Umpqua Basin
Total Maximum Daily Loads (TMDLs)
& Water Quality Management Plan (WQMP)

Response to Public Comments

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State of Oregon
Department of Environmental Quality

Introduction

This Response to Public Comments document addresses comments received regarding the Draft Umpqua Basin Total Maximum Daily Load (TMDL) and Water Quality Management Plan (WQMP) dated February 2006. Grammatical, editorial, and formatting errors noted by reviewers are not addressed here but corrections have been made in the document where necessary. The Oregon Department of Environmental Quality (ODEQ) appreciates the time and effort that all the commenters put into reviewing the document. All comments have been considered by ODEQ and, where appropriate, have been addressed in the final document that has been submitted to the Environmental Protection Agency (EPA). EPA will then either approve or disapprove the TMDL.

Background

The public comment period on the proposed TMDL and WQMP opened February 21, 2006. Written and oral comments were received during the public comment period that extended through April 24, 2006. Four information sessions were provided around the basin prior to the formal public hearings in Reedsport (City Hall) March 30, 2006 and Roseburg (Courthouse Church Annex Building) April 6, 2006.

One commenter provided ORAL comments at the public hearing in Reedsport. Remaining comments received by ODEQ were submitted in written (paper and electronic) form. The TMDL and WQMP were available for downloading from ODEQ's website throughout the comment period. Hard copies and CDs of the document were also available for viewing at ODEQ's offices in Roseburg and Portland. Copies were also available during the comment period at the various libraries in Douglas County. Copies of the document were also provided to those individuals who requested copies.

List of Comments provided on the Umpqua Basin TMDL

The following entities provided comments on the TMDL during the Public Comment Period and were received prior to closure of the comment period 5:00 PM April 24, 2006.

1. US Environmental Protection Agency Region 10
2. Douglas County Board of Commissioners (Kittleman, Van Slyke, Robertson)
3. Leo Naapi
4. Sally Town
5. William Town
6. Jerald Tollefson
7. Arthur Tollefson
8. Tri- City Water and Sanitary Authority (Vicki Howren)
9. City of Myrtle Creek (Steven Johnson)
10. Douglas Timber Operators (Dan Newton, Bill Moore, Jake Gibbs, Bob Ragon)
11. Union County Cattlemen (Pat Larson)
12. Elk Creek Watershed Council (James Mast)
13. Winston-Green WWTF (Dave Hull)
14. PacifiCorp Energy (Rich Grost and Monte Garrett)
15. Douglas County Public Works (Robert Paul)
16. Steve Witbeck
18. Randy Turner
19. Oregon Department of Agriculture (Paul Measeles)
20. Oregon Department of Forestry (Jo Morgan)
21. Sierra Club (Alliyah Mirza for Scott Jerger)

General
In the following section, ODEQ provides our responses to the comments received. Each comment is included in its entirety, organized by the individual or organization that provided the comment. We have included the full text of comments to guard against confusion over intent of the comment or the response. The number associated with the list of commenters above is used to identify their comment(s) in the following response to comment section.
Responses immediately follow each comment and are in *italic* font to avoid confusion. The changes identified in the following responses have been made to the TMDL submitted to EPA. Responses are in the same general order of the text in the draft Umpqua Basin TMDL document. Some comments may cite page numbers of the draft TMDL that may not coincide with pages of the revised document.

Summary of Comments

1. Commenter (1)
Listings Addressed:
The final 2004 Integrated Report is expected to be submitted to EPA in the near future. This iteration of the 303(d) list will be edited to reflect Oregon's current water quality standards, adopted in 2004. Because of this there is uncertainty as to which listings will be on the books at the time this TMDL comes out in final form. Therefore it may have been problematic to specify the listings addressed in all the TMDLs at this time. However this information should be clearly stated in the final TMDL.

In this draft TMDL, there is a lack of consistency in the statements of listings addressed throughout the document. The Bacteria TMDL section refers to the current 2002 listings, the pH, Dissolved Oxygen and Aquatic Weeds section lists the proposed 2004 listings, the Temperature section does not specify and WQMP attachment D shows 2002 listings addressed. It would be helpful to have a table within the TMDL that states the listings that are being addressed, the ones that are not and the ones that will be addressed through other controls.

Response
The listings addressed will be clarified in the final document. Tables indicating water quality parameters and waterbodies covered by this TMDL will be illustrated in tables as noted. Tables covering current Umpqua Basin 303(d) listings not covered by this TMDL will be provided as well.

2. Commenter (1)
p.1-i; Executive Summary & pp. 4-9 through 4-11; Draft Algae/Aquatic Weeds, Dissolved Oxygen and pH TMDL:
Page 1-i states that there are 25 listings for DO, pH, phosphorus and excess algae. However, on page 4-9 to 4-11, there are 37 listings, including those in Diamond Lake. Are the 25 listings from the 2002 303(d) list? Please explain.

Response
The listings addressed will be clarified in the final document. Tables indicating water quality parameters and waterbodies covered by this TMDL will be illustrated in tables as

noted. Tables covering current Umpqua Basin 303(d) listings not covered by this TMDL will be provided as well.

3. Commenter (1)
p.1-iv: In the bacteria summary and throughout the bacteria chapter, the wasteload allocations (WLAs) for the wastewater treatment plants (WWTPs) should include both the extreme and average concentration targets for either freshwater and shellfish criteria, whichever is applicable

Response
The wasteload allocations in the final document will be modified to include the extreme concentration targets.

4. Commenter (1)
4. p. 1-iv; Sediment Summary; paragraphs 2 and 3 and p. 1-5; Introduction; Sedimentation; paragraph 6: The draft version of the 2004 303(d) list shows the streams listed for sediment in the South Umpqua remaining in category 5 (impaired waters) rather than being removed to the "waterbodies of concern" category.

Response
After some considerations ODEQ retained 3 stream reaches as noted in the current 2004/06 303(d) list for sedimentation. They include: Jackson Creek, Beaver Creek and an upper portion of South Umpqua.

5. Commenter (21)
The Clean Water Act requires that "each State *shall* establish for the waters identified…the total maximum daily load, for those pollutants" 33 U.S.C. §1313(d)(1)(C), emphasis added. The Umpqua TMDL ignores this mandate by placing TMDLs for three water quality limited streams in the South Umpqua Subbasin "on hold" indefinitely. TMDL at 1. TMDL states that the "hold" is due to the development of new criteria for quantifying sedimentation, yet there is no timeframe for selection of the new criteria. This is not acceptable. The three listed streams, Beaver Creek, Jackson Creek and the South Umpqua River, are currently exceeding state water quality standards, therefore, DEQ should take affirmative steps to bring these waterways into compliance by providing a timeframe for development of the new sedimentation criteria, instead of ambiguously awaiting "new methods and data." TMDL 1-vi. Furthermore, it is unclear as to whether these new criteria will be developed in the first place. It states that DEQ is "currently developing a new method," while also stating that it is "considering revising the criteria" and that "a quantitative approach will probably be proposed." TMDL at 1 and 1-5.

DEQ should clarify whether the criteria is being developed and if the new criteria is being developed, it should assure that the TMDLs will be developed within a reasonable time. Furthermore, the CWA implementing regulations require that the WQMP provide the date by which it will result in attainment and maintenance of water quality standards and the basis for the determination. 40 C.F.R. § 130.32(c)(2)(iv). With no indication as

to when or if these criteria will be developed, this standard cannot be met in the TMDL or WQMP.

The TMDL proposes to delist four reaches of the Steamboat watershed based on new core sample data: Canton Creek, Little Rock Creek, Horseheaven Creek and Steamboat Creek. TMDL at 1-5, 1-iv. DEQ should not delist these streams. First of all, the TMDL does not provide documentation showing that these streams are in compliance and they are still listed as water quality limited in the WQMP. Secondly, since DEQ is "considering revising" its current sedimentation criteria, DEQ should not delist these streams until the new "quantitative listing criteria" is ascertained. TMDL at 1-5. This is especially true if the current sedimentation criteria are *so uncertain* that new criteria must be developed before TMDLs are assigned to 3 listed 303(d) listed streams in the Umpqua subbasin.

Response
ODEQ seeks periodic data on stream health and evaluates that data to make determinations regarding waterbody 303(d) listing statuses. Four stream reaches on the North Umpqua Subbasin in the Steamboat watershed were de-listed for sedimentation based on data supplied. These determinations and change in status were appropriate based on data collected. When stream reaches are removed from the 303(d) list it is so noted on subsequent lists and the development of TMDLs for these reaches is not warranted as they are attaining criteria for the parameter of concern. As noted in response number four above, three listings will be retained. ODEQ is currently working on developing objective criteria for applying the narrative standard for sedimentation. This objective method will provide a more consistent and robust method to be applied rather than the more subjective opinions. Once developed additional data will be gathered from the remaining streams listed to determine their correct listing status. If sedimentation listings are retained for these stream reaches TMDLs will be developed in a reasonable amount of time. TMDLs can then be designed to ensure uses are protected. Federal land managers in the drainages with listings have employed management practices to reduce sediment loads to these stream reaches and additional work is planned to further reduce such loads.

6. Commenter (3)
Listed below are my comments regarding the Draft of the Proposed TMDLs for the Umpqua Basin. The very first thing that got my attention was how old the data was that was used in this draft. The most recent data accumulated is almost four years old. This report needs to be based on more current data. Conditions have changed even in the last four years.

For example, Scholfield Creek is listed on the 303(d) list for bacteria as a result of testing done in 2002. The City of Reedsport completed a repair in September 2004 that placed a liner inside the waste water line under Scholfield Creek. This has stopped the leaking from the waste water line. The bacteria counts should be much lower today than the tests done in 2002.

Response
The technical analysis and data review for the Bacteria TMDL was completed in 2003. Therefore, more recent data was not included in the analysis. Load Allocations and Wasteload Allocations are based on the water quality standard and therefore would not be changed with including more recent data. Additional data will help guide implementation efforts.

7. Commenter (1)
Upper maximum bacteria freshwater criteria for point and non-point sources:
For point sources, both the upper maximum and geometric mean should be used as wasteload allocations. For nonpoint sources, it is helpful that DMAs will be asked to address repeated violations of the 406 criteria. We also recommend that if the 406 criteria are exceeded, it will trigger additional monitoring in a 30-day period to determine whether the 126 geometric mean target is met.

Response
The wasteload allocations in the final document will be modified to include the extreme concentration target. ODEQ through the implementation and monitoring phase of the TMDL will work with the various DMAs and other entities recommending additional sampling as suggested.

8. Commenter (1)
Upper maximum bacteria criteria for shellfish beds:
For point sources, both the upper maximum and median should be used as wasteload allocations. While the log mean criteria may be an appropriate target for non-shellfish growing waters, applying this criteria for shellfish growing waters is questionable. The fecal coliform standard allows a 10% exceedance of the maximum criteria, which seems like a reasonable target where temporal, high concentrations will not affect shellfish beds. However, if consistently high concentrations (more than 10%) exceed 43 cfu/100mL, shellfish beds may not be protected. Therefore, for shellfish beds, it is advisable to analyze the reductions needed to meet the median and the upper concentration, and apply the more stringent of the two.

Response
The wasteload allocations in the final document will be modified to include the extreme concentration target. The percent reductions necessary to meet the median targets in the different flow regimes also appear to achieve the extreme target. The 90^{th} percentile concentration for Umpqua River upstream of Reedsport is 79 fecal coliform / 100 ml (Table 2.21). Most of these values occur during the high-flow and wet periods (Figure 2.25). Reductions during these periods are 54% and 50%, respectively. Applying these reductions to the 90^{th} percentiles concentration results in concentrations lower than the criteria of 43 fecal coliforms / 100 ml. Likewise, the 90^{th} percentile concentrations for Scholfield Slough and Smith River are 93 and 57 fecal coliforms / 100 ml, respectively. The reductions called for are 86% and 64% for Scholfield Slough and 50% and 39% for Smith River. Applying these reductions results in the 90^{th} percentile concentrations meeting the criteria of 43 fecal coliforms / 100 ml. By design, the extreme value in the

standard was developed to provide an indication based on limited sampling that the average value may be exceeded.

9. Commenter (1)
p. 2-1, Table 2.1. Target Criteria Identification:
Are the WLAs the numeric criterion times the applicable flow or concentration end-of-pipe limits? If it is decided that the WLAs will be expressed as a load, then the mass loading to achieve the extreme bacteria standards should be calculated.

Response
The bacteria WLAs are expressed as the effluent concentration equal to the numeric criteria. The document has been changed to reflect this comment.

10. Commenter (1)
p. 2-1, Table 2.1. TMDL Loading Capacity:
In some cases, the loading capacity has been calculated to meet the maximum criteria, 406 cfu/100mL E. coli or 43 cfu/100mL fecal coliform. That should also be included in the loading capacity.

Response
The document has been changed to reflect this comment.

11. Commenter (1)
p.2-5; Table 2.4 Water Quality Standards Summary for the Umpqua Basin:
Oregon has two water quality standards for bacteria in shellfish waters. It would be good to cite OAR 603-100-0010 as well.

Response
The document has been changed to reflect this comment.

12. Commenter (1)
p. 2-6. Average vs. Extreme Concentration Target:
The justification for choosing the average bacteria target is helpful, particularly the explanation that BMPs for achieving the average target are expected to achieve extreme targets. Additionally, we concur that if peak concentrations continue to occur, they must be addressed. We recommend that additional language be added to address the extreme concentration target concentration, so that the 406 is a trigger for additional monitoring to determine compliance with the 126 geometric mean. For point sources, both criteria should apply.

For shellfish beds, both criteria should apply for both point and non-point sources.

Response
The document has been changed to reflect this comment. For point sources, there are additional considerations for follow-up samples as outlined in OAR 340-041-0009(5).

13. Commenter (18)
I believe that the livestock using the streams and river are major contributors to the nutrients and bacteria in the basin. We still have a lot of livestock using these waterways as their primary watering stations. Possible leakage from septic tanks is of very small concern compared to livestock.

Response
ODEQ acknowledges that there are additional inputs of nutrients and bacteria from non-point sources as noted in the load allocations and at times reductions are needed to support attainment of water quality criteria as noted in the TMDL. As part of implementation measures ODEQ will continue to work with DMAs and monitoring entities to further document sources and work toward reducing excessive inputs employing best management practices.

14. Commenter (19)
Page 2-9: In the discussion of CAFOs on this page, you state that there is only one CAFO with an NPDES permit in the basin. However, our database shows that there are eight permitted CAFOs in Douglas County (which approximates the Umpqua Basin). Besides the Wildlife Safari, the permitted CAFOs include the following:

Camas Valley School, Camas Valley
Bever Livestock Auction, Roseburg
Phillips, Myrtle Creek
Evans, Roseburg
Broken Oak Bull Mastiffs, Elkton
Michaels Ranch, Days Creek
Wuergler, Drain.

All these facilities have active NPDES permits.

Response
The final draft will correct this error and identify the CAFO's in the basin. Camas Valley School, located in Camas Valley does not appear to be within the Umpqua Basin. Therefore, it was not included in the TMDL.

