Rogue River Basin TMDL

Total Maximum Daily Load (TMDL)
& Water Quality Management Plan (WQMP)

Response to Public Comment

Prepared by:
Oregon Department of Environmental Quality
December 2008

Introduction

This Response to Public Comments document addresses comments and questions received regarding the Draft Rogue River Basin Total Maximum Daily Load (TMDL) and Water Quality Management Plan (WQMP) dated October, 2008. The individuals and organizations shown in Table 1 provided comments on the Draft Rogue River Basin TMDL/WQMP during the Public Comment Period which was held from October 1 through December 1, 2008. On November 12, 2008 a public meeting was held in Grants Pass, OR. The meeting began with an informational discussion followed by a formal public hearing. All comments received during the public comment period have been reviewed by DEQ and addressed in this document in the order in which they were received. Comments which require modifications to the TMDL or WQMP are noted. A copy of this responsiveness summary has been submitted to EPA as part of the TMDL-WQMP packet.

Table 1. Comment Submission for Rogue River Basin TMDL

Commenter	Date Comments Received	Format of Submittal
Jennifer Wu, US-EPA Region 10, Seattle, Washington.	11/19/08	E-mail
Fred Fleetwood, Citizen, Trail Oregon	11/21/08	Email
Tim Wilson, Wastewater Plant Superintendent, City of Grants Pass	11/25/08	Email
BLM - Timothy B. Reuwsaat District Manager, Medford	11/25/07	Letter
ODFW - Steve Denney, Regional Supervisor Southwest Region Oregon Department of Fish and Wildlife, Roseburg	11/25/08	Letter
Jim Hill, Water Reclamation Division Administrator, City of Medford	11/26/08	Email
Chuck Closterman – Middle Rogue Steelheaders.	11/26/08	Email
Jean Mount, Citizens Advisory Committee (CAC) Secretary- Lower Applegate CAC, Advisory member- Rogue Advocates, Grants Pass	11/30/08	Email
William Matthews, CAFO Program Manager, Oregon Department of Agriculture	12/01/08	Email
Gerald Kelso, Area Manager, US Department of the Interior Bureau of Reclamation	12/01/08	Email
Lesley Adams, Rogue Riverkeeper Klamath-Siskiyou Wildlands Center PO Box 102, Ashland, Oregon	12/01/08	Email
John G. Ward, Citizen, Ashland, OR	12/01/08	Letter
US Army Corps of Engineers: Jim Britton Portland District, Reservoir Regulation and Water Quality Section, Mike Schneider, Engineering Research and Development Center (ERDC)	12/01/08	Email

NOTE: As with any analysis based on models there is an inherent uncertainty in the Rogue River Basin TMDL. The acknowledgement of such uncertainty should not be used as an excuse to delay the implementation of much needed actions within the basin. Local, state, and federal agencies responsible for implementing the allocations in the TMDL are required to implement the TMDL with the understanding that they may be required to modify their programs over time as new monitoring information becomes available. An adaptive management approach has been adopted by DEQ as the means to make these modifications while the designated management authorities are moving forward with actions that will improve water quality in the Rogue River Basin.

Rogue River Basin TMDL Comments

Comments from: Jennifer Wu US-EPA TMDL Project Manager, Region 10, Seattle Washington. Received 11/19/08

General Comments

1. The explanations of the biological uses and the use of figures and graphs throughout the report to illustrate bacteria and temperature data were very helpful.

2. Introduction. Information on fish use in the Rogue Basin and on parameters that are and are not being addressed was helpful.

Introduction

3. Page 1-19. Page 1-19 states that the DEQ count is the method used to report the number of TMDLs completed to meet the Consent Decree. However, EPA reports the number of TMDLs completed to the plaintiff and will be using the method which EPA attorneys have interpreted to best meet the intent of the Consent Decree. EPA's count is 109 TMDLs (91 temperature TMDLs, and 18 bacteria TMDLs). We will send you our list in a separate document.

Response ODEQ: Changes have been made to Section 1.4, Water Quality Impairments (Page 1-9 in Draft) to clarify that it is EPAs role to report the number of TMDLs completed to the plaintiff.

4. Section 1.5, Page 1-17. The information on parameters not addressed is very helpful. When providing information in the future that supports listing or delisting a waterbody segment, please send a copy to EPA's 303(d) Integrated Report Coordinator.

Response ODEQ: TMDL staff has sent an informational memo to DEQ's WQ Assessment Coordinator & EPA's 303(d) Integrated Report Coordinator.

Temperature

5. Table 2.2, Page 2-4; Page 2-15. In the seasonal variation section, it would be useful to include the shoulder spawning season as a critical condition, though it is not the warmest time of the year.

Response ODEQ: Additional text was added to Section 2.3.3 to address this comment.

6. Page 2-17. Provide a description of sources in Illinois Basin, particularly those segments with spawning listings.

Response ODEQ: Additional text was added to Section 2.4.2 to address this comment.

7. Page 2-17, Section 2.4.2. General permits. This section states that facilities with a general permit are considered to be negligible sources and not given allocations in the TMDL. The implication is that the allocations for these sources are zero. If the intent is for these sources to be given a current use loading that should be stated here.

Response ODEQ: Section 2.8 (WLA section) was clarified to reflect DEQ's intent for sources with a general permit to have a current use loading allocation. References to allocations were removed from the source assessment.

8. Page 2-18, Figure 2.8. What does the green line refer to, the differences in daily average? What data are used to calculate the median? Does this chart show the average daily temperature increase or the daily maximum increase?

Response ODEQ: Additional text was added to Section 2.4.2 to address this comment.

9. Page 2-21, Riparian Vegetation Disturbances. It is unclear how this differs from Near Stream Vegetation Disturbance and Removal.

Response ODEQ: Section 2.4.3 was clarified.

10. Page 2-22 through 2-24, Lost Creek Reservoir. This discussion mentions that operation of Lost Creek Reservoir causes warmer temperatures downstream during the non-critical season but it does not say whether these temperature increases exceed OAR 340-041-0028(12)(b). Figure 2-12 appears to indicate the standard is not exceeded, but it would be good to discuss this in the text.

Response ODEQ: Additional text was added to Section 2.4.3 to address this comment.

11. Page 2-35, Section 2.7.1. This section sets forth load allocations to meet the water quality standard to protect beneficial uses, a requirement of the Clean Water Act. However, we recognize that in the implementation of the TMDL, ODFW, USACE and ODEQ may be unable to immediately restore and protect beneficial uses, and in the interim, the temperature management plan will seek how best to optimize conditions to benefit salmonid fisheries, a step needed to eventually protect beneficial uses. The language in this section discusses how the beneficial uses will be optimized. We suggest the language of optimizing benefits to salmon be put into the context that the long term goal of the TMDL is the protection of beneficial uses, as required by water quality standards.

Response ODEQ: DEQ agrees and believes the document reflects this intent.

12. Page 2-53, Section 2.7.3. Hyporheic Exchange. The paragraph describes the findings of hyporheic exchange rates in the Little Butte and South Fork Little Butte Creeks. One of the other goals of the study was to use the Little Butte system as a means to represent hyporheic exchange rates in other areas of the watershed. Is there other information to include on hyporheic exchange rates from other parts of the basin? It is not clear whether this is an allocation or surrogate measure or what this target is. It is also not clear what DMA would be responsible for achieving it. This should be clarified in the text.

Response ODEQ: The hyporheic exchange rate was not intended to be an allocation and therefore Section 2.7.3 Site Specific Hyporheic Exchange Rate has been removed. The graphs showing estimated natural hyporheic rates have been moved to the source assessment. This information may be helpful during implementation.

13. Page 2-53, Section 2.8. Point sources. The TMDL states that only cumulative impacts were measured in the Rogue River mainstem because of the lack of resources. Are there tributary systems with a high potential for cumulative impacts, or is this unlikely and why?

Response ODEQ: Additional text was added to Section 2.8 to address this comment.

14. Page 2-55, First paragraph, first sentences. Is it more correct to change the sentence to, "The applicable criterion is the greater of the biologically based criterion or the 7DADM NTP criteria"? My understanding is that one only calculates the 7DADM for NTP.

Response ODEQ: The biologically based numeric criteria are also based on the *7DADM*.

15. Page 2-55. The text states that when cumulative impacts are a concern, it makes more sense to use a daily average. How about when cumulative impacts are not a concern? Do you use the daily average metric for all point sources to be consistent, rather than just applying it to City of Grants Pass and City of Medford, the two sources where cumulative impacts comes into play?

Response ODEQ: Section 2.8 (WLAs) has been modified to address other's comments. The WLAs are now based on the 7DADM, not the daily average temperature.

16. Page 2-55, third paragraph. The end of the third paragraph discusses point sources discharging to tributaries whose WLA will be calculated. In the statement, "… the WLA allocation is a 0.3^{o}C increase to the biologically based criteria based on 25% of the 7Q10 or current levels," what does current level refer to? Isn't the 7Q10 the appropriate metric?

Response ODEQ: Section 2.8 was clarified; "current levels" refers to current heat loads. The 7Q10 is a conservative flow metric which may be used if the current impact of the source is minimal and the complexity of flow-based allocations are not needed.

17. Page 2-58, Table 2.16. The column "Cumulative impact from sources less upstream dissipation" is helpful. Is it correct that this column refers to the allowable change in temperature to meet the 0.2^{o}C WLAs?

Response ODEQ: Yes, that is correct. Due to WLA refinements that column is no longer included in the table, however the information is presented graphically.

18. Page 2-60, Table 2.17. Please delete "narrative" from the title of Table 2.17, since equations 2-4 and 2-5 will be used to develop numeric targets. In certain cases, EPA does not approve narrative allocations.

Response ODEQ: The word "narrative" has been deleted and the title of the table clarified to better represent our approach.

Bacteria

19. Page 3-6, Figure 3.1. Figure 3.1 should be titled 303(d) listings addressed in TMDL. The map does not include the estuary listing in the Lower Rogue mainstem.

Response ODEQ: Title of Figure 3.1 has been changed.

20. Page 3-7, Point sources under a general permit. Please provide more explanation about point sources under a general permit and why it was determined that they do not contribute to bacteria loading.

Response ODEQ: An explanation addressing this comment has been added in Section 3.1.5 Point Sources

21. Page 3-8, Nonpoint sources. In the middle of the first paragraph, the TMDL states, "Given the typical dry summers …, the typical nonpoint sources input would produce a pattern of low bacterial numbers in the summer … during the first numbers." The following sentence might be clearer if expressed as the following: "However, Bear Creek experiences high summer bacteria concentrations as a result of extensive irrigation water use and transfer."

Response ODEQ: Sentences have been rewritten to address this comment in Section 3.1.5 Nonpoint Sources

Water Quality Management Plan

22. Implementation of Lost Creek Reservoir temperature targets. Though EPA does not approve implementation plans for TMDLs, EPA supports the cooperative efforts between Oregon Department of Fish and Wildlife and Oregon Department of Environmental Quality to work together to develop annual temperature targets that optimize operations to protect beneficial uses.

Response ODEQ: Thank you for the comment and support.

23. Throughout Chapter 4 the Water Quality Management Plan (WQMP) is referenced as the tool for implementing the TMDL. For the reader this can be confusing because the WQMP is not the tool for implementing the TMDL, rather it represents the "umbrella document" which defines the tools for TMDL implementation. The DMAs' TMDL Implementation Plans are the tools for achieving compliance with the WLAs and LAs. The language in Chapter 4 should be changed to reflect this point.

Response ODEQ: Changes have been made to reflect the WQMP is a compilation of implementation plans that will be used to guide TMDL implementation.

24. Oregon Administrative Rules clearly define what is required of DMAs in developing their TMDL Implementation Plans. While DEQ does mention one element of the rules, the time frame for DMAs to submit their implementation plans (18 months after adoption of the TMDL), the State should provide a much more robust discussion of its rules for DMAs in this chapter. It might even be appropriate for DEQ to include the actual rules in this section since it is likely many DMAs will be paying close attention to the Chapter 4.

Response ODEQ: Oregon Administrative Rule 340-042-0080 has been incorporated into the WQMP.

25. ODA and ODF, and possible other state agencies, do not have the resources to fully implement their respective rules which the WQMP suggests support the

implementation of the TMDL. These programs are often complaint driven and lack resources for follow-up or resources for general implementation. Consequently, there is limited ability or capacity for proactive collaboration for implementing actions that target the goals of the TMDLs. DEQ along with other state agencies like ODA and ODF should complete a gap analyses to determine what can actually be accomplished. Understanding those true gaps establishes a much more accurate account of what is achievable, by whom and when. This is foundational for making changes on the ground that will lead to the goals of the TMDL.

Response ODEQ: DEQ has signed agreements with most state agencies which describe the process by which agencies will meet water quality standards. It is anticipated that gap analysis will be on going as part of the TMDL implementation process.

26. DEQ indicates that it will monitor and track the accomplishments and shortfalls of DMA implementation by reviewing the DMAs' annual reports. While DEQ doesn't describe in detail how this will be accomplished, considering the numerous reporting elements DMAs must address in their annual reports, it seems impracticable for DEQ to expect it will be able to successfully monitor and track the DMAs progress over the years without a clearly defined and strategic approach. DEQ needs to define a more detailed approach for monitoring and tracking DMAs' successes or challenges. It should consider how it could use its limited resources to develop a tracking system (possibly a data base) that will serve this purpose. It might also consider how to use a third-party or a contractor to develop a data/information tracking and monitoring strategy, such as a watershed council or a COG.

Response ODEQ: Initial reporting guidance is contained in the TMDL Implementation Plan Guidance – for State and Local Government Designated Management Agencies, May 2007. DEQ acknowledges that refinements will be needed as implementation plans are developed.

27. <u>Page 4-3, the second sentence in the second to the last paragraph.</u> The sentences states that "Revisions may include recalculating the TMDL loading capacity and allocations or the possible alternatives to TMDLs including use attainability analysis (UAA) and site specific criteria." UAA and site specific criteria are not alternatives to the TMDL. They are approaches to consider if, after completion of the TMDL, there is a determination that the targeted standards or beneficial uses cannot be achieved. The language should be changed to reflect this point.

Response ODEQ: The sentence has been revised to read: "If use attainability analysis (UAA) and/or site specific criteria show that the targeted standard or beneficial uses cannot be achieved then revisions to the TMDL may include recalculating the TMDL loading capacity and allocations."

28. <u>Page 4-15</u>, indicates that irrigation districts are not sources of bacteria but do transport water that carry bacteria and heat into surface waters. Irrigation canals can be sources of bacteria and certainly are heat sources. Many, if not most irrigation canals are unprotected and open to the atmosphere. Surface water runoff from the landscapes crossed by the canals collects in the canals, while heat energy warms the irrigation waters in the open canals as the water moves throughout the system. While one may argue that the irrigation districts are not direct generators of heat or bacteria, such as CAFOs or a point source discharge, the districts are, at the least, indirect generators of bacteria from runoff and heat from solar exposure. Unless

DEQ can present data that shows otherwise, the language in this paragraph should be restated to say irrigation districts can be sources of bacteria and heat.

Response ODEQ: Language in Chapter 4 has been changed to the following: "Irrigation districts are considered nonpoint sources that influence the quantity and timing of both heat and bacteria delivery to down stream river reaches. While irrigation district operations themselves do not create fecal bacteria, the laterals and canals that are used to convey water can play a major role in transporting bacterial contamination across the landscape and into surface waters. Implementation Plans will need to be developed that include management measures to address heating and aggressive operations and maintenance practices that address conservation practices to improve irrigation water use and conveyance efficiency to reduce the potential of polluted return flows. Irrigation districts need to develop management strategies that address heating and fecal loading to irrigation canals. Districts may contact users directly or in conjunction with ODA and the Soil and Water Conservation Districts to inform irrigation users of effective irrigation practices, manure management and other practices to keep fecal organisms and heat out of the irrigation system and out of surface waters."

Comments on Rogue River Tributary – Little Butte Creek Geomorphology and Groundwater Connectivity Assessment

29. Overall impression. In summary, I think the report essentially tells us that the rate of hyporheic exchange in the Little Butte Creek and its tributaries is estimated to be around 6%. This was reported to be within the norm (2% - 12%) of hyporheic exchange in streams and rivers, and was reported to be very consistent with existing literature. This estimate is derived from a comparison of targeted geomorphic changes in LBC and its tributaries based on three sets of aerial photos spanning approximately 65 years.

Response Tetra Tech Inc.: Curtis Loeb, Water Resources Engineer. The summary is correct.

30. Because of limited resources to expand this study and limited time to complete this work, no other conclusions could be made without further, more detailed analyses. While it is good to have some idea of the exchange rate, the impacts of the exchange rate on water quality could not be or were not addressed.

Response Tetra Tech Inc.: Curtis Loeb, Water Resources Engineer. It is true that assessing the impacts of geomorphic and groundwater connectivity changes on water quality (temperature) were outside scope of this study. However, Section 3.2 (Figure 3-2) describes the impacts of the hyporheic flow estimates on stream temperatures as a back-check to ensure that estimates of hyporheic flows are reasonable. The impacts on stream temperatures were within the range of those documented in the literature.

31. Methods Section, Sections 3.1 to 3.1.1. The methods section from 3.1 to 3.1.1 was well written and helps explain how the estimates were developed. Note in paragraph 3 that the generalizations for the decision to choose South Fork Little Butte Creek over North Fork Little Butte Creek are adequate. It would be helpful to add that we had some assumptions that groundwater connectivity in the South Fork Little Butte Creek would be more impacted from land use changes, which may or may not have been supported when data were reviewed. Also note that DEQ FLIR analysis was

pointing to South Fork Little Butte as having a more significant groundwater component, hence the decision to focus our efforts there.

Response Tetra Tech Inc.: Curtis Loeb, Water Resources Engineer. Assumptions about GW connectivity in the South Fork based on known land use changes and previous ODEQ FLIR analysis were added to Section 1.3.

32. We strongly recommend that the metadata be included as an appendix to this report or included in the body, in particular, the tables that were generated in Step 2, including the estimates, and the high, moderate, and low-grade designations used in Step 4 for hyporheic exchange.

Response Tetra Tech Inc.: Curtis Loeb, Water Resources Engineer. The hyporheic flow values in Tables 3-2, 3-3, although discrete quantities, reflect the qualitative estimates made for hyporheic flow. These values (rounded, increments of roughly 2%) themselves denote the high, moderate, low designations as numeric values. The tabulated values were a result of Step 4, after Steps 2 and 3 were done basically in tandem. The only 'metadata' recorded are those numeric estimates shown in the tables.

33. Natural Conditions, Section 3.13. Page 3-4 notes that "one final incremental estimate of change was applied to the historic conditions to back out the natural condition." Please provide more information about what the incremental estimate was and how the estimate is used to correlate historic and natural conditions.

Response Tetra Tech Inc.: Curtis Loeb, Water Resources Engineer. Added sentences in Section 3.1.3 describing an example of the reference approach used to estimate the natural condition from reaches with development pre-1939.

34. Table 3-2. The revised document addresses why bankfull widths for 2005 were not in the table. However, it would be helpful to include the bankfull widths for 2005 to compare with historical bankfull widths.

Response Tetra Tech Inc.: Curtis Loeb, Water Resources Engineer. 2005 bankfull were added to the table for the Mainstem and North Fork.

35. Tables 3-2 and 3-3. Why is there a difference in intervals between the South Fork and mainstem Little Butte? The distances between points used to evaluate the estimated hyporheic flow exchange over time varied in the South Fork LBC whereas the distance between evaluation points on the main stem of the Little Butte Creek was almost always 200'. Please provide the reason for the inconsistent distances between the points used in the South Fork. Figure 3-1 shows South Fork Little Butte analysis to 50,000 meters. The full distance should be shown in Table 3-3, if it is shown in Figure 3-1. Also, provide bankfull widths in Table 3-3.

Response Tetra Tech Inc.: Curtis Loeb, Water Resources Engineer. TetraTech Intervals are of different sizes because the South Fork involved only analysis of the 2005 photoset, the table generally shows only locations where estimates changed (at irregular intervals). This was done to reduce the number of repeated values (if done at regular intervals) and reduce the size of the table. If multiple photosets had been compared for the South Fork, regular intervals of comparison would have made more sense, similar to Table 3-2.

36. Table 3-4 data is relative to 2005. We recommend adding this to the table.

Response Tetra Tech Inc.: Curtis Loeb, Water Resources Engineer. TetraTech Added "relative to 2005."

37. Page 2-2. Define channel abbreviations.

Response Tetra Tech Inc.: Curtis Loeb, Water Resources Engineer. Abbreviations were added as notes below table.

Editorial comments

38. We have noted some grammatical errors and will provide these in a separate document.

Response ODEQ: Thank you for the review – changes have been made.

Comments from Fred Fleetwood, Citizen Trail Oregon. Received 11/21/08

1. GENERAL COMMENT – About the Proposed set of Seven-Draft Rogue Basin Temperature and Bacteria TMDL documents: All the information contained in the text of these voluminous documents is overwhelming – too overwhelming to be properly assimilated and digested in the two month comment period provided. To adequately comment on the material, one would almost have to spend all his/her free time doing nothing but concentrating on, and writing about, the material. Therefore, a two-month comment period is just not enough time to write adequate comments. But I'll try… Side note: I only became aware of the proposed documents just two weeks prior to the end of the comment period. I am typing this as I review the documents, and at the moment I am wondering if I have the fortitude to keep doing this. The 2nd sentence of the Executive Summary – the beginning portion of the Rogue Basin TMDL documents is:

> "The following document contains the required components for a Total Maximum Daily Load (TMDL) as described by the U.S. Environmental Protection Agency (EPA) for compliance with the Federal Clean Water Act."

Then that paragraph continues with the next sentence (the 3rd sentence) by stating:

> "The document and its appendices provide a thorough analysis of pollutant sources and accumulation processes in the Rogue River Basin."

Not until the 4th sentence does the document finally get around to stating what a TMDL is; that is, that "TMDLs are limits on pollution." The document should start out by first defining what a TMDL is – in the first sentence! But it doesn't. Is that being hypercritical? Maybe, but I don't believe so.

Response ODEQ: The term TMDL is defined in the introduction to the TMDL on page 2

2. The Executive Summary and, of course, the other portions of the proposal, do not state (but should) why a Total Maximum Daily "Load" (TMDL) is not being established for water quantity. The answer, again of course, is that good water quantity (i.e., sufficient water) is not negative to good water quality. Sufficient (i.e., minimum) water quantity is a positive contribution to good water quality, whereas the TMDL parameters are negative (i.e. pollutants), by definition.

Response ODEQ: The influence of flow on water quality is stated in numerous places in Chapter 2: "Human or anthropogenic heat sources may include discharges of heated water to surface waters, increases in sunlight reaching the water's surface due

to the removal of streamside vegetation and reductions in stream shading, changes to stream channel form, and reductions in natural stream flows and the reduction of cold water inputs from groundwater. " The direct regulation of flow is not under the jurisdiction of DEQ but is addressed through Oregon Water Resources Department.

3. That begs the questions of: "But what about the TMDL being established for dissolved oxygen? Is dissolved oxygen a pollutant?" It is not. Dissolved oxygen, just as good water quantity is, a positive contribution to good water quality. So, if a TMDL can be established for dissolved oxygen, why can't there be a TMDL established for water quantity?

Response ODEQ: Dissolved oxygen is a water quality standard that can be negatively affected by pollution. DO issues in the Rogue Basin are discussed on page 1-18 of the draft.

4. Apparently the answer to that question ["Why can't there be a TMDL established for water quantity?"] is that to do so would be beyond the purview of the DEQ. For the DEQ to set a minimum quantity of water would be "stepping on the toes" (i.e., authority) of a fellow state agency's (the Water Resource Department's) jurisdiction. And, God forbid, we wouldn't want that to happen, would we. That is also probably why the Water Resource Department (WRD) is not one of the Designated Management Agencies (DMAs) indicated in the Water Quality Management Plan (WQMP). Having the WRD excluded from the Rogue Basin TMDL proposal is unacceptable.

Response ODEQ: DMAs are identified in the WQMP and are those entities that have legal authority over a sector or source of pollutants being addressed in the TMDL. Flow is not a pollutant and therefore the OWRD was not named as a DMA in the Rogue TMDL. However, flow does affect pollutants addressed in the Rogue TMDL. Water withdrawals have the potential to impact surface water temperatures within the Rogue Basin and are evaluated in section 2.4.3 Nonpoint Sources and in Table 2.11. It is current DEQ policy not to assign allocations to compensate for the decreased assimilative capacity caused by consumptive use of water. In the future, in-stream water rights as well as other tools that could be used for maintaining flows may help in meeting the water quality standards addressed in the Rogue TMDL.

5. About the 1st paragraph under the heading of "Temperature TMDL" (which is located on the first <u>unnumbered</u> page of the Executive Summary – Bye-the-way, the pages of the Executive Summary should be numbered.): This paragraph starts out immediately by talking about "The temperature standard … ." Then later (in the last sentence of that same paragraph), it suddenly switches to a different subject – the subject of "The TMDL," like it can't make up its mind which it wants to talk about.

Response ODEQ: Executive summary has been paginated.

6. The subject of The temperature standard and the subject of The [temperature] TMDL (if my understanding is correct) are two different subjects, even though they are intimately related. But discussions of them must be made in separate paragraphs so they are not confused. Therefore, that first paragraph should be broken into two paragraphs, and the subject of the first paragraph should (as the heading indicates) be the Temperature TMDL. The second paragraph should then speak to how the Temperature Standard is related to the Temperature TMDL. (From this reader's perspective, it seems the author's of the document can't even keep from confusing the two subjects.)

Response ODEQ: Achieving the applicable criteria as defined by the temperature standard is the goal of the TMDL. The executive summary is only a summary – explanations and more in depth discussions of the standards and the TMDL are found in the text of the document itself.

7. The current 2nd paragraph under the heading of "Temperature TMDL" indicates the various sources (that is, "reasons") of temperature impairment. But I want to emphasize one of those sources/reasons it mentions. I want to emphasize it because I believe it is the most important reason! That reason is the "removal of water" from the streams. That reason may not be "the major" reason for temperature impairment, as this 2nd paragraph states (not in those exact words), but (again, in my opinion) it is the most important reason. That reason is the most important reason because, after all, the removal of water from streams (i.e., the diminishment of water quantity is directly related to the increases of water temperatures – the very reason for establishing a "Temperature Total Maximum Daily Load"! In other words, water quantity comes before water quality! Another way of saying it, is: There can be no water quality -- of any kind, good or bad -- without first having water quantity! And, again, that's why it is important for the WRD to be one of the Designated Management Agencies (DMAs) indicated in the Water Quality Management Plan (WQMP).

Response ODEQ: See response to 4 above.

8. Executive Summary's Temperature TMDL: Observation: The 2nd paragraph under the heading of "Temperature TMDL" starts the new subject of sources of temperature impairment. Where this new subject starts in that 2nd paragraph under that heading of "Temperature TMDL", a new paragraph should also start that addresses the effects of Lost Creek Reservoir. That new paragraph should briefly state what those specific concerns are about the reservoir's impact on the temperatures of the river and the chinook salmon. Even though those concerns are explained in the 2nd paragraph under the heading of "*Chinook Salmon (Oncorhynchus tshawytscha)*" on page 1-7 of the Water Quality Management Plan, this recommended new paragraph in the Executive Summary should (for emphasis) explain those concerns here also – especially in regard to the spring chinook. The Executive Summary should not gloss over that subject so lightly as the draft document now does.

Response ODEQ: The topic of spring Chinook abundance related to Lost Creek dam operations is discussed in detail on page 1-7 and the subject of spring Chinook as an impacted beneficial use is discussed on the section that includes allocations for Lost Creek Dam – page 2-22 through 2-35.

9. Executive Summary Comment - About the 1st paragraph under the heading of "Bacteria TMDL": Again, this 1st paragraph erroneously mixes together the two subjects of "The Bacteria Standard" and the "Bacteria TMDL."

Response ODEQ: Achieving the applicable criteria as defined by the bacteria standard is the goal of the TMDL. The executive summary is only a summary – explanations and more in depth discussions of the standards and the TMDL are found in the text of the document itself.

10. I believe, if I am not mistaken, the word "apply" (contained in the last sentence of the last paragraph pertaining to Bacteria TMDL) which states "Pollution limits apply basin-wide and will insure streams, rivers and lakes are safe for water contact recreation.", should be changed to "are applied", so the sentence reads thusly:

"Pollution limits are applied basin-wide and will insure streams, rivers and lakes are safe for water contact recreation."

Response ODEQ: Pollution limits apply is the correct terminology.

11. Chapter 1, Introduction, Comment No. 1: About the Water Quality Management Plan (the WQMP): Again, the Oregon Water Resources Department (the WRD) is erroneously left out of (omitted from) the WQMP as a Designated Management Agencies (DMAs).

Response ODEQ: Refer to question 4 response.

12. Chapter 1: Introduction; Section 1.3 *Oregon's TMDL Program*, The paragraphs of this section (pertaining to Oregon's TMDL Program) mention the subject of "violations of water quality criteria," but nowhere in this "Plan," are the definitions of "water quality criteria" found when using the document's electronic edition's "search" mechanism. There are only three locations of the documents where the words "water quality criteria" are found. One location is in the Executive Summary, and the other two are found in the two above referenced paragraphs of the Plan. And in none of those three locations are the "water quality criteria" defined. So… the Plan should state what the "water quality criteria" are.

