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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: Comments on the Instream Flow Study - Rush and Lee Vining Creeks

On August 6, 2009 the State Water Resources Control Board (SWRCB) appointed scientists released their Instream Flow Study - Rush and Lee Vining Creeks. This report quantifies adult holding (primarily winter) and foraging (spring, summer, fall) microhabitat areas over a range of test flows, then assesses trout microhabitat area in conjunction with water temperature, fish passage, and riffle hydraulics where trout food resources (benthic macroinvertebrates) are concentrated. The report includes the results of these studies and discussion of flows that optimize these microhabitats for trout.

The Instream Flow Study - Rush and Lee Vining Creeks is an important component of flow recommendations for Rush and Lee Vining Creeks as ordered by the SWRCB but it is not the only component. In fact there are five additional recent reports the stream scientists will use to inform their flow recommendations in addition to over a decade of data collected from various monitoring. All of this will be referenced in their Synthesis Report which is due to be released this fall. The Synthesis Report will blend and incorporate the needs of the entire system which include the needs of the fishery, hydrological needs, geomorphic needs, and flows necessary to maintain and expand the riparian vegetation.

We do have additional questions and comments not contained in this letter and therefore respectfully request either a meeting or conference call with the stream scientists in order to gain a complete and accurate understanding of the information presented. These questions do not rise to the level of inclusion in this letter but nonetheless would help us have a greater level of understanding. In order to be most effective, this meeting or conference call should occur before the Synthesis Report is released.

Comments

The Mono Lake Committee (MLC) would like to offer the following comments:

1. Page 6: *The baseflow recommendations also need to be reevaluated because: (1) in the 22 years since the initial instream flow studies channel morphology has changed, and therefore the relationship between baseflow and fish habitat has changed, (2) now we have a greater understanding of the trout populations and flow conditions that may be limiting recruitment of older age-classes and diminishing survival at key life stages, and (3) necessary assumptions made in past evaluations may not apply today as a result of knowledge gained through recent extensive monitoring.*

Comment 1: The report should discuss how this current study and recent work either builds on or refutes the original Instream Flow Incremental Methodology (IFIM) model that was used to establish the original flows. How is this report consistent or not with the original Department of Fish and Game (DFG) studies and evaluations? The original flows were set by a lengthy and arduous process and having the reasoning available for departure from those conclusions will be helpful.

Comment 2: This section implies that even the new recommended flows will need to be reevaluated in the future since a) the stream habitat will change even further as the creeks adjust and evolve with the new flows, b) climate change issues will continue to affect run-off patterns and stream temperatures, and c) more data will be gathered which will continue to inform our knowledge of what the stream needs. The Stream Synthesis report should recommend a process for such an evaluation.

2. Page 7: *The Fisheries Stream Scientists are also submitting four additional reports in August 2009 that will be used to guide flow recommendations. These four reports are:*

- *Temperature-Flow Report for Rush and Lee Vining creeks.*
- *Rush Creek SNTEMP Temperature Model.*
- *Rush Creek Radio Telemetry-Movement Study Report.*
- *Pool Survey Report for Rush and Lee Vining creeks.*

Comment: It is now October and we have not received the Rush Creek SNTEMP Temperature Model.

3. Page 7: *Based upon our ten years of monitoring the fish population in Rush Creek and our collective experience we have identified two factors that are likely limiting survival and growth (and ultimately the size) of trout in Rush Creek:*

1. *Lack of suitable winter holding habitat for larger trout, particularly microhabitats with low water column velocities near the stream bottom; and*
2. *Elevated water temperatures from summer through early autumn, which stresses the trout, causing reduced growth rates.*

Comment: It would be helpful to know more specifically how this conclusion was reached. What other factors existed in the pre-1941 Rush Creek fishery that may have allowed large trout to flourish? What conditions benefitted the fishery then and which of those conditions are restorable? How are they addressed by the recommendations contained in this report? The report should review the pre-1941 conditions that benefitted the fishery as determined by the SWRCB and explain their relevance, or lack thereof. This review should be included in the Synthesis Report given that they will be the basis for a major change in flows.

4. Page 10: *Adult brown trout's preference for direct overhead cover was another consistent theme found throughout the published literature.*
Page 11: *Cover was considered an essential component of viable trout streams and adult brown trout seek cover more than any other trout species (Raleigh et al. 1986).*

Comment: Both Rush and Lee Vining creeks are still recovering vegetation, especially the larger more robust pines and cottonwoods. The pre-1941 channels contained lots of wood, roots, and overhanging vegetation that provided cover and velocity breaks. What role will restored riparian forests play in providing habitat for large trout? What projections can be made with regard to the continued vegetation recovery and the positive influence those conditions will have on trout cover and habitat?

5. Page 13: *With exception of predation on young-of-year and juvenile trout by larger adult trout, trout generally derive most prey from drift of benthic macroinvertebrates.*

Comment: At what size does this exception begin to dominate? What proportion of the Rush Creek population is "deriving most prey" from benthic macroinvertebrates? If the focus is on larger trout, this exception should be explored further.

6. Page 13: *However, relative contributions of terrestrial insects such as grasshoppers, ants and beetles are unknown in Rush and Lee Vining creeks, which in many systems are seasonally important food sources that can provide a significant percentage of a trout's annual energy intake (Saunders and Fausch 2007).*

Comment 1: What season are the terrestrial insects important? Is it the fall when water and air temperatures cool down reducing macroinvertebrate production? Could the lack of terrestrial insects, especially in the fall, be a contributing factor to the low condition factor of the trout going into winter? Could terrestrial insects have been more abundant in pre-1941 conditions especially with more meadow vegetation such as existed in the Vestal Springs area? Why is this significant enough to mention and should it be monitored?

Comment 2: MLC supports further exploration of the terrestrial insect and benthic macroinvertebrate component and small fish component of trout condition factor and whether or not this is currently a limiting factor.

7. Page 16: *Past habitat mapping efforts have been criticized for lacking reproducibility because some methods included biologists' professional judgment in identifying habitat polygon boundaries, instead of relying solely on measured criteria (Railsback and Kadvany 2008; Gard 2009). To improve the reproducibility of habitat mapping methods, the Fisheries Stream Scientists developed brown trout habitat criteria based on measurable criteria (obtained from the scientific literature and from our previous field studies) and implemented a field protocol in which all points that defined a polygon boundary were measured and the distances between all points were also measured.*

Comment: We believe the stream scientists have conducted systematic and comprehensive habitat mapping on the selected sections of Rush and Lee

Vining creeks. We continue to be concerned that the mapping was conducted in summer to inform winter flow recommendations. We recognize the infeasibility of conducting extensive habitat mapping in the winter months, however the report should discuss possible problems or inaccuracies with the transferability of habitat studies from summer to winter conditions. It is for this reason that we continue to urge winter stream monitoring to insure and validate that the prescribed low flows are actually delivering the forecast benefits and are not problematic.

8. Page 17: *We also have doubts that rainbow trout would naturally sustain their current composition of the Lee Vining Creek trout population if the annual and frequent stocking of catchable rainbow trout by CDFG at the diversion pond ceased. Thus, brown trout were considered the focal species during the Lee Vining Creek IFS.*

Comment: We would like more information that supports the statement that rainbow trout may not be sustainable in Lee Vining Creek. In the past, we have understood that Lee Vining Creek was *better* for rainbow trout rather than brown trout because of the steeper gradient and cooler water.

9. Page 24: *However, we suspected that the highest test flow would provide minimal habitat that meets the adult trout criteria due to excessive velocities. For example, in September of 2005 we were barely able to wade and electrofish Lee Vining Creek at 50 cfs and in September of 2006 we were unable to sample at 60 cfs due to unsafe wading conditions.*

Comment: Difficulty in wading the stream at these flows is not an example of trout habitat quality. "For example" should be removed.

10. Page 27: *In Lee Vining Creek, the presence of multiple side-channels and braided channel sections, and prevalence of coarse substrates reduced the utility of field discharge measurements, and discharge was not measured.*

Comment: McBain and Trush took discharge measurements in the A-4 channel and this discharge is provided later in the report. Flow measurements or estimates for the lower reaches of Lee Vining Creek should be made (difficulties can be overcome) in order to gain some idea of the gains and losses. April and May gains and losses are different from August or January. There should be some seasonal measurements or estimates made of how representative the flow at the diversion dam is of the flow in the mapped

reaches of Lee Vining Creek, in the same way this is being done for Rush Creek. At a minimum there should be more discussion of this topic based on estimates and historical observations and theories of riparian vegetation "pulling up" the water table.

11. Page 30: *A metric called "percent of maximum habitat" was derived for both holding and foraging habitats by dividing the surface area of each of these habitat types observed at each test flow by the largest total surface area observed for each of these types of habitats.*

Comment: We believe it would be more accurate to say "percent of maximum *mapped* habitat" since the actual maximum may be at a non-test flow amount?

12. Page 31: *The combined contributing flow from Parker and Walker creeks was 4.9 cfs as measured by DWP on August 12th and 20th, and was assumed to be stable during the 10 day IFS period. The 4.9 cfs release was assumed to emulate a probable wintertime flow contribution to Rush Creek.*

Comment: Were the Parker and Walker creek releases verified to insure that a constant 4.9 cfs contribution at the confluence of Rush Creek was indeed achieved? It is doubtful given natural fluctuations that there would have been a constant contribution to Rush Creek. It would be helpful to know what the range of contribution was during the test flows. Then the range could be compared to a predicted winter input to Rush Creek.