15. Commenter (21)
In the temperature section, DEQ incorporates NPDES permitted point sources into the TMDL analysis. The chapter notes that the NPDES permit renewal process will use the new Wasteload Allocation equations to "ensure water quality standard attainment year round." TMDL at 3-51. We think this is a good approach. NPDES permitted point sources should be analyzed and incorporated for all TMDL parameters. Unfortunately, the bacteria section falls short of this goal. In the bacteria section, DEQ consistently assumes that NPDES point sources are not contributing to the water quality violations, therefore shifting the focus to non-point sources. While it may be true that on an *individual* basis each WWTP's effluent is "generally been in compliance" with water quality standards, these plants are still discharging an amount of bacteria into the same

closed stream system. TMDL 2-9. DEQ should look at the cumulative effects of all the NPDES permitted waste streams and if they are found to be cumulatively contributing to the violations, then the NPDES permits should be revised accordingly.

Response
The influence of point sources contributing to bacteria standard water quality violations was based on analysis in the watershed specific source assessment sections, not based on assumptions. Since each point source's effluent must comply with the standard, their cumulative impact will not cause or contribute to violations in the water body they into which they discharge. The estuary is discussed in more detail below.

Commenter (1)
p. 2-12. Bacteria Source Tracking:
This is a helpful discussion of bacteria source tracking, with both the benefits and limitations. We believe that these findings are most useful post-TMDL during implementation. Because the science behind bacteria source tracking continues to develop, the findings can be used in conjunction with other traditional ways of preventing fecal loading into streams, such as fencing or septic system maintenance.

No Response

16. Commenter (3)
I noted that Providence Creek is noted in the report. I drove out to the end of Ranch Road where there is pasture land towards the Umpqua River. I saw numerous geese near Providence Creek. DNA testing needs to be done to determine what sources are contributing towards the bacteria problem. The geese could be a major contributor but we would be guessing until we use the DNA matching technology.

After seeing the preliminary results of the Bacteria Source Tracking study done by CH2M Hill, I am convinced that the use of DNA matching is the best way to find out the source of the bacteria. This will give you the scientific information that is required by SB 1010 so an informed decision can be made. You cannot solve a high bacteria problem in a stream of water unless you know the source of the bacteria.

Commenter (2) similar comment
Smith River BST
…"As recently demonstrated with the Smith River DNA study, 87% of the bacteria are not of human or livestock origin. Given this high incidence of bacteria from sources that do not lend themselves to anthropomorphic control, it is imperative that the TMDL recognizes this limitation and do not unduly burden the communities with control mechanisms not likely to address the problems.

Response
The load allocations being assigned to the Smith River are assigned to all nonpoint sources producing bacteria and not just to livestock operations. These load allocations

are critical to reducing the contamination reaching shellfish beds in the estuary, and to protecting the health of shellfish consumers. Public health and the Clean Water Act require that load allocations result in bacteria standards being met.

Commenter #3 indicated that Providence Creek is noted in the draft TMDL. A thorough review of the draft Bacteria TMDL and draft Bacteria Technical Appendix confirms that Providence Creek is not mentioned in either report, nor is it part of DEQ's waterbody assessment database.

However, Providence Creek is extremely close to one of the Smith River DNA testing sites at the Gardiner Boat Ramp, and any bacteria from Providence Creek could flow into the lower Umpqua estuary and presumably be picked up by the DNA study. The recent study did not find any DNA exactly matching that of geese. It is possible that some of the bacteria from the avian category may have been geese.

The DNA study was unable to provide data for times of higher precipitation and flows, and it is possible that geese are contributing bacteria during these times.

DEQ encourages local watershed councils to continue bacteria testing to help identify the sources of bacteria. Studies upstream and downstream of potential sources are another way to identify which sources are contributing to the problem. In addition, identification of conditions that clearly contribute bacteria into streams, such as improper disposal of manure near waterbodies, or livestock actually in the stream is another way to identify bacteria sources.

Commenter #2 sites the DNA study results that 87% of the bacteria are not from livestock or human origin. The study was focused on the Smith River, lower Umpqua, and the estuary, where bacteria levels generally are significantly lower than other streams listed for bacteria in the Umpqua Basin. Sampling conducted on Calapooya and Elk Creeks at the same time as the Smith River sampling showed those streams almost always had higher bacteria levels. Therefore, the results of the Smith River study should not be interpreted as representative of the rest of the Umpqua basin.

In addition, the Bacteria Source Tracking Study was conducted during a year of greatly reduced precipitation and flows, so was unable to provide information regarding the source of bacteria at high and wet flows when the TMDL load allocations are in effect.

Bacteria sources differ under different precipitation and flow conditions. Sources to be expected during low flows are primarily "direct deposits" by swimmers, pets, livestock in the stream, and wildlife. The influence of failing septic systems usually begins to show up during slightly wetter conditions. (The Smith River study did not reveal anything suggestive of failing septic systems.) During wet and high flows, the times when the TMDL load allocations are effective, bacteria from overland flow and from re-suspension of bacteria from sediments are the prominent sources. These are also the conditions when wastewater treatment plant overflows might occur. This is the time period of

interest for the TMDL, and the study did not provide information on sources during these events.

17. Commenter (2)
The Board of Commissioners is formally requesting that the timeline for completion of the TMDL extended to allow for this new information to be thoroughly analyzed and incorporated into the document."

18. Commenter (3)
The final report on the Bacteria Source Tracking project for the Smith River Watershed council should be ready by the April 24 deadline. I am requesting this report be incorporated into your final report. I am requesting a thirty extension from April 24, 2006 so we have ample time to study this voluminous document.

19. Commenter(s) (4-7) Identical comments
May I request that the Smith River Bacteria Source Tracking project be included with the TMDLs that the Department of Environmental Quality is getting ready for the state of Oregon.

Response to 17, 18, and 19
Please see response 16 above. ODEQ has reviewed the final draft of the Smith River Bacteria Source Tracking study. ODEQ has incorporated the relevant data. Per the scientifically valid conclusions in the study, no load reductions for bacteria are required for low or moderate flows. However, during greater flows, load reductions are necessary to protect the health of the shellfish consumer.

20. Commenter (1)
20. p. 2-15. Table 2.7. Exceedances in bold print: Water quality violations are not bolded in this table and in most other tables in this section. It would be helpful if they were bolded.

Response
The water quality violations are noted with highlighting in the final document.

21. Commenter (21)
Bacteria
The TMDL should identify all the specific sources for which allocations of the TMDL are being made. 40 C.F.R. § 130.2. While it is certainly difficult to determine the exact location of all non-point source contributors, the TMDL does not make an effort to address the most significant of these locations. A comprehensive analysis of existing sources is an essential element if a TMDL is to provide for the attainment of water quality standards. This is especially true for Calapooya Creek, Myrtle Creek, Rice Creek, and the Smith River Watershed where non-point sources are the only cause of water quality violations. TMDL at 2-20. It is difficult to see how, without more specified information on non point sources, DEQ will meet the requisite 73% reduction in bacterial load for Calapooya Creek.

Response
Various levels of bacteria data were used for development of the TMDLs and to determine reductions needed on a watershed scale to meet water contact recreation or shellfish bacteria criteria. In some watersheds, more detail was available to focus bacteria loading reductions. Additional data will be needed to determine stream reaches where exceedances of the numeric criteria occur. Additional monitoring needed to identify sources may be appropriate to further identify origins of fecal bacteria.

22. Commenter (1)
22. p. 2-28; Deer Creek Watershed; Long-term Data: North Fork Deer Creek is listed on the current (2002) list as impaired for E. coli. It states here that data collected in the waterbody for the TMDL confirms that it is impaired. However, this stream is no longer listed as impaired for bacteria on the proposed 2004 list. Please clarify.

Response
The North Fork Deer Creek 303(d) listing for bacteria inadvertently left off the 2004 list. Data from the monitoring in this portion of Deer Creek was used to build the load duration curves and subsequent bacteria reductions necessary to meet the criteria for the Deer Creek bacteria TMDL. It is noted as listed in the South Umpqua Basin criteria covered by these TMDLs.

23. Commenter (1)
p. 2-32. Table 2.15. Zero wasteload allocations vs. end-of-pipe limits:
The text states that point sources are not discharging in the summer, so they are given a zero wasteload allocation. It may be worthwhile to allow end-of-pipe criteria limits or include language that allows future point sources to discharge at the criteria.

Response
The document has been changed to reflect this comment and bacteria waste load allocations are stated in terms of effluent concentration.

24. Commenter (1)
p. 2-34. Extreme concentration targets:
The text states that "a stream is considered water quality limited for fecal bacteria when more than 10% of the samples exceed either 400 fecal coliform org/100mL or 406 E. coli org/100mL." The 10% exceedance should apply only to the fecal coliform criteria. However, Oregon has adopted the E. coli criteria. Please clarify.

Response
The TMDL has been changed to clarify.

25. Commenter (21)
The existence of “spatial overlap” or “re-suspension of bacteria from sediment” should not relieve DEQ from attempting to identify point sources that play a greater role in the bacteria violation. See TMDL at 2-52. Furthermore, in Deer Creek Watershed, DEQ was

able to identify urban and agricultural sites that "should receive emphasis during implementation." If DEQ can provide some non-point specification for Deer Creek Watershed, then why can it not do so for others? TMDL at 2-33. An accurate analysis of channel morphology, as well as riparian and upland vegetation conditions and the effects of agriculture, logging and urban development past and future on these conditions is essential to ensuring accurate load allocations within the TMDL and effective implementation in the WQMP.

When discussing the Umpqua Estuary, the TMDL makes conflicting assumptions about the bacterial loading effects of "die off" without any actual measurement standard. DEQ first admits that die off creates uncertainty for determining bacterial loading. The TMDL states "the impact of loading from point sources upstream of estuary area is difficult to estimate because of the die-off of bacteria." TMDL at 253. DEQ then later relies on "die off" to assume upstream point sources will not cause a violation of water quality standards. In regard to point sources upstream of the Umpqua Estuary, the TMDL states that "[d]ue to dilution and die-off, these WLA will not likely cause or contribute to water quality standards violations in the Umpqua Estuary." TMDL at 2-54. If die off creates such uncertainty, then DEQ cannot reasonably rely on it to assume water quality standards will be met. Furthermore, stating that the wasteload allocations are not *likely* to contribute to standards provides no an assurance that the Estuary will be in compliance with the stringent shellfish standard. See TMDL 2-41. If DEQ cannot apply a measurable standard for assessing the effects of die off, then a conservative approach should be employed for the Umpqua Estuary.

Response
The source assessment was appropriate for determining the TMDL and the specificity was appropriate to the available data.

The point sources upstream of the estuary are allocated a maximum E. coli load of 1.2 x 10^{11} E. coli / day. Without considering die-off, which would likely be significant, the point sources allocations are approximately 3% of the loading capacity in the estuary during periods when reduction are necessary (assuming a 1:1 relationship between E. coli and fecal coliform). Given the point sources' relatively small overall contribution, the conservative assumption that no die-off occurs, and the inherent variability of fecal bacteria concentrations, this amount of loading will not likely cause or contribute to measurable water quality standards violations in the estuary.

26. Commenter (15)
Reedsport Landfill Bacterial Wasteload Allocation (Chapter 2 of the draft documents)
The Reedsport Landfill should be removed from Table 2.25 (page 54) as a point source with a wasteload allocation because it has no reasonable potential for an exceedance. Therefore, Reedsport Landfill is not a contributor of bacteria pollution and does not need a wasteload allocation. The basis for determination is discussed below.

Page 52, second paragraph: this paragraph discusses point source contributions to the Scholfield Slough and notes that the Reedsport Landfill is the only point source discharge identified. It identifies that the average wet weather flow is 0.14 million gallons per day (mgd) with an average effluent concentration of 6 fecal coliform/100 ml. This paragraph further notes that nonpoint sources dominate loading to Scholfield Slough.

Page 53, Table 2.25: This table shows the Reedsport Landfill is a very minor discharger, particularly when compared to other point sources (Winchester Bay, Brandy Bar, and Reedsport WWTP). The landfill has a discharge at 0.14 mgd, while the other three sources are 1 to 2 mgd.

The Discharge Monitoring Reports (DMR) sent to the DEQ for the Reedsport Landfill show the treatment pond does not discharge during summer and fall, typically between May and October. The source of minor amount of fecal coliform detected in the samples collected from the treatment pond discharge is believed to be waterfowl and other wildlife using the pond, not the leachate from the landfill.

The low average wet weather discharge, low average fecal coliform count, and lack of discharge during the summer months confirm the Reedsport Landfill leachate treatment pond discharge will not have a measurable impact on the Umpqua Estuary.

Consequently, the Reedsport Landfill should not have a wasteload allocation.

Roseburg Landfill Bacterial Wasteload Allocation (Chapter 2 of the draft documents)

The Roseburg Landfill (listed in Table 2.19, page 39) contributes a negligible bacterial load to the south Umpqua River, is not a significant contributor of bacteria pollution, and should not have a wasteload allocation. Exceedances that have occurred are due to stormwater influences only. The basis for this request is discussed below.

Chapter 2 does not discuss the impact of the Roseburg Landfill Leachate Treatment System discharge, but Table 2.19 lists the site with seven other facilities, the maximum flow, and proposed wasteload allocation. The reported maximum dry weather flow at the Roseburg Landfill is 0.09 mgd. At the other facilities, the reported flows range from 1 to 10 mgd.

The effluent flow from the Roseburg Landfill is measured at the end of a series of shallow ponds. The effluent after that point flows to a large pond, and then into a 1,200-foot long, shallow, low gradient channel. The point of compliance, where the water quality analyses are performed, is at the end of the 1,200-foot channel. The actual flow in the summer months is less at the point of compliance than where measured at the end of the first set of ponds. In fact, as the DMRs show, the flow at the point of compliance during summer months can be zero such that the County is unable to obtain water quality samples. So the maximum flow of 0.09 mgd reported in Table 2.19 is conservatively high.

At the point of compliance (WL-002A) the E. coli measured to date is typically below the proposed wasteload allocation during the dry weather flow, with an occasional spike that is storm-related (see attached chart). Temporary plastic sheeting covering waste within the active waste cell accumulates bird, wild turkey, deer, skunk, and other animal fecal matter. After storms, the E. coli counts rise and then return to the normal low values. The increase is attributed to stormwater runoff "washing" fecal matter off the plastic and into the leachate. Even with these spikes, at the low flows measured (0.09 mgd), the Roseburg Landfill effluent contributes very little to no bacterial load to the Umpqua.

Therefore, the TMDL should note that the Roseburg Landfill leachate does not contribute to the exceedances of the bacteria standard and should not need a wasteload allocation.

Response
ODEQ is setting bacteria allocations so that people can safely use streams and rivers for contact recreation. ODEQ agrees that the document does not fully account for the storm water-like quality of the landfill leachate treatment system. Additionally, we acknowledge that animal fecal matter (not leachate) is not the primary source of fecal bacteria in these systems. To account for this, we have modified the TMDL WLAs for the landfill leachate treatment systems to be in conformance with the conditions of the general 1200Z storm water. This is storm water permit benchmark of 406 e coli per 100 ml.

27. Commenter (1)
p. 3-6; Target Identification – Applicable Water Quality Standards. It would be desirable to quote the relevant portions of the water quality standard, including the thermal plume portion of the mixing zone section.

Response
Because of the length and complexity of the temperature standard, it is summarized and referenced, rather than quoted in the document. The thermal plume portion of the mixing zone standard is not relevant to the TMDL which analyzes the far-field impacts of sources. Sources need to comply with mixing zone requirements regardless of the TMDL.