Response ODEQ: The water quality criteria are a part of the water quality standard. The water quality criteria for temperature and bacteria are presented in the Introduction under the heading "Applicable Water Quality Standard".

13. The 3rd paragraph of this Section 1.3 of the Introduction goes into great detail to explain and define TDML. Example: It explains that TDML is equivalent to pollution from "point sources," pollution from "non-point sources," from "future sources," and from "uncertain sources." And then, for some unexplained reasons it: Changes the terminology of "point sources" to "Waste Load Allocation," Changes "non-point sources" to "Load Allocation," Changes "future sources" to "Reserve Capacity," and Changes "uncertain sources" to "Margin of Safety." Changes in this simple terminology are simply nonsensical – and unnecessarily confusing, even if it is required by the Oregon Environmental Quality Commission's (the OEQC's) Administrative Rule (OAR 340-042-0040). The OEQC needs to change its OAR's to reflect the reversion back to the original terminology. So…, don't change this terminology! Leave it the way it is, and keep it simple!

Response ODEQ: Terminology is consistent as defined in the Oregon's Administrative Rule.

14. Observation concerning Section 1.4 *Watershed Characterization*: This section starts out by using the term "HUC" (with a number following it) without stating what "HUC" stands for. Then in the sixth line of the 1st paragraph it finally gets around to stating that those initials stand for "Hydrologic Unit Code." Where the acronym "HUC" <u>is first used</u> (that is, <u>immediately</u> following the use of it – in this case, in the paragraph under the heading of "*Geographic Setting*" on page 1-2), the document should explain what "HUC" stands for.

Response ODEQ: HUC has been defined where first used page 1-2.

15. Comment No. 5, also concerning the paragraph under the heading of "*Geographic Setting*: Place a coma between the "9" and the "4" of the number (located near the top of page 1-3) that indicates the elevation of Mt. McLaughlin.

Response ODEQ: Change made.

16. About the last sentence of the second paragraph on page 1-7 of Section 1.4 "Watershed Characterization" under the heading of "Rogue River Basin Fisheries". That last sentence states: "Once the egg sac has been completely absorbed, the alevin emerges from the gravel as a fully developed fry." Comment No. 6, concerning the last sentence of the second paragraph on page 1-7. I have observed the Trail Creek (a Rogue River tributary in the Upper Rogue Subbasin) salmonid "alevin" already emerged from the gravel with the "egg sac" still not yet absorbed.

Response ODFW: Tom Satterthwaite – ODFW biologist. Yes, it is not unusual for alevins to emerge from the gravel before complete absorption of the yolk sac. Late-stage alevins will commonly move in and out of hiding places in the substrate until the yolk sac is completely absorbed.

17. About the paragraph under the heading of "*Steelhead (Oncorhynchus mykiss)*" on page 1-7 of the Water Quality Management Plan (the WQMP). Observation: The last two sentences of that paragraph state: "Many of the small streams preferred by steelhead for spawning dry up in the summer, and steelhead fry produced in these ephemeral streams migrate downstream into larger streams as flows decrease (Everest 1973). In addition to high water temperatures, numerous other factors limit steelhead production in the Rogue River Basin." Comment No. 6, concerning the Water Quality Management Plan (the WQMP): However, the situation described by those last two sentences under the heading of "*Steelhead (Oncorhynchus mykiss)*" on page 1-7 of the Water Quality Management Plan (the WQMP), also exists for several of the former perennial streams. A case in point is Trail Creek. That creek (except for the very upper reaches of its mainstem and its tributaries) dries up <u>every year, regardless of whether the water year is a wet one or a dry one</u>. The principal reason for that "diminishment of water <u>quantity</u>," and therefore increases of water <u>temperatures</u>, is the <u>over-appropriation of water</u> rights along the creek. That situation is (again, and again, as I've stated earlier) is the reason the Oregon Water Resources Department (the OWRD) should be made one of the Designated Management Agencies (DMAs) included in the Water Quality Management Plan (the WQMP). [A side note (I can't resist letting this pass): If the "truth" of the situation was actually made known, the OWRD and its Commission would be <u>abolished</u>, and the missions of the OWRD and the ODEQ would be combined so those two agency missions would not conflict.]

Response ODEQ: See response to Comment 4 above.

18. About the paragraph concerning the coho salmon under the heading of "*Coho Salmon (Oncorhynchus kisutch)*" on page 1-8 of the Water Quality Management Plan (the WQMP). Observation: That paragraph describes the life cycle and habitats uniquely peculiar the coho salmon – i.e., that: "… Juveniles rear primarily in small streams during the summer months within pools, glides, and other slow velocity areas with overhead cover. They spend the winter months in low radient braided channel areas where side channels, sloughs, and beaver ponds are present, before migrating to the ocean. In general, they depend on smaller streams that have wide riparian areas with marshes and side channels and pools in off-channel areas, alcoves along the edges of streams and rivers and beaver dams for summer and winter freshwater habitat. These fish must remain in freshwater habitat, generally tributary streams, for one year before migrating downstream to the ocean." There is, however, at least one exception to that description of the Rogue River Basin coho habitats. That exception is Trail Creek. Trail Creek is NOT dominated by those physical characteristics described in the paragraph under the heading of "*Coho*

Salmon (Oncorhynchus kisutch)" on page 1-8 of the Water Quality Management Plan (the WQMP). And yet, coho salmon are present in Trail Creek. Their presence in Trail Creek is well documented by Rich Nawa of the Siskiyou Project, by Tom Satterthwaite of the ODFW, and by the juvenile fish rescue efforts by ODFW volunteers during the late 1990s and during the present decade. The ratio of their presence in Trail Creek (in comparison to the summer steelhead in Trail Creek) is roughly 15%, as of the 2008 rescue efforts. Again, and again, at the risk of "beating the dead horse to death," the facts of the existence of coho in Trail Creek, and the annual drying of the middle and lower reaches of the creek principally because of the over-appropriation of water rights along the creek's mainstem and tributaries, is yet another reason for the WRD being one of the DMAs in the WQMP.

Response ODEQ: See response to Comment #4 above.

19. About the discussion and tables appearing on pages 1-9 and 1-10 of the WQMP: Observation: That discussion and those tables do not appear to take up more space than would occupy more than one page. Comment No. 8, concerning the Water Quality Management Plan (the WQMP): Therefore, if at all possible, place this discussion and those tables all on one page.

Response ODEQ: Format changes will be made if possible.

20. About the 1st paragraph under the heading of "*Oregon Water Quality Index (OWQI)*" on page 1-10 of the WQMP: Observation: There is a semicolon following the word "parameters," instead of a colon.Comment No. 9, concerning the Water Quality Management Plan (the WQMP): Replace the semicolon with a colon.

Response ODEQ: Change made.

21. About the 2nd paragraph under the heading of "*Oregon Water Quality Index (OWQI)*" on page 1-10 of the WQMP: Observation: Of the 8 sites within the basin that were tested, notably missing were tests of Big Butte Creek, Elk Creek, Lewis Creek, Trail Creek, Indian Creek, and Dry Creek.

Response ODEQ: OWQI analysis and results are presented for all Rogue ambient sites. Sites mentioned above may be water quality sites but are not part of the ambient network of sites across the state.

22. Comment No. 10, concerning the Water Quality Management Plan (the WQMP):As long as the Rogue River at Dodge Park was being tested, the water at the mouths of Big Butte Creek, Elk Creek, Lewis Creek, Trail Creek, Indian Creek, and Dry Creek could have just as easily been tested also. These creeks should be tested also. [And at the time of testing, if the mouth of Trail Creek is dry, that fact should be recorded.]

Response ODEQ: Sites mentioned are not currently part of the ambient network of water quality sites.

23. About the paragraph under the heading of "*Sedimentation*" on page 1-19 of the WQMP: Observation: The first two sentences under that heading of the WQMP state: "There are six segments in the Rogue River Basin that were listed in the 2004/2006 WQ Assessment as sedimentation impaired (Table 1.12 and Figure 1.10). The impairments were determined based on Oregon Department of Fish and Wildlife (ODFW) reporting that a high percentage of fine sediment was measured in most reaches during a 1994 survey." Comment No. 11, concerning the Water Quality Management Plan (the WQMP): Of those six stream listings on the 2004/2006 WQ

Assessment for sedimentation impairment, none are located in the Upper Rogue Watershed Council area. Streams of the Upper Rogue Watershed Council area were again notably missing. In my opinion that situation is both objectionable and unacceptable. Was it because there were no volunteers for that work from the Upper Rogue Watershed Council? In particular, Big Butte Creek, Elk Creek, and Trail Creek are famous for carrying high sediment loads. So…, Why were those stream neglected in the previous sedimentation assessment process? That question may not be appropriate for this particularly proposed TMDL draft, which is restricted to establishing TMDLs for only temperature and bacteria, but nevertheless I would like to know the answer to that particular question concerning sedimentation.

Response ODEQ: At the time of the writing of the TMDL the streams mentioned above were not on the 303(d) list identifying them as water quality impaired. DEQ is currently refining methods and standards related to sedimentation and as stated in the TMDL 1-19 will address the listings during the 5 year review of the TMDL.

24. Thirdly: About the DRAFT ROGUE RIVER BASIN TMDL CHAPTER 2: TEMPERATURE. Chapter 2, Comment No. 1:When one gets to the "*DEFINITIONS*," he/she is introduced to the strange three-syllable and highfalutin word "Anthropogenic." It is apparently used, for no other purpose, than to impress the readers with the authors' vocabulary. That word simply means "human caused." Trying to impress the readers is UNnecessary. So eliminate it! Use the two words which represent its meaning. Keep things simple. Chapter 2, Comment No. 2: There are 12 more GOBBLEDEGOOK definitions of new words and terms (new to me, at least) which are listed following "Anthropogenic." Apparently I'm going to have to effectively learn a new language to understand these documents. Therefore I will only comment on the material about which I believe I can understand.

Response ODEQ: Terminology is defined and is consistent with previous TMDLs.

Comments from Tim Wilson, City of Grants Pass. Received 11/25/08

1. On behalf of the City of Grants Pass Wastewater Treatment Plant, I am requesting the refinements to section 2.8 (PERMITTED POINT SOURCES - WASTE LOAD ALLOCATIONS) that were completed in October 2008 be included in the Draft Rogue River Basin TMDL document for final approval.

Response ODEQ: The expression of waste load allocations in Section 2.8 have been refined as a result of discussions originating at Technical Advisory Team meetings. Please see completed TMDL.

Comments from ODFW: Steve Denney, Regional Supervisor Southwest Region Oregon Department of Fish and Wildlife Roseburg, OR.

Thank you for opportunity to comment on the October 2008 document titled ***DRAFT Rogue River Basin TMDL***. In addition to compliance with requirements of the federal Clean Water Act of 1972, the Oregon Department of Fish and Wildlife (ODFW) believes that implementation of a well designed TMDL can also advance the goals of the Oregon Plan for Salmon and Watersheds. As described in Executive Order Number EO 99-01, the purpose of the Oregon Plan is to "restore Oregon's wild salmon and trout populations and fisheries to sustainable and productive levels that will provide substantial environmental, cultural, and economic benefits and to improve water quality".

ODFW also believes that a well designed TMDL can also advance the goals of other federal legislation specific to the Rogue River Basin. House document 566 (United States Congress 1962) authorized the construction and operation of Lost Creek Dam on the Rogue River by the United States Army Corps of Engineers (USACE). A primary authorized purpose of reservoir operation is fishery enhancement in downstream areas. To determine actions needed to optimize fishery enhancement benefits, a long term (twenty year) fisheries research project was conducted to identify the effects of water quality and quantity on salmonid fishes in the Rogue River. This project was completed and ODFW uses the findings to craft management recommendations that are designed to optimize salmonid production in areas downstream of Lost Creek Dam. A directly relevant finding of the research project was that increased water temperature during autumn and winter, as a result of reservoir operation, is a primary factor that limits production of salmonids in the Rogue River.

1. It is the policy of the Environmental Quality Commission of Oregon to protect aquatic ecosystems from adverse warming and cooling caused by anthropogenic activities. The purpose of temperature criteria, adopted in rule, is to protect designated temperature-sensitive, beneficial uses, including specific salmonid life stages. As detailed in the following comments, results from the comprehensive fisheries research project clearly show that temperature targets for Lost Creek Reservoir need to be carefully planned in order to enhance beneficial uses in downstream areas. ODFW has detailed research findings that indicate a simple adoption of short-term release temperatures directed towards Natural Thermal Potential (NTP) will result in decreased, rather than increased, beneficial uses for salmonid fishes. For this reason, ODFW supports a coordinated multi-agency effort designed to develop water temperature release strategies that optimize beneficial uses in downstream areas. This approach is mentioned in portions of the draft document, but should be clarified in the Water Quality Management Plan section of the document.

Response ODEQ: We also support a multi-agency approach to regulating Lost Creek Dam temperatures. The WQMP has been modified to more clearly state the level of coordination anticipated between ODFW and ODEQ to develop a single set of temperature targets for the Lost Creek Dam project and the development of a Memorandum of Understanding that clearly defines this collaborative process.

2. Currently, the USACE employs reservoir release strategies that are developed annually with input from the Rogue Basin Water Management Advisory Group. Various federal and state agencies compose this advisory group; which includes ODFW. The Oregon Water Resources Department (OWRD) serves as the lead agency that submits, to the USACE, a coordinated package of reservoir release recommendations for the State of Oregon.

   Development of reservoir release recommendations begins with ODFW assessments of potential fish enhancement options because fishery enhancement is a primary authorized purpose of the USACE Rogue Basin Project. ODFW uses the knowledge gained through the long-term fish research projects in the Rogue River Basin to guide development of recommendations for volumetric and temperature releases from Lost Creek Dam. Recommendations for volumetric and temperature releases must be integrated so as to optimize the benefits of salmonid production in downstream areas. For these reasons, ODFW recommends that the TMDL be revised to document that ODFW should act as the technical lead, among Oregon state agencies, by which to assess the impacts of reservoir releases on salmonid fishes in downstream areas. In addition, ODFW recommends that the TMDL be revised to state that ODEQ and ODFW will work to produce coordinated

recommendations for reservoir release temperatures that can be integrated with volumetric reservoir releases recommended to the USACE by the state of Oregon.

Response ODEQ: As per the response to comment #1 above, ODEQ is committed to working with ODFW to develop a single set of temperature targets for the Lost Creek Dam project. DEQ will coordinate with ODFW on the implementation of the TMDL for Lost Creek to ensure that load allocations are met and beneficial uses optimized as described in Section 2.7.1 describing Lost Creek Dam.

3. ODFW appreciates the challenge associated with trying to address water quality problems within an entire watershed. We appreciate the chance to review and comment on the draft TMDL and focused our comments on Chapters 2 and 4. Please feel free to contact Tom Satterthwaite, ODFW fish project leader, at 541-474-3145 if you have any questions about our comments.

Response ODEQ: We look forward to ODFWs continued involvement in the TMDL process.

Comments from BLM, Timothy B. Reuwsaat. District Manager, Medford.

Thank you for the opportunity to review and comment on the *Draft Rogue River Basin Total Maximum Daily Load (TMDL).* I appreciate the complexity of preparing the TMDL and commend the Department of Environmental Quality (DEQ) on the detailed, thorough analysis. Please accept the following comments on the Rogue Basin TMDL from the Medford District Bureau of Land Management (BLM).

1. The *Draft Rogue River Basin Temperature TMDL* states on page 2-3, Table 2.2 (under Waterbodies) that it covers all perennial and intermittent streams within the Rogue Basin that are not already addressed by an existing TMDL. Section 2.7, Nonpoint Sources: Load Allocations, on page 2-32 identifies system potential effective shade as the surrogate measure to meet the TMDL load allocation for nonpoint sources other than irrigation diversions, return flows, reservoirs and dam operations. This implies that all urban, transportation, agriculture, and forestry Designated Management Agencies (DMAs) will be required to provide system potential effective shade on all perennial and intermittent streams, regardless of whether or not the streams support beneficial uses.

Response ODEQ: Your interpretation is correct and further elaborated on page 2-36 under the heading Urban, Transportation, Agriculture, and Forestry as well as page 2-34.

2. Previous temperature TMDLs completed for watersheds within the Rogue River Basin have covered all perennial streams (Applegate Subbasin) or all perennial and intermittent fish-bearing streams (Bear Creek Watershed). The inclusion of fish-bearing and perennial streams in these TMDLs addresses protection of beneficial uses that are dependent on stream temperature. The inclusion of intermittent nonfish-bearing streams in the Rogue River Basin Temperature TMDL is not tied to beneficial uses.

Response ODEQ: The Rogue River Basin TMDL applies to all perennial and intermittent streams within the Rogue Basin that are not already addressed by an existing TMDL (Table 2.2). DEQ's current position includes the protection of streams designated as non-fish bearing because of potential downstream impacts. Intermittent streams whether or not they are fish bearing can have significant impacts

on downstream water quality and restoring beneficial uses. DEQ intends to review and update TMDLs on a 5 year basis. It is anticipated that during the review process past TMDLs will be updated to apply to all perennial and intermittent streams as well.

3. The *Draft Rogue River Basin TMDL Water Quality Management Plan* provides management strategies for nonpoint sources by DMA (pages 4-15 to 4-19). The management strategy for the Oregon Department of Forestry (the DMA for all private commercial timber operations) is to apply water protection rules in accordance with the Forest Practices Act (FPA) (page 4-17). Examples of FPA best management practices (page 4-18) include the following: "maintain riparian vegetation with a 20-foot no harvest zone of trees and a 10-foot zone of no disturbance of all understory vegetation that is near the high water level of the stream or river (except all intermittent streams which have no protections)." The FPA would not meet the target nonpoint source load allocation identified in the *Draft Rogue River Basin Temperature TMDL* for intermittent streams.

Response ODEQ: The TMDL assigns load allocations for the temperature TMDL based on effective shade targets which were linked to system potential vegetation and were used as a surrogate for thermal loading. The effective shade targets developed for this TMDL can be found in Section 2.7.2. How DMAs make their operations consistent with a load allocation is to be established through their planning process and development of TMDL implementation plans as required in the TMDL rule (Division 42). The Oregon Department of Forestry (ODF) is the DMA under the TMDL rule (Division 42) and implementation of any limitations or controls applying to nonpoint source discharges or pollutants resulting from forest operations on non-federal forestlands are subject to ORS 527.765 and 527.770 in the Rogue River Basin, as well as statewide. Water protection rules are applied per OAR 629-635-0000 through 629-660-0060 and Forest operators conducting operations in accordance with those rules are not considered to be in violation of water quality standards. However, if it is found that FPA is not protective of water quality then any party including DEQ and ODF can petition the Board of Forestry to amend the BMPs in the FPA. The Board of Forestry is in the process of completing an on-going review of the FPA Water Protection Rules – initiated in 2003 – in order to determine whether revisions and/or additional voluntary approaches are necessary, consistent with current Oregon Revised Statutes It is anticipated this issue will be part of the Board's March 2009 meeting.

4. I recommend that you change the coverage of the Rogue River Basin Temperature TMDL from all perennial and intermittent streams to all fish-bearing and perennial streams. This change would provide protection for the beneficial uses and would include those intermittent streams that are fish bearing.

Response ODEQ: See response to comment #2 above.

5. The *Draft Rogue Basin Bacteria TMDL* discusses nonpoint sources from forest managed lands (page 3-8) and concludes that there is little data locally that indicate the potential input of bacteria from forest areas and points to studies in the Willamette and North Coast Basins that indicate that background levels coming from forested areas are well below standards. Three sections in the *Draft Rogue Basin Bacteria TMDL* address nonpoint source load allocations for forest managed lands (pages 3-37 to 3-38, 3-57, and 3-77 to 3-78). The following comments apply to the two paragraphs specifying the BLM in all three

sections. I recommend that the wording regarding the BLM/DEQ memorandum of agreement be changed to read as follows:

In July 2003, the Bureau of Land Management (BLM) signed a memorandum of agreement (MOA) with DEQ establishing a process by which the BLM and DEQ will cooperatively meet state and Federal water quality rules and regulations. The agreement which expired in 2007 was extended by mutual consent of the agencies until December 31, 2008. Pursuant to the MOA, the BLM develops Water Quality Restoration Plans (WQRPs) that are the equivalent of TMDL implementation plans. Where necessary and appropriate, WQRPs propose a set of actions and timeline for achieving nonpoint source load allocations and meeting water quality standards. In the case of E. coli, management of federal forest lands does not contribute to elevated levels of E. coli that are the basis for the listings.

Response ODEQ: The language in the referenced paragraphs has been updated as follows:

"In July 2003, the Bureau of Land Management (BLM) signed a memorandum of agreement (MOA) with DEQ establishing a process by which the BLM and DEQ will help ensure compliance with State and Federal point and non-point source rules and regulations requirements on BLM lands. This agreement recognizes the BLM as the DMA on BLM-administered lands in Oregon. The agreement, which expired in 2007, was extended by mutual consent of the agencies until December 31, 2008.

Pursuant to the MOA, as resources allow, BLM will coordinate with DEQ to develop Water Quality Restoration Plans (WQRPs) for BLM-administered lands and will revise or adapt WQRPs to be consistent with and applicable to the final TMDL and associated Water Quality Management Plan (WQMP) (the TMDL subbasin implementation strategy). The WQRP will be the TMDL implementation plan for BLM-administered lands.

BLM will conduct management activities on BLM administered lands consistent with WQRPs and provide updates and reports on restoration progress according to DEQ's implementation schedule. Where necessary and appropriate, WQRPs propose a set of actions and timeline for achieving nonpoint source load allocations and meeting water quality standards. In the case of E. coli, research in other Oregon watersheds indicates that the management of federal forest lands does not typically contribute to elevated levels of E. coli that are the basis for the listings."

6. I also request that the paragraph regarding the Western Oregon Resource Management Plans be deleted. This paragraph referencing the Strategy is inappropriate as the focus of the Strategy is the temperature criteria. The above replacement paragraph should be sufficient for the nonpoint source load allocation section pertaining to the BLM.

Response ODEQ: The referenced paragraphs (see BLM comment #5) regarding the Western Oregon Resource Management Plan have been deleted.

7. The *Draft Rogue River Basin TMDL Water Quality Management Plan* (WQMP) provides reasonable assurance that the WQMP will be implemented and that the TMDL and associated allocations for nonpoint sources will be met through DMA management strategies. The management strategy for the BLM (page 4-16) discusses the development of WQRPs and the implementation of the Strategy which is recognized by the DEQ as the temperature TMDL implementation mechanism under the Clean Water Act. The Strategy was the basis for developing the Riparian Management Area land use allocation under the Proposed Resource Management Plan in the October 2008 *Final Environmental Impact Statement for the Revision of the Resource Management Plans of the Western Oregon Bureau of Land Management Districts*. The BLM Medford District will continue to use the Strategy to guide riparian area management under the revised resource management plan which will be signed in December 2008. I recommend that the second paragraph under the BLM DMA section on page 4-16 be deleted as it is outdated and irrelevant.

Response ODEQ: The paragraph has been removed.

8. All but one of the WQRPs listed under the BLM and U.S. Forest Service DMA section on page 4-16 were completed by the BLM for BLM-administered lands. I suggest that you separate the WQRP lists by agency to provide a better depiction of what each agency has accomplished.

Response ODEQ: WQRPs have been listed by the respective agency.

Comments from Jim Hill, Water Reclamation Division Administrator, City of Medford

This email constitutes the formal written comments from the City of Medford regarding the October 2008 Draft Rogue River Basin TMDL. Please review and incorporate these comments into the final revised TMDL document. Comments are focused on Chapter 2 – Temperature, with an emphasis on Section 2.8 – Permitted Point Sources, since Medford's primary concern involves the discharge from its Regional Water Reclamation Facility (RWRF) to the Rogue River at river mile 130.8.

1. **Section 2.3.3** – "Agness" is misspelled in the third sentence of the first paragraph. The language in the first paragraph use the term "season of impairment" when describing those periods exceeding the biological numeric criteria. This is misleading, because it doesn't explain that the higher temperatures may be due to unavoidable natural thermal conditions, and leaves the reader surmising that the higher temperatures are due to point or non-point activities. Figure 2.6 makes no reference to the fact that exceedance of the numeric criteria may be due to natural conditions. Also, since there is mention of the Dodge Bridge numeric criteria exceedance, there should be a figure showing the extent of the exceedance, with the same considerations as mentioned for Figure 2.6.

Response ODEQ: The typo has been corrected. The following sentence has been added to Section 2.3.3 to help clarify: "This determination [of the season of possible impairment] is conservative in that it does not consider whether exceedances of the biologically based criteria are anthropogenic." The label of Figure 2.6 has also been modified to "season of <u>possible</u> impairment" to help clarify that that the biologically-based criteria alone does not indicate impairment. The graph of temperatures at the Dodge Bridge site was similar to the graph in the document so DEQ decided to only

include the figure that showed the longest period of exceedance of the biologically-based criteria.

2. **Section 2.4.1 Natural Background Sources** – It is necessary to mathematically reconcile the maximum shading used in calculating the natural thermal potential with the acknowledgement that fires are naturally occurring events that in themselves are beneficial.

Response ODEQ: The process of quantifying the impact of natural disturbance of the riparian area on stream temperature is complex, arduous and uncertain. Furthermore, since natural disturbance is a random event and variable with space and time, it is not clear how the information gathered from an analysis would inform allocations. The impact of natural disturbance was quantified in the Umpqua Basin TMDL (DEQ 2006, http://www.deq.state.or.us/wq/TMDLs/umpqua.htm). It was found that natural disturbance of the riparian area caused no measurable increase in stream temperature for the largest rivers simulated (i.e. South Umpqua River, North Umpqua River, Umpqua River). Of the analysis in the Umpqua Basin, these rivers are most similar to the Rogue River to which most point sources discharge. In addition, not considering natural disturbance in the estimate of NTP is a conservative assumption that is used in the Margin of Safety. Given the above information, DEQ decided not to quantify the impact of natural disturbance on NTP.

3. **Section 2.4.2 Point Sources: Individual and General NPDES Permits –** The City of Medford has issues with the language in the second paragraph of this section, shown below: *"The largest increase (known as the point of maximum impact) is approximately 4.1 miles downstream of the Medford Waste Water Treatment Plant (WWTP) outfall at river mile 130.8 (**Figure 2.8**). This maximum impact is caused by the effect of early morning effluent discharges from Medford WWTP not completely dissipating by late afternoon when stream temperatures are warmest. Early morning river temperatures tend to be coolest and have the greatest potential for warming from point source discharge. As the warmed water moves downstream it contributes to the maximum impact when river temperatures are warmest in the afternoon. Water moving by Medford WWTP in the morning only travels 4.1 miles downstream by mid afternoon because of the impoundment from Gold Ray dam at river mile 126.2."* The proposed methodology determines the cumulative temperature differential using morning temperatures and applying a time factor. It is our understanding that the 0.2^{o}C human use allowance is to be based upon a comparison of the DADM of the river temperature and the point source temperature, and is not time related. Please provide justification and explanation as to why this is not being applied to the point sources on the Rogue River – especially the Medford Regional Water Reclamation Facility (RWRF). Also, the last sentence above states that the Gold Ray dam impoundment impacts the upstream water temperatures by slowing down the velocity. If that is the case, then removal of Gold Ray could change the point of maximum impact to some point further down stream, and possibly lower the actual temperature increase. This is not stated in the text and not shown in Figure 2.8, and is very important to possible Medford temperature mitigation options, if needed.

Response ODEQ: The source assessment analyzes the impact of point sources' effluent on the current condition 7-DADM temperature of the length of the Rogue River while the allocations analyze point source effects on NTP. Additionally, the WLAs (in Section 2.8) have been refined so that the 7-DADM temperature is the target which addresses issues raised in the Technical Advisory Team meetings and concerns by the cities of Medford and Grants Pass. The point source point of

maximum impact (Section 2.4.2) was determined by using a water quality model that accounts for time varying effluent and river temperatures as well as advection and dispersion of heat in the river. The document also has been revised as to clarify that, in this case, POMI is only accounting for the impact of point sources.

Section 2.4.2 is a source assessment and in the source assessment each group of sources is examined under current temperature and hydraulic regime. In contrast, WLAs are determined under NTP. Therefore, WLAs were calculated using a NTP model scenario (ie without Gold Ray dam). The TMDL model is used for a preliminary analysis of the impacts of the low head dams on the entire river. However, the model is not appropriate for determining the specific impacts of the Gold Ray dam removal because of the limited amount of bathymetric and temperature data in that reach and the limited hydraulic capability of the model. The point of maximum impact of the WLAs is discussed in Section 2.8.

4. **Section 2.4.3-1 Nonpoint Sources –** If, as stated in the third paragraph, no allowances are made for naturally occurring events, such as fire and flood damage (i.e. the January 1997 flood that took out trees along the wild and scenic section of the Rogue River), then the natural thermal potential in fact is based upon unrealistic expectations that can never be consistently met.

Response ODEQ: Please see the response to question #2. In addition, loss of shade due to natural events is not considered a violation of the allocations established in the TMDL.

