ENVIRONMENTAL ASSESSMENT DECISION NOTICE

WESTSLOPE CUTTHROAT TROUT ENHANCEMENT THROUGH RAINBOW AND HYBRID TROUT REMOVAL

June 5, 2023

Background and Description of Proposed Project

Westslope cutthroat trout are one of the handful of native fish species that has adapted over thousands of years to conditions in the Flathead River system. However, the relatively recent introduction of non-native species like rainbow trout seriously threaten the persistence of native cutthroat trout through hybridization (interbreeding) and competition for resources.

Currently, genetically unaltered westslope cutthroat trout exist in less than 10% of their historic range in the United States and less than 20% of their historic range in Canada. In response to these significant population declines, Montana Fish, Wildlife & Parks (FWP) and the American Fisheries Society classified westslope cutthroat trout as a species of special concern, and the U.S. Forest Service and Bureau of Land Management classified them as a sensitive species. Additionally, a collaborative agreement between resource management agencies, tribes, private organizations, user groups, and landowners was developed to provide guidance on conservation of westslope cutthroat trout throughout its range (FWP 2007).

Within Montana, the South Fork of the Flathead River drainage upstream of Hungry Horse Dam makes up about half of the remaining large, interconnected habitat for genetically unaltered westslope cutthroat trout. The North and Middle forks of the Flathead represent a substantial portion of remaining populations in the state. This project addresses management of only those populations of westslope cutthroat trout found in the mainstem, Middle Fork, and North Fork of the Flathead River, and certain tributaries to these rivers, through removal of non-native rainbow and hybrid cutthroat-rainbow trout (referred to as hybrids hereafter).

FWP acknowledges that hybridization will always exist within the mainstem, Middle Fork, and North Fork of the Flathead River, and certain tributaries to these rivers. However, FWP believes that minimizing the spread of hybridization and reducing its impacts to remaining genetically unaltered westslope cutthroat trout as well as low-level (less than 10%) hybridized populations is a realistic and important goal in the long-term effort to protect this native species.

To address this goal, FWP identified success measures in the 2013 EA for this work to inform future westslope cutthroat trout conservation strategies in the affected river system. These measures included minimizing the spread of hybridization and reducing hybrid and rainbow trout at targeted sources. In evaluating these metrics, FWP used research that it and its partners have conducted to better understand how hybridization spreads in the affected river system. By tracking fish to their spawning areas using radio telemetry and by studying the genetic structure of fish across the drainage, FWP has learned how to be most efficient and effective in stemming the loss of westslope cutthroat trout populations. Since that research was first conducted in the early 2000s, FWP has removed hybrid and rainbow trout by electrofishing and trapping in five key spawning streams that have largely contributed to their spread. These tributaries include Third, Ivy, Rabe, Sekokini, and Abbot creeks. A reference list of all prior studies on the subject within the affected river system is included as Attachment A to the 2023 EA.

Since 2013, FWP repeated radio telemetry research and updated the genetic information gained during the early 2000s to evaluate progress associated with removing hybrids from source streams. Results of these studies address success measures identified in the 2013 EA for this work, with the following observations in the affected river system as compared to pre-2013 (supporting data and detailed summaries of each bullet below can be found in Attachment B to the 2023 EA):

- A reduced rate of hybrid trout expansion from downstream sources (Table 1, Attachment B).
- A declining number of spawning adults in suppressed hybrid source streams (Figures 1 and 2, Attachment B).
- An increase in the number of westslope cutthroat trout encountered at suppressed hybrid source streams (Figure 3, Attachment B).
- An increase in the proportion of westslope cutthroat trout genetic composition in targeted hybrid source streams (Table 2, Attachment B).
- 53% fewer hybrids and rainbow trout spawning in tributaries targeted for suppression, with more fish spawning in the mainstem Flathead River (Figure 4, Attachment B).
- A 19% average increase in angler catch rates for westslope cutthroat trout during 2015 and 2016 as compared to 2002 and 2003 (Tables 4 and 5, Attachment B).
- A more than doubling of the average proportion of anglers specifically targeting westslope cutthroat trout over rainbow trout upstream of the Stillwater River confluence during 2015 and 2016 as compared to 2002-2003 (Tables 6 and 7, Attachment B).

This project would incorporate lessons learned from past similar actions in FWP's ongoing effort to conserve native westslope cutthroat trout by reducing negative impacts from non-native rainbow and hybrid trout in the affected river system. FWP will continue to monitor the efficacy of the proposed project by tracking the distribution of hybridization in the affected river system, the population genetic structure in streams targeted for suppression, and the relative number of spawning hybrid and rainbow trout captured at targeted sources.