28. Commenter (10)
The purpose of this letter is to express our concerns with the Draft Umpqua TMDL, specifically the portion discussing water temperature. We have participated in the meetings with the hope that the TMDL would set realistic targets for thermal potential based on analysis of natural disturbance. While the Draft TMDL made an attempt to model disturbance, and a lot of effort was expended by the committee on this, it appears that the results were not used in setting temperature targets that would be achievable or that would mimic a natural disturbance regime. We think it is a mistake to define a standard that is not achievable in nature and that does not seek to emulate the environment that our native fish evolved with. In addition, we do not agree with the modeled results of disturbance.

As we understand it today, the TMDL will not allow any anthropogenic increase in stream temperature if the temperature currently exceeds 16 degrees Celsius (7-day maximum), regardless of the natural disturbance history. For example, if the natural, historic temperature had been above 20 degrees (with disturbance history modeled correctly) and the current temperature is below 20 degrees (colder than historically, due to the shade resulting from fire suppression, stream buffers left during timber harvest, reforestation) no anthropogenic increase above current temperature will be allowed. This is unrealistic.

There is no reason to believe that temperatures in the basin have ever met the standard or that it would be desirable even if it were possible.

Response

Water temperatures affect the biological cycles of aquatic species and are a critical factor in maintaining and resorting healthy salmonid populations throughout the State. The purpose of the temperature criteria in rule is to protect designated temperature sensitive, beneficial uses, including specific salmonid life cycle stages in waters of the State. The temperature standard is periodically reviewed and revised as determined through the triennial review process. Opportunity to provide input to revise the various criteria and language of the standard is provided during the times of periodic review/revision.

The current temperature criteria establishes a biologically based numeric criteria (OAR 340-41-0028 (4)) for basins across the State. The Umpqua Basin has three numeric criteria that establish upper limits for life cycles covering periods of: 1) spawning and egg incubation (13.0 degrees Celsius); 2) rearing (18.0 degrees Celsius); and areas identified as having core cold water habitat (16.0 degrees Celsius) needing protection.

The Environmental Quality Commission recognizes that some of the State's waters will, in their natural condition, not provide optimal thermal conditions at all places and at all times that salmonid use occurs. Under OAR 340-41-0028 (8) Natural Conditions Criteria "Where the department determines [as part of the Umpqua TMDL process] that the natural thermal potential of all or a portion of a water body exceeds the biologically based criteria, the natural thermal potential temperatures supersede the biologically-based criteria, and are deemed to be the applicable temperature criteria for that water body.

Under definition in the OARs the natural thermal potential means the determination of the thermal profile of a water body using best available methods of analysis and the best available information on the site-potential riparian vegetation, stream morphology, stream flows and other measures to reflect natural conditions. Natural conditions by definition means conditions or circumstances affecting the physical, chemical or biological integrity of a water of the state that are not influenced by past or present anthropogenic activities. Disturbance from wildfire, floods, earthquakes, volcanic or geothermal activity, wind, insect infestation, and diseased vegetation are considered natural conditions.

The temperature standard 340-041-0028 (12) Implementation of the Temperature Criteria subsection b) Human Use Allowance notes: Insignificant additions of heat are authorized in waters that exceed the applicable temperature criteria. Subsection (B) states "Following a temperature TMDL or other cumulative effects analysis, wasteload and load allocations will restrict all NPDES point sources and nonpoint sources to a cumulative increase of no greater than 0.3 degrees Celsius above the applicable criteria after complete mixing in the water body, and at the point of maximum impact. Thus although minimal a slight increase in temperature is allowed.

The Umpqua Basin temperature TMDLs applied a wildfire level layer of disturbance during shade modeling exercises that ODEQ identified as the best available information. The TMDL could be re-examined if new information would cause a significant change to allocations. Please see additional discussion on this issue of fire's impact on riparian conditions in this response to comments.

The temperature standard allows a 0.3 ^{o}C temperature increase for human use (called the human use allowance) above the summer seven-day-average maximum temperature of either the biological criterion or the natural thermal potential, which ever is larger. The natural thermal potential includes natural disturbance. Under the scenario described in comment 28, if the natural thermal potential is warmer than current conditions (and current conditions is warmer than the biological criterion) than the natural thermal potential plus the 0.3 ^{o}C human use allowance becomes the criterion.

Only under the protecting cold water provisions in OAR 340-041-0028 (11) is the anthropogenic increase of 0.3 ^{o}C restricted to current temperatures. This provision applies when the summer maximum is below the biological criterion and only when the colder water is needed to ensure downstream criteria is meet, threatened and endangered species are present, or it is critical habitat. Other comment 28 concerns with the modeling of natural disturbance are discussed in response #33.

29. Commenter (3)
I question the scientific validity of Thermal Imaging to calculate the water temperature. The best way to get accurate water temperature readings is to take several readings across the creek or river, rather that at the streambank.

Response
Thermal Imaging Radiometry (TIR) is a well established scientific method to measure water temperature. There have been a number of studies and peer reviewed articles discussing the science of this remote sensing methodology. ODEQ has listed a few articles for your review at the end of this response.

ODEQ and ODEQ contractors always validate TIR data for thermal accuracy with in-stream temperature data loggers. The average absolute differences between the in-stream data loggers and the temperatures derived from the TIR images were within < 0.5^{o}C. This is well within acceptable ranges.

When possible, in-stream temperature loggers are placed below the water surface in the center of the stream where the flow is most active. To do this staff must wade to the center of the stream, and use high strength cable to securely attach it to the bottom of the stream around rocks or by driving a stake into the substrate. On larger rivers such as the South Umpqua this type of deployment can be dangerous for staff. In this case temperature loggers are placed closer to the streambank or in side channels. ODEQ takes note of this and it is clearly described in the data record. In-stream temperature loggers validating TIR data were placed in the center of the stream.

Avery, T. E., and G. L. Berlin. 1992. *Fundamentals of remote sensing and airphoto interpretation. Macmillan Publishing Company, New York, USA.*

Belknap, W., and R. J. Naiman. 1998. *A GIS and TIR procedure to detect and map wall-base channels in western Washington. Journal of Environmental Management 52: 147-160.*

Faux, R.N., H. Lachowsky, P. Maus, C.E. Torgersen, and M.S. Boyd. 2001*. New approaches for monitoring stream temperature: Airborne thermal infrared remote sensing. Inventory and Monitoring Project Report, Integration of Remote Sensing. Remote Sensing Applications Laboratory, USDA Forest Service, Salt Lake City, Utah*

Torgersen, C.E., R. Faux, B.A. McIntosh, N. Poage, and D.J. Norton. 2001. *Airborne thermal remote sensing for water temperature assessment in rivers and streams. Remote Sensing of Environment 76(3): 386-398.*

30. Commenter (3)

Apparently a decision has been made that the water temperature must not be above 64 degrees in any stream in the Umpqua Basin or it will be listed on the 303(d) list. We were informed in the meeting on March 14, 2006 that some other watersheds have a 68 degree benchmark. This is being very arbitrary and inconsistent in assigning a 64 degree benchmark to some river basins and some other river basins have a 68 degree benchmark.. I attended a NOAA meeting in Coos Bay and I found out that salmon can still live in 70 degree temperature water. They are probably getting uncomfortable at this temperature, but the point is they are still alive.

I believe most of your water temperature readings were taken near the shoreline of the streams and rivers. You cannot assume that the water temperature at the shoreline is the same in the middle of the stream or river. I was involved in the Bacteria Source Tracking study done for the Smith River Watershed Council. We took five water temperature readings on the Umpqua River at the Dean Creek Elk Viewing parking lot. This gives you the scientific data you need as required by SB 1010.

Response

See response #29 regarding temperature readings near the streambank.

Water quality criteria (e.g., 64°F for rearing and migration of salmon and trout) are part of the water quality standard along with "natural thermal potential". These criteria are applied to waterbodies based on the known or expected uses of that water. The criteria are based on the best available science regarding not only tolerance to temperature, but on promotion of healthy fish populations. These biologically based criteria (for migration corridors, rearing and migration, and spawning) are referenced during the process of screening waters to assess overall achievement of water quality standards and for developing the 303d list of impaired waterbodies. However, the temperature TMDL for the Umpqua Basin is based on an estimate of natural thermal potential, or the temperature that can reasonably be expected to occur given natural conditions of shade.

31. Commenter (16)

South Umpqua Temperature TMDL

While the model appears to be well done and the projected outcomes from the model are believable, I believe the allocations are not consistent with the Oregon Temperature Rule (OAR340-041-0028) and need modification, especially for the spawning season…

DEQ has determined that the Natural Thermal Potential (NTP) for the South Umpqua at Roseburg is 27.2 degrees C. Because the NTP is higher than the numeric criteria for cold water fisheries (18 degrees C), the NTP supersedes the numeric Criteria and becomes the Water Quality Standard for the river.

DEQ has used the Human Use allowance found in OAR 340-041-0028(12) to determine Wasteload allocations.

The Oregon Temperature rule stipulates that the Human Use allowance is to be used when the ambient temperature of the River exceeds the applicable criteria, which in this case is 27.2 degrees C for the lower South Umpqua. The South Umpqua clearly does not exceed that standard at this time and therefore the criteria for protecting cold water (OAR 340-041-0028(11) is the most appropriate criteria to follow. The summertime criteria provides for allocating thermal allocations between point and non point sources only, which makes sense since the current loading is less than the Loading Capacity for the River given the new temperature standard (the difference between the actual loading and the loading capacity should be sufficient to provide for reserve capacity.

The spawning season criteria for protecting cold water is somewhat less stringent than the summertime criteria with a minimum allowed increase of 0.3 degrees C when the water is at applicable temperature to be shared by all sources and an individual increase allocation for each and every point source discharger of up to 1 degree C when the ambient 60-day rolling average temperature is more than 0.2 degrees C below the applicable standard.

In addition to modifying the allocations to be consistent with Oregon Temperature rule I would also like to request that the new allocations be based on the actual contributions from point source discharges and the contributions of the Non –Point sources rather than

arbitrarily dividing up the allocation equally as was done in the draft document.

Response
The allocations presented in this TMDL are consistent with the temperature standard and do not need to be modified. In section 3.6 the draft document stated "Wasteload Allocations presented below are applicable only to the summertime critical period…". Consistent language appears in the final document. Since the South Umpqua River is not identified as impaired during the spawning season for temperature, no waste load allocations have been computed. If the South Umpqua River is later identified to be impaired during the spawning period, the NPDES permitting process will establish year-round thermal loads which are based on the applicable water quality criterion and river flow.

ODEQ disagrees that the portions of human use allowance allocated to reserve capacity, point, and nonpoint sources needs to be changed. ODEQ believes the allocations are fair and consistent for all parties involved because the allocations are split equally between point sources, nonpoint sources and reserve capacity.

32. Commenter (1)
p. 3-9; Seasonal Variation and Critical Condition:
"The critical condition (maximum temperatures) typically occurs in July and August (Figure 3.5). The TMDL focuses the analysis during July as a critical condition as identified by 2000, 2001, and 2002 data."

Though the maximum temperatures occur in the months of July and August, there are two seasonal numeric criteria in the Oregon Water Quality Standards for most streams addressed in the TMDL. The rearing or core cold water criteria apply during the July and August low water season. The spawning criteria are generally applicable in the fall through the spring, and though water temperatures are lower at these times than in July or August, the spawning criteria is more stringent. Therefore it is not necessarily true that the critical season is the season of maximum stream temperature.

Response
The TMDL addresses streams with spawning temperature impairments that do not have impoundments or point sources. Activities designed to improve summer temperatures on these streams are the same activities that will improve fall and winter temperatures. The nonpoint source load allocations are expressed as effective shade targets and apply year-round. This addresses most of the streams on the 303(d) list for temperature impairments during the spawning period.

During the spawning period, there are three impaired segments on the North Umpqua River that are downstream of a hydro-electric project and a point source is present. More data and analysis are needed to complete those TMDLs. Likewise, on other steams and rivers that are not currently identified as impaired during the spawning period and have point sources or dams, the TMDLs were not computed.

33. Commenter (10)
We have spent months working with DEQ staff to develop modeled Natural Thermal Potential (NTP) which includes disturbance. Initially, it appeared that DEQ would use NTP as the metric for compliance, rather than the state water quality standard.

It is apparent in the Draft TMDL that the temperature standard, not the estimate of NTP, will set allowable anthropogenic increases. This is difficult for us to accept and quite frankly raises the question why we spent so much time trying to model disturbance. In addition, we have concerns that the NTP model has inputs which significantly underestimate the amount of natural (pre-settlement) disturbance in the Umpqua basin, which would serve as a baseline for determining historic shade levels, as well as historic temperatures which occurred in the basin. The purpose of establishing the amount of natural disturbance is important because it gives an indication of the historic amount of aquatic shade and temperature regime that fish in the basin evolved with. It is not possible to emulate natural disturbance with management if the historic disturbance baseline is inadequately dealt with.

On page 3-14, the TMDL makes the statement, "Historically, human activities have altered the stream morphology and hydrology and decreased the amount of riparian vegetation in the basin". This assumption (that there is less shade and that water temperatures are higher today as a result of humans) is woven throughout the document, but no data have been provided to support this significant premise. For this to be true, the rate of shade-reducing disturbance would have to be higher today than it was pre-settlement.

While we certainly acknowledge that humans have the capacity to reduce shade through land management activities, including timber harvest, land clearing for agriculture and homes, there are significant offsetting activities humans do to increase shade over water and which need to be accounted for before making blanket statements that humans have "decreased the amount of riparian vegetation."

There are numerous examples of positive anthropogenic effects across the Umpqua and most basins in Oregon which need to be accounted for. For starters, buffers are left along fish bearing streams on all timberlands, providing shade over the water. Currently, federal lands have practically no timber harvest. We actively regenerate forests, which accelerates shade recovery. Timber growth exceeds harvest in Oregon by a two to one margin. On private lands and some portion of federal lands, fire is aggressively put out. The TMDL attempts to quantify "negative" anthropogenic effects of human disturbance, but no credit is given for fire suppression. In pre-settlement times, there was essentially no fire suppression. Fires lit by native people or lightning, burned until they come to a natural fuel break or until winter rains eventually put the fire out. The historic evidence is clear. Many of these fires were larger than 100,000 acres and many were stand replacement in intensity.

One can learn a lot about the net effect of effective fire suppression on private lands, by observing what happens on public lands when fire suppression is not as aggressive or

effective. One has only to fly over the 500,000 acre Biscuit Fire (U.S. Forest Service lands) to see what can happen when lightning strikes and fire is not aggressively extinguished. The pattern on the Biscuit Fire may be a good place to understand the pattern of natural disturbance in SW Oregon that existed pre-settlement. A high percentage of the Biscuit burned as a stand replacement fire. Unlike timber harvest, the fires did not leave buffers and it will be decades before shade is restored on many of the streams. On private lands, this kind of fire simply does not happen, yet the TMDL does not acknowledge the massive positive effect that fire suppression has had on shade levels on private lands. In fact, humans are doing a lot to maintain and increase shade through proactive management on private and a lot of public lands.

In Section 5 Natural Disturbance, p. 60, the comment was made "In most streams analyzed, the difference between current condition and natural thermal potential was greater than the variability predicted to be caused by a range of natural disturbance scenarios." We would like to point out that this is true only if the assumptions in the model are correct, and we have good reasons to believe the model assumptions are, as it was explained to us by a DEQ staff person, "conservative". We do not think this document should be based on "conservative" assumptions, but should be based on the best available information.

We have provided DEQ with information that suggests that there is more volume of trees (and presumably shade) on the landscape today than 100 years ago, yet the DEQ modeled output continues to show that current shade levels are lower than NTP. This raises questions about the model.

We believe the model has a number of assumptions which lead to an output based on compounding conservatism.

1. The matrix used in the NTP model runs are artificially low disturbance levels based on the assumption that a mixed severity regime dominated the basin. The large areas of relatively even-aged forests on federal lands, greater than 100 years old, provide ample evidence that there was a great deal of stand replacement fire before the development of fire suppression in the last several decades.
2. The modeled disturbance return interval of .25-2% per year is lower than what is indicated in the literature (Agee, 2002), (Gannett, 1902) and is lower than what we see with current fire statistics. For example, in 2002, in SW Oregon on Forest Services protected lands, 557,702 acres burned out of 1.6 million acres in an area that included much of the Umpqua, Siskiyou and Rogue National Forests – **35%** of the area **burned in one year**, including the Biscuit Fire. And that was with millions of dollars spent on suppression.
3. The use of randomly distributed "nodes" to emulate fire disturbance does not emulate the pattern of concentrated disturbance that we know occurred prior to modern fire suppression. It may emulate some kinds of disturbance, but it does not work for fire.

All of this translates into modeled output which does not reflect a realistic disturbance regime and leads to incorrect and overly conservative assumptions.

The use of a static standard to evaluate or regulate a dynamic ecosystem can have unintended and undesirable consequences. This approach will not do the right thing for fish or for landowners. If the fish evolved with a range of shade and water temperatures, then we should seek to emulate that pattern, not set arbitrary standards which did not exist naturally.

The goal of maximizing shade is not consistent with the history of the area and it is not consistent with maximizing fish productivity. While there can be temperature increases associated with canopy opening, the majority of studies on canopy opening (logging) have shown positive effects on fish (Murphy and Hall, 1981) (Hawkins et al. 1983), (Wilzbach et al. 2005), and (Mellina et al. 2005).

How can DEQ explain the recent "record or successful" runs of anadromous fish in the Umpqua Basin if most of this basin will not meet the temperature standard that has been arbitrarily adopted by DEQ? Surely this inconsistency must be addressed somewhere in the report and we haven't found it. If the fish are surviving and thriving, why aren't the stream temperatures currently experienced in the basin considered adequate? And as long as timber growth exceeds harvest in the basin, streamside shade must be adequate.

In summary, we can not support the Draft TMDL, as written. We have worked diligently with the DEQ staff to bring scientific validity to the TMDL process. We have presented evidence of the dynamic natural disturbance history of the region. We have analyzed the model and its outputs and cannot find agreement between its findings and research and literature findings. If the Umpqua TMDL is to be a credible document striving to maintain and protect water quality in the basin, then significant changes need to be made regarding how anthropogenic influences are measured against historical levels.

Response 33 *Issues have been broken into 4 parts:*

1. Concerned the department significantly underestimated the amount of natural pre-settlement disturbance via the assumptions used in the model (mixed severity, range of 0.25%-2% area burned per year, randomly disturbed nodes).

Response: *ODEQ respectfully disagrees that it has underestimated the amount of pre-settlement natural disturbance. ODEQ based these assumptions on data from literature and after talking with scientists and researchers familiar with natural disturbance process, particularly fire (Agee 1993, Hardy et al. 200l and Schmidt et al. 2002). The mixed and high severity fire regimes are the two predominant natural fire regimes in the Umpqua basin with the majority of the basin being in the mixed severity regime.*

Mixed severity fire returns intervals range from 35 – 200 years with high severity fire return intervals range form 200 - 500 years. Recalculating the values using the fire rotation metric on a per year basis, the mixed severity fires range from 0.50% - 2.9%

area burned per year. High severity fires range from 0.20 % - 0.50 % area burned per year. The 0.25% and 2.0% values used in the natural disturbance models fall within these ranges.

ODEQ agrees the Biscuit fire and the 2002 Umpqua fires provide good opportunities to study the effects of fire on riparian systems. Although it is open for interpretation if these fires are representative of pre-settlement natural disturbance fires. Hardy et al. (2001) and Schmidt et al. (2002) show the fire regimes currently observed in the Umpqua and Siskiyou regions (as well as other parts of Oregon) have been significantly altered from their historical range. This is due to anthropogenic forest management activities that may have influenced the fire size, pattern, and intensity. This is why ODEQ does not solely rely on these fires to make judgments about historic fire patterns.

In the Biscuit and Umpqua 2002 fires the riparian area did not exhibit the degree of stand replacement high severity burns implied in comment 33. Of the riparian/matrix areas that burned in the Biscuit fire, only 3% were high severity, 17% were moderate severity, and 80% were low or very low severity (Azuma, et al. 2004). A study by Morrison et al. (2003) found that the 2002 Umpqua Fires had similar riparian burn patterns as the Biscuit Fire (see table below). Even though current fire regimes are significantly different from historical ones, ODEQ feels this pattern of burn is not inconsistent to the mixed severity values and assumptions used in the TMDL natural disturbance models.

2002 Umpqua National Forest Riparian Area Burn Severity (acres)
(Morrison, et al. 2003)

	High	Moderate	Low	Very Low	Total
Apple Creek Facial	3	57	274	8	342
Calf Creek	15	74	780	589	1458
Panther Creek	310	614	1080	479	2483
Ash / Zinc Facial	82	135	305	1000	1522
Boulder Creek / MSU	331	2446	2785	3032	8594
Dumont Creek	35	366	654	409	1464
Black Rock Fork	7	56	160	192	415
Buckeye Creek	8	31	54	179	272
Castle Rock Fork	35	188	447	908	1578
Quartz Creek	66	355	413	551	1385
Skillet / Emerson Facial	41	144	176	508	869
Jackson Headwater	1	0	18	115	134
Upper Jackson Facial	41	151	266	283	741
Total	975	4617	7412	8253	21257

2002 Umpqua National Forest Riparian Area Burn Severity (percent)
(Morrison, et al. 2003)

	High	Moderate	Low	Very Low	Total
Apple Creek Facial	0.9%	16.7%	80.1%	2.3%	100%
Calf Creek	1.0%	5.1%	53.5%	40.4%	100%
Panther Creek	12.5%	24.7%	43.5%	19.3%	100%
Ash / Zinc Facial	5.4%	8.9%	20.0%	65.7%	100%
Boulder Creek / MSU	3.9%	28.5%	32.4%	35.3%	100%
Dumont Creek	2.4%	25.0%	44.7%	27.9%	100%
Black Rock Fork	1.7%	13.5%	38.6%	46.3%	100%
Buckeye Creek	2.9%	11.4%	19.9%	65.8%	100%
Castle Rock Fork	2.2%	11.9%	28.3%	57.5%	100%
Quartz Creek	4.8%	25.6%	29.8%	39.8%	100%
Skillet / Emerson Facial	4.7%	16.6%	20.3%	58.5%	100%
Jackson Headwater	0.7%	0.0%	13.4%	85.8%	100%

Upper Jackson Facial	5.5%	20.4%	35.9%	38.2%	100%
Total	5%	22%	35%	39%	100%

Burn Severity Classifications	
Very Low	Mosaic of unburned and very-low severity ground fire. Consumption of ground cover and vegetation mortality are minimal. Canopy remains vigorous and green. Mortality of trees and shrubs is slight.
Low	Vegetation is lightly scorched, few large trees are killed, very-small diameter fuel is consumed.
Moderate	Much of the litter has been consumed. Fine fuels close to the ground may be all consumed, and trees may exhibit 40 to 80 percent mortality.
High	Tree crowns are completely consumed, few to no leaves or needles remain on trees, and mortality can be assumed to be close to 100 percent.

In ODEQ's view, determining burn locations using random algorithms is an acceptable assumption given the goals and scope of this project.

The goal of ODEQ's natural disturbance modeling was to develop system potential vegetation that exhibits a greater variability of vegetation densities and heights within any single ecoregion classification. This is to recognize the various seral stages present in a natural system caused by natural disturbance. The alternative to this is to simply model system potential vegetation as a single average height and density for any ecoregion classification. ODEQ also wanted to understand the broad effects this variability has on the natural thermal potential river temperatures versus the method using a single average value.

ODEQ recognizes that natural disturbance is a complex process. In nature, there is potential for fire to occur at any location, but some areas obviously have different local site characterizes that influence burn extent, intensity, and fire frequency. Influential local site characteristics include fuels, micro climate, soils, topography, and the current vegetation community.

It is almost impossible to incorporate every detail observed in the natural world into models so we must use assumptions that simplify the natural world when building models. The assumption that fires are occurring at random locations is one of those assumptions. ODEQ feels this is acceptable because inputs such as natural fire frequency and intensity are within ranges expected in the Umpqua Basin. The values themselves were derived from modeling which did take more complex factors such as fuels, micro climate, soils, topography and natural vegetation into consideration. ODEQ's model also does not force fire to occur where system potential vegetation communities are not expected to grow, such as on serpentine soils or large outcropping rock.

In ODEQ's view introducing further complexity is not required to provide variability among vegetation densities and heights for modeling purposes. Additionally, if ODEQ tried to introduce further complexity it would require a much larger landscape model (not just one along the riparian area) and lots of very specific data about site characteristics under natural conditions for which data is limited and difficult to determine. Such an effort is beyond the resources of this project and out of scope for the goals of this study.

2. Concerned about the department's assumption that humans have decreased the amount of riparian vegetation. Related concerns about more volume of trees on the landscape now (and presumably more shade) than 100 years ago, yet the department's models show current shade levels lower than natural conditions with natural disturbance.

Response: *ODEQ does not disagree there may be more volume of trees across the landscape now than in historic times. ODEQ disagrees with the assumption that more*

volume of trees equates to more shade over riparian areas. For this assumption to be true it would imply that:

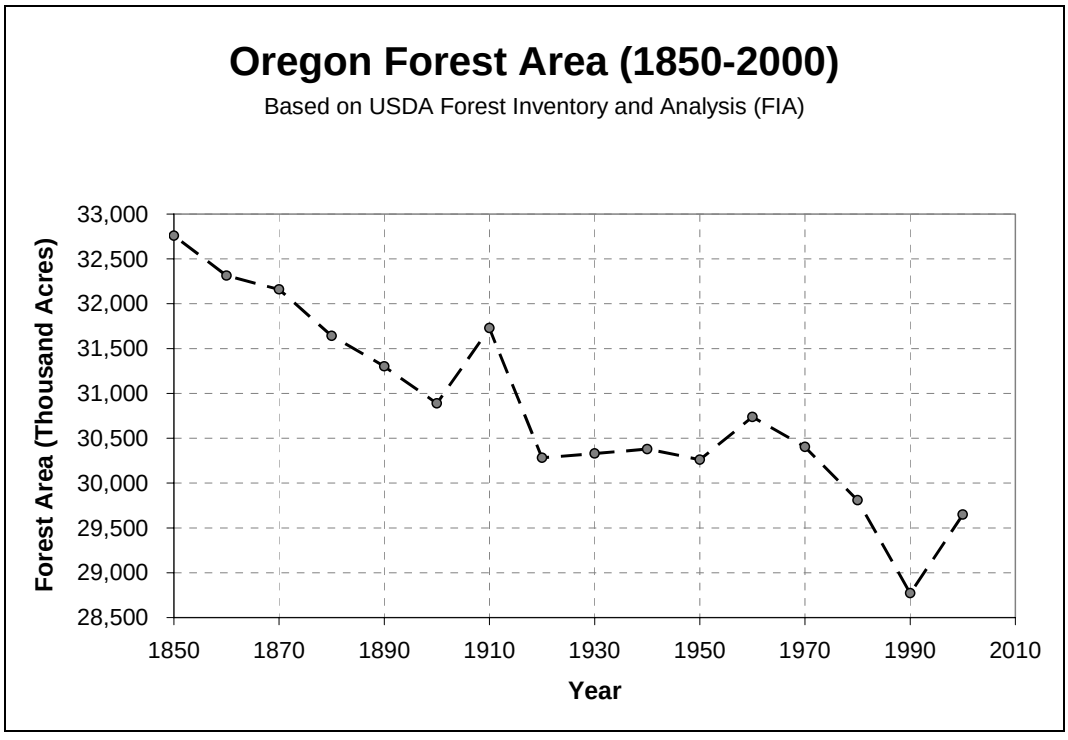
1) *More volume of trees (generally) equates to more volume of trees in riparian areas (specifically).*

2) *More volume of trees (in riparian areas) equates to more shade because:*

   a) *There is a larger spatial extent of riparian forest cover, and therefore more volume of trees (and shade) now where there were none before. Or,*

   b) *The spatial extent of riparian forests is the same as historic times but there is more volume of trees growing closer together therefore the shade density per unit area has increased.*

ODEQ is not aware of any study that specifically determines the volume or area of forest specifically in riparian areas over time. Studies from (Maclean, 1990), (Bolsinger, 1973) and trend data from the USDA Forest Inventory and Analysis (FIA) Program show that in Oregon there is less total land area devoted to forests than in historic times [see chart below]. While certainly more studies need to be done, this data does not indicate a pattern in which comment 33 assumptions are based on.



Another factor to consider is typically forest inventories do not focus on riparian forests, in valley bottoms along 3rd, 4th, and 5th, order streams where ODEQ conducts the majority of its modeling. While some of these valley bottoms certainly were historically grasses and range land, primarily caused by fires from native peoples, riparian areas

were more thickly vegetated, had stronger connections to the flood plain, and wetlands were more persistent (Winterbothom, 1994). It is in these areas the majority of vegetation and floodplain connections have been lost to agriculture and urban uses. ODEQ bases this statement from well documented changes to valley bottom riparian areas all over the state recorded in historic surveys by the General Land Office, literature, photographs, personal statements, and our own land use inventory from aerial photographs.

3. Concerned about the department's temperature standard and the goal of maximizing shade is not consistent with the fish productivity.

Response: *ODEQ's temperature standard is based on literature that shows the detrimental impact of high temperatures on cold water fisheries. This TMDL linked increases in temperatures with increases in solar radiation due to the removal of riparian vegetation. This means that some areas will need to restore natural vegetation and provide shade over streams to keep them from warming. ODEQ is not requiring natural vegetation where it will not grow naturally, nor is ODEQ proposing all human activities in the riparian area must stop. This TMDL allocates one third of the human use allowance to nonpoint sources of pollution. This TMDL also recognizes natural disturbance process will naturally reduce or remove some natural vegetation cover in the future.*

ODEQ has reviewed the literature cited in your comment regarding fish productivity and canopy openings: Murphy and Hall, (1981), Hawkins et al. (1983), Wilzbach et al. (2005), and Mellina et al. (2005). These studies take place in upper watersheds where it was reported the majority of sites had stream temperatures well below Oregon's numeric biological temperature criteria. This would indicate that at these locations even with canopy openings, the temperatures were not warm enough to thermally stress salmonids.

Mellina et al. (2005) discusses this point.