13. Page 33: *After Rush Creek polygon data were entered into Excel spreadsheets and initial flow-habitat relationship curves were developed, we decided to drop the 45 cfs data set from the analyses due to the problems encountered with the aerial photos and adaption to these problems by field crews during the first 1.5 days of mapping. Fortunately, the 45 cfs test flow was a transitional point between larger amounts of habitat available at lower test flows and the steady decrease in habitat as test flows increased beyond 45 cfs (Figure 4).*

Comment: We understand the reasons but are concerned that the 45 cfs data was dropped from the analysis because it is the most common flow in the last 15 years (as noted on page 20) and therefore appears that it would be one of the most important flows to analyze. The report should include discussion of the stream scientist's level of confidence that the flow/ habitat area relationship is a straight line between the 30 cfs and 60 cfs point?

14. Page 37: *At the 10-Channel, the maximum amount of adult trout holding habitat was present at a measured flow of 22.6 cfs, with less of this habitat being present at both lower and higher test flows (Figure 8). At 12.3 cfs, 96.6% of the maximum amount of holding habitat was present. At 48.1 and 62.0 cfs, this amount was reduced to 86.5% and 75.6%, respectively.*

Comment: Given that the 45 cfs data point was not used, how confident are the stream scientists that the 10-Channel maximum is at 23 cfs and not some higher amount? Do the stream scientists have any usable results from the 45 cfs test flow to support that the maximum is closer to 23cfs than 60 cfs?

15. Page 67: *These analyses suggest that a winter baseflow (as measured at the study reaches) ranging from approximately 19to 23 cfs would provide the most area of adult trout holding habitat in Rush Creek downstream of the Narrows and flows of about 30 cfs would provide the most area in the Upper Rush Creek reach.*

Comment: Since the study does not use the 45 cfs data, is it possible to determine if the 10-Channel and Old Mainstem might have achieved a maximum at flows higher than 23 cfs?"

16. Page 68: *A re-examination of the composite habitat-flow relationship curve suggests that a flow of 18-20 cfs would provide approximately the same amount of holding habitat as a 28 cfs release (Figure 31). The rationale for not selecting 28 cfs as a potential winter baseflow recommendation for Lee Vining Creek in the upcoming Synthesis Report is two-fold. First, the increase in holding habitat between 20 and 28 cfs on the composite curve was mostly influenced by Unit #13, the large pool located near the Mono Lake delta (Figure 14). While this pool currently provides habitat, it is located at an elevation above mean se level (6,386 ft) that will be submerged as Mono Lake rises towards its targeted recovery elevation of 6,392 ft. Secondly, the increase in test flow increase between 20 and 28 cfs resulted in a 42% decrease of winter holding habitat in Class-5 Pool #1; whereas the holding habitat loss in this high quality pool between 12 and 20 cfs was less than 6% (Figure 32).*

Comment 1: This section indicates that the winter holding habitat baseflow that will be recommended in the synthesis report is 20 cfs or less. We look forward to seeing further analysis and discussion in the Synthesis Report,

however some of our concerns are included here. Is this anticipated for which year types? GLOMP shows this as the average natural unimpaired flow for October, February, and March (and all other months are higher). What are the long-term effects on the stream ecosystem of a winter baseflow that is lower than the average unimpaired flow during most months? And what might the effect be of turning 20 cfs into a "maximum" winter flow? This would seem to be outside the range of natural variation and should be undertaken cautiously. In addition, some thought should be given to unusual circumstances, such as the geomorphic value of passing undiverted a rain-on-snow flood, such as the one in January 1997, or such as flexibility to ramp up in March for an April peak in a warm and dry year.

Comment 2: We understand that deep pools and cover are important to trout as they overwinter but we are concerned that pools are receiving too much emphasis in terms of trout health. Again, referring to the pre-1941 conditions to reference that pools (as opposed to, for example, deep runs with plentiful wood, over-hanging branches, and roots for cover and velocity breaks) were the dominant feature and analyzing what other factors may have been contributing to the overall size and health of the fishery would be important.

Comment 3: Since no pool survey was conducted between the diversion dam and Hwy 395, there is no knowledge of how representative the pool habitats in the mapped reaches are of this upstream area. In fact, almost half of Lee Vining Creek below the diversion dam is ignored in this study.

17. Page 71: *We again emphasize the dynamic nature of the stream channels in both lower Rush and Lee Vining creeks. As these channels and their associated riparian zones continue to develop over time, habitat-to-flow relationships will undoubtedly change. We recommend that these relationships be re-evaluated after another 10 years, or if channel monitoring indicates either channel cross-sectional areas or pool habitat frequencies have appreciably changed.*

Comment: MLC agrees and appreciates the intent to continue the adaptive management process.

Conclusion

MLC appreciates the opportunity to provide written, formal comments on the Instream Flow Study - Rush and Lee Vining Creeks. Since this report will

serve as an important foundational component to the Synthesis Report expected to be released later this year we want to have a thorough and complete understanding of the Instream Flow Study results and conclusions.

It is our understanding that all comments submitted will be addressed and answered by the stream scientists before the Synthesis Report is released and that there will be an opportunity for us to voice our additional questions and comments as well. If any other process for handling comments is anticipated please advise us promptly.

If you have any questions please contact me at (760) 647-6595.

Sincerely,

Lisa Cutting
Eastern Sierra Policy Director

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