Fourmile Creek will be further compromised or that amphibians or rare aquatic invertebrates will be impacted. Richardson Creek fish already have access to the lower Fourmile Creek population. This transfer should simply increase the numbers of genetically pure WCT in the Fourmile Creek drainage, which is a positive benefit for WCT.

2) **Unique, endangered, fragile or limited environmental resources.**

This proposed action should benefit WCT. WCT are a species of special concern in Montana and have been petitioned for listing as a federally threatened species. This action will increase the amount of WCT habitat in the Castle Mountains and replicate a pure WCT population that has a very high risk of extinction. Assuming a minimum population size of 200 WCT it is unlikely that removal of a total 80 – 100 WCT over a two-year period will have long term impacts on the WCT population in Richardson Creek. To help protect this WCT population

EB will continue to be removed by electrofishing in Richardson Creek for at least two years after the transfer is completed. This will limit EB competition with WCT in Richardson Creek until WCT numbers return to pre-transfer levels. Future hybridization between Richardson Creek and Fourmile Creek WCT is possible. To reduce the likelihood of transferring slightly hybridized fish into upper Fourmile Creek, transfers will be completed by November 2001.

B. Impacts to the Human Environment

1) Agricultural or Industrial production

The Forest Service revised the livestock management plans for the Castle Mountains in 1997 and established new direction for reducing grazing impacts on WCT streams, including Fourmile Creek. However, the upper reach of Fourmile Creek where WCT will be introduced is not considered suitable range and has no allotment on it. There should be no effects on grazing from this action.

2) Access to and Quality of Recreational Activities

The proposed action could improve catch and release fishing opportunities by increasing fishable stream length by about 3 miles in Fourmile Creek.

3) Demands on Government Services

This action will be undertaken by fisheries staff as part of normal field operations. Other fisheries projects may be postponed due to the fish transfer. Much of the work for this transfer has already been completed. It is anticipated that it will take a four person fisheries crew about six days to complete the WCT transfer and complete EB removal during the two-year project period.

III. Discussion of Reasonable Alternatives

1) No Action

The upper 3 miles of Fourmile Creek would remain fishless and there is a high likelihood that the genetically pure Richardson Creek WCT will become extinct. There would be no additional costs associated with introduction.

2) Introduction of WCT from other populations

The Richardson Creek population is at a high risk of extinction. Use of a different population would not preserve this genetic stock. Fourmile Creek may have some connectivity to Richardson Creek and was likely the aboriginal source of the pure WCT population that survives there. The WCT technical committee has recommended that WCT introductions should be done using WCT from connected populations (Leary et al. 1998). No other pure WCT populations are connected to the Fourmile Creek drainage (Michael Enk 2000, personal communications). It would take a minimum of one year, with additional funds, to test a

different wild WCT population for transfer into upper Fourmile Creek. Use of Montana's WCT brood stock would prevent using upper Fourmile Creek for future replications of WCT populations east of the divide.

III. Environmental Assessment Conclusion Section

- 1) **Is an EIS required?** No the action is expected to be minor and beneficial.

References

- Allendorf, F. W. and R. F. Leary. 1988. Conservation of distribution of genetic variation in a polytypic species the cutthroat trout. *Conservation Biology* 2: 170- 184.
- Enk, Michael. 2000. Fisheries Biologist, Lewis and Clark National Forest. Fisheries and amphibian surveys,1996-1999. Great Falls, MT.
- Kanda, Naohisa. 2000. University of Montana genetic report letter dated 1/10/2000.
- Kanda, N. and R. Leary. 1999. University of Montana genetic report letter dated 2/4/1999.
- Leary, R. F., B.B. Shepard, B. W. Sanborn. W. P. Dwyer, J. A. Brammer, R. A. Oswald, A. Tews, D. Kampwerth, M. Enk, R. Wagner and L. Kaeding. Genetic Conservation of the Westslope Cutthroat Trout in the Upper Missouri River Drainage. Prepared by the Upper Missouri Westslope Cutthroat Trout Committee.
- Montana Department of Fish, Wildlife and Parks. 1999. Memorandum of Understanding and Conservation Agreement for Westslope Cutthroat Trout in Montana. Helena, Montana.
- Peterson, Jim. 2000. Montana Department of Fish, Wildlife & Parks. Fish Health Coordinator. Great Falls, MT
- Shepard, B. B., B. Sanborn, L. Ulmer and D.C. Lee. 1997. Status and risk of extinction for westslope cutthroat trout in the upper Missouri River Basin. *North American Journal of Fisheries Management* 17:1158-1172.
- Tews, A., M. Enk, W. Hill, S. Dalbey, G. Liknes and S. Leathe. In preparation. Region 4 Westslope Cutthroat trout Restoration Opportunities. Montana Fish, Wildlife and Parks and U. S. Forest Service.

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Environmental Assessment Checklist

Project: Upper Fourmile Creek Westslope Cutthroat Trout Introduction

Division: Fisheries Division

Description of Project: Westslope cutthroat trout will be introduced into a fishless area above a waterfall barrier on Fourmile Creek, a tributary to the Smith River. Fourmile Creek is isolated from the Smith River System by a dry stream reach. Genetically pure westslope cutthroat trout will be transferred from Richardson Creek, a tributary of Fourmile Creek.

Potential Impact on the Physical Environment

	MAJOR	MODERATE	MINOR	NONE	UNKNOWN	COMMENTS ON ATTACHED PAGES
1. Terrestrial & aquatic life and habitats			X			X
2. Water quality, quantity & distribution				X		
3. Geology & soil quality, stability and moisture				X		
4. Vegetative cover, quantity & quality				X		
5. Aesthetics				X		
6. Air quality				X		
7. Unique, endangered, fragile or limited environmental resources		X				X
8. Demands on environmental resources of land, water, air & energy				X		
9. Historical & archaeological sites				X		

Potential Impacts on the Human Environment

	MAJOR	MODERATE	MINOR	NONE	UNKNOWN	COMMENTS ON ATTACHED PAGES
1. Social structures & mores				X		
2. Cultural uniqueness & diversity				X		
3. Local & state tax base & tax revenue				X		
4. Agricultural or industrial production				X		X
5. Human health				X		
6. Quantity & distribution of community & personal income				X		
7. Access to & quality of recreation and wilderness activities			X			X
8. Quantity & distribution of employment				X		
9. Distribution and density of population & housing				X		
10. Demands for government services				X		X
11. Industrial and commercial activity				X		
12. Demands for energy				X		
13. Locally adopted environmental plans & goals				X		
14. Transportation networks & traffic flow				X		

Other groups or agencies contacted or which may have overlapping jurisdiction: U.S. Forest Service

List of Individuals or groups contributing to this EA: Michael Enk, Fisheries Biologist, Lewis and Clark National Forest, Jay Frederick, Biologist, Lewis and Clark National Forest, Jim Petersen and Ken Staigmiller, MFWP, fish disease lab.

List of all agencies and individuals who have been notified of this proposed transfer: Notification will be done via the State of Montana electronic bulletin board. Copies of EA will be sent to members of the Interagency WCT Technical Committee and to the WCT steering committee members.

Recommendation concerning preparation of EIS: No EIS Required. Action Expected to be minor.

EA prepared by: Anne Tews, Fisheries Biologist, Date: March 1, 2000

Comments will be accepted until: April 14, 2000.

Comments should be sent to: Anne Tews, MFWP, P.O. Box 938, Lewistown, MT 59457