Project Purpose and Need

FWP will help to protect and benefit native westslope cutthroat trout by continuing to remove hybrid and rainbow trout from the mouths and channels of Abbot, Sekokini, Rabe, Ivy, and Third creeks in the Middle and the North forks of the Flathead River. Trapping and electrofishing will be used to catch fish during their spawning season (April-May), with subsequent relocation to a nearby community fishing pond, conditions permitting. Trapping begins annually in March when stream flows are low and trap installation is most feasible and safe. Electrofishing begins when river flows permit safe and effective operation of a jet boat, typically during April. Hybrid and rainbow trout captured on the final night of a multi-night winter (February/March) population estimate will also be relocated to a nearby community fishing pond. Further, FWP will electrofish between July and September to remove hybrid and rainbow trout offspring from identified target tributaries.

Within the affected area, the proposed work will benefit westslope cutthroat trout, any person who enjoys fishing for them or otherwise values their existence, the State of Montana, and the ecosystem in which they reside by helping to:

- Mitigate the loss of traits that have evolved locally in westslope cutthroat trout. These traits have helped native cutthroat thrive in the affected environment for thousands of years.

- Retain the ecosystem role served by westslope cutthroat trout, potentially avoiding adverse impacts to other organisms including insects, other fish, birds, and mammals that may result if hybrids and rainbow trout replace cutthroat completely.
- Maintain westslope cutthroat trout as a valued sportfish in the area affected by the proposed project, avoiding unacceptable social and economic impacts associated with losing the opportunity to fish for them.
- Reduce the likelihood of federal Endangered Species Act (ESA) listing and protection of westslope cutthroat trout. ESA listing could limit public opportunity to fish for and otherwise interact with and enjoy this native fish species.
- Protect Montana's state-designated fish, preventing further adverse impact to the affected populations and safeguarding against adverse impact to Montana's cultural values associated with the species.

Alternatives Analyzed

In addition to the proposed Project, and as required by MEPA, FWP analyzed the "no-action" alternative in this EA. Under the "no action" alternative, this project would not occur. Therefore, no additional impacts to the physical environment or human population in the analysis area would occur. The "no action" alternative forms the baseline from which the potential impacts of this project can be measured.

Rainbow trout and hybrids would not be removed from known tributary source populations within the affected area of the Flathead River system. Over time, the likely result of the "no-action" alternative would be a more rapid increase in rainbow trout hybridization and further loss of westslope cutthroat trout conservation populations (those less than 10% genetically altered) resulting from the expansion of hybrid trout from source populations. A resulting reduction in the range of westslope cutthroat trout could lead to listing under the Endangered Species Act, changing state management of the species and likely limiting public opportunity to fish for and otherwise interact with and enjoy this native fish species. It is possible that under this alternative, nonhybridized westslope cutthroat trout would eventually become locally extinct (extirpated) in the connected portions of the North Fork, Middle Fork, and mainstem of the Flathead River system altogether.

This action would not achieve a primary goal of FWP's Fisheries Division, which is "to protect, maintain, and restore native fish populations and their genetic diversity." This goal is backed by FWP policy and state law, which require FWP to "implement programs that manage sensitive species in a manner that assists in the maintenance or recovery of those species, and that prevents the need to list the species under ESA" (FWP 2018).

This alternative also would not meet the primary goals of the collaboratively-developed Memorandum of Understanding for Yellowstone Cutthroat Trout and Westslope Cutthroat Trout in Montana (FWP 2007), which include: 1) ensuring the long-term, self-sustaining persistence of each subspecies distributed across their historical ranges as identified in recent status reviews (Shepard et al. 2003; Shepard et al. 2005; May et al. 2003), 2) maintaining the genetic integrity and diversity of nonhybridized populations, as well as the diversity of life histories, represented by remaining cutthroat trout populations, and 3) protecting the ecological, recreational, and economic values associated with each subspecies.

Further, it is unknown exactly how hybrids and rainbow trout perform compared to the westslope cutthroat trout populations that evolved within the local environmental conditions of the Flathead River system. However, numerous studies have documented a range of negative impacts resulting from an increase in the amount of rainbow trout hybridization, including a decline in the number of offspring produced (Muhlfeld et al. 2009a, 2009b, 2009c; Kovach et al. 2015, 2016; Strait et al. 2021).

