

***Objection to the High Uintas Wilderness – Colorado River Cutthroat Trout
Habitat Enhancement FEIS and Decision, Roosevelt/Duchesne Ranger District,
Ashley National Forest, Duchesne County***

Contacts Listed for the Decision: Ron Brunson Fisheries Biologist and Kristy Groves District Ranger

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Credentials: I am a researcher who has worked on lake ecosystems in the Uinta Mountains for more than 20 years. I have published on my findings in peer-reviewed journals. Further details of credentials are provided in my original comments on the DEIS, which are included in the FEIS.

Relevant background Information: I submitted my comments on the DEIS Dec. 2013. I received a response in the FEIS to those comments July 23, 2019 and was given 45 days to respond to the FEIS document. I have done the best to state my objection as clearly as possible, but 45 days, particularly in the middle of the summer was not adequate time to carefully review and consider material that I last thought about almost 6 years ago. There are many more points I would have liked to have made, but simply ran out of time. I would also note that I did not have access to the Courtwright and Miller (2016) report in 2013.

Summary

The proposed project is aimed at protecting the endangered Colorado River Cutthroat Trout (CRCT), which is a worthy goal. The proposed project, however, poses risk to aquatic species and overall ecosystem health and integrity. Although I appreciate the responses to my concerns, I strongly object to the decision to use rotenone to remove fish in the High Uinta Wilderness (HUW) to “enhance” CRCT habitat. My main objection continues to be that the project does not abide by the intent of Public Law 98-248 Wilderness Act of Utah (Public Law 98-248). The proposed project does not protect the “1) natural conditions and wilderness character or “wildness”; and the 2) ecological health and integrity” of the UHW. The FEIS states (pg. 81) that “an EPA (2006) study found that while risks to terrestrial wildlife and plants were insignificant when rotenone was applied as a piscicide, ***risks to non-target aquatic organisms could be significant.***” This finding is supported by data collected from the Sheep Creek drainage, in the Ashley Forest, that show that rotenone applications resulted in a decrease in aquatic macroinvertebrate species diversity. Loss of species diversity or changes in community composition of macroinvertebrates or zooplankton poses risks to food webs (including CRCT) and ecological integrity. And therefore, does not abide Public Law 98-248. No evidence is presented to show that removal of non-native trout has been successful in previous rotenone applications in the Ashley Forest and no evidence is provided to show that CRCT have been successfully reintroduced following rotenone applications. Rotenone was applied in Sheep Creek in 2012, seven years ago. Presumably, if this project

had been successful, these results would be featured in the FEIS as "proof-of-concept". If non-native fish cannot be successfully removed and CRCT cannot be reintroduced, arguments that the proposed project adheres to the Wilderness Act are void. The effects of climate change have not been fully considered; such consideration would help to target drainages where the re-introduction of CRCT is most likely to be successful. The added risk of climate change has been only considered cursorily. The FEIS fails to provide adequate planning for rotenone use and evidence that rotenone concentrations can be maintained below 50 ppb. I am not convinced that it is possible to apply rotenone and abide by the general prohibitions and special orders. Finally, the FEIS remains vague about how "success" will be assessed. Such assessment is critical to ensure protections of aquatic species, meeting legal requirements, and the long-term success of the project.

Although some of the responses to my comments and additions to the FEIS are reassuring, I find there is an overall lack of evidence to support the proposed project. Arguments for my position against the decision remain the same as I previously provided and are described below under five general themes: 1) risk to aquatic species, 2) lack of evidence that "enhanced habitat" will protect CRCT; 3) inadequate consideration of climate change; 4) failure to provide adequate plans to ensure that application of rotenone meets all legal requirements, and 5) lack of details on assessment of the success of the project. My previous comments are included in the FEIS.

1. Risks of rotenone application on macroinvertebrates and other aquatic species

First, using rotenone will endanger aquatic species, maybe even threatened or endangered species (see my comments in FEIS 13a, b, s). The USFS decision states that the FEIS "specifically states that the Proposed Action could result in the loss of individual macroinvertebrate taxa in waters targeted for treatment" (pg5 of the Decision document), and acknowledges "that there is much uncertainty when determining whether individual aquatic macroinvertebrate taxa will be lost as a result of the application of rotenone to target waters" (pg5 of the Decision document). If there is uncertainty, the Forest Service should apply the precautionary principal (i.e., when the impacts are uncertain, there is a duty to protect the environment from potential harm) and reject the proposal. However, I argue that there is little uncertainty. The application of rotenone **will** affect aquatic species and the ecological integrity of the HUW, and therefore, the decision has to be to reject the proposed project.

Data is available that indicates a threat to macroinvertebrates, zooplankton and overall ecosystem health following the application of rotenone in the Sheep Creek drainage of the Uinta Mountains. The report on the effects of rotenone to macroinvertebrates and zooplankton in the Sheep Creek drainage by Courtwright and Miller (2016), which is referenced in the FEIS, makes it clear that there were shifts in the macroinvertebrate community following rotenone treatments. There were significant reductions in total species richness in streams (Courtwright and Miller, 2016). Additionally, assemblage composition changed in both streams and lakes, with long-term reductions in the Ephemeroptera, Plecoptera, and Trichoptera (EPT) taxa in streams and the zooplankton (*Daphnia*) in lakes that lasted for at least 2 years post-treatment. Specifically, there were significant reductions in total richness and EPT richness and density, which did not recover to pre-treatment levels. Courtwright and Miller (2016) indicate that these changes could have important implications for food webs, CRCT, and the response of the overall

ecosystem to climate change. These results show a negative effect due to the use of rotenone on a Uinta Mountain aquatic ecosystem, and more importantly implies a loss of quality habitat for CRCT. This shows that the proposed project is in violation of Public Law 98-248 Wilderness Act of Utah. The findings from Courtwright and Miller are included in the FEIS (pg. 62-63), but downplayed.

The Forest Service decision indicates that the effects of rotenone are not fully understood due to the absence of long-term (5 years or more) data. The FEIS identifies that in 2012 rotenone was applied in the Sheep Creek drainage of the Uinta Mountains. Therefore, it should be possible to determine whether the effects shown in Courtwright and Miller (2016) have persisted. Why hasn't this been done? In response to my comment 13s (pg. 142-143) it is stated "that the results of such a study would not preclude the approval and implementation of the proposed plan." I disagree. Whether or not such a study precludes the approval and implementation of the proposed plan is dependent on the results of the study and cannot be ascertained prior to obtaining those results.

2. Lack of evidence that "enhanced habitat" will protect CRCT.

The FEIS states that the "rotenone treatment is intended to remove fish populations of treated waters. The proposed project would enhance the ecosystem for all species in the treated area by eliminating impacts of non-native invasive fish species. This proposed project is consistent with the Wilderness Act because it is devoted to the public purpose of conservation (Wilderness Act Section 4(b)) and serves to preserve wilderness character of the area by maintaining naturalness." (pg. 152).

Further it states that "the temporary negative effects of treating with rotenone is intended to enhance watersheds, wildlife habitat, and ecological health and integrity over the long term by allowing the reestablishment of native species and removing invasive nonnative species." (pg. 143).

No data or evidence is provided in the FEIS to support these statements. I requested more information on this in my original comment 13e and expand here. What evidence is there that the proposed project would enhance the ecosystem for all species? What evidence is there that this project will successfully remove non-native species? Have non-native species been successfully eliminated in the Sheep Creek drainage after three applications (2012, 2013, 2014) of rotenone? What evidence is there that native CRCT can be successfully re-introduced? Have CRCT been successfully introduced in Sheep Creek? Where is the data to show whether the Sheep Creek rotenone project was successful? If after seven years, non-native fish have been successfully removed and CRCT have been successfully introduced and you have metrics to show that the ecosystem is "enhanced", why aren't these data presented? Such data would provide "proof-of-concept". If the data show otherwise, then they provide strong evidence that the proposed project will not succeed, and should not go ahead. Based on the statements above from the FEIS, abiding the Wilderness Act requires success of the proposed project. If the data don't exist, it supports my fears that monitoring will not be adequate or successful for the proposed project and therefore, the proposed project should not go ahead.

3. Inadequate consideration of climate change

Added to my concerns of whether the proposed project will “enhance the ecosystem for all species” is a failure to fully consider the impacts of climate change (previously noted in my comment 13j, k and l). The inclusion of climate change in the FEIS is an improvement from the DEIS, however, the review of climate change is cursory. My main concern here is that the FEIS focuses on direct effects of climate change (i.e., effects of warmer temperatures on fish), with little to no regard to indirect effects. Climate warming will have many indirect effects that are complex. For example, warmer temperatures will change the timing and amount of peak runoff, amount of snowpack, timing of precipitation, occurrence of extreme events, duration of ice cover and wildfire. All of which could indirectly effect the success of reintroducing CRCT. To illustrate this, consider research by Reiman and Isaak (2010) referred to in the FEIS. Based on this research, the FEIS suggests that climate warming may benefit cutthroat trout (FEIS, pg. 28). This article, however, also illustrates the complexities of determining how climate change will affect trout (e.g., figure on page 25 of Reiman and Isaak, 2010). Research by Harig and Fausch (2002) shows that the successful translocation of CRCT is dependent on water temperature being greater than 10 degrees C, and that small streams with few deep pools may lack the space necessary to permit overwinter survival of a sufficient number of individuals to sustain a population. The FEIS states that stream temperatures in the HUW are presently 10 degrees C, which would seem to be too low to support CRCT, so perhaps climate warming would help in the future to re-establish CRCT. However, warming temperatures could also lead to drier conditions, reduced connectivity and fewer pools, which could reduce the success of CRCT. A more careful and thorough consideration of the potential effects of climate change would help to better target the drainage(s) most suitable to successfully support CRCT as climate changes, which would reduce risk, save time and money and increase the probability of success.

4. Failure to provide adequate plans to ensure that application of rotenone meets all legal requirements

I continue to have serious concerns about using rotenone in a wilderness area, particularly when it is unclear how baseline conditions (e.g., identification of whether there are rare or endemic aquatic species in the targeted drainages region) will be determined. There is an indication that BMI surveys have been done – last ones in 2014. Will these be repeated prior to rotenone application? Are these data or species lists available? Such information is critical to fully understand the potential threat posed by application of rotenone.

Although the FEIS provides more details regarding the application of rotenone than the DEIS, I continue to have concerns because some things have not been adequately addressed (e.g., see FEIS comment and response 13d, 13t, u, v, 13mm). The Courtwright and Miller (2016) report shows that following rotenone application in 2012 rotenone concentrations were measured at levels in excess of 50 ppb. The report shows that in the lakes treated rotenone concentrations exceeded 50 ppb 4 times; one was as high as 250 ppb. One of the exceedance values was measured 24 hours after application. After the 2013 treatment values exceeded 50 ppb 4 times and one of these values occurred 24 hours after application. In the response to my comment 13v it is stated “Although the results of analysis of water samples indicate concentrations sampled were higher than those intended for the Middle Fork Sheep Creek treatment, all samples except one taken at Hidden Lake, were lower than the concentrations allowed according to the label (200 ppb).” It is not clear to me whether these measures meet all of the

regulations identified by the USEPA. Nor is it clear to me the potential impacts for aquatic organisms exposed to rotenone for 24 hours at levels of 250 ppm. Most importantly, there are no details of how levels of exceedance will be avoided in the wilderness area. In the response to my comment 13v, it is stated that “Careful lake volume calculation and bioassays to determine the correct amount of product necessary to achieve the target concentration combined with efficient dispersal of rotenone across the lake would avoid potentially high rotenone concentrations within lakes treated in the High Uintas Wilderness.” Presumably this was done in Sheep Creek? Why didn’t it work and how will it be avoided in the HUW? Courtwright and Miller (2016) provide striking evidence that the protocols in place were unsuccessful at maintaining rotenone concentration targets. There is no analysis of what went wrong or thoughtful adjustment to plans to ensure exceedance does not occur in the HUM.

In my comments in the DEIS I expressed concerns about insufficient details regarding the logistics of using rotenone in a wilderness area (see my comments 13aa-13ff in the FEIS). The FEIS and decision states that all HUW general prohibitions and special orders will be followed. Logistically this seems impossible. The Sheep Creek rotenone treatment involved over 60 people on site for 2-3 days. Details of how special orders will be abided with a group this size needs to be described in detail in the EIS to ensure it can be done meeting all prohibitions and special orders. In Sheep Creek, helicopters were used to move in the 900+gallons of liquid rotenone to treat 8 lakes. Based on the FEIS a smaller group and less rotenone likely will be required if individual trips target 2-3 lakes and shorter stream sections, but I would imagine 30 people and 300+ gallons of liquid rotenone is a reasonable estimate. Can 15 horses safely carry 300+ gallons of liquid rotenone?

The FEIS needs to include detailed plans to demonstrate that this massive project will be carried out with no impacts on the HUW.

5. Monitoring of impacts on macroinvertebrates and zooplankton from rotenone use in High Uinta Wilderness Area

The FEIS inadequately describes plans for monitoring of the effects of rotenone and measuring “success” in the High Uinta Mountains. This assessment is critical to ensure protections of aquatic species, meeting all legal requirements, and determining the long-term success of the project. Responses to USEPA comments in the FEIS include this statement “The agencies have extensive experience with rotenone treatment assessments and understand the importance of a thorough and well planned treatment to ensure long-term success of the project.” This is an inadequate response to concerns about how monitoring and assessment will be done, particularly given its importance to the proposed project.

The FEIS indicates that drainages will be treated one at a time, and that results from monitoring will be used to “adjust” rotenone application (pg. 165). Although both the decision (pg. 3) and FEIS (e.g., pg. 156) indicate long-term assessment and monitoring will be done, there is insufficient information to accurately judge whether these assessments are valid. A successful plan would describe in detail:

1) How baseline conditions will be determined. This would include what measurements would be taken, when measurements would be taken, how often would they be taken, where they would be taken, how many would be taken to ensure accurate results.

2) At how many and how often will samples to determine rotenone concentrations be taken? Will the number of sites and periodicity of sampling be sufficient to be representative, particularly in lakes? Will samples be taken from depth? Analysis of these samples is expensive. Who will pay for them?

3) What metrics and range of values of those metrics will be used to determine the success of the project?

4) What metrics and range of values of those metrics will indicate that there is a problem?