5. **Section 2.5 TMDL LOADING CAPACITIES 40 CFR 130.2(F) –** In the first paragraph it states that the absence of a margin of safety would be explained below, yet there is no explanation for either the margin of safety or the human WLA.

Response ODEQ: Changes have been made in the text to reflect that *see margin of safety below* refers to section 2.10.

6. **Section 2.5.1 Excess Load OAR 340-042-0040(4) (e) –** In this section it is stated that the natural thermal potential (NTP) temperature is used in all tributaries for the purpose of determining the Rogue River NTP. Is that also true for the TMDL listed streams that are not mentioned, such as Bear Creek?

Response ODEQ: Yes. In addition to the tributaries listed in Table 2.12, inputs from Big Butte Creek, Trail Creek, Bear Creek, Applegate River, Illinois River and Lobster Creek were adjusted to estimate their NTP condition. Other, smaller tributaries are believed to have a negligible impact and were not included in the mainstem analysis.

7. **Section 2.8 <u>PERMITTED POINT SOURCES – WASTE LOAD ALLOCATIONS</u> –** The second sentence of the 4th paragraph on page 2-53 should include language stating that the 0.2°C cumulative impact is to the 7DADM river temperature.

Response ODEQ: Section 2.8 has been revised to reflect this comment.

8. **Tables 2-15 (A-G) –** Per extensive discussions, the applicable temperature criteria should be either the NTP or the biologically based criteria, whichever is greater, and should not be adjusted for the average diel fluctuation. The last two columns of each of the tables should be eliminated, and the "Applicable Criterion" in the third column should be used for any compliance calculations.

Response ODEQ: Section 2.8 has been revised to reflect this comment.

9. **Table 2-16 –** The Rogue River 7Q10 flow for Medford is too low. It should be 981 cfs, as was originally presented by DEQ to Medford in its initial WLA calculations.

Response ODEQ: Section 2.8 has been revised and the final only refers to the 7Q10 in concept. The applicable 7Q10 flows for each plant will be determined as part of the permit process.

10. **Box 2.1 Rogue River Basin Thermal Waste Load Allocations –** The definition of the T_R used to calculate the T_{WLA} needs to be changed to *"Applicable 7DADM criteria (see Tables 2.1 A-G) ^oC"*, to reflect the revised criteria in those tables.

Response ODEQ: Section 2.8 has been revised to reflect this comment.

11. **Other Issues** - Section 2.5.1 implies that the NTP is used for Bear Creek when calculating the excess thermal loads on the Rogue River. If flows from Bear Creek in fact exceed the NTP, then there is a good possibility that the temperature increase below the confluence of Bear Creek with the Rogue River could be even greater than that caused by the Medford RWRF discharge. DEQ should include provisions in the TMDL for point and non-point temperature trading between the Medford RWRF and the Bear Creek watershed to improve Bear Creek as well as the Rogue River, even though the confluence of Bear Creek is downstream of the Medford RWRF outfall.

Response ODEQ: The following sentence was added to the trading discussion in Section 2.8: "Given that the point of maximum impact for all sources is at of river mile 64 (Figure 2.17), Medford WWTP could trade with nonpoint sources within the Bear Creek watershed to help meet its WLA."

Comments from Chuck Closterman – Middle Rogue Steelheaders.

I am writing to you on behalf of the 500 members of the Middle Rogue Steelheaders (chapter 649 of Trout Unlimited). Our organization is involved in river and tributary clean-up projects, woody debris placement, tree planning, dam removal and improving fish passage. However, all this work will be for naught if MAJOR water quality issues are not addressed and addressed very soon. After reviewing the extensive paperwork explaining the Rogue River TMDL our group has several General Comments

General Comments

1. The Rogue Basin TMDL's Paragraph 1-1 - states that the TMDL's are required **to protect human health and salmon and trout in the Rogue River Basin.** The report also states that the Designated Management Agencies (DMA's) are not required to comply with the NPDES Phase II requirements but are currently applicable to Cities in the Bear Creek TMDL's. Since the Rogue Basin TMDL's are focused on protecting human health as well as salmon and trout, **it would seem appropriate for the DMA's to be required to implement all or at least a portion of the six minimum control measures required for in the NPDES Phase II Permit.** These measures are proven to help protect human health and salmon and trout in other areas. To accomplish this with minimal costs, the DMA's could consult with existing local Ph II communities to get information, brochures, ordinances, illicit discharge programs, inspection and enforcement procedures, and post construction programs.

Response ODEQ: As part of the TMDL implementation process DEQ will be bringing all of the DMAs together to explore compliance pathways as a group. Stormwater

management is recognized as an important component to meeting the bacterial portion of the Rogue TMDL and it is anticipated that the experience of local phase II communities will provide a useful model.

2. Since this TMDL covers a huge area **the Implementation Plan should include a list of personnel or agencies to call to report spills or people dumping pollutants in the Rogue Basin.** In the past, Middle Rogue Steelheader's have noticed pollutants in the Rogue River and adjacent land but could not get anyone to investigate and take timely enforcement action.

Response ODEQ: For spills the Oregon Emergency Response System must be contacted: 1-800-452-0311. For general environmental complaints the best point of contact is the DEQ office in Medford: 541-776-6010. For additional information the WQMP lists contact numbers for the DMAs.

Temperature TMDL's

3. Page 1-1, Paragraph 1.1 – Elevated stream temperature is not the only reason salmon and trout are at risk. This paragraph implies they are the only reason.

Response ODEQ: Sentence re-written to state "Elevated stream temperatures are a risk to salmon and trout."

4. The effects of Climate Change in the Rouge Basin should be addressed. The scientific community has indicated that temperatures will increase in the Rogue River area, snow levels will raise, possibly some species of plants and trees will be negatively impacted and temperatures in creeks and rivers will surely increase.

Response ODEQ: Climate change is currently a priority for the State of Oregon as set by the Office of the Governor. As currently written the TMDL relies on long-term averages to determine compliance limits such as 7Q10 flows or site-potential shade targets. As the impacts of Climate Change are realized, these long-term averages may be impacted. Individual implementation plans, the WQMP, and the TMDL are part of an adaptive management process. DEQ intends to regularly review the progress of implementation plans. Modifications to implementation plans are expected to occur on an annual basis, while reviews of the TMDLs are expected to occur approximately five years after the final approval of the TMDLs, or whenever deemed necessary by DEQ. As part of the regular review of the TMDL and implementation plans, DEQ will take into consideration the current climate changes and the affect to water quality. It is expected that the general strategies set forth in the WQMP will allow for a more dynamic and resilient system through riparian and floodplain protection, enhancement, and restoration. Implementation of these management strategies will allow the system to withstand greater high-water flows, allow for increased groundwater recharge, and decrease solar loading and other pollutant loading. DEQ will encourage the use of a wide range of native riparian and drought tolerant upland species to survive a greater range of climatic conditions.

Bacteria TMDL's

5. Page 4-19 – DMA Oregon Dept of Agriculture – this paragraph states that SB1010 directs ODA **to work with** locals… Since SB1010 apparently is voluntary. A major focus of the Rogue Basin TMDL's should be to provide better management of agricultural activities including enforcement provisions to stop

the bacteria from entering local creeks/river. An example is where livestock are free to go in an out of a creek, rain and/or irrigation water flowing over the pasture flushes the pollutants including bacteria directly into the creek. Not only does this activity increase bacteria but also erosion along creek/river banks where livestock enter and exit the creek/river.

Response ODA: Eric Nusbaum, Water Quality Specialist Oregon Department of Agriculture. Under the Inland Rogue Agricultural Water Quality Management Area Plan (AWQMAP), the Oregon Department of Agriculture (ODA) works with landowners on water quality issues in a proactive, voluntary manner by providing information and technical assistance for implementation of water quality protective measures. The Inland Rogue AWQMA rules outline measures to address water pollution problems. Landowners found to be out of compliance will be notified and directed to take actions necessary to bring the condition of the subject lands into compliance with the area rules.

Comments from Jean Mount, Citizens Action Committee (CAC) Secretary-Lower Applegate CAC, Advisory member- Rogue Advocates, Grants Pass, OR.

PROTECT WATER RESOURCES IN RIVERS AND STREAMS OF SOUTHERN OREGON

The Rogue River and watershed has had a continuing and cumulative assault from development and aggregate mining. Over the past five years rapid growth has extended into rural farm lands, causing a decrease of water quantity and quality, and increase in temperature. Aggregate mining along the streams and between the banks of streams has caused erosion, flooding, cumulative harmful effects on fish and wildlife, and degradation of spawning gravel for salmon. Housing development without adequate riparian setbacks has reduced vegetation leading to increased water temperature, erosion, and sometimes flooding. Development and logging, especially near rivers and streams, has resulted in decreased water for fish, wildlife, and farm irrigation. Water runoff has added to the pollution of the river.

1. The Riparian Ordinance of Josephine County was revised in 2006, but the riparian setbacks (after public hearings), fell short of meeting the minimum for "State Safe Harbor" Riparian Corridor Setbacks. The County continued the same setbacks of 25ft and 50ft along streams and rivers which has been shown to be inadequate. Meeting the riparian setback should not be a goal, but a state requirement with differences in setbacks based upon data and the specific for the river. Education of property owners, developers also important in preventing further harm to waters of the Rogue River.

Response ODEQ: As part of the TMDL implementation process DEQ will be meeting with Josephine County to discuss the TMDL and its implementation. The development as well as the enforcement of riparian ordinances are key components of an implementation plan. Public outreach is also integral to the success of any plan.

2. The Josephine County Riparian and Aggregate Ordinances do not include a regional problem solving agreement. In fact, an Impact Area Agreement in the

Aggregate Ordinance- revised 2006, allows neighbors within 1500ft of a mine site to sign an agreement of no objection to mining. The mine operator only has to make efforts to get this agreement, and if no one signs or only a few sign, the mine can proceed. In the past royalty payments have been made to the neighbors signing the agreement for each truck load of aggregate removed from the site. The IAA is an incentive to minimize the negative impacts of aggregate mining on water, riparian corridors, rivers and streams. The IAA also minimizes the opportunity for the public to have significant impact with their comments.

Response ODEQ: Thank you for your comment however this is outside of the scope of the TMDL. For more information please contact Michael Snider, Josephine County Planning Director 541-474-5421 extension 5424.

3. The Josephine County Riparian/Aggregate Ordinances- 2006-002, allow aggregate mining between the banks of the streams. Mining which has occurred in floodplains and sites close to the Applegate River has resulted in erosion, flooding and capture of the mine pits. Mining should not be allowed in floodplains and between banks of the streams. The rivers and streams are public waters and important for multiple purposes including farming, tourism and recreation. The fish and wildlife habitat should not be damaged and destroyed in the process of aggregate removal. Current Ordinances, and agency permitting are not providing the needed protections.

Response ODEQ: In the State of Oregon, the Department of Environmental Quality is the designated agency for issuing water quality certifications under Section 401 of the Clean Water Act to applicants for federal permits to conduct instream aggregate mining. DEQ does not regulate mining in floodplains (typically above the average high water line). A Section 401 water quality certification is required before a federal permit is issued for instream aggregate extraction. This section of the Clean Water Act provides the State an opportunity to ensure that federally approved activities will meet water quality standards established by the State under the Clean Water Act. The Department will continue to work closely with federal and state agencies regarding any permit applications for instream aggregate extraction in the Rogue Basin.

Governor Kulongoski recently designated the Applegate Sustainable Aggregate effort as a new Oregon Solutions project. The project involves participation from both Jackson and Josephine Counties, along with the Applegate Partnership and Watershed Council and a variety of other interested stakeholder groups. Each of these entities shares a common interest in the health of the Applegate River watershed, the community, and the local economy. An Oregon Solutions team will review the current conditions and available data and identify the conditions and studies needed for sustainable gravel extraction in the Applegate Watershed, while considering natural resource needs and local economic realities in the community. DEQ will be involved in this process. For more information please contact Michael Snider, Josephine County Planning Director 541-474-5421 extension 5424.

4. Additional monitoring is needed of water temperature, turbidity and fish kills, and overall monitoring of impacts on the Rogue River. I would welcome additional measures to be taken to limit the pollution of the Rogue River.

Response ODEQ: It is our intent to continue with our ambient monitoring network and to continue to partner with local agencies and organizations that are conducting

water quality monitoring activities. In addition DEQ does provide section 319 grants as available to assist in monitoring.

Comments from William Matthews, CAFO Program Manager, Oregon Department of Agriculture.

1. Rogue Basin TMDL. Confined Animal Feeding Operations (CAFOs) registered to the Oregon CAFO General (NPDES) Permit (permit) are managed to ensure no discharge of fecal bacteria or nutrients under normal conditions. Discharge is allowed under conditions of an extreme rainfall event, defined in the permit as greater than the 25-year / 24-hour rainfall amount. To qualify for this exemption, CAFOs operate and maintain their system as designed to contain all waste and one 25-year / 24-hour storm event. The permit also stipulates that during such a discharge effluent cannot cause or contribute to a violation of state water quality standards. All land application of manure and process wastewater must be done in accordance with Oregon Department of Agriculture (ODA) approved Animal Waste Management Plan (AWMP). The AWMP is required for each CAFO and each site-specific AWMP is incorporated into the permit by reference.

   Each permitted CAFO receives a routine inspection from the area Livestock Water Quality Inspector (inspector) once a year, on average. During this inspection, the operator and inspector discuss the operation and review required plans and records. The inspector views the entire operation to assure compliance with permit terms and water quality rules and laws. The inspection reports detail permit compliance in the following areas: permitted number of animals, animal confinement requirements, manure and silage containment requirements, manure application requirements, AWMP and recordkeeping. Problems in any of these areas, including incomplete recordkeeping, can result in the issuance of a water quality advisory or a notice of noncompliance (NON). When a discharge occurs or when there is a potential for a discharge, ODA may take samples of the effluent to determine bacterial concentrations. Surface water quality samples are taken when visual or anecdotal evidence of discharge is present.

   NONs have been issued to CAFOs in the Rogue Basin. Some of these NONs have detailed potential releases of bacteria and the potential for CAFOs to impact bacteria levels in the Rogue River. When a violation is found, the inspector works with the operator to develop a solution to the problem and a schedule to complete the corrective actions. ODA can also issue civil penalties for violations listed in NONs.

Response ODEQ: The language regarding CAFOs, pages 3-7 & 3-8, has been updated.

Comments from Gerald Kelso, Area Manager, US Department of the Interior Bureau of Reclamation Comments on the *Draft* Rogue River Basin Total Maximum Daily Load

Temperature TMDL

1. **Page 1-7, Paragraph 6:** A citation is needed to support the last sentence of the paragraph. "In addition to high water temperatures, numerous other factors limit steelhead production in the Rogue River Basin".

Response ODFW: Tom Satterthwaite – ODFW biologist. Citations added: ODFW 1992; ODFW 1994".

2. **Table 2.2, TMDL Load Allocations; Human Use Allowance**: Lost Creek Dam, Fish Lake and low head dams were given no portion of the HUA. Justification for this exclusion is not included in the document. These structures have limited opportunities to decrease or mitigate their temperature effects on the Rogue River. Ultimately these types of heat sources were the reason for HUA, rather than other types of nonpoint sources which can mitigate or change their temperature effects through implementation of best management practices. Reclamation disagrees with the zero allocation of the HUA for dams within the basin and requests that the HUA be reallocated to those sources with high economic costs associated with mitigation and BMP implementation.

Response ODEQ: The approach is consistent with the Willamette TMDL where US Army Corp dams were allocated none of the human use allowance.

3. Reclamation also disagrees with the decision to distribute the reserve for growth at this time. A more prudent approach would be to wait until it is demonstrated that thermal loads are achieved.

Response ODEQ: As per table 2.2, the Reserve Capacity is 0.05C and is not allocated to any source at this time.

4. **Figure 2.1, page 2-8:** This figure is unreadable in the electronic distribution material. Please consider updating the figure.

Response ODEQ: Figure is also available online at the DEQ website: http://www.oregon.gov/DEQ/

5. **Figure 2.2, page 2-9:** This figure is unreadable in the electronic distribution material. Please consider updating the figure.

Response ODEQ: see response to #4 above.

6. **Page 2-19, last paragraph**: Reclamation agrees with the concept of using system potential for riparian shade targets, with the understanding that dams have irrevocably changed the system hydrology. Dams and the resulting hydrological changes should be included in the system potential discussion.

Response ODEQ: Allocations are meant to achieve natural thermal potential (NTP). Per OAR 340-41-0002, NTP is determined using the best available information regarding site-potential riparian vegetation, stream geomorphology, stream flows, and other measures to reflect natural conditions. Therefore, NTP is estimated without the influence of dams.

7. **Page 2-26. 1st paragraph:** Fish Lake Dam is not owned, nor operated by the Bureau of Reclamation. Fish Lake dam is operated jointly by the Medford Irrigation District and the Rogue River Valley Irrigation District. Reclamation has repayment contracts with TID, MID, and RRVID for the project. These contracts provided for the past rehabilitation, enlargement, and extension of existing facilities and the repayment of costs associated with the work. While Reclamation does provide monetary support for the maintenance of the project, through loans to the irrigation districts, Reclamation has no control over the operational aspects of the reservoir. As a result Reclamation is not a designated management agency (DMA) in regards to Fish Lake Dam. Furthermore, the operation and maintenance of Fish Lake Reservoir, Fourmile Reservoir and the Cascade Canal were determined to be not interrelated and interdependent actions under an Endangered Species Act consultation (Rogue River Draft Biological Opinion 2006). This finding indicates the Reclamation is not a DMA for these water bodies. As a result Reclamation should be removed as a DMA for Fish Lake (page 4-9 paragraph 1).

Response ODEQ: The document was revised to reflect this comment with changes on 2-26, 2-35, and 4-9. Reclamation has been removed as a DMA for Fish Lake. The Medford Irrigation District has been identified as the operator and DMA for Fish Lake.

8. **Page 2-26, Table 2.10 and Last Paragraph**: Agate Lake is located on Dry Creek which is not listed for temperature. Furthermore, the discharge of Agate lake does not reach Antelope Creek, which is temperature listed, but is instead diverted wholly into a canal for distribution to agricultural lands during the critical period. While temperature impacts from Agate Lake may occur in the Rogue River they are not distinguishable from the temperature effects of irrigation return flows and would be covered by the implementation plans of the irrigation districts. Reclamation would participate in the implementation planning process for Agate Lake with the irrigation districts if necessary. However, hydrologically Agate Lake does not fall under the scope of this TMDL as it is currently written. As a result Reclamation should be removed as a DMA for Agate Lake (page 4-9 paragraph 1).

Response ODEQ: The US Bureau of Reclamation has been removed as the DMA for Agate Lake. Rogue River Valley Irrigation District has been identified as the operator and DMA for Agate Lake.

9. **Page 2-27, Table 2.11:** It appears that the trans-basin water delivery from Fourmile Reservoir into Fish Lake Reservoir, and through the North Fork Little Butte Creek is included in the water budget and the resulting temperature changes due to water withdrawals. If this is the case, then the without withdrawals percent change and predicted temperature increase are over estimates. The flow at North Fork Little Butte Creek mouth, without water withdrawals, should be presented without the trans-basin water delivery.

Response ODEQ: NTP was estimated using the best available information concerning the natural flow regime of North Fork Little Butte Creek. Natural flow at the point of Fish Lake Dam was estimated using a water budget that accounted for the trans-basin transfer Fourmile Reservoir via Cascade Canal (see “Flow 2” in Table B5, Appendix B). The text has been clarified

10. **Page 2-29 second bullet item paragraph 2:** Reclamation does not agree with the assumption of using natural flow conditions (no dams, no irrigation

withdrawal, no point sources, no water imported into the watershed) to determine the NTP. This also appears to conflict with the discussion of system potential (page 2-19). Reclamation understands that no explicit changes in flow were linked to the individual allocations. However, the temperature TMDL, which is based on the concept of achieving a natural thermal potential, relies on eliminating major irrigation withdrawal, dams, and water transfer into the watershed. As written by ODEQ the NTP will not be achieved under current hydrologic operations. ODEQ intends to seek EPA approval of the TMDL (under authority of the CWA) under the auspices that these changes in flow would/could occur in order to meet the NTP. However, ODEQ has no authority in such matters and should not take a regulatory action that is technically based on eliminating major irrigation withdrawal, dams, and water transfer into the watershed.

Response ODEQ: Water withdrawals have the potential to impact surface water temperatures within the Rogue Basin and are evaluated in section 2.4.3 Nonpoint Sources and in Table 2.11. It is current DEQ policy not to assign allocations to compensate for the decreased assimilative capacity caused by consumptive use of water. The impact of this allocation policy on achieving NTP was not evaluated. The HeatSource model established for the mainstem and several tributaries can be used to examine the effect of changes in flows on stream temperature if water rights do become available in the future.

11. **Page 2-35, paragraph 5:** The Bureau of Reclamation does not own nor operate Fish Lake Dam and Reservoir (see previous comment). Reclamation also disagrees with the need to mitigate to Natural Thermal Potential in the North Fork of Little Butte Creek or to the estimated spring water temperatures of 8 degrees C. As shown in figure 3 on page 2-31, the NTP target is lower than the biologically based water quality criteria. Therefore the owners of the dam would need to mitigate to the biologically based criteria.

Response ODEQ: The document has been revised to reflect that the Bureau of Reclamation does not own nor operate Fish Lake Dam and Reservoir. The target of NTP, even when less than the biologically based criteria, is consistent with the approach for Lost Creek Reservoir and reservoirs in the Willamette TMDL. If DEQ were to use the biologically based criteria as the target at the base of the dam, natural solar loading would soon warm the water above both the biologically based criteria and NTP. Therefore, in order to protect downstream water quality, DEQ has allocated an NTP target to Fish Lake Dam and Reservoir.

12. Also, the conservative value for determining compliance should not be the spring water temperature. This assumption ignores the existence of Fish Lake prior to the construction of the dam, and the warming of the waters stored in the natural lake. Furthermore it ignores the hydrology and morphology of the system, in that the lake would have discharged waters from the epilimnion or surface water prior to the construction of the reservoir at temperatures higher than the estimated spring water temperatures. Although the additional water brought into the system from the Klamath Basin and delivered to the lake are excluded in Fish Lake Natural Thermal Potential estimates, ODEQ ignores the cooling effect this additional waters have on the discharge from Fish Lake. The 8,000 acre feet delivered to the reservoir, via a subterranean route, increase spring flows dramatically during the critical period. Without these inputs discharge from Fish

Lake, during the critical period, may have been negligible or would not have occurred at all.
It is incumbent on ODEQ to simulate all pre-dam conditions, if pre-dam conditions are to be used in determining natural thermal potential or temperature allocation based on pre-dam conditions. Therefore, ODEQ must adjust the allocation to include the likely surface water discharge location of natural lakes, the natural heating of the water stored in the natural lake in addition to the decreased flow that would have naturally occurred without the additional water from the Klamath Basin.

Response ODEQ: The data and resources are not available to simulate all pre-dam conditions. The allocation to Fish Lake Dam is a temperature target of NTP. Given the limitations of the TMDL analysis, the allocation allows for further analysis during the writing of the temperature management plan.

13. Finally, in Appendix C section 4, ODEQ's preliminary study undertaken to determine the effect of Fish Lake Dam and Reservoir on the temperature regime of the North Fork Little Butte Creek system found that "Fish Lake does not have a significant warming (or cooling) influence on temperatures in the North Fork during summer extreme temperature Season" (page 4-7). This statement conflicts with the allocations proposed for Fish Lake and the need to mitigate to 8 degrees C.

Response ODEQ: The analysis conducted by TetraTech has a number of short comings. It is based on a paired watershed approach comparing a site downstream of Fish Lake and a site on the South Fork of Little Butte Creek. The site on the South Fork Little Butte used for comparison is impacted by out of basin water transfers and it is at a location where DEQ is predicting significantly cooler natural temperatures (approximately 7 °C when comparing current condition to NTP using the maximum 7-DADM). Furthermore, the drainage areas are significantly different (the South Fork site being much larger) and the geographic settings appear to be much different (the South Fork site being in a canyon while the North Fork site is a marsh). Therefore, DEQ does not believe the South Fork site can be used a proxy for natural temperatures at the site of Fish Lake dam. Given the problems with TetraTech's analysis, DEQ decided that the NTP analysis of North Fork Little Butte Creek would use the conservative assumption of spring temperatures as a proxy for natural temperatures at Fish Lake Dam. This approach also has a number of significant flaws. However, it is the more conservative of the two approaches for determining NTP. The allocation to the dam and reservoir is to meet NTP at the site of the dam. DEQ acknowledges that current available data and approaches have significant short comings in estimating NTP at the site of dam and would welcome refinements to this approach as part of temperature management plan development.

14. Page 2-53 Hyporheic Exchange Targets (HET): The HET methods used to develop the temperature allocations is based on a preliminary study that falls short of the scientific rigor necessary for inclusion in a TMDL. As stated in Appendix C

"…hyporheic flows have only been recently studied in detail, likely because they are difficult to measure directly. Correlating hyporheic flow to individual and specific stream features is also difficult because of the myriad variations in stream conditions even within the same watershed".

The allocations are based upon a one-time site visit during a high water event, with no follow-up visits during low water events to ground truth the features noted from the aerial photographs. The geomorphic parameters were also qualitatively noted and then correlated to literature values that may not be applicable to the Rogue River Basin due to the basin being "one of the most biologically, botanically and geologically diverse areas in the country" (page 1-3). The results were then compared to natural thermal potential model. As a result, the process for determining the HET is based upon qualitative estimates derived from photographs tested against a theoretical model without means of verification. The authors of the study also indicate that the results should be considered preliminary, and that the range of uncertainty could be on the order of 5 to 10 percent or higher. This range of uncertainty encompasses the range of results. Therefore, predicted hyporheic flow differences cannot be distinguished from the range of uncertainty.

Reclamation suggests that the HET should be removed from the TMDL until follow up studies such as those suggested in Appendix C page 3-10 are completed.

Response ODEQ: Hyporheic flow targets are preliminary in nature and are meant to provide a range of values that may be beneficial when implementing projects in the future. In the final document, the estimates of natural hyporheic flow are no longer included in the allocation section. Pages 2-53, and 2-36 have been changed to reflect this.

<u>Bacteria TMDL</u>

15. **Page 3-25, First Paragraph:** As noted in several locations throughout the Bacteria TMDL, the irrigation system does not create bacteria, it simply transports it. However, the location of this paragraph indicates that the irrigation districts are nonpoint sources of bacteria. ODEQ should move this paragraph to a more appropriate location such as section 3.2.4 and include a discussion that indicates the irrigation districts affect the seasonal variation of both point and nonpoint sources of bacteria and are not sources of bacteria.

Response ODEQ: Irrigation district activities do not create bacteria however management practices can result in significant bacterial loads coming from canals. As such ODEQ recognizes irrigation districts as a nonpoint source DMA. Irrigation districts are not permitted through DEQ for waste loads entering waterways and are not considered a point source. The following sentences were added to the end of the referenced paragraph: *"Irrigation districts are considered nonpoint sources that influence the quantity and timing of both bacteria delivery to downstream river reaches. While irrigation district operations themselves do not create fecal bacteria, the laterals and canals that are used to convey water can play a major role in transporting bacterial contamination across the landscape and into surface waters."*

16. **Page 3-38, Third Complete Paragraph:** As recognized throughout the Bacteria TMDL, the irrigation system does not create bacteria, it simply transports it. However, this paragraph and others says "the irrigation districts will be *required* to develop implementation plans that include a description of operations and maintenance practices to limit bacterial inputs into the canals". Reclamation does not agree that it is the irrigation districts management responsibilities to regulate the sources of bacteria that may enter the irrigation districts facilities. Especially given that; 1) this statement is made with respect to non-point

sources; 2) the contact recreation beneficial use is impaired by excess fecal contamination, not by water management measures or methods. The Oregon Department of Agriculture is the appropriate regulatory agency with the responsibilities of managing applications of manures and other sources of bacteria to and from farm lands. This section should be removed and the bacteria TMDL focus should remain on controlling the sources of bacteria contamination, not the transport mechanism(s). As a result, the irrigation districts should be removed as a DMA for bacteria and replaced with an appropriate regulatory agency.

Response ODEQ: As per OAR 340-42-0030(12) "Source" means any process, practice, activity or resulting condition that causes or may cause pollution or the introduction of pollutants to a waterbody. Since by this definition districts are a source, DEQ would be remiss in not identifying irrigation districts as a DMA and requiring the development of an implementation plan and compliance with the applicable load allocation.

17. Page 3-57, 3-58: See previous comment.

Response ODEQ: See response to #16

18. Page 3-78: See previous comment.

Response ODEQ: See response to #16

Comments from Lesley Adams, Rogue Riverkeeper, Klamath-Siskiyou Wildlands Center, PO Box 102, Ashland, Oregon

Subject: KS Wild/Rogue Riverkeeper comments on the Rogue Basin TMDL

Dear DEQ:

Please accept the following comments from the Klamath-Siskiyou Wildlands Center, Rogue Riverkeeper program concerning the proposed TMDL for the Rogue Basin. KS Wild/RRK has approximately 1,800 members concentrated in southwest Oregon and northwest California. We, and our members, support clean water to meet all beneficial uses especially drinking water, fish and wildlife habitat, and recreation.

<u>Climate Change</u>

1. The TMDL should anticipate global climate change, at least to the extent that it provides for adaptive management and a larger reserve capacity. The July 2008 Rogue Basin climate change study (Climate Leadership Initiative, the Institute for Sustainable Environment at the University of Oregon, National Center for Conservation Science & Policy and the U.S. Forest Service Northwest Research lab in Corvallis) estimates localized impacts of climate change in the Rogue Basin. Data indicates that the Rogue Basin will experience increased temperatures, a dramatic decrease in snow accumulation with earlier mountain snowmelt, transition from snow to rain, and higher and flashier winter and spring runoff events. Less snow in the mountains means extended low stream flows in the summer.

Increased and extended summer temperatures along with extended periods of lower summer stream flows will likely result in decreased dissolved oxygen and increased incidence of bacteria and disease, producing fish kills. Climate change impacts will easily eat up reserve capacity in the coming years, therefore existing point and nonpoint sources should be strictly monitored for implementation and compliance with the Clean Water Act.

Response ODEQ: Please see ODEQ Response #2 in response to comments from Chuck Closterman - Middle Rogue Steelheaders for a discussion of the TMDL and Climate Change.

Bureau of Land Management Resource Management Plan

2. Pursuant to Memoranda of Agreement with the U.S. Forest Service and the Bureau of Land Management, water quality standards are expected to be met through the development and implementation of water quality restoration plans, best management practices and aquatic conservation strategies. We urge DEQ to actively pursue these programs and hold the federal land management agencies accountable. These agencies, whose activities over the last century have had dramatic impacts on watershed health, need close scrutiny to ensure their logging and road projects avoid harm to water quality.

   The BLM's January 2008 Water Quality Restoration Plan for this TMDL describes how the overall long-term goal of the BLM, as a DMA, "will meet Oregon water quality standards for 303(d) listed streams on BLM-administered lands within the Big Butte Creek Watershed." The WQMP states that, "Timber harvest, roads, and livestock grazing are the primary impacts specific to federally managed lands that have the potential to affect water quality conditions in the plan area."
   The WQRP further states that, "100 percent of the load allocation for the Big Butte Watershed is assigned to natural sources and the allocation for BLM-managed lands is zero percent. Any activity that results in anthropogenic caused heating of the stream is unacceptable." Indeed, BLM cannot decrease riparian buffers, nor can DEQ approve the proposed LNG project - both activities that would increase temperatures beyond allocations.

   In this WQRP, the BLM heavily relies on the Northwest Forest Plan Standards and Guidelines to fulfill its obligations to address water quality impairments in the Rogue Basin: "The recovery of water quality conditions on BLM-administered land in the Big Butte Watershed will be dependent upon implementation of the BLM Medford District Resource Management Plan (RMP) (USDI 1995a, USDI 1995b) that incorporate the NWFP (USDA and USDI 1994). Paramount to recovery is adherence to the Standards and Guidelines of the NWFP (as amended, USDA and USDI 2004) to meet the ACS. This includes protection of riparian areas and necessary silvicultural treatments to achieve vegetative potential as rapidly as possible.

   In contrast to this adherence, BLM issued their Final EIS for the Western Oregon Plan Revisions (WOPR) in September 2008. The WOPR FEIS withdrawals the 2.5 million acres of public land it manages in western Oregon from of the scientific framework of the Northwest Forest Plan, including hundreds of thousands of acres in the Rogue Basin.

The statement that the goal of the national forest plans is to "[m]anage National Forest resources to protect all existing beneficial uses of water and to meet or exceed all applicable state and federal water quality standards" taken in conjunction with the fact that the TMDL does not establish what it means for these lands to meet Oregon's standards demonstrates that the Department and the federal government are engaged in circular reasoning. The BLM's WOPR has significant implications for water quality in the Rogue Basin and the changes in forest management from the BLM's 1995 RMP to the 2008 RMP require more analysis. It is remiss on the part of DEQ to state in the TMDL that BLM will develop a WQRP for their share of TMDL implementation while the BLM states in its WQRP that is managing its lands under the Standards and Guidelines of the Northwest Forest Plan as it is rewriting its RMP to ignore those very Standards and Guidelines.

Response ODEQ: To ensure collaboration, DEQ has a memorandum of agreement (MOA) with BLM which establishes a process by which the BLM and DEQ will work together to achieve compliance with State and Federal point and non-point source rules and regulations as requirements for BLM lands. This July 2003 agreement expired in 2007 was extended by mutual consent of the agencies until December 31, 2008. The agreement is currently undergoing revision. As part of the MOU BLM will conduct management activities on BLM administered lands consistent with WQRPs and provide updates and reports on restoration progress according to DEQ's implementation schedule. Where necessary and appropriate, WQRPs propose a set of actions and timeline for achieving nonpoint source load allocations and meeting water quality standards.

<u>Effective Shading</u>

3. We are concerned that the "effective shade" methodology may not fully account for the effect on water temperature of vegetation manipulation further from the stream. While direct shade is an important determinant of the cooling capacity of riparian vegetation, there is in fact a much larger "edge effect" caused by the removal of forest cover. In fact, the edge effect may be more like 240 meters (Chen, J., J. F. Franklin, and T. A. Spies. 1990. Microclimatic pattern and basic biological responses at the clearcut edges of old-growth Douglas-fir stands. Northwest Environmental Journal 6:424-425). The TMDL should recognize that trees beyond the immediate streamside area may not provide direct shade but are still valuable for maintaining cooler air temperature, reduced wind speed, and higher humidity in the stand, so these trees also affect stream temperature and may need protection.

Response ODEQ: DEQ agrees and has included the following in the source assessment (Section 2.4.3): Furthermore, forests even beyond the distance necessary to shade a stream can influence the micro-climate, providing cooler daytime temperatures (Chen et al. 1999).

<u>Arbitrary and Capricious Temperature Criteria</u>

4. As states in Northwest Environmental Advocates v. Environmental Protection Agency, the temperature criteria used in this TMDL is arbitrary and capricious.

EPA's approval of the 18° C criterion for salmon and steelhead juvenile rearing and migration was arbitrary and capricious because it offers, at best, protection at the high temperature of optimum protection, meaning it will degrade salmonid health.

EPA's approval of 13° C criterion for salmon and steelhead spawning was arbitrary and capricious because it failed to take into account specific exemptions to temperature criteria that will preclude those waters from achieving the lower temperatures upon which the approval of the criterion depends.

Response ODEQ: These issues are related to EPA's actions and not to DEQ. The EPA temperature lawsuit from NW Environmental Advocates has been settled. Section 2.5 (pg 45) of the Technical Support Document (referenced below) addresses the arbitrary/capricious issue. Contact Druscilla M Keenan, Office of Water and Watersheds (keenan.dru@epa.gov) for more information.

http://yosemite.epa.gov/R10/WATER.NSF/1507773cf7ca99a7882569ed007349b5/1c041466c9b9545b88256da5007fa6a5!OpenDocument

Addressing All 303(d) Listed Concerns

5. The 2004/2006 303(d) list includes 19 segments in the Rogue Basin that do not meet water quality standards for dissolved oxygen (10 segments), sedimentation (6 segments) and pH (3 segments), yet these three parameters are not addressed in this TMDL. While insufficient data is cited as the cause for ignoring these impairments, the lack of a plan to address them in also insufficient. DEQ states that they *intend* to revisit these impairments when the temperature and bacteria TMDLs are reviewed on a 5 year basis. DEQ also *encourages* long-term monitoring of some parameters on the 303(d) listed streams in the Rogue Basin. Neither an intention nor an encouragement is adequate for attaining water quality standards. The TMDL cannot demonstrate it will lead to attainment of standards and therefore does not meet the requirements of the Clean Water Act.

Response ODEQ: Pages 1-17 to 1-21 detail the 303(d) listed parameters in the Rogue that will not be addressed in the current TMDL and the reasons for not pursuing TMDLs for these parameters at this time. The parameters not addressed include fecal coliform in the Rogue estuary, dissolved oxygen, sedimentation, and pH. It is anticipated that all of these listed parameters will see improvements as a result of implementing the current TMDL. As noted in the current text DEQ intends on revisiting these impairments within 5 years when the TMDL is reviewed. In the future DEQ will be developing monitoring plans and coordinating with partners to gather data that will lead to TDML development for these parameters.

Point Sources on Tributaries, Narrative Allocations

6. The TMDL states that there are four sources which discharge into tributaries of the Rogue River within the scope of this TMDL and that, "the impact of these sources on their specific receiving waterbody is not known (2-55)." These four point sources are the town of Butte Falls, Cascade Wood, Three Rovers School District WWTP and the City of Cave Junction. These point sources should be monitored for their impacts and should be given WLA.

Response ODEQ: These point sources are monitored as per existing NPDES permits. Their allocation approach is a based on using equations presented in the TMDL which

will lead to a quantified WLA when their individual NPDES permits are renewed. More detail on each source is provided below:

- The City of Cave Junction owns and operates a wastewater treatment facility that discharges treated effluent into the Illinois River at river mile 54.6, reaching the Rogue River at river mile 27.5. The plant does not discharge in the summer unless 7 day average receiving water flows are greater than 200 CFS as measured at the USGS gage in Kerby. The STP is allowed to discharge from November 1 – May 31 when meeting discharge standards. The discharge is regulated under DEQ NPDES[1] permit 102610 (last renewed on February 28, 2007). When operating in compliance with the requirements of the NPDES permit, the City of Cave Junction STP does not cause water quality criteria violations in the Rogue Basin. Discharge Monitoring Reports (DMRs) are reviewed regularly to ensure that the WWTF meets its permit requirements.

- The City of Butte Falls owns and operates a wastewater treatment facility that discharges treated effluent into South Fork Big Butte Creek at river mile 1.0, reaching the Rogue River at river mile 155.5. The plant does not discharge in the summer but is only allowed to discharge from November 1 to April 30. The discharge is regulated under DEQ NPDES[1] permit 101552 (last renewed on July 30, 2004). Discharge Monitoring Reports (DMRs) are reviewed regularly to ensure that the WWTF meets its permit requirements.

- Flemming Middle School – Harris Creek River Mile 2.8. NPDES 102578. This is a small sewage treatment plant with a dry weather design flow of 0.02 million gallons per day (MGD), November 1- April 30. No summer discharge is allowed.

- Allweather Wood Treaters River Mile 130.5. NPDES 102034. This permit is for stormwater discharge only. TMDL listed parameters; temperature and bacteria are not required to be monitored but are unlikely an issue in a stormwater discharge.

<u>General NPDES Permit and Temperature</u>

7. There are 216 general NPDES permits within the scope of this TMDL, of which 26 regulate industrial wastewater. The TMDL negligently determines that there is no reasonable potential for general permits to impact stream temperatures even though industrial wastewater is a known source of increased temperatures. The TMDL states that if future data indicates otherwise, a portion of the reserve capacity may be allocated for these general permits. However, given the relatively narrow margin of reserve capacity, its use for future growth, and the ballooning population growth in the Rogue Valley, it is inappropriate to use reserve capacity for a known heat source identified during the development of this TMDL. Furthermore, given the likely stresses of climate change and emerging contaminants on the Rogue Basin in the coming years, reserve capacity should be just that, a reserve, for unknown factors, not for the eventual allowance of currently identified industrial wastewater.

Response ODEQ: The 26 general permits which regulate industrial wastewater have flow, temperature and/or dilution requirements that protect against warming of stream temperatures. These requirements were used the basis that there is no reasonable potential for these sources to cause a criteria exceedance. The TMDL does not

conclude that "industrial wastewater is a known source of increased temperatures" in the Rogue Basin.

Bacteria Allocations and CAFOs

8. Clearly there are bacteria issues related to cattle operations in the Upper Rogue subbasin. The TMDL states that combined point sources contribute only 3.5% of the total loading capacity and that the remainder (96.5%) of the bacterial loading capacity can be assigned to nonpoint sources within the basin. Not surprisingly, these subwatersheds are also heavily grazed by cattle with resultant nonpoint pollution. The TMDL states that , "…there currently exists the potential for CAFOs to impact bacteria levels in the Rogue River (3-7)," yet the Oregon Department of Agriculture (ODA) is overseeing CWA implementation rather than the DEQ.

   ODA should likely not be administering the NPDES program for CAFOs. The Clean Water Act makes clear that the delegated state's pollution control authority is the agency authorized to administer the program. I am aware that a memo of understanding between ODA and DEQ allows ODA to operate the program, but I would like confirmation that EPA has approved this arrangement. It seems that in this case, the fox truly is guarding the hen house – how can citizens rest assured that ODA will adequately regulate the entities it is mandated to promote? While it is stated that 7 of 11 CAFOs have been issued at least one NON, it is inappropriate and insufficient for DEQ to state that, "exceedances were not quantified and the actual impact of CAFOs in unknown." It should be the job of the DEQ to fully implement the CWA with regard to cattle and grazing impacts in the Rogue.

Response ODA: William Matthews, CAFO Program Manager, Oregon Department of Agriculture. The majority of cattle grazing activities occurring in the Upper Rogue TMDL area do not meet the definition of a CAFO in OAR 603-074-0010 (3). Non-CAFO cattle grazing impacts to water quality are non-point sources and would be regulated by ODA in the Agriculture Water Quality Program (AGWQ) under OAR 603-090 (0000 - 120) and 603-095 (0010 – 3960). There are 27 CAFOs in the Upper Rogue TMDL area registered to the Oregon CAFO General (NPDES) Permit. Only 3 of those 27 facilities are beef animal feedlots where animals are held in confinement. All of the 27 registered CAFOs are point source dischargers in the TMDL and have a zero load allocation.

EPA and DEQ partner with ODA to deliver water quality regulatory programs to agricultural sources. ODA delivers both the CAFO, NPDES Permit program and the AGWQ program according to Memoranda of Understanding with DEQ. ODA also has a Memorandum of Understanding with EPA specifying roles and responsibilities for the CAFO NPDES Permit program. DEQ remains the delegated NPDES Permit Program authority in Oregon and the CAFO NPDES General and Individual Permits are issued jointly by DEQ and ODA.

Implementation, Funding

9. What will happen to the reserve allocations if the TMDLs established here do not turn out to be effective at bringing water quality into compliance with standards? We hope that adaptive management and enforcement are used aggressively as necessary to bring practices into compliance. We remain concerned that

implementation and enforcement of this TMDL will be impossible without increased funding for DEQ. We are also concerned that a bare minimum, as required by a court mandate, will not result in the goal of improving water quality for all beneficial uses. We are just starting to understand and acknowledge the water quality impacts of climate change and emerging contaminants. If we cannot strongly monitor and enforce Clean Water Act compliance for logging, industry, sewage treatment and grazing operations, then our hope of mitigating climate change and emerging contaminants in order to continue fishing and swimming in the Rogue remains thin.

Response ODEQ: There are currently no plans or requests to allocate the reserve capacity in the Rogue TMDL. The requirement to develop and implement an implementation plan is enforceable as a Class II violation as defined in OAR 340-012-0055. DEQ intends to review the progress of implementation plans on an annual basis, while reviews of the TMDLs are expected to occur approximately five years after the final approval of the TMDLs, or whenever deemed necessary by DEQ.

Comments from John G. Ward, Citizen, Ashland, OR

Thank you for the opportunity to read and comment on the Draft TMDL for the Rogue River Basin. The depth of information provided is remarkable and the analysis thorough, and as a citizen I appreciate the professional work provided. As you know I had hoped to have Southern Oregon Fly Fishers and Middle Rogue Steelheaders work with Rogue Flyfishers to jointly review and address the Draft TMDL. Travel schedules, health problems and fall deer and elk commitments did not allow this collaboration. There were discussions and club committee meetings but no joint comment was produced. This letter is submitted as a private individual.

1. Page 2-5 The **Salmonid Stream Temperature Requirements** notes thermally induced fish mortality has interactive effects including “decreased food supply (impaired macroinvertebrate populations)”. Experienced fly fishermen report an absence of October caddis downstream of the City of Medford Waste Water Treatment Plant. Whether this occurs near the “point of maximum impact” approximately 4.1 miles downstream from the outfall at river mile 130.8, and whether it is associated with afternoon conditions when river temperatures are warmest needs more checking (page 2-17). Some fishermen report there is a “slime” on the substrate which may occur closer to the outfall, adversely impacting a macroinvertebrate that is regularly fished above the WWTP. The caddis hatch seems to recover further downstream.

Response ODEQ: As part of the TMDL development process the City of Medford WWTP permit and discharge monitoring reports were reviewed to ensure permit limits were being met. As part of the NPDES permitting process the Medford permit will be revised to incorporate the limits set in the TMDL. The new permit is anticipated to be issued in the spring of 2009.

2. Page 4-14 The **WQMP and DMA Specific Implementation Plan Timeline** offers a benchmark for progress on steps to improve water quality in the Rogue Basin. There are general statements in **6. Reasonable Assurance of Implementation** of indicators of progress but no location where the public can

monitor this progress. Can the DEQ provide an online site where interested public can track or follow the DMA-specific implementation plans. If not, can DEQ provide a centralized office where hardcopy DMA reports can be reviewed and copied?

Response ODEQ: Hardcopies of the plans and reports can be obtained from the DEQ office in Medford or from the DMAs themselves. At this time there is no plan to make them available online on the DEQ website.

3. Thank you again for developing a very useful summary of Rogue Basin information. It provides a helpful beginning point toward integrating data across many sub-basins and land uses.

Response ODEQ: Thank you for your comments.

Comments from US Army Corps of Engineers: Jim Britton Portland District, Reservoir Regulation and Water Quality Section, Mike Schneider, Engineering Research and Development Center (ERDC)

SUBJECT: COE Comments on ODEQ Draft Rogue River TMDL Chapter 2: Temperature August 2008

The following memorandum contains comments from the Portland District Corps of Engineers regarding the August 2008 Draft Rogue River TMDL Chapter 2: Temperature prepared by Oregon Department of Environmental Quality. The purpose of these comments is to provide constructive input to the technical and policy TMDL assessment and request further clarification of the methodology and results that are presented.

General Comments:

1. The primary objective of a Temperature TMDL analyses is to determine if and why certain listed 303d water bodies in the Rogue River basin do not meet water quality standards. Does Lost Creek Dam cause the thermal impairment in the 303D listed reach of the Rogue River?

   A review of Rogue River temperatures below Lost Creek Dam indicates not a single day of non-compliance with the applicable temperature in water released from the dam since its completion in 1977 based on methodology described in the above referenced document. The attached Appendix A provides more details on this analysis of historic water temperatures at Lost Creek Dam. Why should additional restrictions in the form of load allocations be placed on Lost Creek Dam when there is little evidence linking the thermal impairments in the 303d listed reach of the Rogue River to the existence and operation of Lost Creek Dam? Wouldn't a more appropriate load allocation for Lost Creek Dam be the applicable numeric temperatures in the Rogue River above Big Butte Creek?

Response ODEQ: DEQ has reviewed the data you have attached in Appendix A. In the TMDL, Appendix B Figure B8 indicates that Lost Creek Dam contributes to thermal impairment of the Rogue River. The rationale for assigning load allocations to the Lost Creek Dam project is clearly stated on page 2-33 in the draft TMDL: "Lost

Creek reservoir is a large impoundment with the ability to positively or negatively impact the temperature and flow of the entire river. In order to ensure no net negative impacts to beneficial uses occur anywhere downstream of the dam during the period of impairment, the heat load allocation assigned to the dam is no heating of river temperatures above natural thermal potential from April 1 to October 31." DEQ has identified USACE as a DMA consistent with OAR 340-0030(2) "*Designated Management Agency* (DMA) means a federal, state or local governmental agency that has legal authority over a sector or source contributing pollutants, and is identified as such by the Department of Environmental Quality in a TMDL" where *Source* means any process, practice, activity or resulting condition that causes or may cause pollution or the introduction of pollutants to a waterbody (OAR 340-42-0030(12)). DEQ would be remiss in not identifying USACE as a DMA with an obligation to meet a Load Allocation. The water Quality Management Plan (Section 4) on pages 7-11 clearly specifies the DMAs and their requirements under the TMDL.

2. If a water body is found not to meet water quality standards, the TMDL is to develop a strategy to return this water body to compliance with these standards. This restoration strategy must be based on a credible assessment of the applicable temperature standard, determination of excursions above the standard, and identification of the responsible source for this impairment. How is model uncertainty and error being incorporated into the assessment of compliance with the OAR? The standard error of model estimate has been calculated in the TMDL appendix as 0.8 ^{o}C. How can this model be used to assess compliance with water quality standards based on a temperature tolerance of 0.3 ^{o}C at confidences levels consistent with credible scientific methods?

Response ODEQ: Uncertainty of the impairment assessment is being addressed by minimizing the chances of a false negative result (i.e. DEQ is trying to avoid indicating that a stream is meeting the water quality standard, when it is not). The model is the best available information to evaluate compliance with the standard and the model is predicting greater than a 0.8 °C impairment. Furthermore, the 0.8 °C error in the calibration does not indicate the same amount of error for the prediction of additive heat load. The 0.3 °C human use allowance is used to calculate allocations and is not related the uncertainty of the model.

3. A major authorized function of Lost Creek Dam and Reservoir is to manage flows and temperatures in the Rogue River to enhance fishery resources in downstream areas. Reservoir management of flows and temperatures generally provides an enhancement of river conditions over what would have occurred in the absence of the project during the summertime. This important function provided by Lost Creek Reservoir needs to be further developed in this temperature TMDL of the Rogue River. The discussion of temperatures in Appendix B presents an alternative summary of impacts of Lost Creek Dam on Rogue River Temperatures. How can the beneficial sources of thermal energy provided by Lost Creek Dam be accounted for in this temperature TMDL?

Response ODEQ: DEQ has reviewed the data in Appendix B. The language in the draft TMDL pertaining to the potential impacts of Lost Creek acknowledges the benefits to temperature and fisheries during certain periods of the year. As stated in the TMDL: Page 2-22: "Based on this data, the operation of the reservoir between 1977 and 2006 appears to have supplied cooler water and additional water from July through late August than would occur without the reservoir." 2-23: "Fall chinook

salmon have increased significantly because reservoir operations reduce water temperature in areas downstream of Grants Pass during summer (ODFW 1992)." Page 2-34: "The USACE in consultation with ODFW and Rogue Basin Interagency Advisory Group has successfully managed their operations to improve fall Chinook runs in the Rogue Basin by reducing water temperature in areas downstream of Grants Pass during the summer (ODFW 1992)." Page 2-35 states "However, DEQ recognizes that current reservoir operations during much of the year benefit the Rogue mainstem by compensating for other sources' current impact."

4. Similarly, the restoration and enhancement of main stem flows by both Lost Creek and Applegate Dams should be recognized in terms of impacts on assimilative capacity and moderation of river temperatures. The need for a load allocation for Lost Creek Reservoir in the absence of clear evidence of causation of thermal impairment to the 303d listed reach of the Rogue River should be provided.

Response ODEQ: As stated on Page 2-35 "… DEQ recognizes that current reservoir operations during much of the year benefit the Rogue mainstem by compensating for other sources' current impact." DEQ would be remiss in not identifying USACE as a DMA with an obligation to meet a Load Allocation as per the response to #1 above.

5. The development of effective temperature management strategies for the Rogue River by Lost Creek Dam operations requires the consideration of both water volumes and temperature properties released from and retained in Lost Creek Reservoir. The recommended target temperatures (load allocation) presented in this TMDL do not take into account the heat flux from Lost Creek Dam or heat content retained in Lost Creek Reservoir, nor does it take into account important fisheries management issues throughout the year. Why should a load allocation for Lost Creek Dam be proposed that conflicts with the support of critical beneficial uses of the system?

Response ODEQ: We agree that effective management of the Lost Creek Dam will need to take into account both temperature and flow. DEQ supports a multi-agency approach to regulating Lost Creek Dam. The WQMP has been modified to more clearly state the level of coordination anticipated between ODFW and ODEQ to develop a single set of temperature targets for the Lost Creek Dam project and the development of a Memorandum of Understanding that clearly defines this collaborative process.

6. The adoption of the proposed load allocation at Lost Creek Dam would be counterproductive with regards to fisheries management and conflict with current reservoir management practices. The policy of meeting NTP conditions based on observed water temperature in the Rogue River below Prospect applied continuously, weekly, or monthly may lead to inefficient temperature management operations requiring the expenditure of cold water resources during the spring at the expense of having these resources available later in the summer and fall. A short presentation on temperature management and reservoir operations at Lost Creek Dam is presented in Appendix E.

Response ODEQ: As stated on page 2-35 of the draft TMDL: "It is DEQ's intent that the implementation of this TMDL will lead to operations of Lost Creek Dam that optimize production of salmonids throughout the year, during all life stages, not just when the current allocations apply. DEQ requests that USACE work with ODFW and DEQ to set temperature and flow targets on an annual basis."

The presentation attached in Appendix E provided a critical review of elements of the TMDL analysis for the Technical Advisory Committee to consider during the public comment process. The discussion generated by the presentation has been used to inform our responses to the TMDL. DEQ feels that the substantive comments/concerns that were raised by the presentation as given on November 5th have been submitted as comments by USACE and others and are addressed in this RTC document.

7. It is important that water quality compliance estimates as represented by "natural thermal potential" be credibly formulated for this assessment. The "natural thermal potential" has been found to exceed the biological criteria during most of the study period and thereby becomes the applicable numeric criteria upon which this document is based. The use of the "maximum potential effective shade" as part of the definition of "natural thermal potential" should be reviewed in light of the fact that it does not reflect realistic or achievable natural conditions. To our understanding, all natural disturbances to shading are being neglected in this study. This assumption results in the estimation of NTP based on idealistic estimates of shading that do not occur in nature.

   The following statement presented in Chapter 2 supports this concern: "This TMDL recognizes that it is impossible for an entire stream to be at its maximum potential effective shade everywhere, all the time. In reality, natural disturbances will create a variety of tree heights and densities and effective shade levels in many reaches will be lower than the NPS Loading Capacity. Reductions in effective shade caused by natural disturbances are not considered a violation of the TMDL or water quality standards."

Response ODEQ: The process of quantifying the impact of natural disturbance of the riparian area on stream temperature is complex, arduous and uncertain. Furthermore, since natural disturbance is a random event and variable with space and time, it is not clear how the information gathered from an analysis would inform allocations. The impact of natural disturbance was quantified in the Umpqua Basin TMDL (DEQ 2006, http://www.deq.state.or.us/wq/TMDLs/umpqua.htm). It was found that natural disturbance of the riparian area caused no measurable increase in stream temperature for the largest rivers simulated (i.e. South Umpqua River, North Umpqua River, Umpqua River). Of the analysis in the Umpqua Basin, these rivers are most similar to the Rogue River to which most point sources discharge. In addition, not considering natural disturbance in the estimate of NTP is a conservative assumption that is used in the Margin of Safety. Given the above information, DEQ decided not to quantify the impact of natural disturbance on NTP.

8. Why does the Rogue River in the wild and scenic area have rates of impaired stream shading from anthropogenic sources similar to much of the Rogue River with residential development?

Response ODEQ: It is not clear what residential reaches to which you are referring. The wild and scenic reach of the Rogue River is from approximately river km 30 to 150. Current average shade is predicted at 12% while system potential shade is 21% (difference of 9%). Conversely, for the residential area just downstream of Gold Hill at river km 190, the model estimates current shade at 2% while system potential shade at 27% (difference of 25%). These calculations do not support your statement of similar shade impairment.

2.1 Overview and Scope

9. Why doesn't this TMDL make a distinction between exceeding the Biological criteria and achieving water quality standards? Water temperatures in excess of the biological criteria have been sufficient criteria for designation of a water body on the 303(d) list as water quality limited. The consideration of natural conditions is required to determine compliance with water quality standards and is needed to substantiate the original 303d designation.

Response ODEQ: The TMDL does distinguish between exceeding the biologically based criteria and achieving water quality standards (Section 2.5.1 and Figure B15).

10. The completion of the Applegate TMDL was based on an earlier Oregon Administrative Rule that was significantly different than the current standards. The methodology and results from the Applegate TMDL are not consistent with the current study and care should be taken in applying the finding from this study.

Response ODEQ: The Applegate is outside of the area covered under this TMDL. It is DEQs intent that the Applegate temperature TDML will be revised when the TMDL is opened for review approximately 5 years after it issuance. The Applegate TMDL was issued in February 2004.

11. Shouldn't this section list reservoir management as being the primary restorative component for flows and temperatures in the Rogue River? Shouldn't the definition of source also include restorative processes resulting in reduction in temperatures and increasing the assimilative capacity of the water body? The overwhelming influence of Lost Creek and Applegate reservoir management is the restoration of flows and temperatures during the critical summer period to the Rogue and Applegate Rivers.
    See OAR 340-042-0040 (4) (f) on identifying the amount of actual pollutant loading from sources. Shouldn't the definition of identifying the amount of actual pollutant loading include both restorative and degradative activities?

Response ODEQ: *Source* means any process, practice, activity or resulting condition that causes or may cause pollution or the introduction of pollutants to a waterbody (OAR 340-42-0030(12)). As per section 2.7 "Impacts of irrigation districts and reservoir and dam operations should be calculated as a change in stream temperature. The nonpoint source HUA allocation may be used by any of the nonpoint sources located in the Rogue River basin, including agriculture, forestry, urban areas, irrigation, dam operations, or for heat trading." The option of trading thermal credits is available to the dam if operations allow. The benefits to stream temperatures due to the operation of Lost Creek Dam are stated in numerous locations in the TMDL as per response #3 above.

Temperature TMDL Overview

12. Shouldn't the directives in OAR 340-042-0040 (4) (h) regarding load allocations distinguishing between natural background and anthropogenic non-point sources be included in the summary in Table 2.2?

Response ODEQ: The load allocations do distinguish between natural background and anthropogenic nonpoint sources. The Table 2.2 reads: "The load allocation for nonpoint sources in the Rogue River basin consists of the sum of the natural

background heat loads from solar radiation plus the heat load that corresponds to 0.04ºC of the Human Use Allowance (HUA) …"

13. Why are the specific study finding listed in Table 2.2 located in this section of the report? This presentation of findings without any detailed descriptions or background can easily misinform the causal reader.

Response ODEQ: The table is included as a summary of the results and is appropriately located for that purpose in the overview section.

14. Achieving natural thermal potential (NTP) conditions are considered compliance with the TMDL only when NTP is the applicable numeric criteria. Why does the load allocation for Lost Creek Dam call for temperatures well below the applicable numeric criteria? "Lost Creek Dam is allowed no increase above natural thermal potential temperatures when the biologically based numeric criteria are exceeded in the Rogue River between the dam and the mouth."

Response ODEQ: As per Section 2.7.1 "In order to ensure no net negative impacts to beneficial uses occur anywhere downstream of the dam during the period of impairment, the heat load allocation assigned to the dam is no heating or river temperatures above natural thermal potential from April 1 to October 31. The dam was given no portion of the human use allowance."

15. Table 2.2 in the TMDL Loading Capacity and Allocation should also refer to OAR 340-041-0028(11)(a) Minimum Duties. There is no duty for anthropogenic sources to reduce heating of the waters of the State below their natural condition. Similarly, each anthropogenic point and nonpoint source is responsible only for controlling the thermal effects of its own discharge or activity in accordance with its overall heat contribution. The role of conservation releases from Lost Creek and Applegate Dams during the summer time is to moderate river temperatures and provide for a greater assimilative capacity in the downstream river reach. These restorative operations do achieve a reduction in heating of the waters of the State during critically warm periods below their natural conditions for the purpose of supporting fisheries resources. At some level, these activities can be viewed as compensation for other anthropogenic sources of heat in the basin or as trading of thermal credits. Why isn't this major restoration theme a prominent component of overall study findings?

Response ODEQ: Language in the TMDL in Section 2.7.1 acknowledges the benefits to summer temperatures and the fall Chinook runs as a result of the Lost Creek dam through the management efforts of the interagency advisory group. In addition the TMDL states "…DEQ recognizes that current reservoir operations during much of the year benefit the Rogue mainstem by compensating for other sources' current impact." In the final section 2.8 it is stated that dams and reservoirs may play a role in temperature trading.

16. Table 2.2 Why reference small temperature tolerances of 0.05^{o}C, 0.01^{o}C, 0.04^{o}C when thermal monitoring equipment are accurate to +/-0.1 ^{o}C and temperature model simulations have a standard error of 0.8 ^{o}C? The sampling variability in most water bodies is often many times greater than the measurement error.

Response ODEQ: The standard error is used to evaluate the calibration of the model and it is not appropriate to use the calibration error to judge the magnitude of allocations.

2.2 Beneficial Use Identification

17. Why doesn't the section on Salmonid Stream Temperature Requirements not address issues of fish mortality when temperatures criterion of 13 and 16 C are exceeded? This explanation would help identify the biological consequences of exceeding the applicable temperature standards in the spring and fall on the Rogue River. Exceeding maximum summertime temperatures as defined by the NTP are not an issue on the Rogue River.

Response ODEQ: See Table 2.3 Modes of Thermally Induced Cold Water Fish Mortality and Section 1 pages 6-7 for a discussion of fisheries impact related to water temperatures. DEQ does not agree that "summertime temperatures as defined by the NTP are not an issue on the Rogue River" and has established appropriate thermal allocations for all identified sources through the Rogue River Basin TMDL.

2.3 Target Identification

18. The Rogue River is listed for temperature from RM 0 to 125. Why are load allocations designated for sources above Gold Ray Dam if this reach is not thermally impaired and no casual linkage is identified in the 303(d) listed reach?

Response ODEQ: A water quality model was used to determine casual linkage between sources upstream of Gold Ray Dam and the impairment downstream of Gold Ray dam.

19. Why wasn't Big Butte Creek addressed in this TMDL since it is listed for temperature? Big Butte Creek influences Rogue River temperatures at the McLeod gauge. The natural flows and temperatures in Big Butte Creek were not available for estimating the influence of conditions at the upstream boundary of the modeling domain.

Response ODEQ: There are nonpoint and point source allocations for the Big Butte Creek watershed so it was addressed in this TMDL. The NTP model boundary condition did account for estimated natural flow from Big Butte Creek.

20. Why are observed river temperatures on the Rogue River at Agness used to identify the season of impairment? No comparison with natural conditions was presented.

Response ODEQ: Natural conditions were only estimated for 2003 while multiple years of data were available at Agness. The approach is conservative and helps account for the uncertainty of the analysis as a margin of safety.

21. What is the difference between critical conditions and the point of maximum impact? It seems inconsistent to identify the point of maximum impact to occur during a non-critical condition at the end of September when temperatures fall below the sub-Lethal limit (Table 2.4).

Response ODEQ: Critical conditions refer to a time period and point of maximum impact a geographic location. The point of maximum impact can vary with time so there is no inconstancy.

22. Why include temperatures data from Trail Creek when this data clearly misrepresents the seasonal temperature this tributary to the Rogue River? Temperature probes can easily become covered by sediment and monitor temperatures of interstitial flow.

Response ODEQ: As stated in Section 2.3.3: "The quality of this data was double checked and met the requirements for 'A' level data." No additional information concerning this data was provided to DEQ. DEQ would be remiss if we discounted data simply because it does not confirm our preconceived notions of the temperature regime at this site.

2.4 Existing Pollution Sources

23. Why aren't natural disturbances decreasing stream side shading potential recognized in this study?

Response ODEQ: Natural disturbances decreasing stream side shading potential is recognized in the TMDL and is specifically discussed in load allocation section 2.7.2.

24. Can system potential shade exist everywhere at the same time under natural conditions?

Response ODEQ: Yes.

25. How can natural thermal potential based on system potential shade devoid of natural disturbances of vegetative shade represent natural conditions?

Response ODEQ: DEQ used the best available approaches and data for the Rogue River basin to derive NTP. No data nor suggestions of approaches regarding natural disturbance was provided during the technical committee meetings or the public comment period. See response to comment 7.

26. Why wouldn't the impacts of grade control structures and dams have an impact on decreasing the sediment load from the stream?

Response ODEQ: A TMDL was not developed to address sediment.

27. Shouldn't the temperature TMDL focus on sources of thermal impairment and not on "potential" or minor sources of thermal impairment?

Response ODEQ: The focus of the TMDL is to address the sources of impairment where "Sources" are identified as any process, practice, activity or resulting condition that causes or may cause pollution or the introduction of pollutants to a waterbody.(OAR 340-42-0030(12)).

Lost Creek Reservoir

28. The regulation of Lost Creek Reservoir provides additional flows from June through mid-September.

Response ODEQ: The comment has been considered.

29. The temperature and flow analyses of Lost Creek Dam should note that Big Butte Creek also influences conditions at the near McLeod station.

Response ODEQ: DEQ agrees and Section 2.7.1 was revised to address this comment. DEQ supports the refinement of the regression relationship to remove the influence of Big Butte Creek or shifting the compliance point for the dam from the McLeod station to another site provided an adequate relationship is demonstrated between upstream temperatures and NTP at the proposed new point of compliance.

30. The listing of Lost Creek Reservoir as an existing pollution source for temperature misrepresents the flow and temperature management role this project plays in the Rogue River.

Response ODEQ: Since the dam has such a large potential impact on the river, both for flow and temperature, DEQ would be remiss in not identifying USACE as a DMA and requiring the development of a temperature management plan and compliance with the applicable standards.

31. The flow summary shown in Figure 2.11 is misleading. A figure comparing reservoir inflow to outflow along with the typical seasonal rule curve would be a more effective means of describing the hydrologic impacts of Lost Creek Dam.

Response ODEQ: DEQ disagrees that the flow summary is misleading and believes it is an effective way of presenting the flow data.

32. The analyses presented in Figure 2.12 a and b inappropriately equates Lost Creek Dam impacts with temperatures observed on the Rogue River near McLeod. Why does the TDML not distinguish between temperatures releases from Lost Creek Dam and temperatures observed in the Rogue River near McLeod? There are observed data that are not consistent with the conclusion presented in this section that states that Lost Creek Dam causes temperatures that are substantially warmer from March through early June. An alternative discussion of observed and calculated temperature data on the Rogue River near Lost Creek Reservoir is presented in Appendix C. This presentation of data suggests that Lost Creek Dam is not the source for thermal impairment in the Rogue River above Gold Ray dam.

Response ODEQ: See response to #29 above for rational for the use of McLeod station. The analyses were appropriate and based on the best available data and approaches for the Rogue River. No data nor suggestions of other approaches were provided to DEQ to better address the impact of Big Butte Creek. The TMDL does distinguish between temperature releases from Lost Creek Dam and the temperature observed in the Rogue River near McLeod. The proposed allocation for Lost Creek Dam does not specify the temperature released from the dam but rather a necessary temperature at a compliance location (the McLeod gage). As stated in the TMDL 2-33, and Appendix B, the McLeod station was chosen because of the quantity of data collected prior to the construction of LCR. The analyses of Lost Creek Dam in the TMDL shows Lost Creek Dam contributes to downstream water quality impairment (Appendix B, Figure B8). DEQ has reviewed Appendix C and used it to inform our response.

33. COE does not know of any quantified data that the Prospect Hydroelectric project does not impact Rogue River temperature at the Prospect gauge. The rerouting of flow from the heavily shaded river channel into an exposed diversion channel, storage reservoir, and penstock may likely have a significant impact on river temperatures at a measurable scale. The temperature tolerance of 0.3 C and importance of daily maximum temperature are quite sensitive to anthropogenic impacts exerted by the Prospect Hydroelectric project.

Response ODEQ: The Prospect Hydroelectric project is discussed in the source assessment and received an allocation which limits its impact to less than 0.3 °C.

Low Head Dams

34. Why lump the entire Rogue River from Gold Ray dam to the mouth for this analysis? Given that the daily maximum temperature is used to quantify the thermal properties in the system, it appears that a well supported conclusion would be that Low Head dams locally reduce the 7DMADMAX as shown in Figure 2-14.

Response ODEQ: DEQ wanted to assess of the impact of the low head dams on the Rogue River from Gold Ray dam to the mouth and evaluate at the impact to the entire river in addition to the local impact.

Hydromodification

35. Where is the load allocation for consumptive users of water throughout the basin? Can the temperature standards as defined by NTP be achieved without the restoration of natural flows to the system?

Response ODEQ: See #5 BOR Comment.

2.5 TMDL Loading Capacities

36. Why use the flawed concept that "reservoir effects on stream temperature are better expressed as water temperatures targets rather than as a heat load."? The impacts of Lost Creek Dam releases on the Rogue River temperatures are directly dependent on the total loading released from the dam. Estimating downstream impacts based on only release temperatures from the dam is insufficient information for determining downstream effects on stream temperature. If Lost Creek Dam released temperatures warmer than NTP, the influence on Rogue River temperature maybe a cooling effect depending upon the corresponding discharge rate from the dam and tributary and meteorology thermal components. The extent of remediation of Rogue River temperatures through conservation flows from reservoirs will be directly related to thermal loadings (Cp Q Tmp) and not simply water temperatures or change in water temperature.

Response ODEQ: DEQ disagrees with the statement that the allocation approach is flawed and believes the approach is appropriate.

37. What is the difference between a non-point source heat load and excess heat load?

Response ODEQ: Excess load is the difference between the actual pollutant load in a waterbody and the loading capacity of the water body. Nonpoint source heat load is the pollutant load contributed by the nonpoint source sector.

38. The definition of point of maximum impact needs to be defined in terms of the biology of the river if it is to be meaningful. The current temperatures can greatly exceed the applicable temperature but if few fish are impacted by this event, it would not seem to qualify as a period of maximum impact.

Response ODEQ: The concept of the "point of maximum impact" is documented in the water quality standard, OAR 340-041-0028(12)(b)(B) and has been applied consistently with its usage therein.

39. This is a critical section of the report that needs to describe where, how, and why temperature impairments and enhancements occur throughout the study area. The OAR 340-042-0040 (4) (f) directs the TMDL to identify the sources and amount of loading from these sources. Without clearly identifying the source for the impairments it is difficult to quantify the appropriate load allocations.

Response ODEQ: The sources are appropriately assessed in Section 2.4 using the best available data and approaches.

40. Why use a single point in time to characterize thermal conditions in the river? The figures in this section display a point in time over the entire river reach. These snap shots in time can be deceptive in terms of quantifying the variation of thermal properties in time particularly in a system that experiences considerable day to day temperature variations. A more meaningful presentation of this data that was used in the Willamette River TMDL uses a frequency analyses to summarize spatial and temporal model results. The reliance on systemic impacts based on a frequency analysis of model estimates during critical time periods should be used to characterize thermal sources and not specific events. The systemic thermal impacts can be based on estimates the 10th and 90th percentile delta temperatures versus river mile or by contrasting cumulative temperature frequency curves for current and natural conditions at a single location.

Response ODEQ: The thermal conditions of the river were assessed throughout the year and using multiple years of data. Figure 2.17 shows longitudinal plots of the maximum temperatures for the model period (not necessarily occurring on the same day). This is a common way to evaluate the thermal condition and is consistent with previous TMDLs.

Permitted Point Sources

41. Do the point sources cause temperature impairment in the listed reach below Gold Ray Dam? Are upstream anthropogenic sources of heat responsible for the load allocations placed on these point sources?

Response ODEQ: The TMDL analysis does not indicate that point sources cause temperature impairment in the listed reach below Gold Ray Dam. Upstream anthropogenic sources of heat are not responsible for the load allocations placed on point sources

2.6 Allocation Approach

42. Why was Lost Creek Dam given no portion of the Human use allowance? It would see logical to give the Dam a significant portion of this allowance because of the net cooling influence caused by the dam.

Response ODEQ: The approach is consistent with the Willamette TMDL where US Army Corp dams was allocated none of the human use allowance.

2.7 Nonpoint Sources Load Allocation

Lost Creek Dam

43. " In order to ensure no net negative impacts to beneficial uses occur anywhere downstream of the dam during the period of impairment, the heat load allocation

assigned to the dam is no heating or river temperatures above natural thermal potential from April 1 to October 31."

What are the negative impacts to beneficial uses if Lost Creek Dam releases were to exceed estimated NTP during the months of May or September?

Response ODEQ: The heat load allocation assigned to the dam has been established to protect beneficial uses. Temperature excursions beyond NTP will potentially have a negative impact on beneficial uses and is not acceptable.

44. The designation of load allocation at Lost Creek Dam as only a water temperatures is insufficient criteria to ensure no net negative impacts to thermal resources in the Rogue River. Release temperatures warmer than NTP at Lost Creek Dam can have either a warming or cooling impact on downstream reaches depending upon the volume of water releases, tributary heat loads, and meteorologic conditions

Response ODEQ: It is DEQ's current practice not to assign flow targets as part of the allocation.

45. The methodology used to estimate the NTP and target temperatures for Lost Creek Dam is highly uncertain and inaccurate. The linear regression equation used to estimate NTP near McLeod contains a standard error of estimate larger than 1.0 C.

Response ODEQ: The regression relationship presented in the TMDL is based on the best data available at the time (further discussion of regression in Appendix B of the TMDL). DEQ supports the refinement of the regression relationship to determine NTP to better support management of the dam.

46. Why is a temperature management plan needed if Lost Creek Dam has never exceeded the loading allocation defined by this document or caused a temperature impairment in the Rogue River as defined by OAR?

Response ODEQ: See response to #30 above.

47. What is the basis for the implementation of this TMDL that will lead to operations of LCR that optimize production of salmonids throughout the year even when the current load allocations do not apply?

Response ODEQ: As per the TMDL, load allocations apply April 1 – October 31 however a primary authorized purpose of reservoir operation is fishery enhancement in downstream areas and applies year-round as per House document 566 (United States Congress 1962) which authorized the construction and operation of Lost Creek Dam on the Rogue River by the USACE.

48. If a load allocation is required for all potential sources of thermal impairment then an alternative load allocation for Lost Creek Dam is presented in Appendix D. This proposal provides the general methodology for generating a load allocation defined by a seasonal range in target temperatures defined by an upper and lower bounds of the applicable numeric temperature.

Response ODEQ: Appendix D requests that no load allocation be given to the Lost Creek Dam. As stated in the response to #1, USACE is a DMA and as such a load allocation is assigned. As mentioned previously, DEQ supports the refinement of the regression relationship to determine NTP and is in support of shifting the compliance point provided an adequate relationship is demonstrated between upstream

temperatures and NTP at the proposed new point of compliance. DEQ will review alternative proposals as part of the USACE plan submittal.

49. Why does the temperature management plan requested by ODEQ for Lost Creek Lake include the justification for flow targets?

Response ODEQ: The final document no longer refers to flow targets.

50. What types of actions should a temperature management plan include when no adverse temperature effects relative to OAR temperature standards have been identified (only the potential for adverse acts have been identified)?

Response ODEQ: The temperature management plan will need to detail how the USACE proposes to meet the load allocations specified in the TMDL as per OAR 340-042-0080.

51. Effective Shade Targets- Are the potential effective shade targets achievable? The definition of potential effective shade with no natural sources of impairment seems inconsistent with a working definition of natural conditions.

Response ODEQ: As stated in the draft TMDL 2-36 and 2-38, "Natural conditions or natural disturbances (non-anthropogenic) that result in effective shade below the maximum potential will not be considered out of compliance with the TMDL." This terminology sets realistic expectations for the fact that system potential may not be achieved along the entire river at the same time.

52. Does the site-specific hyporheic exchange estimates meet basic criteria required by credible scientific methods?

Response ODEQ: Hyporheic flow targets are preliminary in nature and are meant to provide a range of values that may be beneficial when implementing projects in the future. In the final document, the estimates of natural hyporheic flow are no longer included in the allocation section. Pages 2-53, and 2-36 have been changed to reflect this.

2.8 Permitted Point Sources – Waste Load Allocations

53. This section was difficult to follow. It seems like the TMDL used 2003 temperature simulations with 7Q10 low flow conditions. Wouldn't the NTP temperatures during a 7Q10 event vary significantly from the 2003 simulations and effect the load allocation calculations?

Response ODEQ: Per DEQ's Temperature Internal Management Directive, effluent target temperatures should be based on using NTP temperatures as an instream target and actual stream flow.

54. The presentation made to the Rogue River Technical Team on November 5, 2008 has been included in Appendix E. This presentation contains additional material and comments regarding the temperature TMDL that expand upon and add to the comments contained in this section.

Response ODEQ: Thanks for your input and participation in the TMDL process – See DEQ response to #6 above for response to related to Appendix E.

Appendix A: Review of historical Rogue River Temperature below Lost Creek Dam as compared to the Applicable Temperature Criteria

The purpose of this data analyses was to compare the observed water temperatures at Lost Creek Dam with the current ODEQ water quality standards for temperature as defined in the Draft Temperature TMDL. The ODEQ water quality standard defines the biological criteria in the Rogue River from Lost Creek Dam to the confluence with Big Butte Creek to be as follows: 13 ^{o}C from October 15 – May 15 (Salmon and Steelhead Spawning) and 16 ^{o}C the remainder of the year (Core cold water habitat). The natural thermal potential in the Rogue River below Lost Creek Dam at McLeod sampling station was defined to be a linear function of the observed water temperatures in the Rogue River below Prospect gage (14330000) as defined by the following equation T_{Mcleod}= 0.95 $T_{Prospect}$+1.85. The applicable temperature criteria as defined by ODEQ 340-041-0028 based on the seven day average of the daily maximum stream temperature is the warmer of the biologically based numeric criteria and the natural conditions as estimated by the natural thermal potential temperature (NTP). The observed temperature records in the Rogue River below Prospect were compiled from 1977 to 2007 and the 7 day moving average of daily maximum temperatures were computed for the Rogue River near McLeod station. The biological criteria was almost always warmer than the computed NTP during this time period and hence was the basis for the applicable temperature criteria below Lost Creek Dam most of the time.

The water temperatures in the Rogue River below Lost Creek Dam were compiled since the dam was completed in 1977. Water temperature records at Lost Creek Dam were available in the Corps of Engineers Data Base located at http://www.nwd-wc.usace.army.mil/perl/dataquery.pl for the period from 1986 to 2007. The observed temperatures were also compiled in the Rogue River near McLeod from 1977-2007. The 7 day moving average of daily maximum temperatures was computed for the period of record and compared to the applicable numeric temperature described in the first paragraph. The observed water temperatures below Lost Creek Dam were composed of temperature at Lost Creek Dam when they were available and from the near McLeod gage for the remainder of the time period. This data assembly allowed the comparison of observed temperatures (7DADM) with the estimated applicable numeric temperature over a 31 year period since the completion of Lost Creek Dam.

The observed 7DADM water temperatures below Lost Creek Dam were always found to be colder than the applicable numeric temperatures OAR 340-041-0028 during the 31 year period from 1977 to 2007. A tabular summery of the comparison of observed water temperatures and applicable numeric temperatures is listed in Table A1. This table lists the number of days the observed and applicable numeric temperatures were compared each year, the number of days where the observed temperatures were warmer than the applicable temperature, the cumulative degree-days of the difference between the applicable temperature and observed temperature, and the average difference between the applicable temperature and observed temperature. With the exception of 1977, the average difference between the applicable and observed temperature ranged from -5.1 to -6.6 ^{o}C. A graphical summary of Rogue River Temperatures below Lost Creek Dam is shown in Figure A1. The calculated natural thermal potential temperatures for 1977-2007 (dark blue symbols) are shown along with the biological temperatures (pink line) and observed releases temperatures

(green symbols) from Lost Creek Dam (1986-2007). The biological temperatures are generally warmer than the NTP temperature with the exception for a part of the summer months. The observed release temperatures remained well below the applicable temperature consisting of the greater of the biological numeric temperature and the NTP. The general trend in the observed temperatures remained cooler than the NTP for the entire year with the exception of the month of December.

This analysis of water temperature data in the Rogue River below Lost Creek Dam raises questions regarding the justification for a load allocation for Lost Creek Dam. The water temperatures in the Rogue River have always been cooler than the applicable temperature criteria based on 31 years of data. Furthermore, the observed temperatures have been generally cooler than the calculated NTP throughout the critical time period of April 1 through October 31 used by this temperature TMDL. The appropriate load allocation for Lost Creek Dam should be defined by not exceeding the applicable temperatures and not a more restrictive criterion.

Table A1. Daily Summary of Observed Rogue River Water Temperatures below Lost Creek Dam to the Applicable Numeric Temperature OAR 340-041-0028				
Year	Number Days Tested	Days $T_{obs}>T_{wq}$	Sum $(T_{wq}-T_{obs})$ ^{o}C-days	Average $(T_{wq}-T_{obs})$ ^{o}C
1977	275	0	-958.9	-3.5
1978	322	0	-1657.4	-5.1
1979	365	0	-2047.9	-5.6
1980	328	0	-1789.9	-5.5
1981	268	0	-1436.2	-5.4
1982	350	0	-2151.1	-6.1
1983	307	0	-1799.4	-5.9
1984	337	0	-2026.4	-6.0
1985	357	0	-2164.9	-6.1
1986	317	0	-1956.0	-6.2
1987	358	0	-2218.9	-6.2
1988	211	0	-1340.8	-6.4
1989	301	0	-1850.0	-6.1
1990	365	0	-2338.5	-6.4
1991	365	0	-2160.7	-5.9
1992	366	0	-1994.0	-5.4
1993	293	0	-1940.5	-6.6
1994	365	0	-2182.6	-6.0
1995	338	0	-2046.9	-6.1
1996	331	0	-1987.2	-6.0
1997	354	0	-2141.1	-6.0
1998	365	0	-2184.0	-6.0
1999	365	0	-2418.9	-6.6
2000	366	0	-2261.9	-6.2
2001	365	0	-2278.3	-6.2
2002	365	0	-2246.4	-6.2
2003	365	0	-2268.4	-6.2
2004	366	0	-2240.8	-6.1
2005	359	0	-2189.3	-6.1
2006	345	0	-2052.4	-5.9
2007	365	0	-2125.2	-5.8

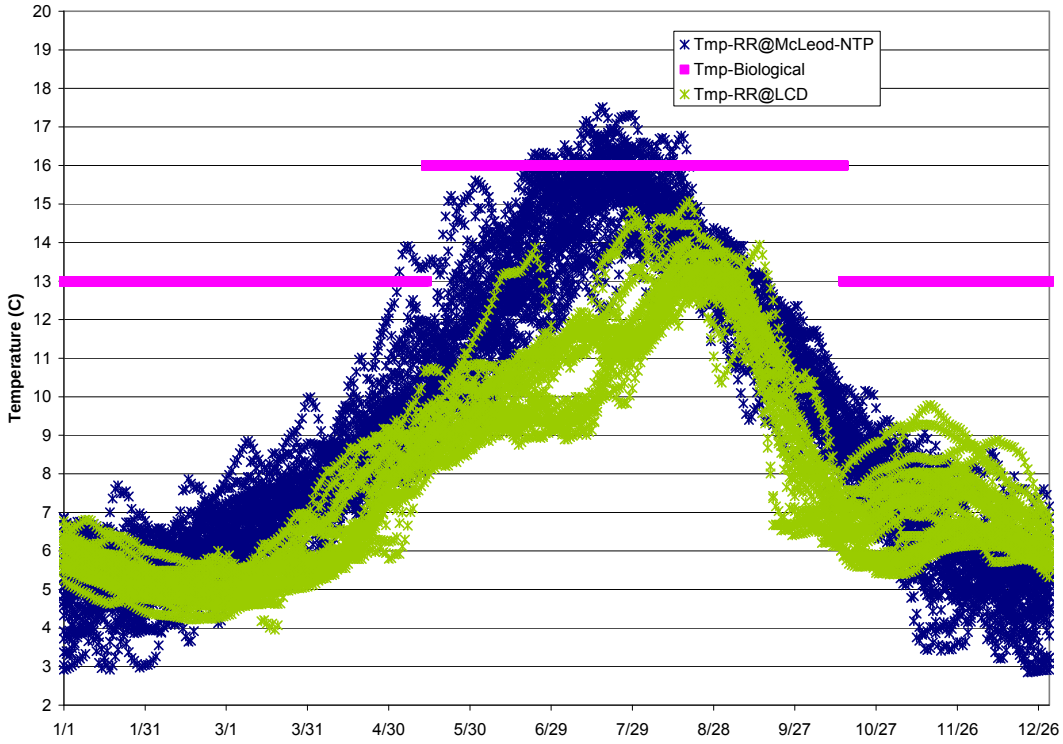

Figure A1. Seasonal Water Temperatures in the Rogue River below Lost Creek Dam 1977-2007 (Tem-RR@McLeod-NTP Natural Thermal Potential 1977-2007, Tmp-Biological, Tmp-RR@LCD Observed 1986-2007)

Appendix B: Statistical summary of Rogue River Temperatures below Lost Creek Dam

A major authorized function of Lost Creek Dam and Reservoir is to manage flows and temperatures in the Rogue River to enhance fishery resources in downstream areas. Reservoir management of flows and temperatures generally provides an enhancement of river conditions over what would have occurred in the absence of the project during the summertime. This important function provided by Lost Creek Reservoir needs to be further developed in this temperature TMDL of the Rogue River.

The frequency analysis of Rogue River temperatures at River Mile 157.2 with and without Lost Creek Dam should be presented in the TMDL. A summary of the data is shown in Figure B1 for the period from May 15-October 15 2003. The observed 7 dam moving average of the daily maximum release temperatures from Lost Creek Dam (current conditions) was compared to estimates of the natural thermal temperature (NTP) near McLeod proposed by the ODEQ for 2003. This data summary clearly demonstrates compliance with the applicable temperature of 16 ^{o}C and the frequency and degree of enhancement in river temperatures during this time period. The median Rogue River temperature with Lost Creek operations was about 3°C cooler that the estimated NTP without Lost Creek Dam from May 15-October 15. During the remainder of the year from October 15-May 15, when the biological criteria is 13°C, the release temperatures from Lost Creek Dam were again cooler than both the NTP and the biological criteria as shown in Figure B2. This analysis does not indicate current temperatures below Lost Creek Dam during the fall and winter months are on average warmer than natural conditions during 2003.

This type of characterization of river temperatures is consistent with the methodology used in the Willamette TDML and should be used in the Rogue River Temperature TMDL. This presentation of Rogue River Temperatures reflects the systemic influence of Lost Creek Dam as a cooling source and not a source of thermal impairment. Why then is a punitive load allocation required for Lost Creek Dam especially when this load allocation conflicts with the optimal allocation of thermal resources for fisheries management in the Rogue River?

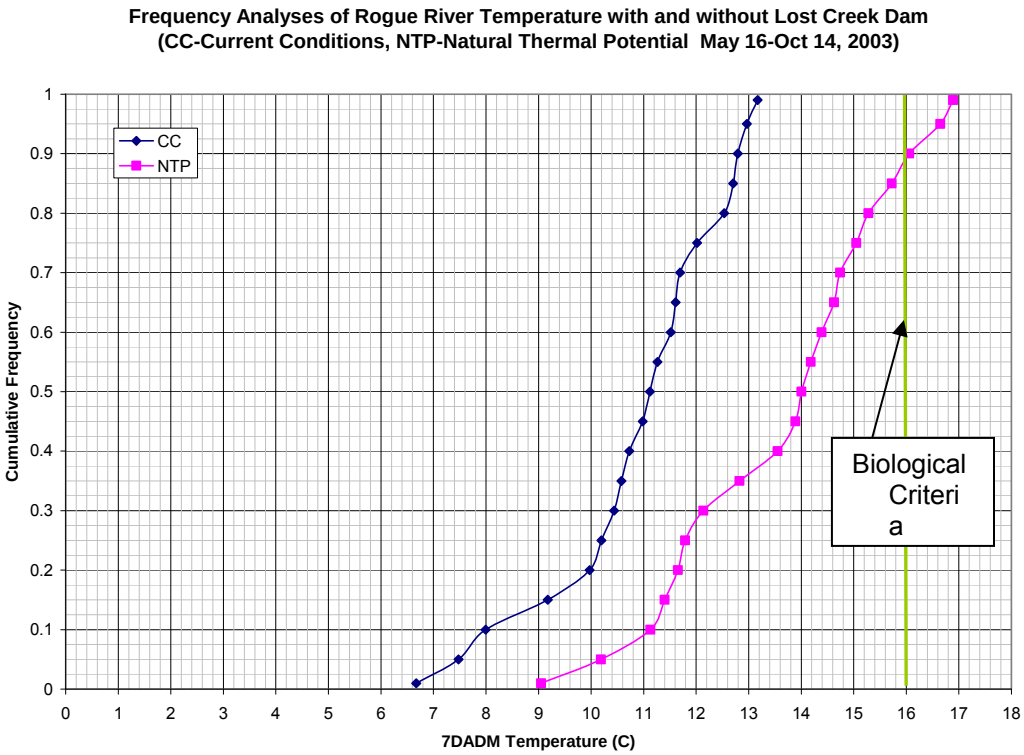

Figure B1 Cumulative Frequency Analyses for Rogue River Temperature with and without Lost Creek Dam (RM 157.3, May 16-Oct. 14 2003)

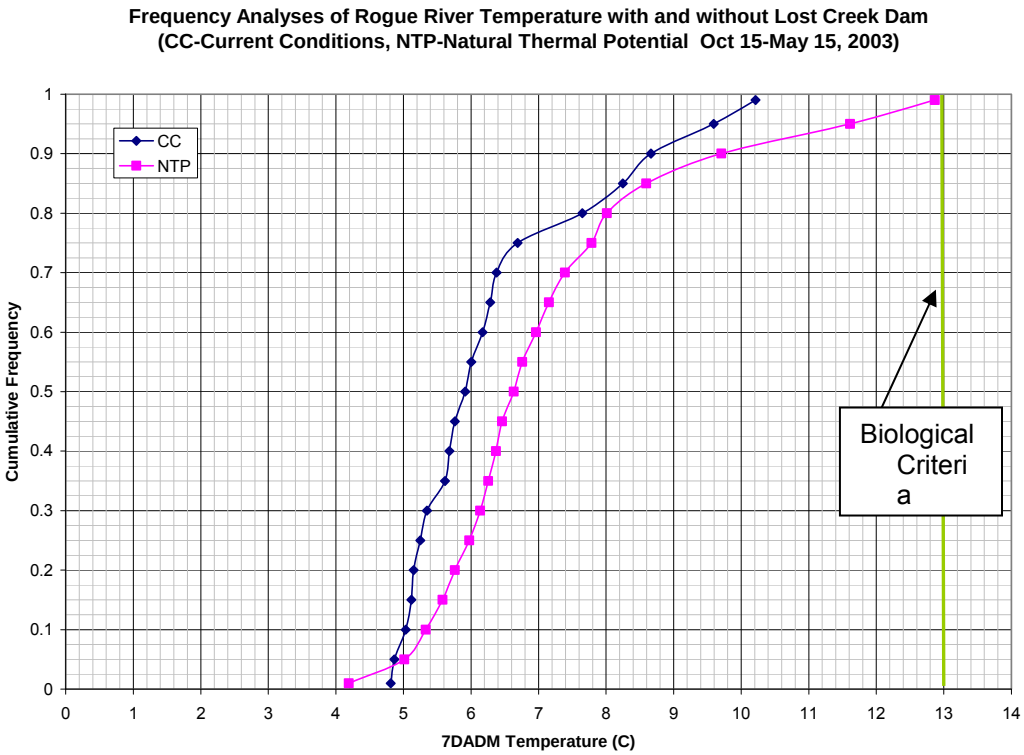

Figure B2 Cumulative Frequency Analyses for Rogue River Temperature with and without Lost Creek Dam from October 15-May 15, 2003 (RM 157.3)

Appendix C. Lost Creek Dam and Reservoir impacts on Rogue River Temperatures.

It is inappropriate to equate the thermal regime as observed at the USGS gage near McLeod as an unbiased estimate of the impact of releases from Lost Creek Dam. The impacts of Big Butte Creek and thermal exchange over this three mile reach (LCD to RR nr McLeod) substantially changes the characteristics of the compliance metric for temperature based on a review of observed data. The subsurface releases from Lost Creek Reservoir do not contain the wide diurnal fluctuation in temperature observed in the river. The first figure C1 shows the observed 7DMADM at various gauging stations on the main-stem Rogue River for 2003 including release temperatures at Lost Creek Dam (light green line). The data indicates that release temperatures from Lost Creek Dam are generally cooler than the natural thermal potential temperature (Red line) estimated for the Rogue River near McLeod during the months of April and May which is the period when the current TMDL concludes LCD is a source of thermal impairment.

The summary of differences between calculated current conditions and the applicable temperature (warmer of natural thermal potential and biological criteria) are shown as color contours in Figure C2. The two events showing current conditions warmer than the applicable criteria above Gold Ray Dam occurred in the spring around May 24, 2003 and in the fall on September 18, 2003. Figures C3-5 show both calculated and observed temperature conditions in the Rogue River for selected critical conditions on 5/24, 7/25, and 9/18. These figures demonstrate the importance of considering the temperature properties at the dam in assessing the source of thermal impairment. The temperatures at Lost Creek Dam were not significantly warmer than the biological or natural thermal potential temperatures during these critical periods. This analysis demonstrates that considerations of thermal exchange processes from the Dam to the McLeod gage are important in assessing the impacts of Lost Creek Dam on thermal impairment on the Rogue River.

The assessment of non-compliance is based on estimates of NTP at the McLeod gauge using a simple linear regression equation with a high degree of uncertainty and temperatures observed at the USGS gauge on the Rogue River below Prospect reflecting conditions not impacted by anthropogenic sources. The rerouting of Rogue River flow upstream of Lost Creek Lake through the PPL canal to a storage reservoir and into a lengthy penstock before returning to the river may have a significant impact on observed temperature at the Prospect gauge especially when compliance is based on daily maximum temperatures at a 0.3 C tolerance. The formulation of this upstream temperature boundary condition is a critical component in assessing the impacts of Lost Creek Dam on temperatures in the Rogue River.

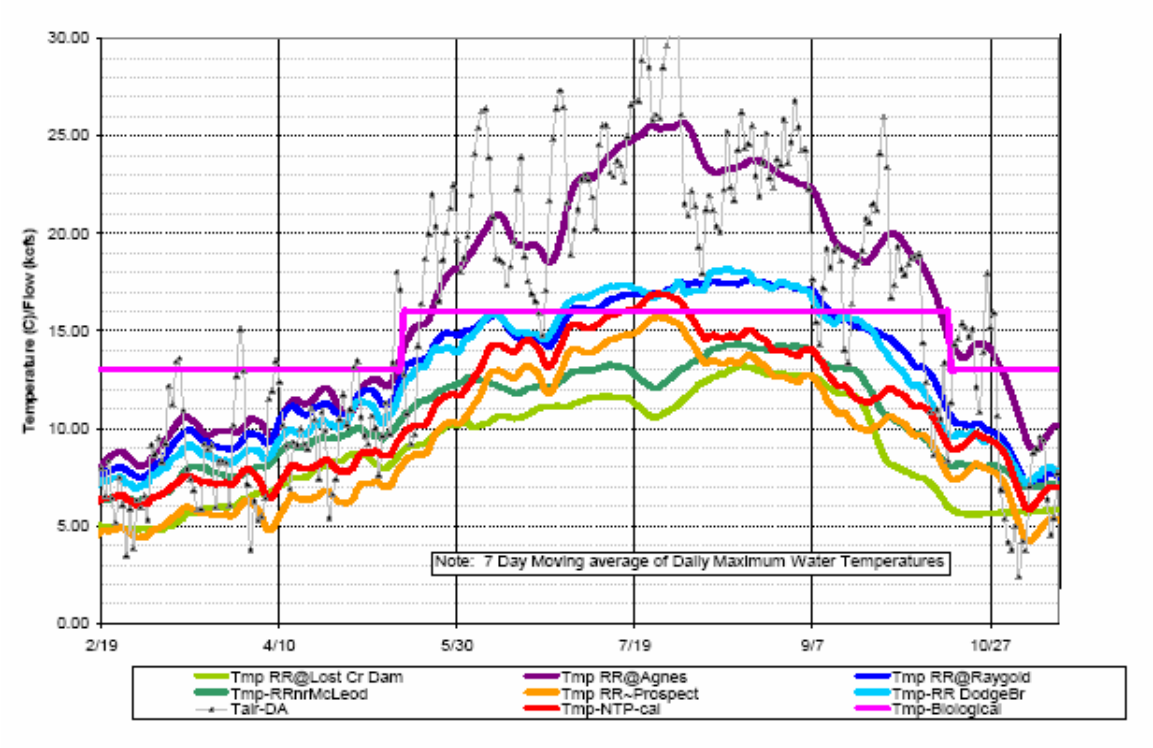

Figure C1. Observed and Calculated Temperatures (7DADMAX) in Rogue River 2003 Light Green-Rogue River at Lost Creek Dam, Dark Green-Rogue River nr McLeod, Red-Cal Natural Thermal Potential nr McLeod, Pink-Biological Criteria

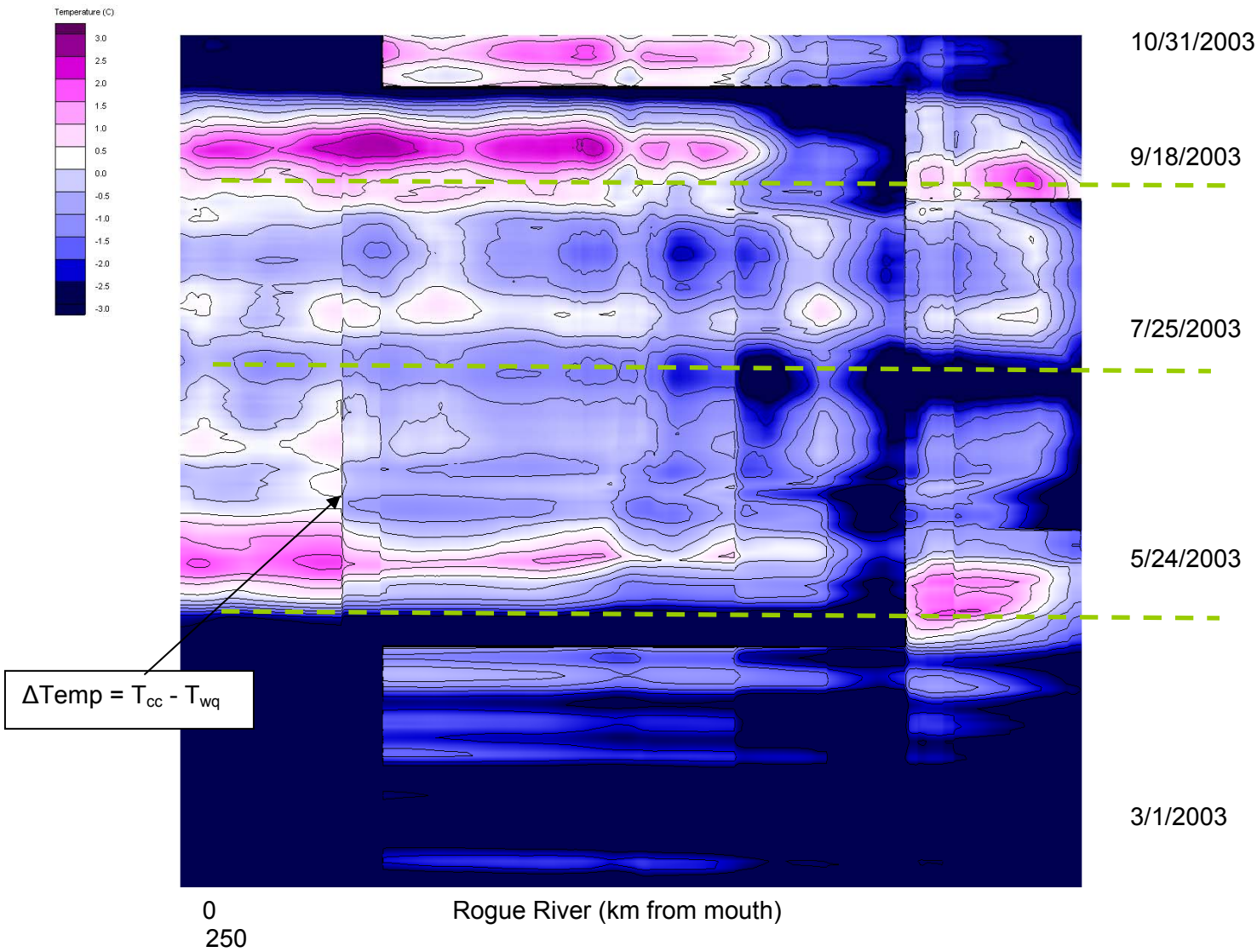

Figure C2. Estimated Delta Temperature Contours in Space-Time Domain in the Rogue River, 2003 (Blue – Calculated Current Conditions Temperatures are colder than the Calculated Applicable Temperature, Pink – Calculated Current Conditions Temperature warmer than Calculated Applicable Temperature)

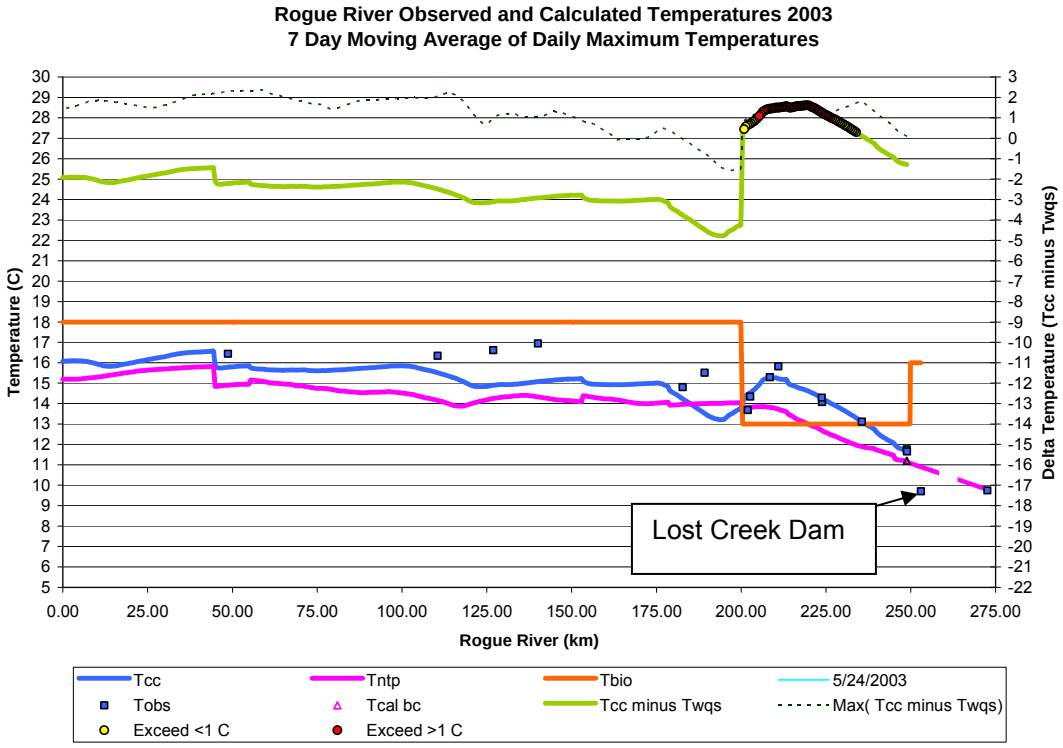

Figure C3. Observed and Calculate Temperatures for Current Conditions and Natural Thermal Potential in the Rogue River, May 24, 2003

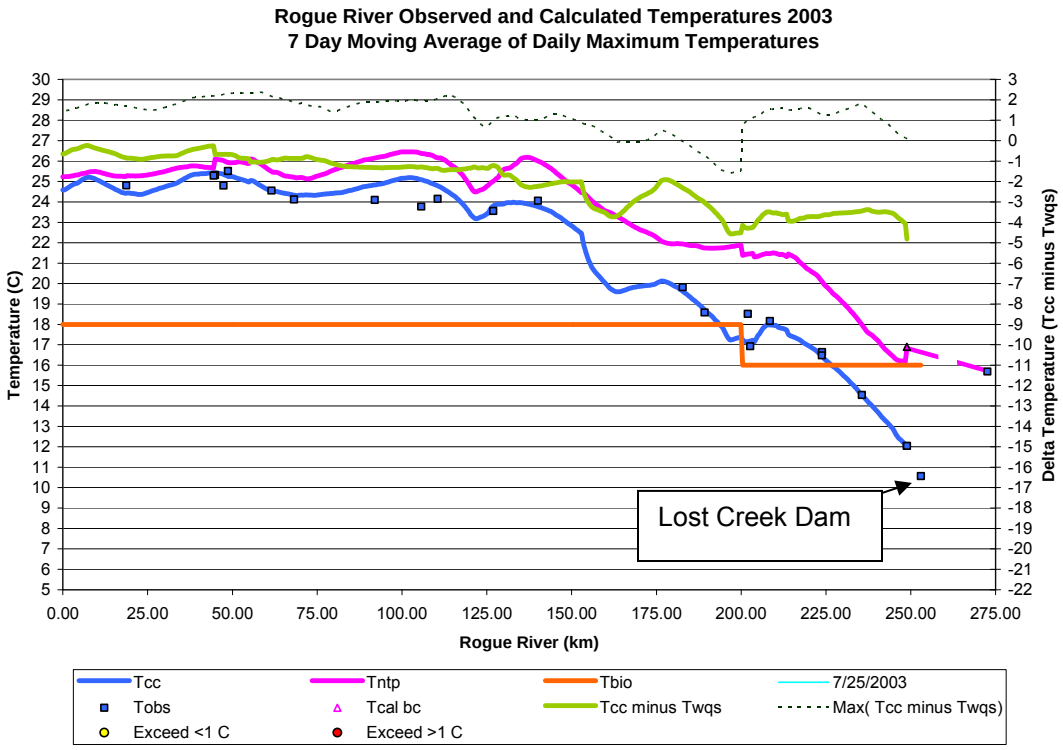

Figure C4. Observed and Calculate Temperatures for Current Conditions and Natural Thermal Potential in the Rogue River, July 25, 2003

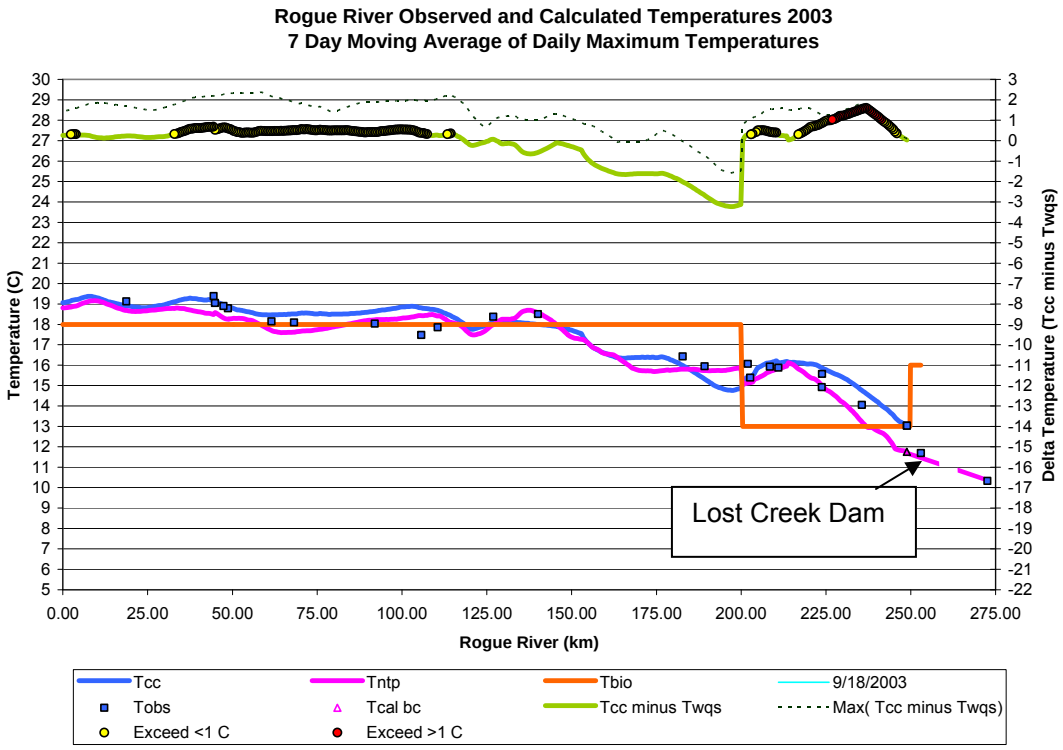

Figure C5. Observed and Calculate Temperatures for Current Conditions and Natural Thermal Potential in the Rogue River, September 18, 2003

Appendix D: Recommendation concerning load allocations for Lost Creek Dam

No load allocation should be required for Lost Creek Dam and Reservoir because compliance with temperature standards has been met and exceeded since completion of the project. Furthermore, Lost Creek Dam could have been operated differently in 2003 to release temperatures that tracked the NTP estimates by exercising different outlet port operations. This would have diminished the temperature excursions above NTP upstream of Gold Ray Dam in May and September when non-critical thermal conditions were present in the river. Those cold water resources would not have been available at more critical time periods during the year diminishing the ability to effectively manage Rogue River temperatures for fishery resources. Current reservoir management practices involving ODFW have been successful in supporting fisheries resources, with the exception of spring Chinook salmon. Why should a competing temperature management policy be introduced into this process without demonstrating clear benefits to fisheries resources? The Rogue River is not listed as thermally impaired above RM 124.8 and allocations should address the thermal impairments downstream of Gold Ray Dam.

However, if a seasonal target temperature curve for Lost Creek Dam is determined to be a required component of the TMDL because the project could potentially cause a violation of OAR temperature standards, alternative methodology could be used to develop these load allocation based on a range of temperature conditions. It is also recommended that the point of compliance be located directly in the releases from Lost Creek Dam at RM 157.2 and not at the McLeod gage located over 3 miles below the project and below the confluence with Big Butte Creek. An example of a seasonal load allocation (April 1-October 31) based on the maximum release temperature threshold not to exceed the 95th percentile (5 percent exceedance temperature or some other appropriate return frequency) of NTP estimated below Lost Creek Dam as shown in Figure D1. A lower temperature threshold could be likewise determined. This methodology would generally not conflict with temperature management policies recommended by the ODFW and restrict maximum release temperatures to those estimated from natural conditions.

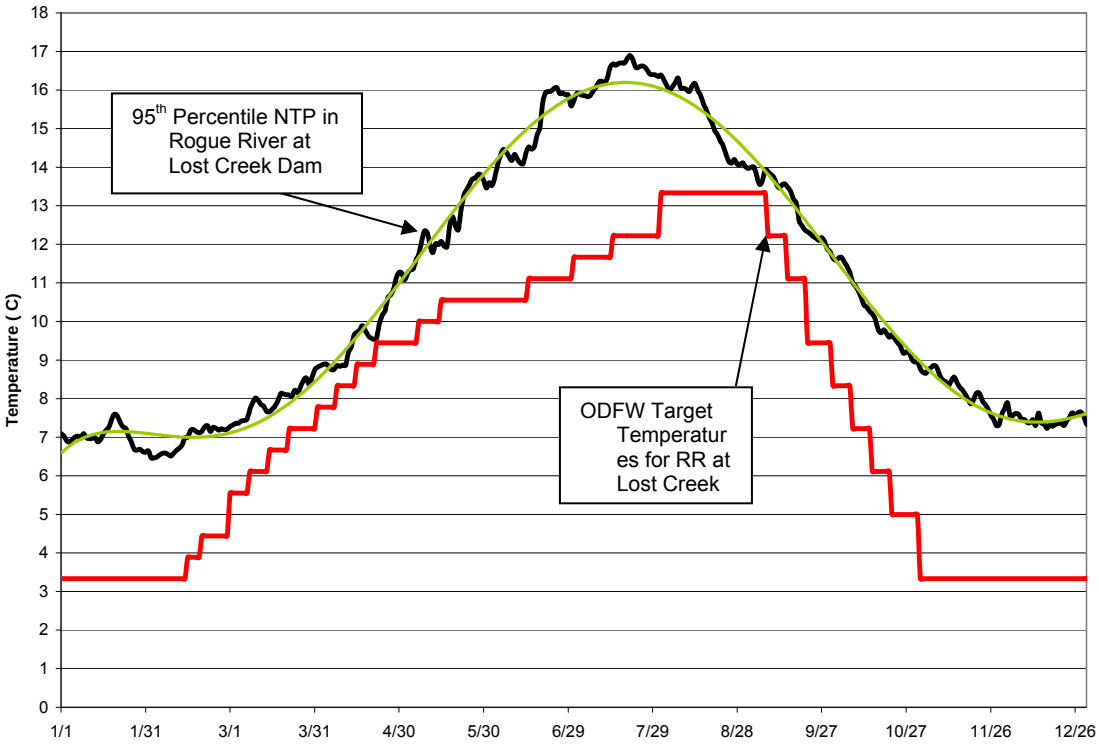

Figure D1 Seasonal Temperatures in Rogue River below Lost Creek Dam for estimates of Natural Thermal Potential (95th percentile based on 1968-2007 temperature records at USGS 1433000)

Appendix E. Presentation to the Rogue River Technical Team on November 5, 2008.

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Rogue Basin TMDL Advisory Team
10-05-2008

US Army Corps of Engineers

Mike Schneider
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Introduction

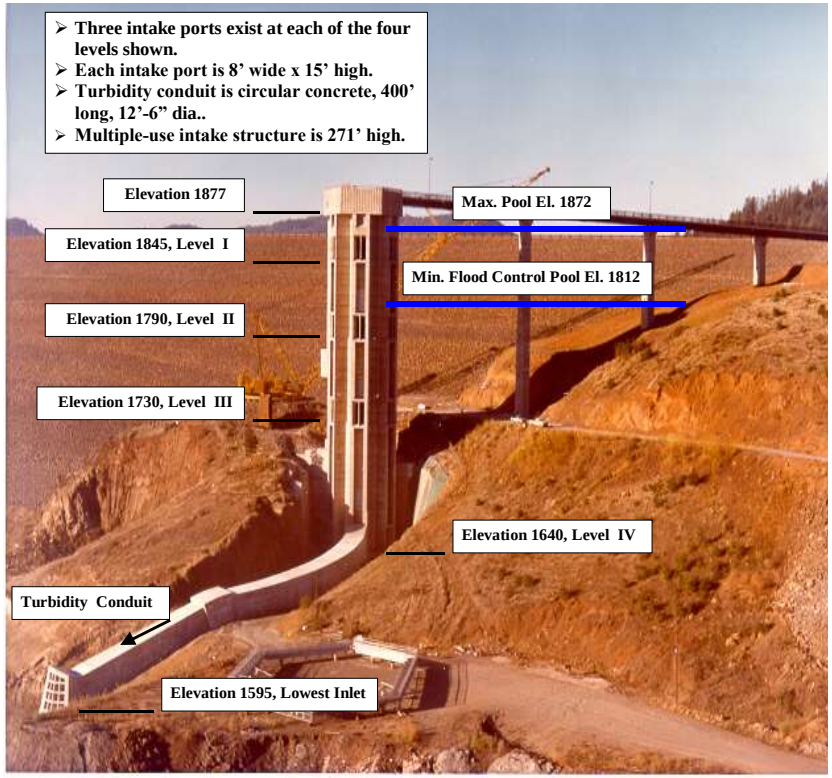
- Comments/Concerns regarding Chapter 2 Draft Rogue River Basin TMDL: Temperature October 2008
  - Two sets of informal comments/concerns submitted to ODEQ
  - Several meeting to discuss TMDL content
  - Preparing formal comments
- Background CE Projects

Background

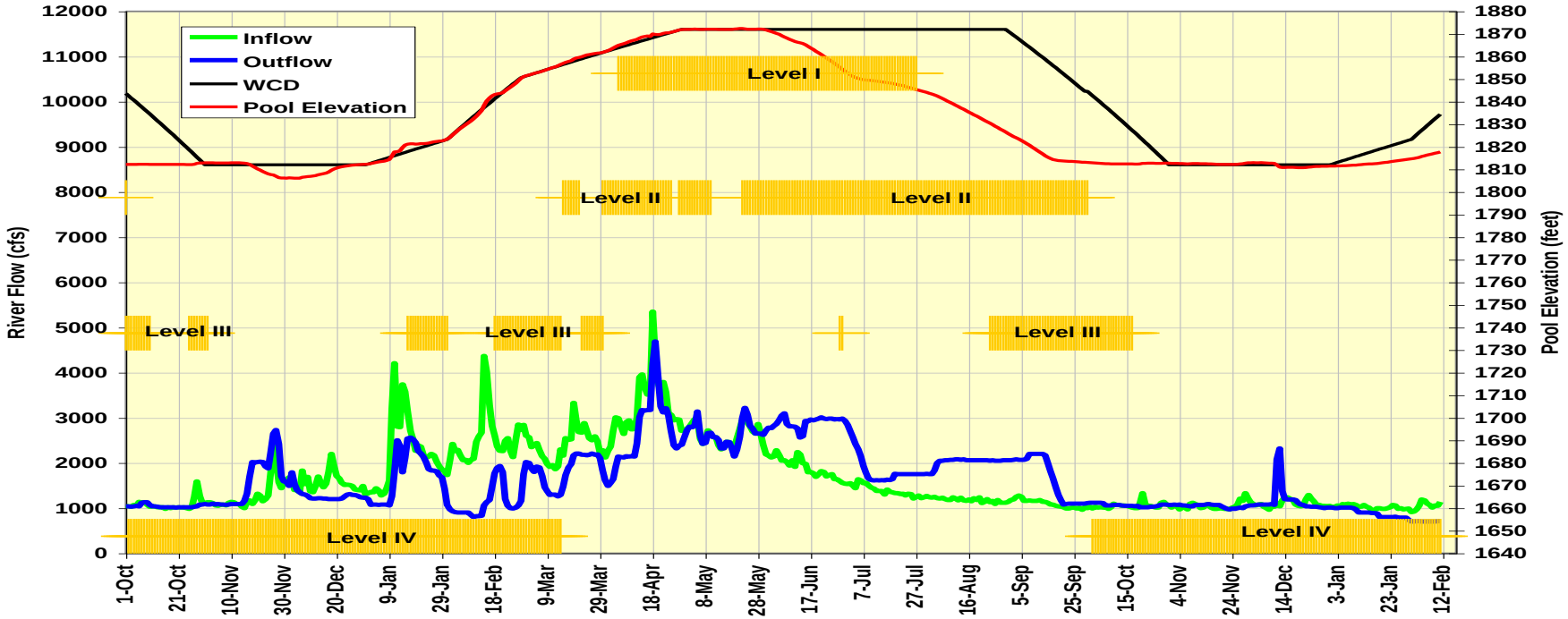
- CE Multipurpose Projects in Rogue River Basin
  - Lost Creek Lake and William L. Jess Dam (1977)
    - Flood Control
    - Fisheries Enhancement
    - Irrigation
    - Water supply
  - Applegate Lake and Dam (1980)
    - TMDL completed 2004
  - Elk Creek Dam (started 1971)
    - Fish Passage Corridor (notch)
    - Channel Restoration (2008)

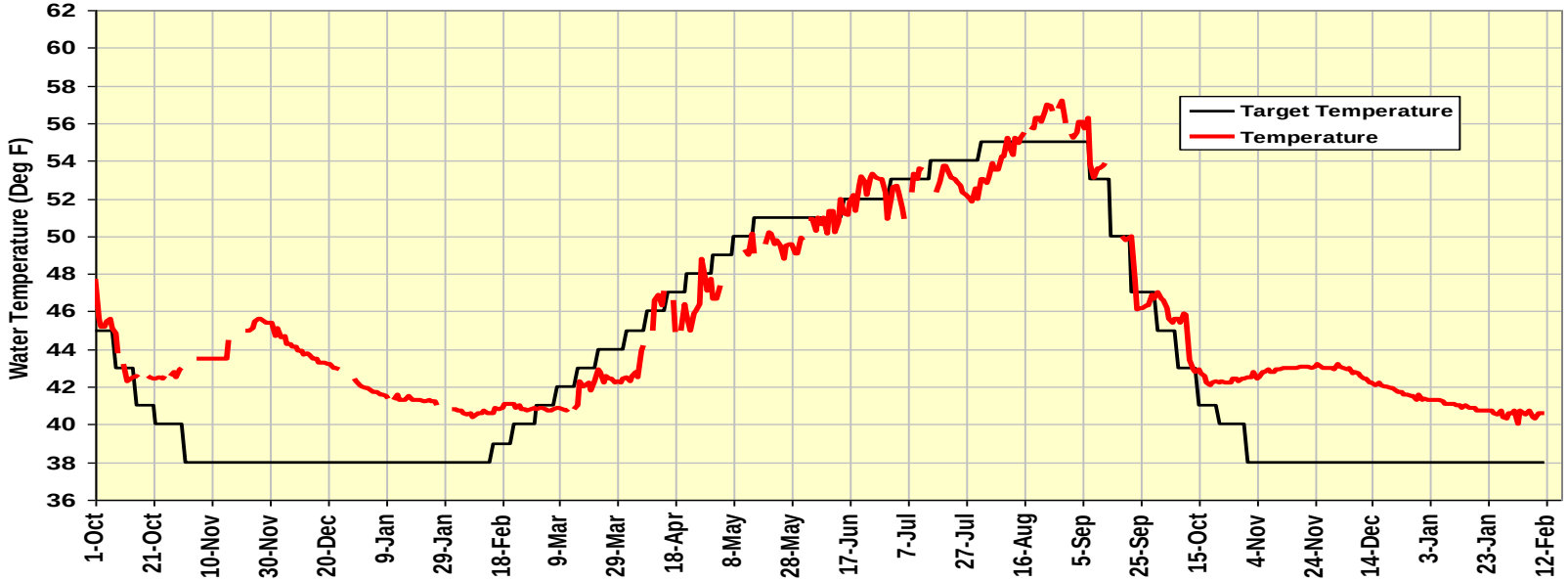
Background

- Lost Creek Lake Outlet Tower
  - Flow and Temperature Control
  - 12 outlet ports with turbidity conduit
  - 5 levels of withdrawal
  - Outlet Discharge
    - Powerhouse
    - Regulating outlets

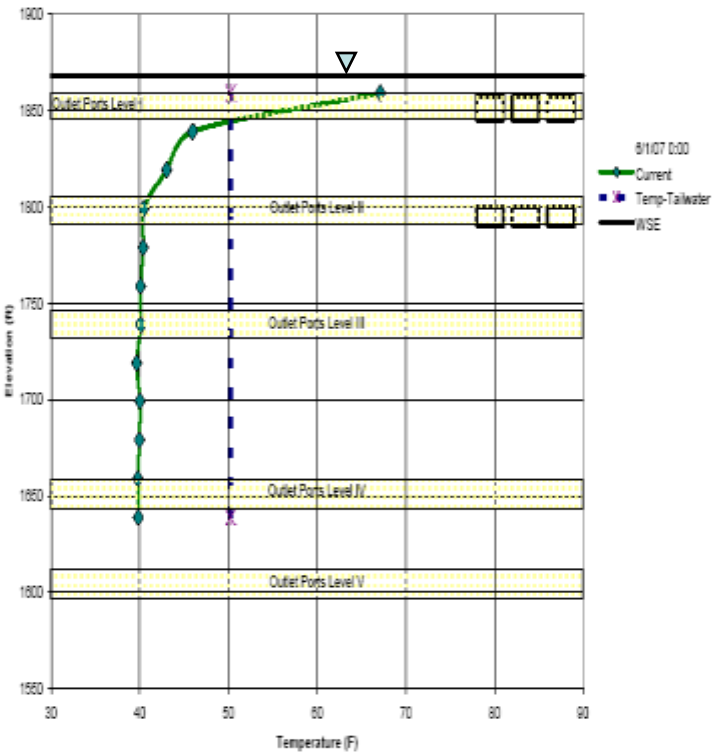


LOST CREEK LAKE
WY 2000 Operations

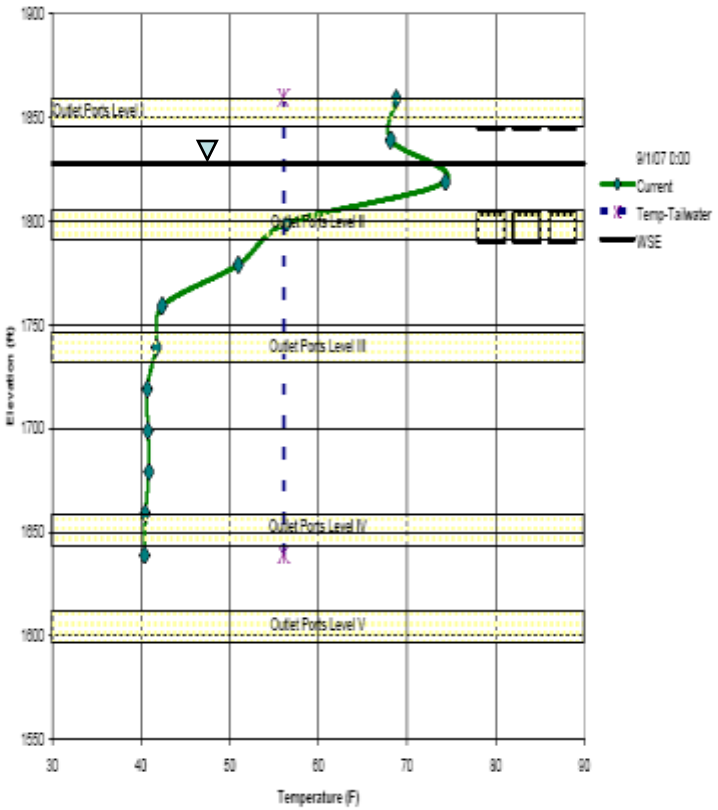




Lost Creek Lake Temperature Profiles



June 1, 2007



September 1, 2007

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Comments/Concerns Policy

- Support Temperature TMDL Goals
  - Attainment of water quality standards
  - Thermal Habitat Restoration
  - Support of critical beneficial use
    - Fisheries enhancement
- Watershed approach can help illuminate the interaction of fisheries, land, and water management activities
- CE will continue to maintain and improve management of water and temperature resources at Lost Creek and Applegate Lakes
  - Monitoring
  - Modeling
  - Interagency Coordination
- Temperature TMDL challenging technical investigation

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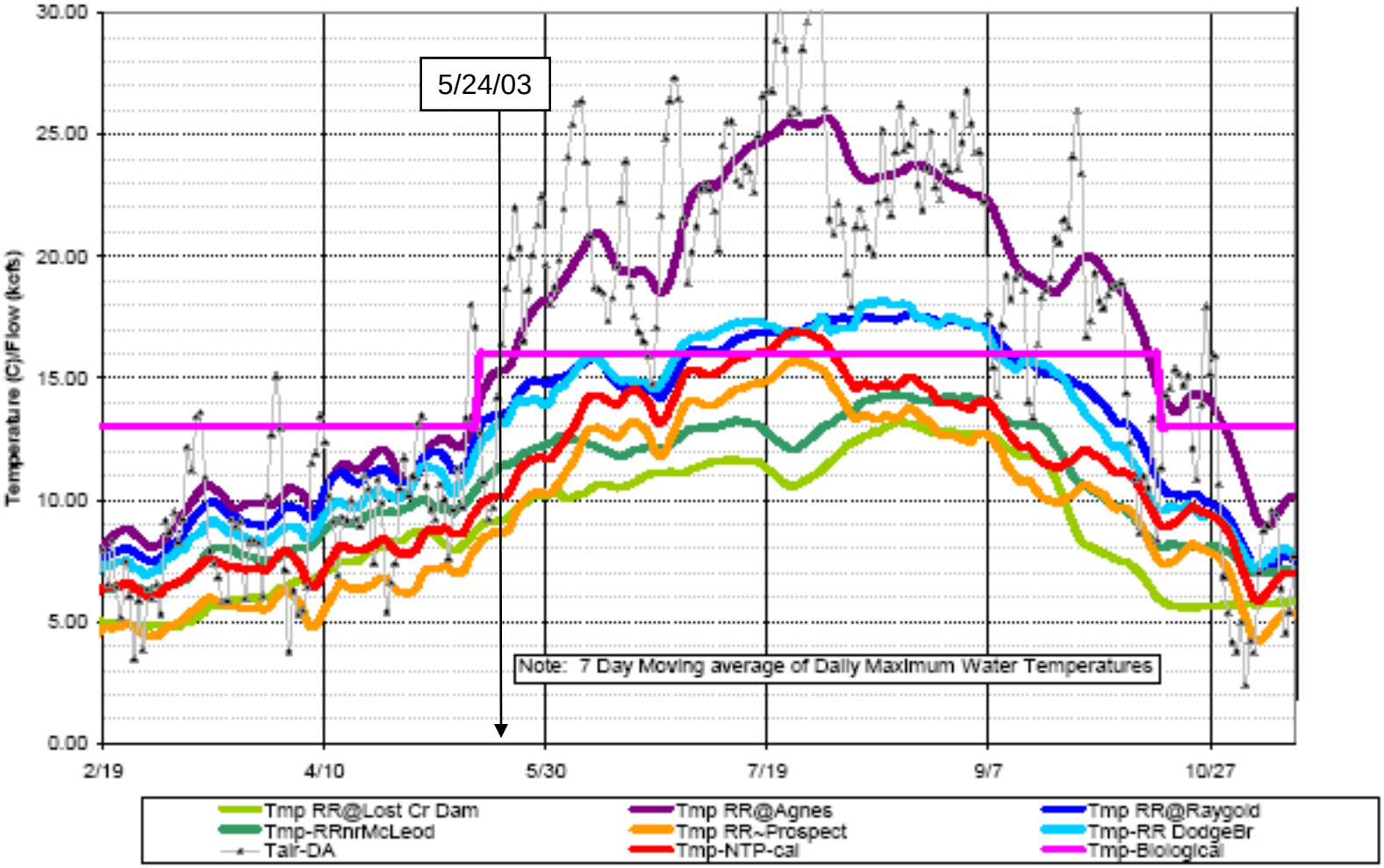
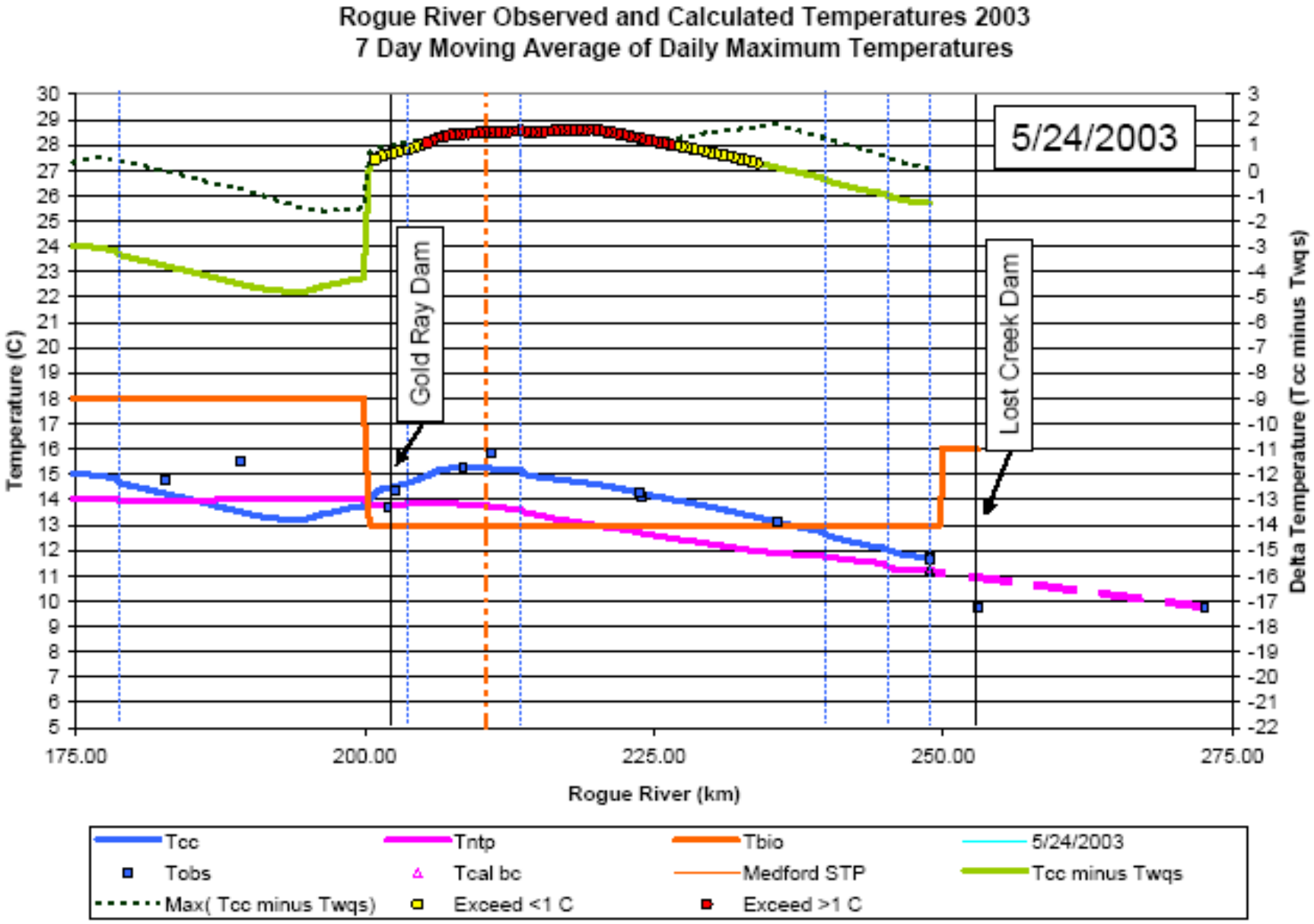
Comments/Concerns

- Characterization of Lost Creek Lake Operations on Thermal conditions in the Rogue River
  - TMDL implies LCD source thermal impairment in Rogue River
    - Spring and Fall
  - TMDL equates LCD (RM 158.6) releases with observed temperatures at USGS gauge Rogue River near McLeod (RM 154.0)
  - Observed releases temperature at LCD are significantly cooler than observed at the “near McLeod” gauge
    - 7DADMAX temperature metric
    - Subsurface releases from the lake buffer diurnal variation in temperature
    - Influence of Big Butte Creek
    - Atmospheric heat exchange over 4+ mile reach

Lost Creek Dam
Big Butte Creek
USGS Rogue River nr McLeod
Imagery © 2005 i3
Google
Pointer 42°39'45.26" N 122°41'41.49" W elev 1707 ft
Streaming 99%
Eye alt 12272



Observed Temperatures (7DADMAX) in Rogue River 2003
Light Green-LCD, Dark Green-RR nr McLeod, Red-Cal NTP RR nr McLeod,
Pink-Biological Criteria


Rogue River Observed and Calculated Temperatures 2003
7 Day Moving Average of Daily Maximum Temperatures
5/24/2003
Gold Ray Dam
Lost Creek Dam
Temperature (C)
Delta Temperature (Tcc minus Twqs)
Rogue River (km)
175.00
200.00
225.00
250.00
275.00
Tcc
Tntp
Tbio
5/24/2003
Tobs
Tcal bc
Medford STP
Tcc minus Twqs
Max(Tcc minus Twqs)
Exceed <1 C
Exceed >1 C

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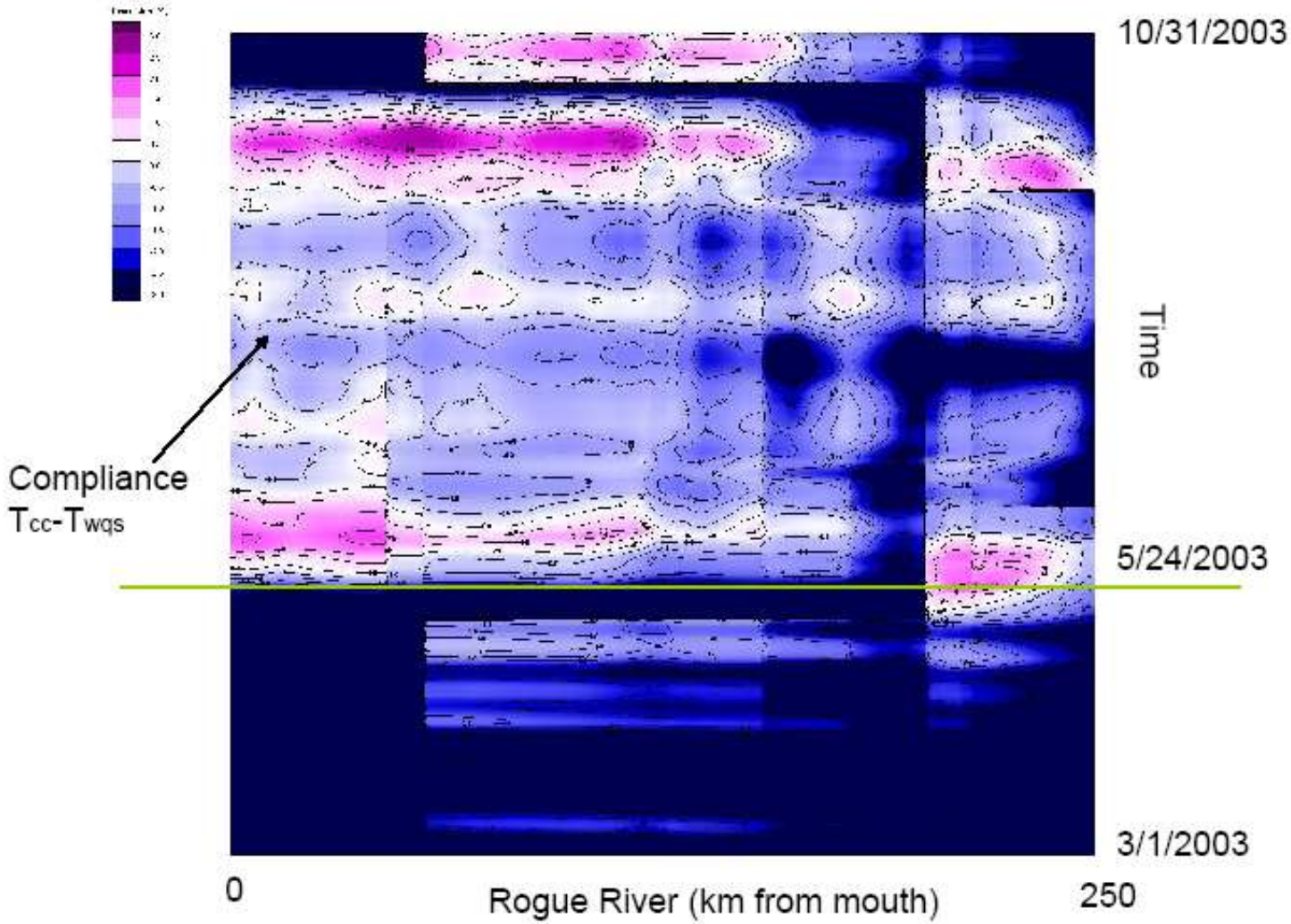
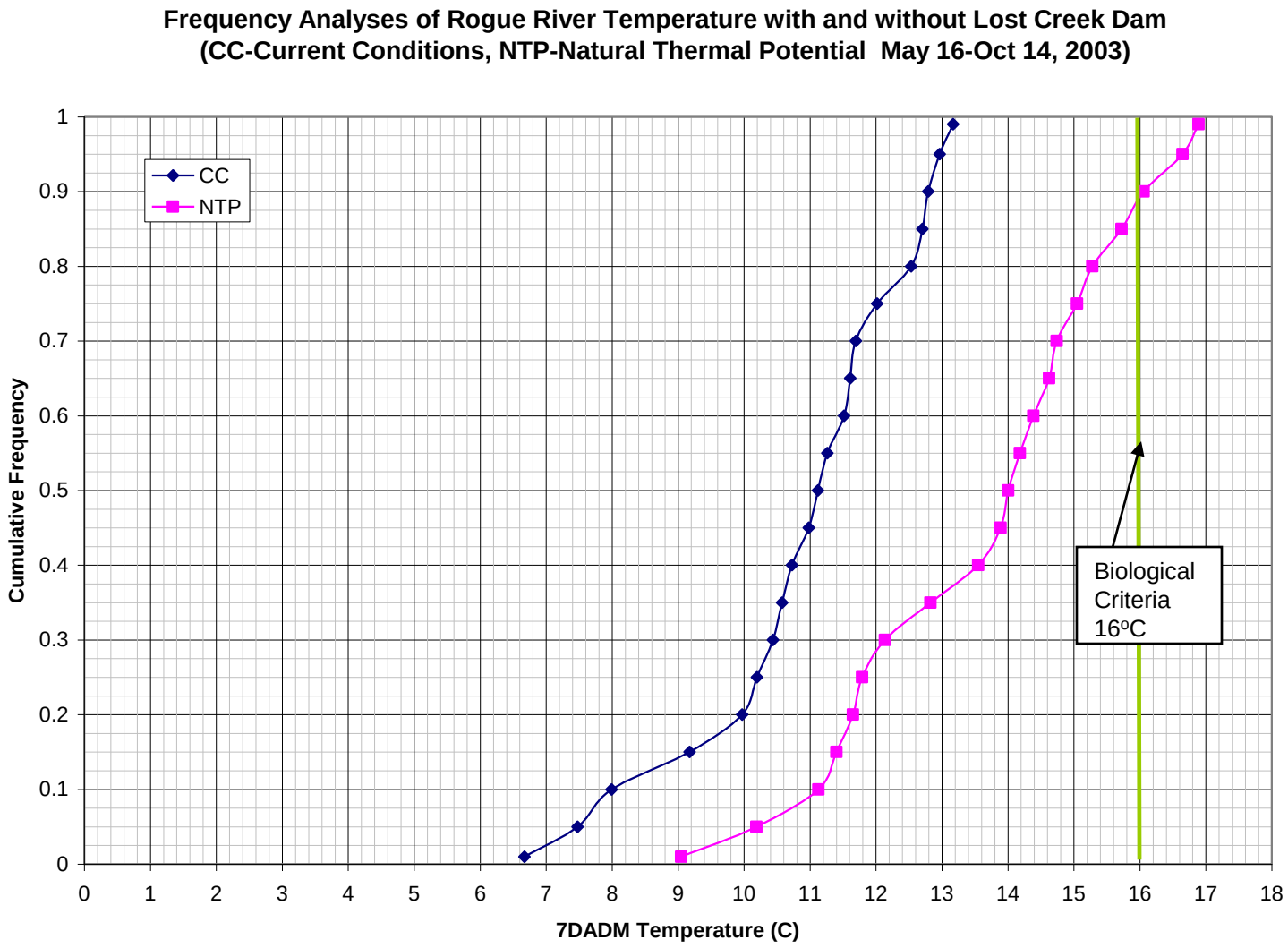
Comments/Concerns

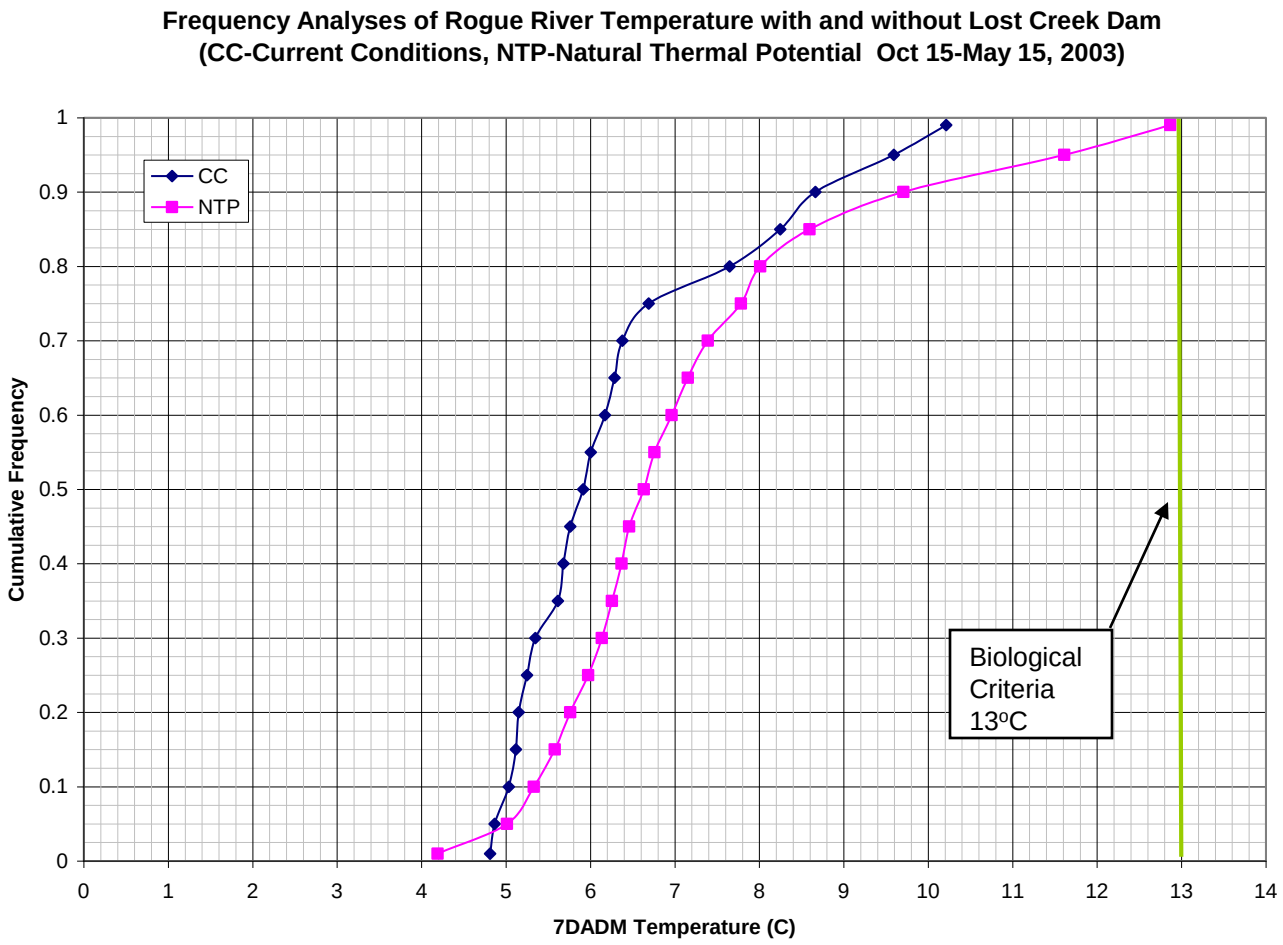
- Characterization of Lost Creek Lake Operations on Thermal conditions in the Rogue River (continued)
  - Predominant influence of LCD operations relative to OAR for water temperature is the establishment of conditions cooler than natural during the summer months
    - Increased assimilative capacity
    - Compensates for other anthropogenic source of heat
  - Review of Observed Data at LCD since completion in 1977-2007
    - No excursion above the applicable temperature at point of discharge
  - Frequency analyses of 2003 conditions provides comprehensive summary of the influence of LCD on RR temperatures
    - Rearing
    - Spawning and migration
  - Emphases should be placed on prominent sources of thermal impairment in the basin and away from "potential" sources of impairment
  - Rigorous management strategy of RR temperatures must involve the thermal loading released from LCD ($T_{rel}Q_{LCD}C_p$)
    - $T_{rel} > T_{npt}$ at LCD => $T_{cc}<T_{npt}$ at RR Downstream depending on the Q_{LCD}, thermal loading of tributaries, atmospheric heat exchange



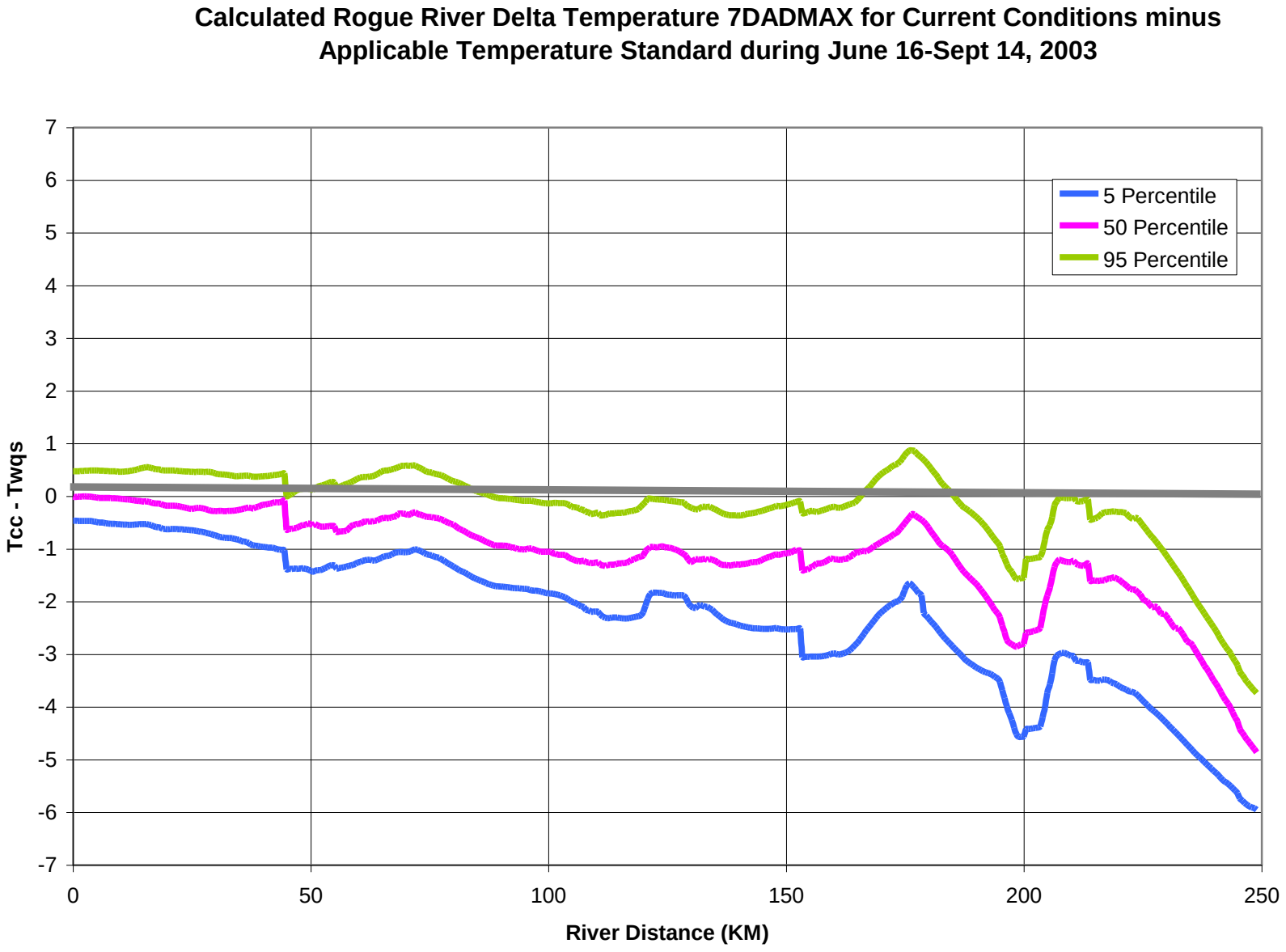
Contours of the temperature difference between calculated current conditions (cc) and the applicable water quality standard (wqs) (Pink-above WQ standard, Blue-below WQ standard)



Cumulative Frequency Analyses for Rogue River Temperature with and without Lost Creek Dam (RM 157.3, May 16-Oct. 14 2003)



Cumulative Frequency Analyses for Rogue River Temperature with and without Lost Creek Dam from October 15-May 15, 2003 (RM 157.3)


Calculated Rogue River Delta Temperature 7DADMAX for Current Conditions minus Applicable Temperature Standard during June 16-Sept 14, 2003
5 Percentile
50 Percentile
95 Percentile
Tcc - Twqs
River Distance (KM)
7
6
5
4
3
2
1
0
-1
-2
-3
-4
-5
-6
-7
0
50
100
150
200
250

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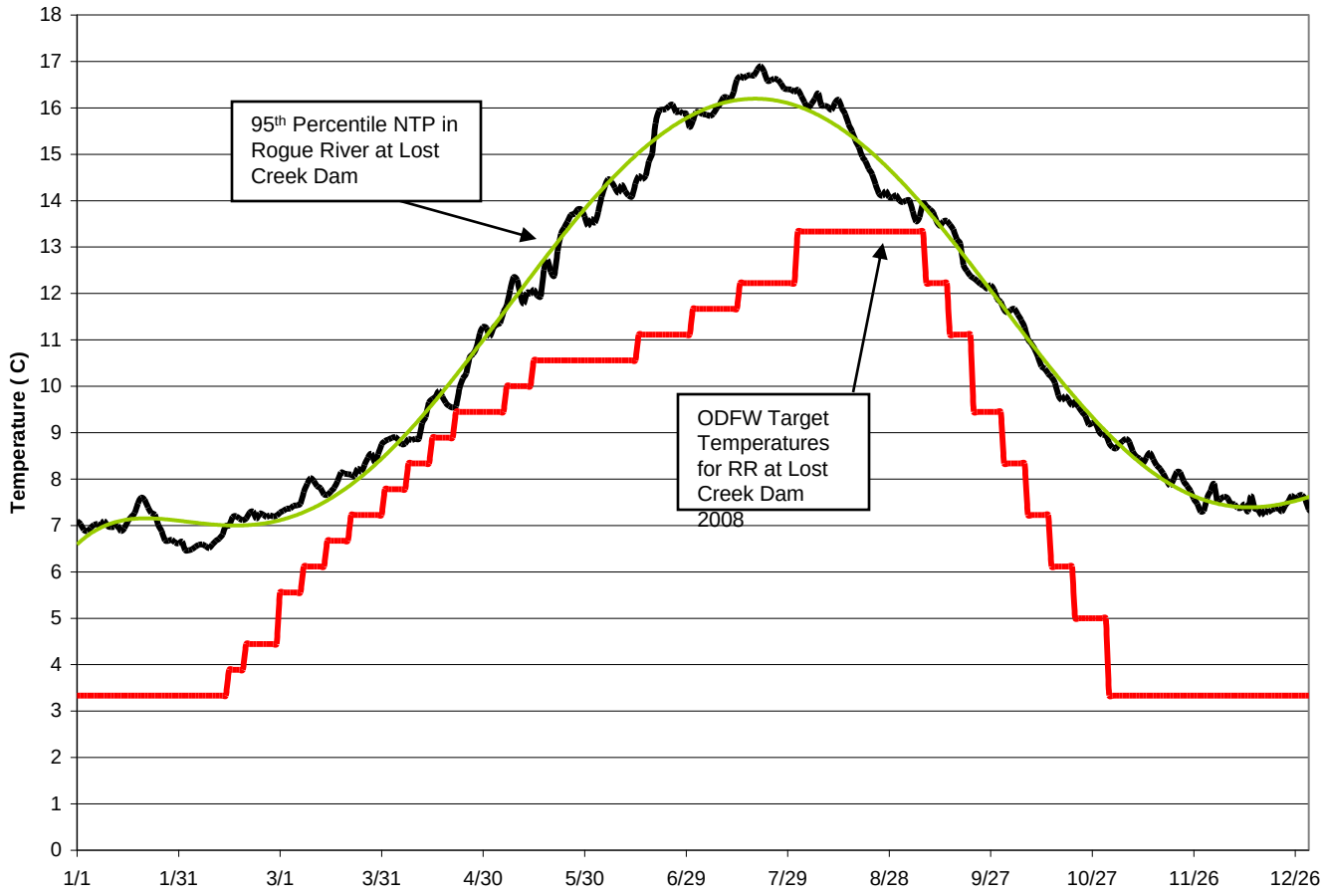
Comments/Concerns

- Potential for Conflicting Temperature Management Policies
  - ODEQ Target Temperatures based on NTP
    - Based on RR near Prospect observed temperatures (RM 169.4)
      - Regression equation $T_{targ}=0.95\ T_{pros}+1.85$
    - Highly variable temperatures with passage of weather systems
    - Requires frequent gate changes
  - ODFW Target Temperatures based on optimizing fisheries benefits
    - Strategy is to manage limited volume of cold water in LC Lake over entire year
    - Season rise and fall in target temperatures
  - Example of Load Allocation based on 95th percentile of estimated NTP conditions (7DADMAX) at point of compliance
    - Upper bound on release temperatures
    - Based on historical estimates of NTP
    - Accommodates flexible temperature management policy



Recommended Upper Bound on Target Temperatures in Rogue River below Lost Creek Dam based on estimated NTP (95th percentile based on 1968-2007 temperature records at USGS 1433000)

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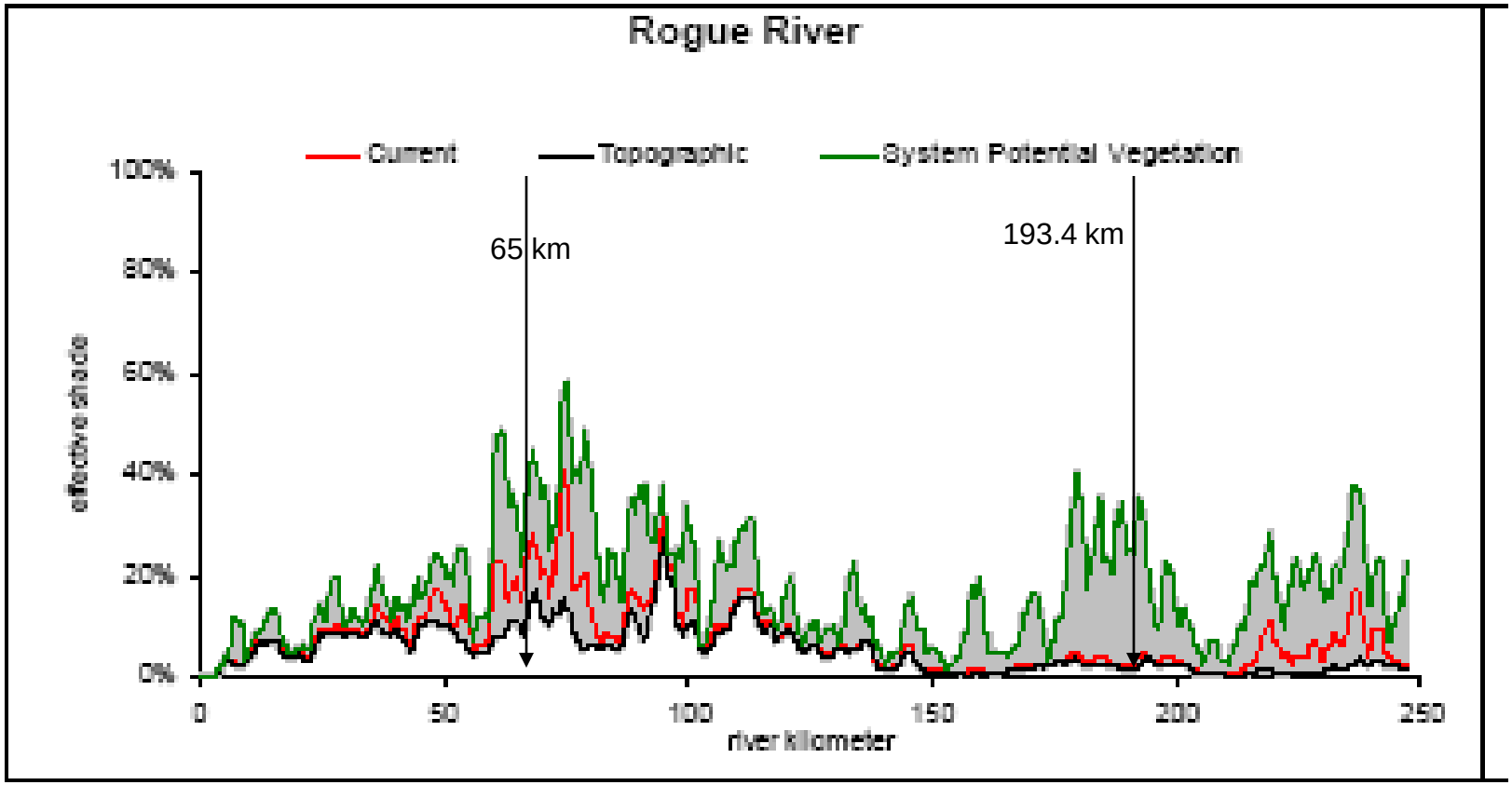
Comments/Concerns

- Natural Thermal Potential is the primary basis for determining WQ standards for Temperature in the Rogue River Basin
  - Since natural thermal potential temperatures exceed Biological Criteria, DEQ rules state that achieving natural thermal potential conditions are considered compliance with the TMDL
  - TMDL assumes
    - No natural disturbance of shading is present anywhere in the study area
      - Fire, Wind, Disease, Drought, Erosion
    - Maximum potential effective shade was basis for NTP scenarios
    - Considerable impairment of shading was designated in areas not actively managed
  - In reality, natural disturbances will create a variety of tree heights and densities and effective shade levels in many reaches will be lower than the NPS Loading Capacity.
  - Reductions in effective shade caused by natural disturbances are not considered a violation of the TMDL or water quality standards
  - Natural conditions ≠ NTP

Effective shade targets for water bodies in which a water quality model was developed. The area in gray between the topographic and system potential vegetation lines indicates the range of shade possible due to natural disturbance



66
65
Sulphur Spring
D 64.9
D 64.8
D 64.8
D 64.7
Image State of Oregon
© USFWS
Google

D193.8
Gold Hill
1st St
D193.6
D193.5
Upper River Rd
5th Ave
D193.5
2nd St
D193.4
4th Ave
D193.4
D193.3
99
Blackwe
234
Garden Row
193
599 ft
Image © 2008 Jackson County GIS
© 2008 Tele Atlas
Google

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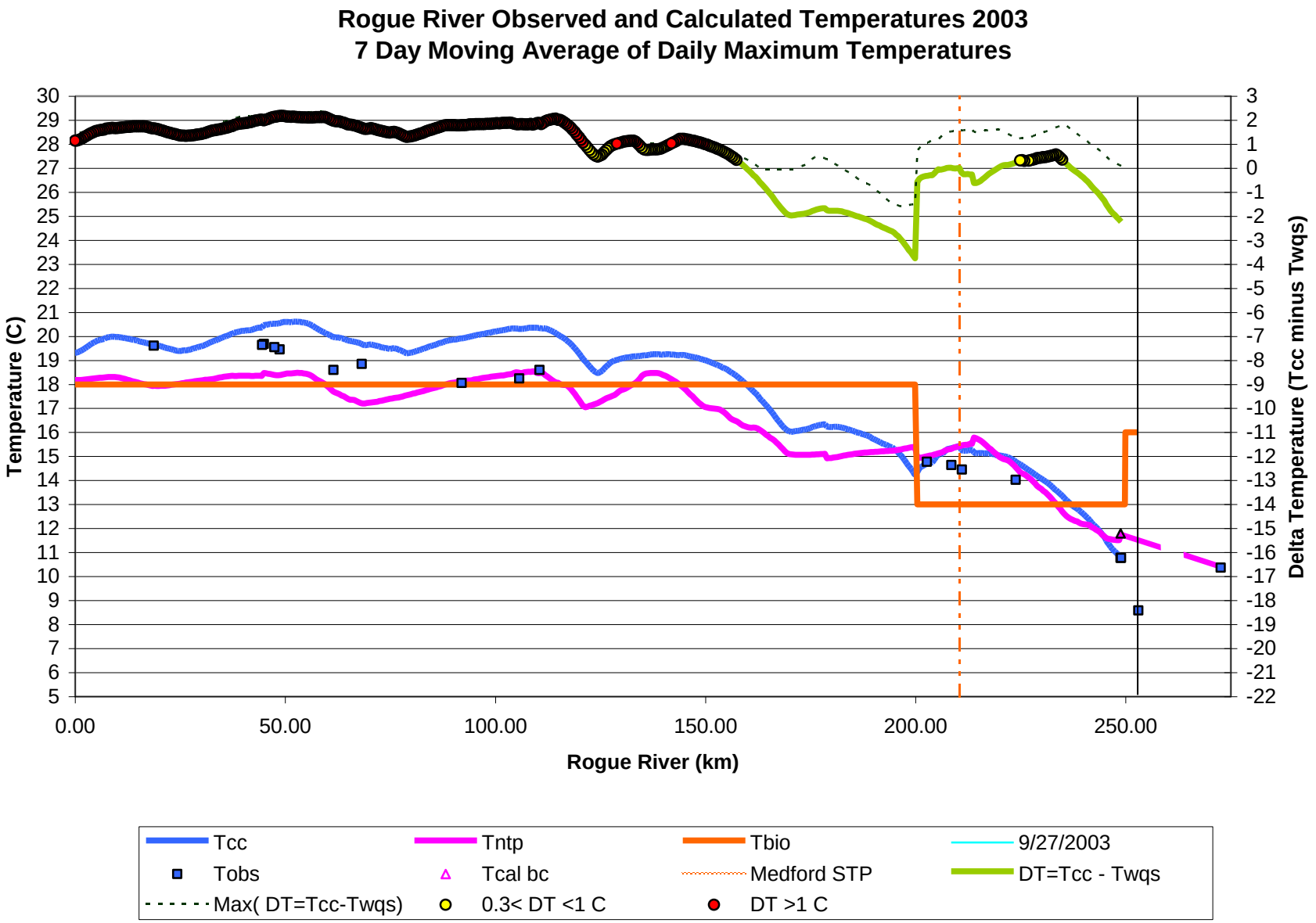
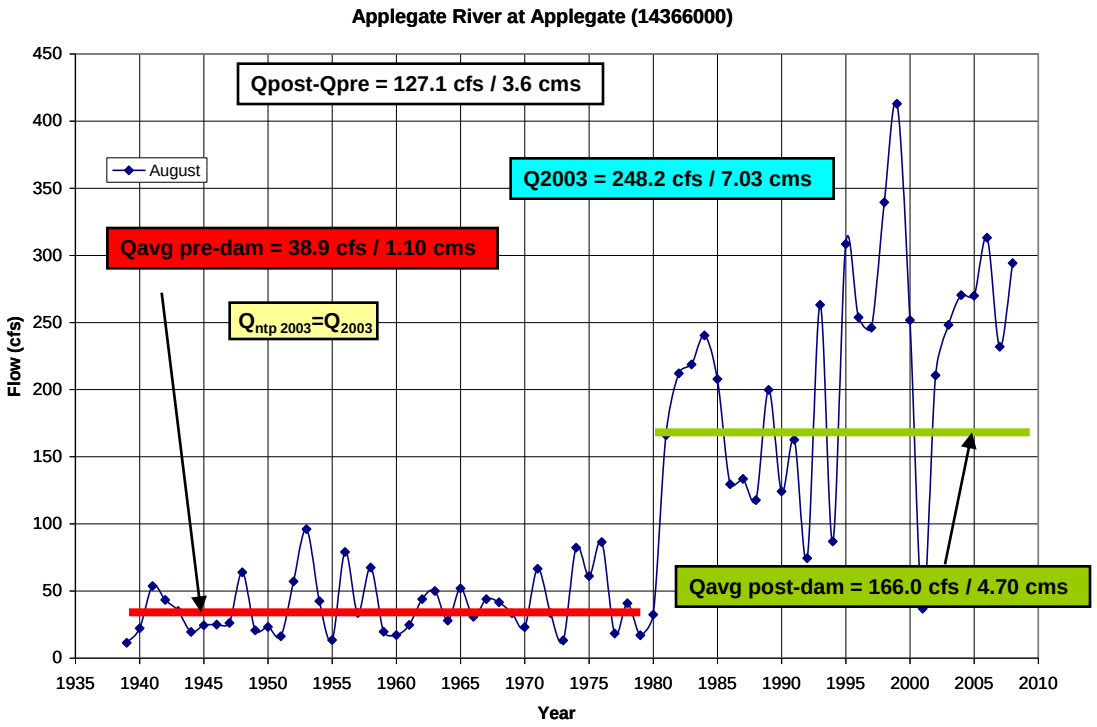
Comments/Concerns

- Modeling methodology (The Warts)
  - River morphology (simplified)
  - Channel roughness prominent calibration coefficient
    - Validation of river stage were not presented
    - Hydraulic Structures
  - Standard error of estimate of Rogue River Temperature ~ 0.8 ^{o}C.
    - Model results used to discern temperature tolerances of 0.3 C
    - Statistical significance of these conclusions questionable MOE
  - Application of model results should take into consideration the inherent errors and uncertainty in this approach to provide meaningful/credible estimates of compliance and load allocation
  - Rogue River upstream temperature boundary conditions for NTP is based on rudimentary approximation
    - Regression equation r^2=0.7 std error~1.5 ^{o}C
    - Impact of Prospect Power plant unknown on river temperatures
  - Discharge boundary conditions updated
    - NTP Rogue River (~20%)
    - Applegate River



Point/Day of Maximum Impact on Rogue River, Sept. 27 2003

Summary Average August Flows in the Applegate River, 1939-2007



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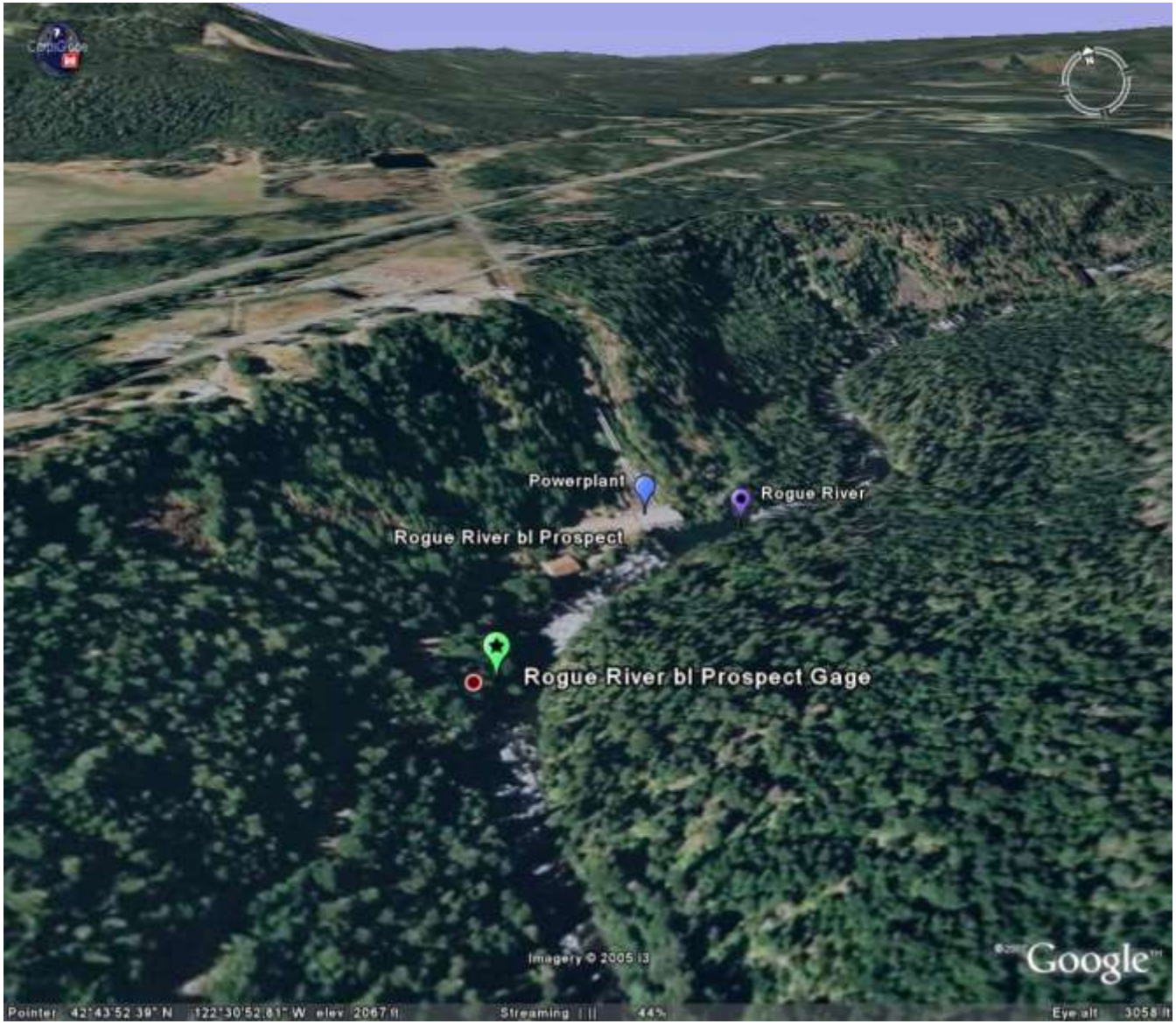
Final Thoughts

- The directives in the TMDL should be based on "real world“ not “virtual world” measures
  - references to temperature tolerances of 0.1 and less hold little meaning where instrument accuracy and sampling errors are significantly larger than this threshold
- The definition of basic principles such as temperature compliance and load allocation need to be clearly and consistently presented in the TMDL.


Powerplant
Rogue River
Rogue River bl Prospect
Rogue River bl Prospect Gage
Imagery © 2005 i3
Google
Pointer 42°43'52.39" N 122°30'52.81" W elev 2067 ft
Streaming
44%
Eye alt 3058 ft