> *Although we found reductions in the overall availability of pool habitat as well as increases in stream temperatures in our logged streams, these changes (and any other habitat alterations we did not measure) were likely not severe enough to elicit a stress response in rainbow trout. For example, average daily maximum stream temperatures in our logged streams during the summer following our field work ranged from approximately 11 to 18 °C, which are well below the reported lethal temperatures of approximately 25 °C for rainbow trout (Jobling 1981). Because stressful water temperatures are often observed in streams at lower latitudes than those of our study areas (Beschta et al. 1987), we speculate that summer temperatures in our streams may not reach stressful levels for this species (even after streamside logging has occurred; Slaney et al. 1977b).*

ODEQ's concern about logging in upper watersheds is not so much about localized thermal stress as it is the cumulative impacts of warming that can contribute to higher stream temperatures far downstream where it can exceed thermal thresholds and stress salmonids.

Wilzbach et al. (2005) discuses this point.

> *The effect of a given temperature increase on salmonid production depends on interactions among growth, food consumption, temperature, and other factors (Railsback and Rose 1999); modest temperature increases need not reduce production. The spatial scale and extent of canopy opening are relevant inasmuch as multiple canopy openings within a watershed have the potential to cumulate thermal loadings downstream (Murphy and Meehan 1991)*

Murphy and Hall (1981) also discuss productivity and cumulative impacts from logging in terms of sediment supply and woody input.

> *Potential logging impacts on predators and on the stream ecosystem in general must be viewed with a perspective for both the geomorphic setting and potential downstream effects. Disturbances in headwater regions often have effects downstream (e.g. Madej 1978.) Sites of sediment export and deposition depend on the competence and capacity of the stream along its longitudinal profile (Leopold et al. 1964). Logging in the western Cascades appears to be accelerating sediment transport from small headwater streams to downstream reaches by accelerating erosion of hillslopes (Swanston and Swanson 1976) and by removing large woody debris form high gradient stream channels. Such shifts in sediment may favor productivity in the headwaters but depress it downstream where gradient is lower.*

Impacts from cumulative warming is why ODEQ has provisions protecting cold water (OAR 340-041-0028(11)) from increases such as those found in upper watersheds from logging or other anthropogenic sources of heat.

See Response #28 regarding the temperature standard.

4. How can the department explain record fish runs?

Response: *The following information on Umpqua Basin fish stocks is provided by Sam Moyers (Assistant District Fish Biologist) an e-mail to ODEQ July 12, 2006.*

Mr. Moyers provided information that discussed current Umpqua Basin salmonid fish stocks and probable limiting factors. The information is summarized here. Moyer cited favorable ocean conditions and reduced harvests for recent increased adult fish returns. He also noted that stream habitat and water quality (specifically elevated stream rearing temperatures) are reducing juvenile fish holding capacities (productivity potentials) for

many Umpqua streams. He cited the lack of deep pools and overhead cover as contributing factors of warmer stream temperatures. He also noted that local research in the Smith River Watershed has shown that elevated temperatures can increase the incidence of fish parasite infestations. The parasites reduce juvenile fish condition which in turn reduces the probability of these salmonids completing their life cycles.

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34. Commenter (20)
Additionally, ODF is committed to working with DEQ to explore and develop alternatives that may be needed to address some of those issues. We suggest that we work jointly to develop a landscape shade modeling perspective with the assistance of the OSU College of Forestry. Recent work by the Coastal Landscape Analysis and Modeling Study (CLAMS) may allow us to look at a watershed and examine riparian shade conditions over time in aggregate across the watershed under different disturbance assumptions.

Response
ODEQ is similarly committed to working with ODF and will entertain proposals of collaborative study.

35. Commenter (19)
Page 3-20, Table 3.5: Information regarding the portion of current total solar heat load that is anthropogenic NPS is misleading when it reports a system total as being only 5%. A casual review of this table suggests that when most stream's anthropogenic heat loads exceed 5% - and range up to 53% - the total load would be above 5%. ODA realizes that DEQ is using flow-weighted heat loads to calculate the total load, but for a table like this you should provide the relative flow of each tributary - along with the other information provided - to make it easier to see why the cumulative total anthropogenic heat load is only 5%.

Response
All variables that are necessary to calculate a percent heat load from anthropogenic sources are provided in table 3.5. To better interpret how these percentages were calculated ODEQ has added the equation and an expanded narrative describing why the system total is only 5%.

36. Commenter (14)
[4]In addition, please note that Figure 3.10 on page 3-22 incorrectly shows 11 dams within the Project. There are only 8 Project dams. The figure appears to have included two dams instead of one at the approximate locations of the Lemolo No. 2, Clearwater No. 2, and Slide Creek Dams.

Response
Figure 3.10 on page 3-22 has been corrected.

37. Commenter (14)
Proposed Temperature TMDL
PacifiCorp was pleased to see that the proposed temperature TMDL concludes that implementation of the section 401 certification conditions for the Project will ensure attainment of the applicable instream temperature criteria within and downstream of the Project. Nonetheless, PacifiCorp was surprised by the substantial downstream temperature influence attributed to the Project. Especially surprising was the conclusion that flow reductions in the Project's bypass reaches "are the primary cause of elevated stream temperatures from Lemolo Reservoir to the Umpqua River tidewater boundary." Indeed, the temperature model results presented in the proposed TMDL appear to suggest that flow reductions in Project bypass reaches under the former FERC license could cause as much as a 2° C. temperature increase below the confluence of the North and South Umpqua Rivers.

The attribution of such large and persistent temperature effects to the Project does not seem reasonable. The Umpqua River tidewater boundary is more than 150 miles downstream of the Project and approximately 80 miles downstream of the confluence of the North and South Umpqua Rivers. Given that the Project returns the flows that it diverts from the bypass reaches to the river, given the many downstream tributaries to the river, and given the many land management activities on the river and its tributaries downstream of the Project, PacifiCorp would have expected any Project temperature effects to be indiscernible far upstream of the confluence of the North and South Umpqua Rivers.[1]

Notwithstanding these concerns, we have not attempted a detailed evaluation and critique of the temperature model and assumptions because the proposed TMDL concludes that implementation of the Project's certification conditions will ensure compliance with the applicable instream temperature criteria. PacifiCorp notes, however, that at least three apparent features of the modeling may cause it to overstate the Project's downstream temperature effects:

Flow assumptions. The flow assumptions used in the model runs are not entirely clear to PacifiCorp, but the figures included in the proposed TMDL describe "current" and "section 401 certification" flows downstream of the Project as 700 cubic feet per second (cfs) but "natural" flows as only approximately 500 cfs.[2] *See* Figure 3.17, page 3-49. Because the Project does not significantly alter natural downstream flows during the modeled season, this difference in flows might overstate the downstream temperature effects of the Project by increasing the volume of warmer water delivered downstream. There are similar discrepancies in the flows used to model Fish Creek and the Clearwater River.[3]

Segmented ModelCalibration. The model was calibrated in two segments. The reach upstream of Steamboat Creek was calibrated with FLIR data from July 2001. The reach downstream of Steamboat Creek was calibrated using data from the summer of 2002. The measured and simulated water temperatures sharply increase at this point. Some increase is to be expected because of the influx of warm water from Steamboat Creek, but the use of calibration data from different years may have altered the performance of the model at this critical junction and may in part explain the large temperature effects attributed to the Project downstream of this point.

Response

Project related warming in North Umpqua is depicted in figures 3.27 and 3.33. These figures show that current FERC license flows are adequate to attain the summer temperature criterion. This is consistent with ODEQ letter of June 6, 2005 addressing revisions to PacifiCorp Energy Temperature Management Plan.

The North Umpqua and mainstem Umpqua rivers are large rivers with large flow volumes. For such large volumes of water, mass heat transfer processes that introduce or remove heat does not occur as easily or as quickly as may be the case in smaller streams. This is due to the water's high specific heat capacity. It is therefore entirely plausible that warmer waters far upstream will continue to be warm far downstream.

The natural flows depicted in figure 3.17 for the North Umpqua River above Steamboat creek, and those for Clearwater and Fish Creek are July 2001 river flows that would be present in the river channel without the presence of dams, diversions, or withdrawals. ODEQ has reviewed the data and is confident in these values.

ODEQ agrees with PacifiCorp that in 2002 the natural flow volumes and regulated flow volumes downstream of Soda Springs Dam are almost the same. For this reason ODEQ used the 2002 regulated flow volumes as the natural flows in the 2002 North Umpqua River model downstream of Steamboat Creek.

Similarly ODEQ used 2002 temperatures for the boundary input in the 2002 North Umpqua River model downstream of Steamboat Creek. For the natural thermal potential model, 2002 boundary temperatures were decreased by 1.5^{o}C based on the average decrease seen in 2001.

38. Commenter (14)

[1]Note also that Table 3-5 attributes only a relatively small anthropogenic solar loading to the stream reaches that include the Project. Because the Project is located on only portions of these reaches, its contribution would be even less.

[2]In addition, the text on page 3-65 states that the natural flow in the North Umpqua River in the reach below Lake Creek is 600 cfs. This is incorrect and inconsistent with Figure 3.17.

[3]*See* Figures 3.25, 3.26, pages 3-64, 3-65.

Failure to Capture Temperature Effects of Land Management Activities Unrelated to the Project.
Land management activities both upstream and downstream of the Project, such as timber harvesting, road construction, and agriculture, influence stream temperatures by reducing riparian shade, reducing summer flows, and changing the width and depth of streams. The temperature model, however, does not account for a large portion of the temperature effects of these activities on tributaries that enter the North Umpqua and Umpqua Rivers above, within, and below the project. So, for example, the expected temperature increases from timber harvests on tributaries that enter the mainstem within the Project are indistinguishable from the effects of the Project. Similarly, land management activities would be expected to reduce tributary flows, thereby diminishing the diluting effect that tributaries would have on Project-induced warming.[4]

Again, PacifiCorp has not attempted to evaluate these concerns in detail because the proposed TMDL concludes that implementation of Project certification conditions will ensure compliance with applicable instream temperature criteria. The absence of detailed comments on the temperature modeling results, however, should not be construed as agreement with the large and extensive downstream temperature effects attributed to the Project.

Response
ODEQ has revised the narrative discussion on page 3-65 to reflect the correct natural flow volumes in the North Umpqua River below Lake Creek.

See response #37 concerning natural flows in Clearwater and Fish Creek.

ODEQ agrees with PacifiCorp that land management activities can influence stream temperature on tributaries flowing into the North Umpqua. While potential impacts have not been modeled, ODEQ took potential impacts into consideration when developing the natural conditions model for the North Umpqua River. Daily maximum temperatures for small tributaries were reduced to be no larger than the biological criterion of 16^{o}C

39. Commenter (21)
In order to determine non point source load allocations, DEQ utilizes "surrogate" methods to quantify temperature loading within waterways. These methods include site "specific effective shade" and "shade curves." When applying both of these methods, DEQ recognizes that natural disturbances may result in lower than maximum shade cover. The TMDL states that "[r]eductions in effective shade caused by natural disturbance are *not considered a violation* of the TMDL or water quality standards." TMDL at 3-28, emphasis added. The CWA does not fashion an exception for DEQ to ignore TMDL standards on solely account of natural disturbances. This is especially true because absent anthropogenic sources, it is unlikely that these streams would be water quality limited in the first place.

A TMDL must lead to the attainment of water quality standards. DEQ obviously recognizes that natural disturbance is a hindrance to attainment, therefore DEQ should consider natural disturbances when determining load allocation reductions. This could be done by fashioning measures that will result in an adequate reduction of anthropogenic point and nonpoint sources so that potential natural disturbances will not violate TMDLs and water quality standards. Furthermore, DEQ should not isolate natural disturbances from anthropogenic sources when fashioning TMDLs and mitigation measures. In order to truly assure that water quality standards are met, they should be looked at cumulatively.

As the TMDL notes, "Oregon's stream temperature standard is designed to protect cold water fish (salmonids) rearing and spawning as the most sensitive beneficial use." TMDL at 3-1. If DEQ wishes to protect salmon rearing and spawning, it should not wait until Coho salmon are listed as threatened to invoke the stream temperature standard. Waiting until the salmon are in a depleted condition does absolutely nothing to protect beneficial uses. In order to comply with the CWA, DEQ should be proactive in protecting salmon by taking actions that will that will help to prevent listing, which includes implementing cold water protection provision of Oregon's Stream Temperature Standard. This is especially true because DEQ is aware of the fact that Coho are proposed to be listed as threatened. See TMDL at 3-57, 3-59, 3-76, 3-78.

Response
The TMDL does not ignore the effects of natural disturbance on temperature. Disturbance is acknowledged as both having an effect on water temperature, and as being an important ecological element for biological communities. The effects of natural disturbance are included in the analysis of temperature, and it receives a portion of the load that is allocated to natural conditions for determination of Natural Thermal Potential. The TMDL does not hold nature accountable for its effects on the environment.

Additionally, please see discussion in response number28 above regarding application of standard, application of natural disturbance, salmonid life cycle protection and protection of cold water classified water body reaches in the Umpqua Basin. The standard takes into consideration the impact of natural disturbances.

40. Commenter (1)
p. 3-49; North Umpqua River 401 Certification Flows:
The North Umpqua River and Fish Creek are both listed as impaired in the spawning season in the areas where they function as bypass reaches in the PacifiCorp hydroelectric development. There is no discussion in the text about how flow diversion contributes to the spawning season impairments and if it does how the terms of the 401 certification will address the impairment. This needs to be explained in the text to establish how the spawning criteria will be attained in these reaches.

Response
PacifiCorp Energy diversion at Fish Creek causes additional warming to occur below the dam to the mouth. To address the warming attributable to the hydroelectric project, minimum bypass reach flows are required in the 401 certification. These minimum flows are higher than the typical June-September hydrograph flows. Therefore, in normal and dry years, the Fish Creek hydroproject development will not be operating during this period. Warming above the diversion dam is not a result of project operations.

Flow diversions in the Slide Creek and Soda Springs developments also act to raise stream temperature in the North Umpqua River. Under the 401 Certification, minimum flows are required under a Temperature Management Plan. The minimum flows in Slide Creek development negate most but not all of the temperature increase. Much of the thermal increase is due to inflow from Fish Creek. The Soda Springs development will tend to have a higher instream temperature under the 401 certification due to dilution of significant spring inflow in the bypass reach. ODEQ believes the increase in stream temperature due to the higher minimum bypass reach flows will more closely approach natural conditions.

Salmon and Steelhead spawning is not a designated use in Fish Creek. When fish passage capability is built at Soda Springs Dam this use will apply (See comment #46).

Currently ODEQ has not performed rigorous numerical modeling to estimate how anthropogenic effects impact spawning period water temperatures below Steamboat Creek because there is limited data to build reliable models to the mouth of the North Umpqua River. All data for this TMDL was collected prior to the new temperature standard which resulted in timing and status changes for these rivers.

During ODEQ's preparation in 2002 of the Clean Water Act Section 401 certification of PacifiCorp's North Umpqua hydroelectric project, we relied on PacifiCorp's analysis, based upon the SNTEMP model, to gauge their effect on stream temperature. This modeling indicated with higher minimum flows the hydroproject's impact relative to the spawning use temperature criterion in effect at the time was adequate down to Steamboat Creek. Modifications to the 401 certification, if they are required, will be addressed in future TMDLs when more data is collected and modeling is complete all the way to the mouth of the North Umpqua.

41. Commenter (1)
pp. 3-50 through 3-53 Point Source Wasteload Allocations:
There is no specific discussion of how the WLAs will address the spawning criteria. Spawning season WLAs should be stated in the TMDL for those point sources that discharge into waterbodies listed as impaired under the spawning criteria.

It also seems likely that the thermal plume requirements for mixing zones may be the limiting factor in determining the allowable effluent temperatures for these point sources.

Response
The TMDL does not address spawning impairments on streams and rivers with point sources and dams. There is one facility which discharges into a reach which is on the 2004-2006 303(d) list for spawning temperature impairment: Glide-Idelyd Park on the North Umpqua River. DEQ did not complete a TMDL for the spawning period for that reach because of data limitations. ODEQ agrees that the thermal plume limitations in OAR 340-041-053(2)(d) could limit some point sources from full use of their wasteload allocation.

42. Commenter (1)
p. 3-51; Point Source Wasteload Allocations; Table 3.8:
OAR 340-041-053(2)(d), the "thermal plume" section of the Oregon Water Quality standards, sets limits for fish exposure to high temperatures in mixing zones. Many of the effluent temperature limitations in Table 3.8 exceed these provisions in the mixing zone section of the standards.

Also Table 9, on page 3-53, does not appear to reflect the requirements of the thermal plume section of the mixing zone standards.

Response
Changes to all the tables have been made to reflect the thermal plume limitations in OAR 340-041-053(2)(d).

43. Commenter (1)
p. 3-57; Cow Creek & p. 3-59 Olalla Lookingglass Creek:
Both of these streams are modeled for the low water season. Assimilative capacity is available for the low water season because of the cooling influence of reservoir flows in these streams at those times. However, assimilative capacity in the spawning season is not discussed.

Both Olalla Creek and Cow Creek are listed as impaired under the spawning criteria. No load capacity or load allocations are presented in the TMDL for the hydroelectric system effects in the spawning season and their impact during these times of year are not assessed in the [sic].

Response
The 2004/2006 303(d) list does not identify Olalla Creek and Cow Creek as impaired for the spawning period. At this time, there is insufficient data to determine the impacts of these reservoirs on spawning period temperatures and therefore no spawning period load allocations have been developed.

44. Commenter (19)
Page 3-59: The use of the reservoir for providing potential assimilative capacity may be setting a novel precedent. In the past, DEQ has had inconsistent methods of incorporating reservoir releases in TMDL modeling for temperature and other water quality concerns. For example, in the Snake River/Hell's Canyon TMDL no changes in reservoir management were asked for or even recommended, even though information presented in the TMDL strongly implied that reservoir management was the cause of some of the water quality issues in the Snake River. This is the equivalent of treating a reservoir as the "natural" condition of the stream. By contrast, in the Hood River TMDL DEQ required an irrigation district assume Designated Management Agency responsibility for regulating flow from a reservoir they managed to reduce heat loading. This is the equivalent of treating a reservoir as a point source. Saying that the reservoir on Olalla-Lookingglass Creek results in a temperature reduction that could increase the assimilative capacity of the system is the equivalent of saying that reservoirs are like water treatment facilities. DEQ needs to have a consistent method for attributing water quality impacts or benefits to reservoirs and reservoir management.

Response
ODEQ agrees consistency is good in interpreting and applying water quality standards. A TMDL is a basin specific study to address basin specific problems. TMDLs address how to bring a waterbody in compliance with water quality standards. Not all water quality problems are the same nor are the solutions to those problems the same in each case. ODEQ retains the flexibility to address site specific problems with site specific solutions. This includes how ODEQ deals with dams and reservoir operations.

In all TMDLs mentioned in comment 44, ODEQ has been consistent by determining water quality impacts by dam and reservoir operations and then proposing site specific solutions that will eventually meet water quality standards. In the case of Snake River/Hells Canyon TMDL, the comment that ODEQ treated the dam as the natural condition of the stream is incorrect. The system was evaluated based on a pre-dam condition as was the Powerdale Project in the Hood River TMDL and the Berry Creek Dam in this TMDL. In each case the reservoir complex was addressed with site specific requirements that will meet water quality standards.

45 & 46. Commenter (1)

p. 3-63; Clearwater River:

Though assimilative capacity is assessed for the rearing criteria in the low water season, no mention is made of what is available during the spawning season, which can be the critical season for hydropower projects. It is advisable to include a discussion of assimilative capacity in the spawning season. It would also be good to discuss how the provisions of OAR 340-041-028(11)(c)(C) of the water quality standards will be met with the available assimilative capacity discussed in this section.

3-64; Fish Creek:

This reach of stream is listed on both the current 2002 303(d) list and the draft 2004 303(d) list as impaired under the spawning criteria as well as the rearing criteria. This is confusing because Figure 320(b) of the water quality standards shows no salmonid spawning use in Fish Creek. It is not clear why this segment of stream would be listed for spawning criteria impairment, or what season applies for spawning. The spawning season criteria is not addressed and no load capacity or allocations are given to address this listing. These are required elements of a TMDL, so this listing is not being adequately addressed.

It would also be good to discuss how the provisions of OAR 340-041-028(11)(c)(C), Cold Water Protection, will be met with the available assimilative capacity discussed in this section.

Response 45a

The Salmon and trout rearing and migration criterion of 18.0^{o}C applies year round to Clearwater River. There is no salmon and steelhead spawning use designation for this waterbody (see OAR 340-041-320 and related figures 320A and 320B). The natural thermal potential during the summer modeling period (with PacifiCorp projects removed) is warmer than the current ambient river temperatures, therefore the project currently meets the cold water protection provisions of OAR 340-041-028(11)(a) during the summer period. The historical ambient river temperatures beyond the summer period have always been cooler than the 18.0^{o}C criterion; therefore the critical season is logically during the summer when ambient river temperatures are the warmest.

Response 45b

ODEQ respectfully disagrees with commenter that the cold water protection provisions applies to waters during the spawning period where there is no salmon and steelhead spawning use designation. OAR 340-041-028 (11)(a) does not apply to Clearwater River or Fish Creek during or outside of the summer critical period because cooler water is not required to ensure that downstream temperatures achieve and maintain compliance with the applicable temperature criteria, no threatened or endangered salmonids are present and the water body has not been designated as critical habitat.

Response 45c

The salmon and steelhead spawning use map Figure 320(b) shows no salmon and steelhead spawning use on Fish Creek because this use does not occur on Fish Creek.

When fish passage is restored at Soda Springs dam, ODEQ will reassess the fish use. ODEQ is not addressing salmon and steelhead spawning listings for this reach under this TMDL. Also, the category 5 impaired reaches on the 2002 303(d) list are based on river segment delineations used under Oregon's old temperature standard. Under the new temperature standard adopted by the EQC in December of 2003 and approved by EPA in March of 2004, river segment delineations have been changed and ODEQ is proposing to remove the salmon and steelhead spawning listings from category 5 on the integrated 2004/2006 303(d) report. If the 2004/2006 303(d) report is approved by EPA, TMDLs are not required during the spawning period.

47. Commenter (1)

3-65 North Umpqua River (Lemolo Reservoir to Steamboat Creek):

This reach of stream is listed on both the current 2002 303(d) list and the draft 2004 303(d) list as impaired under the spawning criteria. Despite this the modeling has been done for the rearing season only and the discussion on assimilative capacity is limited to the low water season. The spawning season criteria is not addressed and no load capacity or allocations are given to address these listings. These are required elements of a TMDL. These listings are not being adequately addressed by the TMDL

It is advisable to include a discussion of assimilative capacity in the spawning season, as that is the season of impairment. It would also add clarity to discuss assimilative capacity in the spawning season and how allocation of the excess assimilative capacity would comply with the provisions of OAR 340-041-028(11)(c)(C), Cold Water Protection.

Response

All data for this TMDL was collected prior to the new temperature standard which resulted in timing and status changes for the spawning period criteria. Because of these changes there is insufficient data to build reliable models and to determine assimilative capacity or whether the hydroelectric projects would result in stream temperatures that meet the applicable spawning use criteria. More data must be collected and these listings will be addressed in future TMDLs.

48. Commenter (1)

It is confusing that Figure 320(b) of the water quality standards shows no salmonid spawning use upstream Soda Springs (RM 69.8) though there are current and proposed listings for that section of stream.

Response

The salmon and steelhead spawning use map Figure 320(b) shows no salmon and steelhead spawning use on the North Umpqua River above river mile 68.9 because there is none in those reaches. When fish passage is restored at Soda Springs dam, the spawning use designation will be reassessed. There is resident trout spawning in those reaches but Oregon does not have a temperature standard for resident trout spawning.

The impaired reaches on the 2002 303(d) list are based on river segment delineations used under Oregon's old temperature standard. The current temperature standard was

adopted by the EQC in December of 2003 and approved by EPA in March of 2004. Based on the new temperature standard, river segment delineations have changed and DEQ is proposing to remove the salmon and steelhead spawning listings on the integrated 2004/2006 303(d) report.

49. Commenter (19)
Page 3-65: The discussion here regarding Lemolo Reservoir further illustrates our points discussed above. DEQ could require changes in reservoir management to augment flows during times of critical temperature problems.

Response
ODEQ has determined that conditions specified in the FERC 401 certification (including minimum flows) for Lemolo Reservoir will not violate the temperature standard for the entire North Umpqua River, therefore further requirements such as flow augmentation are not required. See section 3.7.14 on page 3-72.

50. Commenter (1)
3-76 North Fork Smith River & 3-78; West Fork Smith River & 3-80; Smith River Mainstem:
Most of the simulated reaches are covered under a dual criteria, the rearing criteria, which is discussed in these sections of the TMDL, and the spawning criteria, which is not discussed. Assimilative capacity should be assessed for both criteria to determine which is critical in this system. Until the spawning season assimilative capacity is assessed, it should be stated that the assimilative capacity shown here is only available in the non-spawning season.

Response
The North Fork Smith River, West Fork Smith River, and The Smith River are not listed as impaired on the 2002 or 2004/2006 303(d) list for Salmon and Steelhead Spawning use. TMDLS are not required for segments not listed as Category 5 impaired on the 303(d) list.

Even though TMDLs are not required, ODEQ considers the summer period the critical period with the least amount of assimilative capacity. There are no point sources in these rivers and the majority of anthropogenic temperatures increases are caused by increased solar radiation resulting from the removal of riparian vegetation. Because solar radiation is highest during the summer and significantly diminishes during the spawning period, the critical period for this type of anthropogenic heating is during the summer.

51. Commenter (1)
p. 3-85; Margins of Safety:
It would be preferable to state the margins of safety used in the TMDL here instead of referring to the Appendix.

Response
ODEQ has updated this section and provided a list of the implicit margins of safety.

52. Commenter (1)
For Calapooya, Elk and Deer Creeks, the excess load (% volatile solids) is higher than the allocations. Please explain this discrepancy and whether this is due to changing longitudinal assimilative capacity.

Response
Excess load is defined in Oregon's TMDL rule as the current load minus the loading capacity. There is no discrepancy if the excess load is greater than the allocations.

53. Commenter (1)
p. 4-7, Table 4.7, Seasonal Variation:
The text states that TMDL allocations apply between May 1- October 31, but in some streams, such as the Calapooya, the rearing and migration criteria apply from May 15 to October 15. It would be useful to clarify the dates.

Response
The allocation time period was chosen to comply with pH and dissolved oxygen standards. In most cases, the meeting the pH standard necessitated lower allocations. The pH criteria do not vary by time of year. Exceedances of the pH criteria are commonly observed between May 1 and October 31 in the South Umpqua River.

54. Commenter (1)
p. 4-9 –l0; Draft 2004 Listings for the North Umpqua:
The chlorophyll a listings are not shown as category 5 impairments on the draft list North Umpqua River. Listing 5713 for pH is still shown as category 5 on the 2004 proposed list instead of having been moved to 4b as the write-up states.

Response
This listing 5713 is not addressed by this TMDL document and will be addressed in future updates. The document has been updated to reflect the chlorophyll a listing.

55. Commenter (21)
Salmon spawning and rearing are listed as "the most sensitive beneficial uses" for all DO and pH water quality limited streams. TMDL at 4-1 – 4-7. The TMDL identifies the salmon spawning period as October 15- May 15. TMDL at 4-18. In order to protect salmon and to bring DO listed streams into legal compliance, DEQ must complete TMDLs for all 303(d) listed streams. TMDLs are especially critical during identified salmon spawning and rearing times. We are concerned by DEQ's explicit failure to identify TMDLs for Capalooya Creek and other waterbodies during salmon spawning and rearing times. The TMDL states "a TMDL to address the fall-winter-spring dissolved oxygen limitation will not be completed at this time." TMDL at 4-18. Not only is the fall-winter-spring time period crucial for salmon spawning and rearing, two WWTPs discharge into Capalooya Creek between November 1 – May 31. (See TMDL at

4-22 for dates they may *not* discharge.) This is unacceptable. In order to comply with the Clean Water Act, DEQ must implement TMDLs to protect salmon spawning and rearing. 33 U.S.C. §1313(d)(1)(C).

Response
ODEQ was unable to complete the spawning period TMDL for Calapooya Creek. At this time, there is not enough data from within spawning time period to calculate a TMDL. ODEQ intends to complete this TMDL when resources and data allow. In the meantime, permits will need to be written to ensure that point sources do not contribute to water quality standards violations.

56. Commenter (1)
p. 4-22, Sutherlin discharge:
Is the Sutherlin discharge to Cook Creek for summer months in violation of the NPDES permit?

Response
Yes, DEQ and the City of Sutherlin are entering into an MAO to resolve this issue.

57. Commenter (1)
p. 4-22, Point sources in Calapooya:
How will point sources in the Calapooya be evaluated to make sure they comply with allocations?

Response
The waste load allocations will be incorporated into the NPDES permits. Point sources are required to submit Discharge Monitoring Reports to document compliance with the permit conditions. Therefore, the compliance with the permit conditions will ensure compliance with the WLAs.

58. Commenter (1)
p. 4-24, Time period for Allocations:
The text states that the allocations apply from June 1 through October 31. However, the spawning season for Calapooya Creek is May 15 through October 15. Please explain.

Response
The dissolved oxygen (DO) TMDL addresses the summer (non-spawning) listing only. There is inadequate information available at this time to properly address the DO listing during the spawning season. Allocations were assigned for periods when water quality violations were observed which may not necessarily be consistent with the spawning period designation.

59. Commenter (1)
p. 4-25, Margin of Safety:
One of the margins of safety states that the loading capacity during the critical period is conservative. However, TMDLs should be written to the critical condition, so this is not a margin of safety.

It is unclear how the following sentence is a margin of safety:
"The summer period TMDL is also conservative because it does not explicitly allocate loading above background loading."

It does not seem that this forms a margin of safety, especially when the background loading exceeds the numeric criteria for pH. The Oregon Standards do not allow allocations above background in that circumstance.

Response
Allocating to the critical condition leads to conservative allocations during the remainder of the allocation period. Allocating no anthropogenic loading above background is the most conservative allocation and does merit mentioning as a conservative assumption leading to an implicit margin of safety.

60. Commenter (1)
p. 4-26 Elk Creek Dissolved Oxygen TMDL:
It would be desirable to present and discuss data upon which the listings were based. Also though the pH listing is not shown in Table 4.14 it is discussed in the TMDL and data indicating that the stream is no longer impaired for pH is presented, there should be an explicit mention of whether this document is presenting a case of de-listing which can be done here or through the 303(d) listing process data collection. On the Integrated Report, does DEQ plan to change this listing to Category 3, a waterbody of potential concern?

Response
The document has been updated to address concerns. PH is being addressed by the TMDL.

61. Commenter (1)
p. 4-27; Water Quality Limitations and Seasonal Variation; paragraph 1:
"An intensive water quality survey in September 2002 indicated that the impacted reach extends from approximately the confluence with Hardscrabble Creek (RM 20.8) to the confluence with Pass Creek (RM 24.4). This reach corresponds to the area in and directly downstream of the city of Drain."

This statement appears to conflict with data presented in figure 4.10 on page 4-29, which shows impairment near the mouth of Elk Creek. This figure is isolated in the document with no text reference to explain the data presented in it. It would be helpful to put this data into context with the TMDL discussion.

Response
The synoptic study (Figure 4.9 in Final) was used to determine impacted reach. Since substantial data exists, a more refined DO standard was used the 8.0 mg/L presented in Figure 4.10.

62. Commenter (1)
p. 4-31; Excess Load:
"The current excess of SOD is 1.0 grams of oxygen / m2 / day from river KM 36.5 to 38.5 and the excess volatile solids load is 67% more than the loading capacity."
The above statement about needed load reduction appears to conflict with statements in the Load Capacity and Allocations sections stating a 40% reduction is needed.

Response
Excess load is defined in Oregon's TMDL rule as the current load minus the loading capacity. The two descriptions of loading are consistent. Going from 1.5 (loading capacity) to 2.5 (current) is a 67% increase. Going from 2.5 to 1.5 is a 40% decrease.

63. Commenter (1)
p. 4-32 Deer Creek Dissolved Oxygen TMDL:
It would be desirable to present and discuss data upon which the listings were based

Response
The information is presented on page 4-33 in the draft document.

64. Commenter (1)
p. 4-35; Allocations:
The statement in the first paragraph:
"No point sources of BOD were identified, so allocations focus on nonpoint source load allocations."
Conflicts with this statement from the second paragraph:
"Although the source assessment did indicate that point sources were a significant source of BOD,…"
It seems like the word "not" may be missing from the second quote.

Response
Correct. The document will be updated.

65. Commenter (1)
p. 4-41, Naturally high levels of pH.
These are relatively high natural levels of pH. This seems high.

Response
Due to low alkalinity and higher levels of nutrients in the headwaters of this system, predictions of natural pH are greater than the numeric criterion. No anthropogenic sources of nutrient loading were identified in the source assessment. See also Jackson Creek.

66. Commenter (21)
When configuring TMDLs and load allocations, DEQ should consider the direct and indirect correlations between different parameters. For example, an increase in sedimentation will cause an increase in water temperature, so DEQ should consider the sediment load allocations that would be required to meet both temperature *and* sediment TMDLs. Another example is the relationship between temperature and dissolved oxygen (DO). Temperature increases lower a waterway's ability to dissolve oxygen and also leads to increases in pH. Here, DO and pH are not only correlated to temperature, but since sedimentation also has a direct effect on temperature, it would be correlated to here as well. The TMDL discusses this relationship and identifies thermal loading as a pollutant, but does not include sedimentation in loading computations for DO and pH. See TMDL at 4-23, TMDL at 4-19.

Since sedimentation and temperature parameters are interrelated, sedimentation should be considered along side temperature as corollaries for DO, pH, and algae. One place where parameter relationships should be considered is Steamboat Creek Watershed DO and pH TMDL. The TMDL makes clear note of the fact that temperature affects pH and DO, stating that "[h]eat load allocations are necessary component to the pH TMDL and are described in the Temperature TMDL. These allocations will also insure future compliance with the dissolved oxygen criteria." TMDL at 4-41. While the Temperature TMDL does provide heat load allocations, those allocations are limited to meeting the temperature standards only. There is no discussion of the thermal loading allocations that would be required to meet pH or DO standards. For Steamboat Cree [sic], it seems DEQ is working from the underlying assumption that reductions for one pollutant will automatically meet standards in another, without actually providing any data as to the actual effects. While meeting the temperature standards may indeed reduce pH and DO to safer levels for salmon, DEQ should explicitly outline the causal relationship between the two to demonstrate how water quality standards will be attained. This is especially true for Cow Creek watershed, where "[t]hese [phosophorous] allocations rely on the implementation of the allocations in the Temperature TMDL." TMDL at 4-49.

Response
Cumulative effects of parameters were evaluated where ODEQ believed it was supported by data. Linking sediment targets to comply with DO and pH standards is technically infeasible because of the spatial variability of sediment and the complexities related to sediment delivery and transport. In Steamboat Creek, the temperature TMDL targets natural thermal potential temperature. Likewise the pH TMDL targets naturally occurring pH which depends on the temperature TMDL. Analysis to determine the impacts of further reducing temperature, is not a cost effective use of resources because the necessary temperature would be less than naturally occurring temperature. The causal relationship between temperature and dissolved oxygen / pH is described in general terms in the document and appendix. The specific relationship is much more complex and was quantified using the water quality model Qual2Kw. A description of this relationship would involve repeating the detailed mathematical explanation which can be found in the theoretical basis for the water quality model (see Pelletier, G. and S.

Chapra, 2005, Qual2kw User Manual (Version 5.1), Department of Ecology, Olympia, Washington).

67. Commenter (1)
p. 4-51; Margin of Safety:
Modeling the critical condition is a requirement for a TMDL. Therefore it cannot be used as a margin of safety

Response
Allocating to the critical condition leads to conservative allocations during the remainder of the allocation period. Therefore, it is a conservative assumption and there is merit in describing it as implicit margin of safety.

68. Commenter (1)
p. 4-51, Glendale WWTP WLAs.
The Glendale WWTP has a WLA of 3.1 lbs/day TP, higher than what they currently discharge, 2.8 lbs/day TP. Please explain

Response
WLAs are based on the assimilative capacity of the receiving stream, not on the current discharge. Therefore, Cow Creek can assimilate more phosphorus than is currently being discharged by Glendale at the point of discharge.

69. Commenter (15)
Roseburg Landfill Nutrient (i.e., phosphorous) Allocation (Chapter 4 of the draft documents)

Page 62, second paragraph: The last two sentences should be removed and replaced with: "Consequently, the Roseburg Landfill has no reasonable potential for exceedance and does not need a wasteload allocation for phosphorus."

The basis for this change is the discussion in the paragraph which concludes: "The reasonable worse-case loading would increase the concentration in the South Umpqua by 0.05 ugP/L. this change in concentration would not be measurable and would not adversely affect pH."

Therefore, the Roseburg Landfill is not a significant contributor of phosphorus pollution and should not need a wasteload allocation. Please remove it from Table 4.30 in Chapter 4.

We would be pleased to answer any questions you may have regarding the above comments, and appreciate your consideration of them. You may telephone Tom Manton at (541) 440-4255.

Response

The Roseburg landfill is not identified as a major source for either E. coli or phosphorus. However, it is given a waste load allocation in the TMDL. Its waste load allocation for E. coli is set at the standard and its waste load allocation for phosphorus is set at its current load which has no measurable impact on the South Umpqua River (see document). If no waste load allocation was given, a facility would not be able to discharge any of the pollutant

70. Commenter (18)
I believe that the livestock using the streams and river are major contributors to the nutrients and bacteria in the basin. We still have a lot of livestock using these waterways as their primary watering stations. Possible leakage from septic tanks is of very small concern compared to livestock.

Response
See response 13 above.

71. Commenter (1)
p. 4-64, Margin of Safety, South Umpqua River.
Please explain how using a 14-day average, 3-year low-flow condition is a margin of safety.

Response
Allocating to the critical condition leads to conservative allocations during the remainder of the allocation period.

72. Commenter(s) (16 and 13) Shoulder months
Commenter 16
Nutrient TMDLs
The "shoulder" month allocations are unwarranted The river is meeting pH criteria at every known sampling station above River mile 5 and since Roseburg got the biggest allocation during the shoulder month period, the argument that there's some sort of cumulative effect does not seem logical.

Commenter 13
Shoulder Months:
The South Umpqua River from river mile 15.9 to 57.7 is not listed on the 303(d) list for pH, Aquatic Weeds or Algae for the Spring/Winter/Fall. The shoulder months (May, June, October) load allocations should be removed from the facilities between these river miles.

The "Shoulder season loading analysis graph showing compliance with the maximum pH target" (figure 109 on page 95 of appendix three) predicts the river will hit the pH target of 8.8 in June and October and exceed the water quality standard of 8.5 in May after the phosphorus loadings are reduced to allocation limits. **The predicted outcomes are actually worse than the current conditions according to available lab data. (No**

sample taken above River mile 5 has shown a PH over 8.6 and there was only one sample over 8.5 in almost 200 samples)

DEQ's decision to provide shoulder month allocations for the months May, June and October when there were reported violations in March and November is based on DEQ's conclusion the other violations were rare (<10%). The fact of the matter is that only 6 out of 47 samples (12.7%) exceeded the limit of 8.5, three of the six exceedences were below the new "target" of 8.8, and there was only one exceedence in May and one exceedence in October. The same justification for not including November and March should also be good for May and October.

The shoulder month analysis used the first day in October and the last day of June for their model calculations. This effectively added two days to the critical season analysis and two months to the allocations.

Response
The violation of the pH standard at river mile 5 during the shoulder months is sufficient to set allocations to upstream sources. The assimilative capacity of the river varies along its length, so simple comparison of allocations is not illustrative.

There is not sufficient data to substantiate the claim that predicted TMDL condition is worse than current upstream of river mile 5 during the critical condition of the shoulder season months.

The decision to provide shoulder month allocations is based on the observed daily maximum pH greater than the standard and TMDL target between the months of May and October (Tanner and Anderson 1996). Since pH varies throughout the day, the grab sample data is not always the best indicator of water quality conditions.

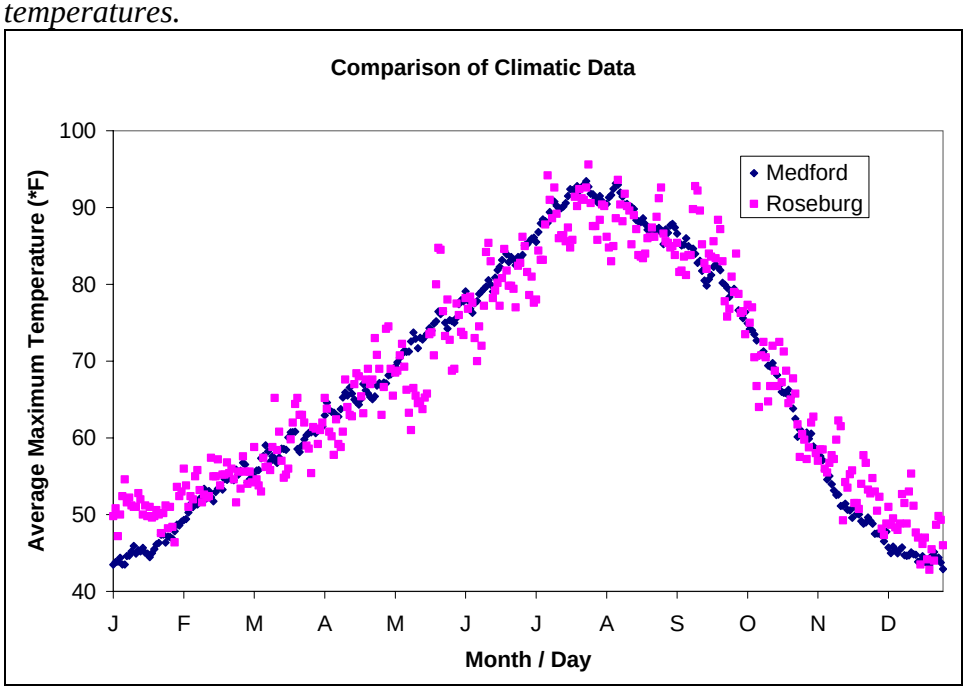
The first day in October and the last day of June were chosen to provide conservative allocations for those months.

73. Commenter (16, 13)
Commenter (16)
DEQ’s decision to substitute Medford weather data for Roseburg data was unnecessary and inappropriate. (Medford gets 18 inches of rain while Roseburg gets about 35 inches of rain.

Commenter (13)
Air temperature data information from Roseburg, instead of Medford, should have been used for all analysis.

Response
Climate data (i.e. average conditions over many years), rather than weather data (i.e. observed conditions), was used in the model for the shoulder season analysis. Daily climate data from the Roseburg airport is computed from weather data collected from

1997 through 2002 while in Medford the record extends back to 1928. Since the Roseburg station has a shorter record, the climatic data showed significant day to day variability (see figure below, data from Oregon Climatic Service). There does not appear to be significant differences in the trends of May, June, and October temperatures.



74. Commenter (16, 13, 8, 9)
Commenter (16)
The most confusing outcome of the shoulder month analysis is that, even though the TMDL document says that the assimilative capacity of the river increases as the temperature of the river goes down and the flow velocity goes up, the analysis actually shows assimilative capacity going down as the temperature of the water is going down and the flow velocity is up when expressed as lbs of phosphorus per cubic meter flow in the River. (Look at the shoulder month allocations on page 4-62 of the TMDL and the flow data used for the shoulder season analysis as found in table 36 on page 93 of appendix 3.)

I would also like to request that any final Nutrient allocations be **flow based** like the bacteria TMDL allocations rather than time based as the current ones are. I would also like to see that any flow based allocations reflect the increased assimilative capacity of the water due to lower temperatures and increased velocity.

Response 74a
The water quality model does not account for any potential periphyton limitation or enhancement based on flow velocity, so the computed loading capacity is not dependent on flow velocity. The impact of temperature on pH predictions is complex because the impact of temperature on pH is non-linear. In addition, temperature can impact all phases of the nutrient cycling and periphyton dynamics. The rate at which temperature impacts parameters (know as "temperature correction") controlling nutrient cycling, periphyton dynamics and pH is suggested by the developers of the model and informed by the literature. The temperature correction was corroborated through calibration of the model to two mid-summer sampling events with very warm, and similar, river temperatures (see Appendix 3, table 32). These correction factors were used to determine the rates during the shoulder season. Unlike dissolved oxygen, the pH predictions do not show much sensitivity to changes in temperature. Hence, most of the predicted increase in assimilative capacity is from dilution.

Commenter (13)
Flow-Based Permitting:
We support **flow proportional discharge permits** that do not have arbitrary seasons. The WLA should be based on river flow rather than season based, similar to other permits in the state

Commenter (8)
Tri-City supports flow proportional discharge permits that do not have arbitrary seasons included, but are based on the actual river flow of the South Umpqua. In addition, we support using the monthly average for determining the wasteload allocation. We believe that this methodology will attain the same goal that is currently expected during the shoulder months, while giving operators needed flexibility in the operation of the wastewater facility. Flow proportional discharge limits are being used in treatment facilities for McMinnville and Woodburn and appear to be working quite well.

Commenter (9)
To this end, the City supports a flow proportional discharge permit that is not attached to arbitrary seasonal times, but is based on the actual flows in the receiving stream. In addition, the City supports the Department's monthly average for determining the wasteload allocation. It is important that the Department recognizes that this methodology will attain the same goal that is currently expected during the shoulder months, while giving operators needed flexibility in the operation of our facility. Flow proportional discharge limits are being used in other treatment facilities in the State and appear to be working quite well.

In conclusion, we strongly urge the Department to reconsider a flow-based approach to discharge limits using a monthly average and to reconsider the impact of non-point source pollution reduction as a way of creating additional wasteload allocations to the majority of the population.

Response 74b
The document has been updated to include flow proportional wasteload allocations which have replaced the "shoulder season" analysis.

Commenter (16)
While the shoulder month allocations have been my primary focus of concern and frustration with this document, I would like to thank DEQ for including the shoulder month allocations in at the last moment. Had the shoulder month allocation not been included I would have not had real current data to compare to predicted outcomes from the model and I would not have been able to validate my concern that there is something wrong with either the model,(not the best choice for our river) or with the set up of the model. I believe that there were either errors in setup or the model was not the best choice for this TMDL (or both). My specific concerns are as follows: [see below]

Response 74c
ODEQ believes that this model is appropriate as discussed in detail in the document. No specific concerns about the mathematics or theory behind the model framework have been raised.

Commenter (16)
The Qual2K model has apparently not been used for any other TMDL in Oregon (I searched for *Qual2K* on the DEQ website and the only hit was in the Umpqua TMDL documents) and has been subject to many revisions the last one being in March of 2006 (after this TMDL was released). While frequent upgrades of computer software and video games is usually a good thing, I am suspicious of any model that upgrades frequently, especially when other EPA models are available that are used frequently and haven't needed an update in several years (WASP).

DEQ calibrated the same model to the same observed conditions two times and got significantly different results, the most significant being the background or natural pH dropping from 9.3 to 8.8. While my conversations with you (DEQ) via e-mail seems to indicate that a 5 fold change in the hydrogen ion concentration doesn't seem to be a significant change to DEQ, I am sure that chemists and other modelers might disagree with that conclusion.

Response 74d
Improvements to the calibration of the model were made by changing the parameters which impact periphyton and nutrient dynamics. The intent of calibration and corroboration is to improve predictive capability.

Commenter (13)
There have been dissimilar allocations on previous Draft TMDLs. The Draft October 2001 TMDL gave Winston-Green WWTF a Wasteload Allocation (WLA) for Dissolved Reactive Phosphorus (Ortho-Phosphorus) of 4.2 lb/day at a River Discharge (cfs) < 150 cfs versus a 1.8 lb/day Inorganic P for the months of July, August, September in the

current Draft TMDL. The point sources should be allowed an opportunity to have an independent model scenario completed.

Commenter (16)
Several factors used to calibrate the model are outside the range recommended by the creators of the model.

Response 74e
Some of the factors were based on field measurements which is preferred over using recommended or literature values.

Commenter (16)

I have concluded that non-point source discharges are under represented in this model. Although the current non-point source phosphorus for the South Umpqua has been calculated by DEQ to be 2.4 lbs the "background" loading on the South Umpqua at Days creek is 1.9 lbs and the total "non-point "source loading when you multiply the inorganic phosphorus concentrations of the various streams feeding into the South Umpqua times the flows plus the background loading from cow creek, you get a number significantly larger than 2.4 lbs) (The background loading from cow creek alone is 2.4 lbs.) While the TMDL seems to ignore the background loading from Cow Creek in their model as non-point source contribution to the South Umpqua there is no indication that non point source discharges directly (or indirectly in the case of septic tanks) were included in this analysis.

Response 74f
Nonpoint sources are represented correctly in the model. Background concentrations from tributaries other than Cow Creek, the model headwaters and diffuse sources were estimated at 5 ug/L of inorganic P (Table 4.29). The total flow from tributaries/headwaters is 2.15 cms and from diffuse sources is 0.4 cms (Appendix 3, tables 25 and 29). This equals a nonpoint source background inorganic P loading of 2.4 lbs / day not considering Cow Creek (as reported in Table 4.30). Cow Creek was considered separately because it has point and nonpoint sources. The same water quality model was used to predict background conditions on Cow Creek and set allocations for Cow Creek (see pages 4-43 though 4-51). The model predicts that at the mouth of Cow Creek, under background conditions, the inorganic P concentration is 2.2 ug/L and a flow of 1.27 cms. This equals a load of background load of 0.53 lbs / day of inorganic phorphorus entering the South Umpqua River. The South Umpqua load allocation does not include this load because it is a result of allocations in Cow Creek. These loads are fully accounted for in the model. The load leaving Cow Creek is less than the load entering Cow Creek because periphyton store nutrients. Nonpoint sources discharging directly into the South Umpqua River are accounted through diffuse sources.

Commenter (16)
I would like DEQ to run the same data through a different model, one which has not gone through several "updates" over the past couple years and one which has been used in Oregon before to see what changes occur in predicted outcomes. (It should be noted that I am not sure that running a different model will change the outcome from one of the two model runs done previously with Quak2K, I am pretty sure that it will either come close to one of the two model runs or it will come up way different.)

Response 74g
DEQ believes that this model and its application to the South Umpqua River are appropriate as discussed in detail in the document. No specific concerns about the mathematics or theory behind the model framework have been raised. If there continue to be concerns with the TMDL, sources may wish to complete additional modeling prior to the issuance of their permits.

75. Commenter(s) (16, 13)
Commenter (16)
If DEQ feels that another model run is not appropriate for the South Umpqua TMDL then I would request that a **Use Attainably** Analysis be performed to determine if the goals set forth in the Nutrient TMDL are obtainable according to EPA criteria (which includes a cost benefit analysis).

Commenter (13)
There should be an **Attainability Analysis** completed prior to the implementation of the TMDL.

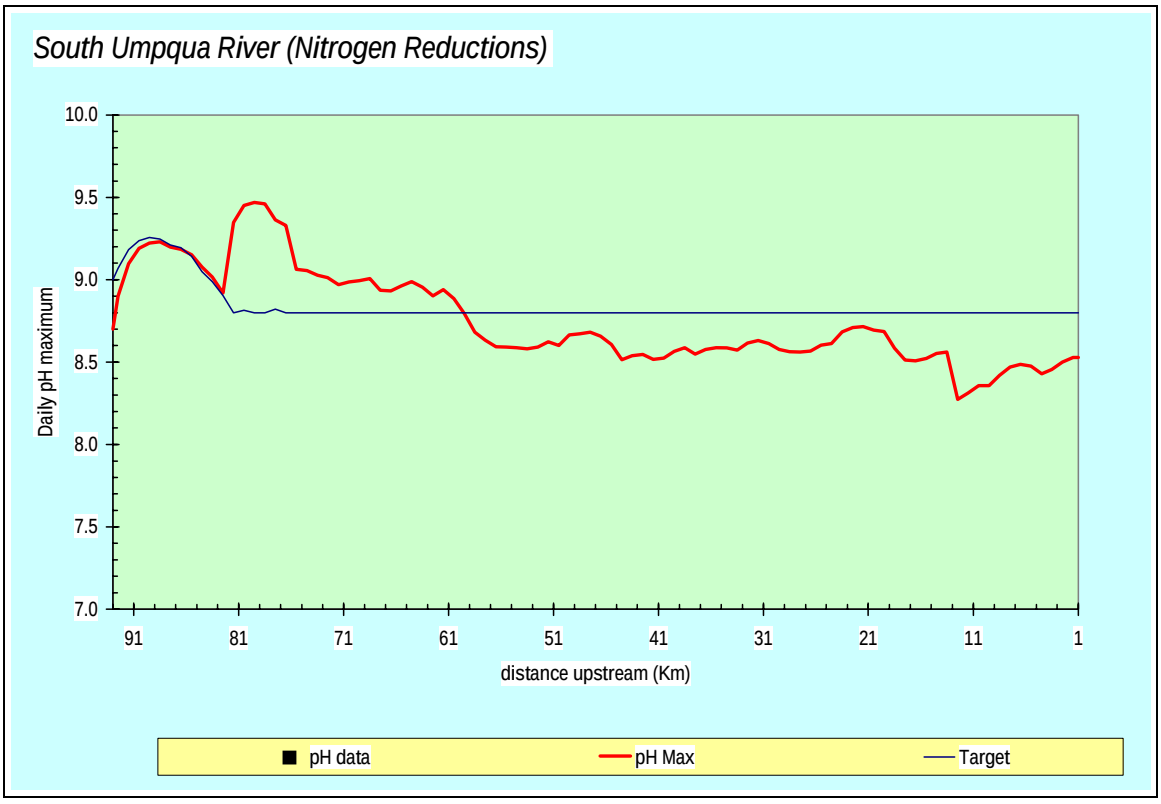
Response
Federal water quality regulations include provisions for the development of site specific criteria or the removal of designated, but not existing beneficial uses. However, analysis is required to demonstrate that all feasible measures have been taken to meet existing water quality standards before such standards modification occur. ODEQ does not anticipate development of use attainability analyses in the near future. UAA are not viewed as an appropriate remedy to the inability to meet water quality standards. Approval of UAA will require concurrence of a number of federal agencies and ODEQ believes this process needs to be established by these agencies before ODEQ undertakes this responsibility.

This TMDL lays out the necessary measures to protect water quality for salmonids which are an existing beneficial use. The Oregon Department of Fish and Wildlife gathered the information used to establish spawning areas and dates in the Umpqua Basin. This data indicates that spawning in the lower South Umpqua is an "existing use" that cannot be removed through a Use Attainability Analysis. 31 fall Chinook were radio tagged in 2001 and 72 fall chinook in 2002. Tracking these fish shows that many ascend into the South Umpqua/Cow Creek subsystem, but that a substantial proportion of spawning Chinook use the lower South Umpqua and the mainstem Umpqua.

76. Commenter (16)
The South Umpqua point sources have asked for an analysis as to what type of Nitrogen removal would be required to accomplish the goals established by the Nutrient TMDL. We have yet to get a response from DEQ. I would like to see an analysis as to what type of Nitrogen removal would be required by the TMDL in lieu of phosphorus removal and an evaluation as to possible combinations of Nitrogen removal and phosphorus removal might be available to achieve the reductions required by the TMDL.

There is significant evidence that the pH upstream of the RUSA WWTP, the Winston Green WWTP and the Canyonville WWTP frequently exceed summertime pH criteria (These are the sites and data used to list the River on the 303(d) list). Since the site above Canyonville was used to determine what the background loading for the river is and that the reduction in non-point source loading is anticipated to be only 15%. I was wondering what specific changes in pH could be expected during the summer months upstream of my plant (RUSA) and what the upstream concentration of inorganic phosphorus is expected when the allocations are implemented.

Response 76
Even if all sources were reduced to background loading concentration of nitrogen, the pH target would not be achieved (see figure below). The South Umpqua River is phosphorus limited under background loading conditions. Eliminating sources of nitrogen would cause the South Umpqua River to switch from phosphorus limited nearer the headwater and nitrogen limited nearer its mouth. However, in the transition zone, the model predicts an increase in periphyton activity causing exceedances of the pH standard.



During the critical period, the pH upstream of RUSA is predicted vary daily between 8.1 and 8.3 and the inorganic phosphorus concentration to be 4 ug/L.

Commenter(s) (13, 8, 9)
Commenter (13)
The United States Geological Survey has indicated there are some unidentified nutrient sources. Roseburg Forest Products has a large on-site sewage disposal system that is contributing to the nutrient budget within the South Umpua River. Non-Point sources should be held accountable for reducing their respective contributions to the pollution problem.

How low do the nutrient concentrations need to be to stop the water quality violations when the violations occur upstream of the point-sources?

Commenter (8)
It is also our contention that non-point sources should be held accountable for reducing their respective contributions to the pollution problem. A greater discharge of phosphorous comes from unknown sources above Riddle on Cow Creek, the agriculture community and State forest lands.

Commenter (9)
It should also be noted that a greater discharge of phosphorous comes from non-point sources such as an unknown area above Riddle on Cow Creek, the agriculture community and State Forests. It is our passion that non-point sources should be held accountable for

reducing their respective contributions to the pollution problem through the existing regulator structures.

Response
As part of the TMDL development process, ODEQ sampled the river upstream end and the downstream end of the reach referred to by Commenter 13. At the time of sampling, the nutrient concentrations did not change and did not indicate a non-point source pulse of nutrients. As part of the TMDL implementation process, ODEQ will continue to work with DMAs using available means to identify and reduce loads from non-point sources. Employment of best management practices combined with monitoring to determine effectiveness is part of the implementation process.

78. Commenter (16)
I would like some detailed information why 4 different approaches were used to address 4 different streams in the same area (South Umpqua, Deer Creek, Elk Creek and Calapooya Creek). The response I got when I asked the question before was that it was "what the data showed us." I would like more specific information such as what specific differences, other than point sources were not really an issue in any of the models except the South Umpqua TMDL, led to the different choices of strategies.

Response 78a
The same strategy was used to determine the TMDLs: data collection and water quality modeling. This strategy led to the determination of different pollutants. Deer Creek was the only TMDL to address spawning period dissolved oxygen violations. The pollutant was determined to be bio-chemical oxygen demand (BOD). Therefore, the TMDL sets allocations for BOD.

The three other water bodies (South Umpqua River, Elk Creek and Calapooya Creek) had TMDLs developed to address concerns during the summer and relied on the same water quality model: Qual2kw. Through modeling and data analysis it was determined that the pollutant(s) for the South Umpqua River: phosphorus, for Elk Creek: organic solids, and for Calapooya Creek: phosphorus and organic solids. The South Umpqua River TMDL development shows large swings in daily dissolved oxygen and pH (Figure 4.28) with the daily mean at or above saturation. These swings are caused by periphyton dynamics which is encouraged by anthropogenic loading of phosphorus.

Calapooya Creek has similar conditions (Figures 4.3 and 4.4) with the exception at the Oakland Drinking Water Intake site. At that site, the daily mean DO is less than saturation indicating an addition oxygen demand beyond that of periphyton dynamics. The water quality model shows that a modest sediment oxygen demand (SOD) along with periphyton growth could account for the observed DO. The pollutant associated with SOD is settable organic solids.

Lastly, DO concentrations, i.e. Elk Creek at Hayhurst Road Bridge (Figure 4.8), are below saturation and show minimal daily fluctuation. Again, the water quality model

showed that a modest SOD could account for the observed DO concentrations and the pollutant was determined to be settable organic solids.

Commenter (16)
The Elk Creek and Calapooya TMDLs call for a reduction sediment oxygen demand through a reduction in volatile solids loading that will take place during bacteria reductions called for in the Bacteria TMDLs . Since 95% or better of oxygen demand is exerted during the first 5 days after volatile solids are deposited in a stream, I was wondering how the sediment oxygen was going to be reduced when no reduction in summertime bacteria loading is called for in the bacteria TMDLs?

I would like to also state that my questions and concerns about the nutrient TMDLs are not intended to get an increase in allocations for the point sources, but are intended to insure the TMDL is accurate and provides the beat [sic] opportunity for us to realize water quality improvements in our basin.

Response 78b
Sediment oxygen demand (SOD) is a function of decay rates (as stated in the comment) and mass. Simply examining decay rates is not illustrative. