October 5, 2009

Ms. Victoria Whitney, Chief
Division of Water Rights
State Water Resources Control Board
1001 I Street
Sacramento, CA 95812

Dear Ms. Whitney:

Subject: California Trout's comments on the Instream Rush and Lee Vining Creeks-Flow Study

On behalf of California Trout, I am pleased to be submitting comments relevant to the Rush and Lee Vining Creeks-Instream Flow Study (IFS). I appreciate the opportunity to present comments as well as acknowledge the work the Stream Scientists have completed thus far. Moreover, the comments and questions provided below should be considered in light of Caltrout's desire to ensure management decisions and future formal recommendations are based on sound science and are comprehensive in scope.

California Trout recognizes that the IFS is one report in a series of five providing the basis for the Synthesis Report. As such, comments herein are primarily focused on information provided within the IFS. However, given the relationship between research conducted for the IFS and the other reports, where necessary, comments pertaining to the IFS in connection to one or more of the additional reports are presented.

Comments relative to "bigger picture" and more general issues are first presented. These comments are then followed by specific on sections of the IFS.

General Comments:

1) It is clear from the study, and via several meetings and conversations, a tremendous amount of work has gone in to conducting the IFS. In addition to conducting the IFS itself, there is a tremendous body of knowledge on the part of the Stream Scientists regarding issues within and outside of the IFS's purview. It would be very informative to have much more discussions within the IFS report having to do with the "why" the findings are what they are. For example it is noted that that there is an inverse relationship between foraging habitat and flows. If foraging habitat is determined to be the same as winter holding habitat less cover, can this finding be further explained? Another example of where a discussion would be useful is on Page 33 where it is noted that winter habitat per a unique reach responded differently per flow tests whereas foraging habitat did not. Presenting more explanation

regarding the results themselves, possibly in a Discussion Section following results would inform the reader more thoroughly about the reasoning behind the results themselves.

2) One of the ultimate goals of the Restoration Orders is to restore the condition of the fisheries to as near pre-1941 conditions as possible. In doing so, termination criteria were established as targets to reach as an indicator of the Restoration Orders being achieved. The termination criteria include targets for the percentage of large brown trout, particularly for Rush Creek as well as other metrics for a healthy fishery. Underlying the established termination criteria is the assumption that the four tributaries in question have the ability to produce and sustain larger brown trout similar to those found pre-1941. Given the complexity of ecological systems and the difference of the Mono Basin today relative to 70 years ago, a simple question (yet very difficult to answer) is whether or not the Mono Basin of today has such an ability to produce and sustain a fishery in comparison with pre-diversion days. Please provide comments with respect to pre-1941 conditions and today and whether the accumulated knowledge/data of the four tributaries to Mono Lake is sufficient to determine whether in fact pre-1941 conditions can be achieved.

3) In a somewhat simplified manner, the IFS explores habitat variables thought to be primary limiting factors for the growth and survival of large brown trout. As I understand it, the underlying hypotheses explored within the IFS are two-fold: (1) the limiting factor for older and larger brown trout is winter holding and foraging habitat and; (2) maximizing proposed benthic macro invertebrate (BMI) habitat, as a proxy for BMI health, would benefit larger and presumably older brown trout. To test these hypotheses, the IFS used flows as the single predictor of winter holding and foraging habitat and BMI habitat. Recognizing that other parameters (such as temperature) are being addressed in other reports and will be taken into consideration for final flow recommendations, are there other variables, such as water quality, primary productivity, percent and cover types, or otherwise, that should be considered with the aim being to comprehensively address the larger "system's" needs to produce and sustain larger (and older) brown trout populations? And, can the Stream Scientist comment on what those studies might comprise of and their relative importance prior to completing the Synthesis Report.

4) Building off of Comment 1 above, the findings of the IFS suggest that lower flows result in greater winter holding and foraging habitat relative to faster flows. On the other hand for BMI habitat, intermediate and higher flows result in increased habitat even though the rate of increase in BMI habitat is greatest at medium flows (30cfs-45cfs). The temperature model will be important in trying to reconcile winter holding and foraging habitat and BMI habitat needs and it may be a happy medium is established. However it may not. In a healthy and functioning ecosystem a dynamic equilibrium is realized. It appears that the BMI and winter holding and foraging habitat needs are not in such a state. Can the Stream Scientists comment on their understanding of the discrepancies between winter holding and foraging habitat and BMI habitat needs for at least Rush Creek?

5) The selection of habitat criteria was based on results of the fish population and relocation studies as well as a literature review. The selection of reaches to include in the IFS was also based on past research and monitoring on the part of the Stream Scientists. Are there

sufficient data, based on sample sizes and locations, to extrapolate the results for other portions of Rush and Lee Vining Creeks?

6) From a dynamic perspective, is it possible to discuss how the suggested flows may influence long-term conditions of Rush and Lee Vining Creeks beyond there being older and larger size classes of fish? For example, is it expected that with suggested flows riparian cover will also expand or might the lower flows inhibit establishment and maturation of riparian vegetation? Is there anyway to predict, based on existing data, what and where various habitat types will be in five or ten years? It would be useful to have some predictions as the basis for future monitoring and evaluation for adaptive management purposes.

7) Within the IFS, there was only discussion based on a set of periodic flows. What is the status of consideration for having a continuous hydrograph and how might establishing a continuous hydrograph influence targeted habitat types? Will a continuous hydrograph be explored in the SNTEMP Temperature Modeling project?

8) General question about the use of aerial photographs and mapping to document winter holding, foraging and BMI habitats at different flows. Within the IFS it is noted that the aerial photographs were difficult to interpret (indeed, tests at 45 cfs were discarded due to data/map quality assurance issues). Please respond to this challenge and is there a means to validate the finding to ensure a reasonable margin of error in the analyses/findings was not exceeded? Validation speaks to the results within the sample reaches as well as for extrapolation purposes.

9) On page 9 it is noted that …if recommendations are made in the Synthesis Report to alter summer baseflows in Lee Vining Creek, and evaluation of changes in potential foraging habitat must be made. Presumably such recommendations are to be made. When would an evaluation of the newly recommended flows take place and findings be incorporated into long-term flow recommendations e.g., the Synthesis Report?

10) In Rush Creek, the study is primarily focused on brown trout. What are the anticipated outcomes based on suggested flows for rainbow trout populations in Rush Creek?

11) Based on recent studies, fish seem to be relatively healthy (K-factor) in Lee Vining Creek and less so in Rush Creek. However, Lee Vining has relatively few large, deep pools and instead have more pocket-pool combinations. If the presence of greater food supplies is thought to contribute to better condition factor in Lee Vining Creek, is there a scientific basis for this conclusion? Does this counter in anyway the theory that in Rush Creek, winter pool habitat is the limiting factor and possibly the influence of pocket-pool combinations is also an important consideration? Moreover, if temperatures and BMI habitat were to be optimized in Rush Creek via flows (i.e. flows maximizing BMI habitat and ideal temps are weighted heavier relative to pool habitat), is it expected that the condition factor for fish within Rush Creek would increase proportionately more than fish growing older and to larger size classes? I am wondering about the potential tradeoffs between possibly having larger fish vs. having more healthy fish as defined by condition factor.

More specific comments:

1) Page 10: First citation should include both pool reports, not just Hunter et al. 2003.
2) Page 10: Noted that most consistent habitat required variable that was required by these fish was low water velocity near the stream bottom. I assume this is based on the exposure the Stream Scientists had during relocation and snorkeling investigations. However, this exposure was relatively short. What about habitat requirements at different times of day etc.?
3) Jowett 1992a is not in citation list.
4) Page 11: The importance of cover is initially discussed and is subsequently discussed throughout the IFS. On Page 13 it is also noted that terrestrial insects are a critical food source. The presence of above-ground cover is likely positively correlated to terrestrial food sources. Beyond measuring the presence of cover, the study limited the role of cover to documenting cover types and measuring the area of overhanging vegetation. Given the potential importance of cover for protection and food sources, how are the flow-findings likely to impact riparian communities? Might higher or lower flows increase riparian dynamics in terms of vegetation coverage and diversity one way or the other?
5) Page 17: Section 2.2 notes that the same criteria were used for habitat mapping for both Rush and Lee Vining Creeks. While the categories of criteria are the same e.g., minimum polygon size, water depths, max velocity and immediate cover present, values within each of these categories differed.
6) Page 17: What is the basis for the theory that rainbow trout will not be able to self-sustain their populations if DFG stops stocking? Can this theory be validated by examining stocking records and fish population studies conducted by the Stream Scientists?
7) Page 20: If the objective of the study was to determine how different flows change pool habitat (either increasing or decreasing) would it be useful to include a reach where larger pools identified in the 2002/2008 pool surveys did not exists?
8) Page 21: The IFS notes that 15cfs was chosen because it "approximated the summer, fall, and winter median unimpaired baseflow for a dry run-off year." Is this the approximate median value calculated based on all "dry" run-off years, based on one "dry" year or a combination of multiple dry years in succession etc?
9) Page 31: First seven lines are methods used as opposed to results.
10) P 33: It is noted that the mapped reaches of Rush Creek contained *significantly* less winter holding habitat than foraging habitat. Is this a *statistically significant* difference? If so, is there a basis to determine why such a difference exists? In other words, what's driving more or less cover within various reaches?
11) Page 38: Table 6 presents test flow rates at the MGORD and near or within selected study reaches. For reaches downstream of Upper Rush, there seems to be a fairly large discrepancy in flow rates between the MGORD and other reaches indicating the loosing nature of Rush Creek. It seems that it would be important and valuable to better understand the gains and losses throughout the year to better understand how flows from the MGORD influence a desired flow further downstream.
12) The names of the respective study reaches should be consistent between the winter holding and foraging habitats and BMI habitats: Winter holding comprises of County Road, Bottomlands, 10 Channel, Old Lower Mainstem, and Upper Rush: BMI habitat comprises of 10 Channel, County Road, Ford, Lowe Rush-Old Mainstem and Upper Rush Creek.

13) Page 54: It would be helpful to have the Sub-Units identified within the Figure 23a-c legends.

On behalf of California Trout, I look forward to progress being made on completion of the various supporting reports as well the Synthesis Report itself. Between now and the completion of the Synthesis Report, I also look forward to receiving responses to comments and questions provided to the Stream Scientists and contributing to the completion of most thorough report(s) possible. To this end, I request that the planned process for the State Board and Stream Scientists to review and respond to the comments submitted be provided as soon as possible. Additionally, I am working with the premise that whatever final flows are recommended will be considered in light of an experiment being conducted and as such there will be future monitoring and evaluation conducted to determine the efficacy of the recommendations within the Synthesis Report.

I submit these comments to the State Board in the hopes they will contribute to sound management decisions for the Mono Basin being made. I look forward to working with all parties to achieve this goal.

As always, please contact me at your convenience regarding the comments above.

Sincerely,

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