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Communications
Bonneville Power Administration, DM-7
PO Box 12999
Portland, Oregon 97212

RE: Montana Trout Conservation Project

Dear Colleen Spiering:

This letter provides comments from the Montana Chapter of the American Fisheries Society (MCAFS) in regards to the South Fork Flathead Watershed Westslope Cutthroat Trout Conservation Program Draft Environmental Impact Statement (DOE/EIS-0353), hereafter DEIS. The MCAFS is an organization of professional fisheries scientists and students from multiple agencies, universities and the private sector across Montana. One of our objectives is the conservation, development and wise utilization of Montana's fisheries. We are keenly interested in the conservation of the large, interconnected metapopulation of westslope cutthroat trout (WCT) in the South Fork Flathead River, as well as the reestablishment of natural and wilderness values in the aquatic ecosystems of the South Fork Flathead watershed.

As a signatory to the Westslope Cutthroat Trout Conservation Agreement, we fully support the goal to preserve the genetic purity of populations in the South Fork of the Flathead River drainage. We also agree with the immediate need to remove hybrid source populations from identified lakes and to replace them with genetically pure and appropriate stocks of WCT in most cases. The proposed activity to remove non-native species from 21 lakes, therefore, is an important conservation action for WCT on which we would like to comment.

First, we would like to make it clear that MCAFS strongly supports the concept of removing non-native species from the South Fork Flathead River basin. We concur that non-native fish (hybridized cutthroat trout) pose a serious threat to the long-term conservation and persistence of westslope cutthroat trout. We also believe that reestablishment of fishless conditions in some of the high mountain lakes is desirable. We are pleased that the Bonneville Power Administration, Montana Fish, Wildlife & Parks (FWP), and the U.S. Forest Service are willing to take on such a

bold conservation action. The South Fork Flathead is a rare ecosystem because it is one of the largest sub-basins in the West that supports a native, intact species assemblage, with the glaring exception of hybrid and non-native fish in some of its high mountain lakes.

MCAFS also concurs that the only viable method to remove non-native species from these 21 lakes is the application of either antimycin or rotenone. While we appreciate that chemical reclamation can be controversial, we think that the risks to non-target species are acceptable and that FWP has sufficient experience to implement the project. The proposed actions implement the chemical reclamation by a variety of means (fixed-wing airplane, helicopter and boats, livestock) based on social, economic, and logistical concerns for each lake. This is a commendable approach and it should help reduce the controversy around working in the Bob Marshall Wilderness or the Jewell Basin Hiking Area.

We think it is wise to gradually phase in the plan in order to learn as you go and not exhaust your resources. Addressing the most critical lakes first would be wise in case the funding or political situation changes in the future. However, the DEIS does not contain a matrix upon which to base biological, logistical, political, recreational, and economical prioritization of this phased approach. This matrix should include a detailed analysis of risks and benefits associated with the treatment and subsequent stocking or non-stocking of each lake among others. The matrix should also contain biological information (fish genetics and relative abundance, invertebrate and amphibian communities etc.) for each lake to characterize physical and biological conditions upon which treatment decisions will be made.

We recommend that the most critical lakes be addressed first in case the funding or political situation changes in the future. Lakes that pose the greatest and most immediate threat to neighboring WCT populations should be given the highest priority, since that is the goal of the project. High priority should be given to lakes located in the Bob Marshall Wilderness and those that contain hybrid populations that have significant non-native contributions (e.g., degree of introgression) and large population sizes. In the case of mixed stocks assemblages (i.e., M012s planted on hybrid swarms), we recommend that the degree of introgression should be calculated on those individual fish in the sample that contain non-native rainbow trout genes. This may require collecting additional genetics samples, as sample sizes will likely be reduced.

We commend your plan to develop an adaptive approach that carefully analyzes risks and benefits to prioritize treatment and non-treatment lakes. However, a sound adaptive management plan should also include a research plan to guide the ensuing treatment phases, and in turn guide a comprehensive long-term adaptive aquatic ecosystem monitoring program. We suggest that prioritization consider the degree of hybridization, the likelihood of maintaining the lake as a pure population (or fishless), the potential for recolonization by native amphibians and zooplankton assemblages, recreational and wilderness values, and the degree of purity of WCT downstream, among others. Each lake should be analyzed independently and then placed in geographic context with neighboring lakes and streams; only then can a wide range of uses and values be accommodated through the proposed actions.