Public Review Process

FWP is required by the Montana Environmental Policy Act (MEPA) to assess significant potential impacts of a proposed action to the human and physical environment. In compliance with MEPA, a checklist environmental assessment (EA) was completed for the proposed project by FWP and released for public comment on February 3, 2023. Comments were solicited for 15 days in accordance with FWP Policy for MEPA Checklist EAs. Legal notices regarding the proposed project were published in the Flathead Beacon and Hungry Horse News and posted on the FWP website. A news release was distributed to local media outlets and the work was discussed during an interview with a reporter from the Daily Inter Lake. The EA notice was emailed to 22 individual and group recipients and mailed to 4 individual and group recipients.

Public Comments

Ten comments were received from private citizens and public groups. Six of these comments were supportive of the proposed project, two were opposed, and two were not directed toward the project specifically.

Supportive comments (6): These comments generally supported native species conservation, the unique recreational and ecological value of westslope cutthroat trout in Montana and locally, and the scientifically sound nature of the project.

Unsupportive comments (2): One commenter supported westslope cutthroat trout conservation but felt that FWP should focus on lake trout and northern pike suppression rather than rainbow trout. Another commenter did not wish for FWP to use resources to change the fisheries we currently have.

> **FWP response:** FWP acknowledges that lake trout and northern pike adversely impact westslope cutthroat trout in the upper Flathead River system. FWP has responded to these nonnative threats through liberal angling regulations and support of lake trout removal through the Mack Days angler incentive program in collaboration with the Confederated Salish and Kootenai Tribes. Further, FWP maintains that as long as *Mysis* shrimp support the lake trout population in Flathead Lake, anglers' license dollars and other funds should be first invested in protecting and restoring upstream habitat and associated population resilience. FWP does not currently support suppression of northern pike in the Flathead River upstream of Flathead Lake due to insufficient social and financial support as well as logistical and bull trout bycatch concerns. Most notably, however, FWP asserts that hybridization and competition with nonnative rainbow trout pose the greatest threats to the persistence of genetically unaltered westslope cutthroat trout in the upper Flathead River system. This project will continue to meaningfully address this threat, in conjunction with other ongoing conservation efforts aimed at supporting and restoring our state fish.
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> In response to the desire to leave existing fisheries unchanged, FWP restates that the primary goal of its Fisheries Division is "to protect, maintain, and restore native fish populations and their genetic diversity." This goal is backed by FWP policy and state law, which require FWP to "implement programs that manage sensitive species in a manner that assists in the maintenance or recovery of those species, and that prevents the need to list the species under ESA" (FWP 2018).

Decision Notice

In accordance with the MEPA process, a decision must be rendered by FWP which addresses the concerns and issues identified for this proposed action. I find there to be no significant impacts on the human and physical environments associated with this project. Therefore, I conclude that the checklist EA was the appropriate level of analysis, and that and EIS is not required.

Upon reviewing the EA and public comment, I accept the proposal to enhance westslope cutthroat trout through rainbow and hybrid trout removal as final.

Sincerely,

Lee Anderson

Lee Anderson
Region One Supervisor

Relevant Resources

Al-Chokhachy R, Muhlfeld CC, Boyer MC, Jones LA, Steed AC, Kershner JL. 2014. Quantifying the effectiveness of conservation measures to control the spread of anthropogenic hybridization in stream salmonids: a climate adaptation case study. N. Am. J. Fish. Manag. 34, 642–652. (doi:10.1080/ 02755947.2014.901259)

Bourret SL, RP Kovach, TJ Cline, JT Strait, CC Muhlfeld. 2022. High dispersal rates in hybrids drive expansion of maladaptive hybridization. Proc. R. Soc. B 289, 20221813. (doi:10.1098/rspb.2022.1813)

Boyer MC, Muhlfeld CC, Allendorf FW. 2008. Rainbow trout (Oncorhynchus mykiss) invasion and the spread of hybridization with native westslope cutthroat trout (Oncorhynchus clarkia lewisi). Can. J. Fish. Aquat. Sci. 65, 658–669. (doi:10.1139/f08-001)

Dangora AJ. 2022. Evaluating the management and consequences of hybridization between rainbow trout and native westslope cutthroat trout. Master's Thesis. University of Montana, Missoula.

Deleray M. 2004. Flathead River angler creel report 2002-2003: Mainstem river and slough. Report of Montana Fish, Wildlife & Parks, Kalispell.

Drinan DP, Webb MAH, Naish KA, Kalinowski ST, Boyer MC, Steed AC, Shepard BB, Muhlfeld CC. 2015. Effects of hybridization between nonnative Rainbow Trout and native Westslope Cutthroat Trout on fitness-related traits. Trans. Am. Fish. Soc. 144(6), 1275-1291. (doi:10.1080/00028487.2015.1064475)

Hitt NP, Frissell CA, Muhlfeld CC, Allendorf FW. 2003. Spread of hybridization between native westslope cutthroat trout, Oncorhynchus clarki lewisi, and nonnative rainbow trout, Oncorhynchus mykiss. Can. J. Fish. Aquat. Sci. 60, 1440–1451. (doi:10.1139/f03-125)

Kovach RP, Muhlfeld CC, Boyer MC, Lowe WH, Allendorf FW, Luikart G. 2015. Dispersal and selection mediate hybridization between a native and invasive species. Proc. R. Soc. B. 282, 20142454. (doi:10.1098/rspb.2014.2454)

Kovach RP et al. 2016. Vive la résistance: genomewide selection against introduced alleles in invasive hybrid zones. Proc. R. Soc. B 283, 20161380. (doi:10.1098/rspb.2016.1380)

Kovach RP, Leary RF, Bell D, Painter S, Lodmell A, Whiteley AR. 2022. Genetic variation in westslope cutthroat trout reveals that widespread genetic rescue is warranted. Can. J. Fish. Aquat. Sci. 79, 936–946. (doi:10.1139/cjfas-2021-0102)

Lowe WH, Muhlfeld CC, Allendorf FW. 2015. Spatial sorting promotes the spread of maladaptive hybridization. Trends Ecol. Evol. 30, 456–462. (doi:10.1016/j.tree.2015.05.008)

Montana Fish, Wildlife & Parks. 2007. Memorandum of understanding and conservation agreement for westslope cutthroat trout and Yellowstone cutthroat trout in Montana. Helena, Montana.

Muhlfeld CC, Kalinowski ST, McMahon TE, Taper ML, Painter S, Leary RF, Allendorf FW. 2009a. Hybridization rapidly reduces fitness of a native trout in the wild. Biol. Lett. 5, 328–331. (doi:10.1098/rsbl.2009.0033)

Muhlfeld CC, McMahon TE, Belcer D, Kershner JL. 2009b. Spatial and temporal spawning dynamics of native westslope cutthroat trout, *Oncorhynchus clarkii lewisi*, introduced rainbow trout, *Oncorhynchus mykiss*, and their hybrids. Can. J. Fish. Aquat. Sci. 66, 1153–1168. (doi:10.1139/F09-073)

Muhlfeld CC, McMahon TE, Boyer MC, Gresswell RE. 2009. Local habitat, watershed, and biotic factors influencing the spread of hybridization between native westslope cutthroat trout and introduced rainbow trout. Trans. Am. Fish. Soc. 138, 1036–1051. (doi:10.1577/T08-235.1)

Muhlfeld CC, Thorrold SR, McMahon TE, Marotz B. 2012. Estimating westslope cutthroat trout (*Oncorhynchus clarkii lewisi*) movements in a river network using strontium isoscapes. Can. J. Fish. Aquat. Sci. 69, 1–10. (doi:10.1139/f2011-128)

Muhlfeld CC, Kovach RP, Jones LA, Al-Chokhachy R, Boyer MC, Leary RF, Lowe WH, Luikart G, Allendorf FW. 2014. Invasive hybridization in a threatened species is accelerated by climate change. Nat. Clim. Change 4, 620–624. (doi:10.1038/nclimate2252)

Muhlfeld CC, D'Angelo VS, Downs C, Powell JD, Amish SJ, Luikart G, Kalinowski ST. 2016. Genetic status and conservation of westslope cutthroat trout in Glacier National Park. Trans. Am. Fish. Soc. 145, 1093–1109. (doi:10.1080/00028487.2016.1173587)

Muhlfeld CC et al. 2017. Legacy introductions and climatic variation explain spatiotemporal patterns of invasive hybridization in a native trout. Glob. Change Biol. 23, 4663–4674. (doi:10.1111/gcb. 13681)

Shepard BB, May BE, Urie W. 2005. Status and conservation of Westslope Cutthroat Trout within the Western United States. N. Am. J. Fish. Manag. 25, 1426–1440. (doi:10.1577/M05-004.1)

Steed AC, Hunt R. 2020. Mainstem Flathead River angler survey 2015-2016. Report of Montana Fish, Wildlife & Parks, Kalispell.

Steed AC, Bourret S, Ingelfinger F, Hunt R, Lamont A, Fried L, Schnee M, Deraleau J, Boyer M. 2021. Annual report of the Hungry Horse Mitigation Program, 1/1/2020-12/31/2020 Annual Report, 1991-019-03.

Strait JT, Eby LA, Kovach RP, Muhlfeld CC, Boyer MC, Amish SJ, Smith S, Lowe WH, Luikart G. 2021. Hybridization alters growth and migratory life history expression of native trout. Evol. Appl. 14, 821–833. (doi:10.1111/eva.13163)