We recommend that drainage or stream specific donor stocks be used for WCT reintroductions in lakes of the South Fork Flathead River in the Bob Marshal Wilderness. The best available scientific information has clearly shown that using a “nearest neighbor” approach for reintroduction of WCT in the South Fork is the best conservation strategy to ensure the long-term genetic integrity of remaining populations. We recognize that this may conflict with a prioritized schedule based upon degree of introgression, therefore some lakes may need to be deferred until after a “nearest neighbor” brood is developed. Recent genetics studies have shown that genetic differentiation between populations is a key factor for WCT reintroductions in South Fork lakes:

- *Leary (2002) concluded: “Since substantial genetic differences exist between the M012 fish and the westslope cutthroat trout populations in Big Salmon Lake, Gordon Creek, and Danaher Creek, and the supposed middle Wheeler Creek population, continued introduction of M012 fish into these drainages genetically does not represent the best conservation approach. This practice could potentially result in significant genetic changes in the downstream populations. Whether or not these changes will negatively affect the viability of the downstream populations is unknown, but the possibility they may negatively impact viability exists. Thus, from a genetics perspective a less risky conservation strategy would be to use westslope cutthroat trout either collected directly, or descended from those collected directly, from each of these drainages as the source of fish for introductions within each respective drainage.*
- Similarly, Dunning and Knudsen (2004) determined the genetic relationships among WCT in the upper Flathead River system and found that samples from the South Fork were significantly differentiated from those of the North and Middle Forks, and that Youngs Creek was the only one that showed significant differentiation between sites in the entire basin.
- The Montana Westlope Trout Technical Committee (1998) also recommended using using a “nearest neighbor” strategy for WCT reintroductions and concluded that “*we do not now recommend that WCT be introduced into waters containing or connected to waters that contain a pure WCT population unless the existing pure population is the source of the introduced fish.*” Furthermore the report states: “*The allelic diversity of westslope cutthroat trout also suggests that historically there has been very little gene flow among populations, except possibly at a very local level (Wright 1932). In this situation, even fairly weak natural selection can effectively establish local adaptations. Thus, there is a good possibility that some populations of westslope cutthroat trout may have some degree of local adaptation (e. g. Fox 1993, Phillipp and Clausen 1995) which could be broken down, compromising population viability, if the native fish interbreed with westslope cutthroat trout from other populations.*”

Thus, the combined information clearly demonstrates the need to implement a “nearest neighbor” approach for reintroduction of WCT in the South Fork. Our comments on this approach are best summarized by Dunning and Knudsen (2004):

“In the case of managing populations using the “nearest neighbor” approach within the Upper Flathead drainage, it is advisable that genetic differentiation between populations be taken into consideration. Management actions that increase the amount of genetic exchange among locally adapted populations, such as transferring fish between streams, could be detrimental if these local adaptations are lost due to outbreeding depression (Allendorf et al. 2001, 2004). Also, given the complex life history of westslope cutthroat in this system, we cannot be certain that migratory forms from one area will thrive in another. However, if a population is actually part of a larger metapopulation, then the threats of transfer of fish to such a population may be overestimated. Management of populations should be done on a case by case basis, depending on the demographic and genetic makeup of the populations at risk.”

Sekokini Springs Natural Rearing Facility provides an ideal opportunity to develop stream-specific donor populations for WCT reintroduction in the South Fork. Donor populations should be selected based on the degree of genetic relatedness using microsallele or allozyme genetic analyses (Dunning and Knudsen 2004). Again, the document should identify specific lakes that will be reintroduced with pure WCT using the “nearest neighbor” approach. This is a critical component of the rehabilitation process for each lake and needs to be addressed and disclosed in the DEIS.

Loss of amphibian species and populations are of global concern. In recent years, there has been an increased number of species declines in the United States, from 5 species in 1980 to 33 in 1998. Declines for both endemic and widespread amphibians are believed to be the result of habitat degradation and alteration. A complicating factor is the inexplicable loss of amphibians in “pristine” areas such as wilderness areas and National Parks that generally lack obvious loss or alteration of habitat. These declines in remote areas appear to be the result of pollutants or effects from introduced species, such as trout. Despite widespread declines of amphibians, however, we still do not have a definitive answer with regards to our local species, like the spotted frog, long toed salamander, and boreal toad.

Fish stocking in the 1.5 million-acre Bob Marshall Wilderness complex appears to be a controversial fisheries management issue due to the potential conflicts with wilderness values and impacts on native fish fauna, invertebrates, and amphibians. The basic question is whether to stock all the 21 lakes, or leave some fishless due to potential impacts to invertebrates and amphibians. The DEIS addresses this as an important issue, so we believe that the proposing agencies should consider leaving some lake fishless as a viable alternative. If the fishless issue jeopardizes this project from moving forward, we urge you to consider leaving a couple lakes fishless to ensure that this important project proceeds and achieves our mutual goal.

Leaving a couple lakes fishless could also provide a scientific framework to evaluate the potential changes to the fish, invertebrate and amphibian communities; fishless lakes could serve as controls and the stocked lakes could serve as experimental treatment groups. This experimental approach would ensure that the best scientific information is used to evaluate the potential impacts of chemical treatments on lake and river systems using an adaptive management approach.

We suggest that the scientific design and interpretation of the existing data regarding the potential impacts of fish on invertebrates and amphibians in the Flathead are inconclusive. While these data suggest limited impacts, we recommend that more rigorous studies will be necessary to conclusively prove that impacts from fish on invertebrates and amphibians in mountain lakes of the South Fork are inconsequential. We strongly recommend that this uncertainty be disclosed in the DEIS. We believe studies to address these issues should be recommended as part of the adaptive management plan for the South Fork. Ideally, these studies should be designed and implemented so that their results could be published in peer-reviewed journals.

We encourage FWP to conduct additional research because little is known about high mountain lake ecosystems. Are there unique assemblages of zooplankton or aquatic invertebrates in large, deep, fishless lakes that do not occur in shallower lakes because of potential winterkill? For example, zooplankton communities in high elevation, fishless lakes are dominated by large-bodied species. Introduction of trout results in the rapid elimination of these species and replacement by smaller-bodied forms. Once extirpated from a lake, the large-bodied species may not be able to recolonize, even if fish are removed, due to their limited ability to disperse. How do recolonization rates of amphibians differ between lakes restocked with fish versus those that are not stocked? What happens to re-established amphibian populations when fish are re-stocked on top of that amphibian population? In the past, we have only been able to infer impacts because fish have been present in these lakes for so long. Now we have a chance to actually determine what impacts may or may not occur. The DEIS fails to mention these research opportunities and the proposal to stock all lakes will result in a tremendous loss of opportunity to further our knowledge in this area.

There is an assumption in the DEIS that a complete fish kill may not be achieved. The effectiveness of the treatment will vary by lake, with the most influential factors being depth and volume. Lakes should be ranked from low to high using these factors on what the expectations are for a complete kill and subsequently monitored to determine if a complete fish kill is achieved. Stocking could be deferred for 1-2 years (at a minimum) in high probability lakes for a complete kill to determine if objectives were met to remove hybrids. If a complete kill is achieved, this may reduce the need to stock a lake to “swamp” the remaining hybrids.

The potential for future illegal introductions should be elaborated on in the DEIS. Lakes should be rated according to risk of illegal introductions. All the proposed wilderness lakes are remote and the risk is low, whereas outside of the wilderness only one lake (Handkerchief) can be reached by road.

The following are detailed comments on the DEIS:

Section 1.2.

The DEIS fails to list which lakes were previously “swamped” and to describe the potential genetic effects from the years of “swamping”. For example, has inbreeding depression or the potential for changing local adaptations associated with the large amounts of M012 occurred?

Section 1.4.

During the scoping process, BPA received 71 comments. A summary is presented in this section. It will be important in the FEIS to respond to these comments as to whether they were substantive and lead to alternative development or were beyond the scope of the project. A detailed analysis of the comments (grouped by theme) is desirable.

Page 1-13. MCAFS questions whether biological integrity will be increased by stocking. Conversely, the aquatic ecosystem and biological integrity of that system is being altered by restocking/perpetuating fish in a previously fishless ecosystem.

Section 2.3

The ESA and USFWS would look at a reduction of imminent threats range wide for the species. To prevent a listing there would have to be significant efforts range wide. A case could be made if the statement “ The No Action alternative could also lead to a WCT ESA listing...” was true why not propose actions in the MF, NF or throughout the Flathead. This statement has little validity, although in concept it may be good. This project is a great conservation measure, however, implemented alone it is unlikely that it would prevent an ESA listing.

Section 2.4.

Pages 2-5 and 2-8. It is commendable that adaptive management will be applied by using lessons learned from previous treatments. It would be worthwhile to mention what was learned. For example, if previous treatments were 100% successful then restocking to swamp out remaining fish would not be necessary but it may be for recreational angling. It is our understanding that FWP has had a 100% success rate (a complete kill was achieved) on the 6 treated lakes to remove trout over the last 10 years. It is our Chapter’s understanding that complete kills for trout are common in lakes when trout are the targeted species. Another option is to design the project for a second treatment as in the case of Cherry Lake. If a second treatment is truly needed then this should be presented up front and the environmental effects analyzed in the FEIS.

The post treatment plan will be critical to the success of this project as will a pre-treatment plan that would determine if a lake should be stocked and, if yes, with what brood (M012 or nearest

neighbor) and at what frequency. Adaptive management learned over the last decade should allow for these decisions to be made in the FEIS rather than post treatment.

We appreciate the thorough discussion associated with the treatment. The use of antimycin and rotenone being applied by various methods will enhance our knowledge in this field. We appreciate your attention to downstream aquatic organisms such as tailed frogs and bull trout.

Pages 2-26 and 2-27. There should be some discussion about using nearest neighbor fish and the effects of inbreeding and changes in local adaptations associated with M012. The WCT Tech. Committee recommendations should be noted and followed. It is assumed that M012 will be used in all lakes since stocking will be conducted the following year with a variety of age classes. Once again, here is an opportunity to put together a pre-treatment plan that would have a variety of restocking options. The statement "restocking streams would expedite the restoration of a viable fish population" is confusing. Does this infer that viable populations currently do not exist in streams below these lakes? If portions of stream segments are treated immediately below the lakes down to a barrier, leaving these stream segments unstocked should be harmless for several reasons. 1) they are rarely fished, 2) the hybrid source is removed from the lake, 3) pure M012 would trickle out to "swamp" remaining hybrid stream fish, 4) little spawning habitat seldom exists in these high gradient reaches and 5) pure endemic SF WCT can move up from downstream until that barrier is reached.

Section 2.7

The MCAFS supports the decision not to use tiger muskies to reduce trout populations and to refrain from creating barriers in wilderness areas. We fully agree that rotenone and antimycin provide the best chance of removing non-native trout from these lakes. Impacts associated with the use of these compounds will be limited in duration.

Section 3.2

Page 3-9. Mention is made of bull trout fishing being re-opened in the South Fork, which we agree is a great opportunity for the angling public. However, the DEIS fails to analyze the socioeconomic affects to outfitters associated with this action. Would this not enhance if at least replace any lost angling opportunities these outfitters may have if a lake was left fishless in their area?

Page 3-12. We appreciate the efforts that are being made to safeguard bull trout populations. The section on direct and indirect effects fails to mention impacts on WCT, such as the purpose of the project to reduce the likelihood of introgression and direct mortality to hybrids. Furthermore, effects upon sculpins, whitefish, or suckers are not disclosed.

Page 3-13. The MCAFS agrees that illegal bait bucket biology is a risk in any given water body.

Illegal introductions are often driven by the availability of fish and access. We request that a risk assessment is completed for each of the treated lakes that would look at the likelihood of illegal introductions and where the potential source would come from. For example, most wilderness lakes, especially those without trails would have a very low likelihood of illegal introductions due to their remoteness and the closest source would be a neighbor lake or fish downstream in the creek. Illegal introductions with these fish may have less genetic risks associated with them than use of M012. The risk assessment would break this issue down from a programmatic risk that "it could happen anywhere" to a site-specific risk that may be very low on a certain waterbody such as Lick Lake. Many of the issues cited are programmatic in nature and given the scale of the proposal don't necessarily apply to every lake that is proposed.

Section 3.3

Table 3-5. This table would be much more useful if divided between fish versus fishless lakes. Adding presence, densities, sizes, etc would allow for a better understanding of potential impacts associated with the proposal. As you may be aware, many studies have documented the changes associated with zooplankton communities in the presence of fish (see Knapp et al. 2001).

Page 3-22. There is a good discussion associated with impacts associated with the chemical treatment but no discussion about the effects upon amphibians and zooplankton associated with restocking. We request that the effects of restocking should be analyzed and included in this section.

Section 3.6

Page 3-40. Cumulative effects on the wilderness resource would vary depending on the number of chemical treatments and if the lakes become self-sustaining versus a rotational stocking. A pre-treatment plan that determines how each lake will be treated, i.e., fishless, one time stocking, rotational stocking, would lead to a better cumulative effects analysis.

Thank you for your interest in conserving westslope cutthroat trout and wilderness aquatic ecosystems. The South Fork Flathead Watershed WCT Conservation Project is a unique opportunity to protect existing pure populations and restore genetically pure and appropriate WCT to their former distribution and abundance. We urge your agencies to consider our recommendations to conserve WCT in the South Fork Flathead, as the decisions made now will influence these important conservation areas for many years. We look forward to working with the agencies in restoring genetic integrity to the South Fork Flathead ecosystem.

Sincerely,

Clint Muhlfeld, President
Montana Chapter of the American Fisheries Society

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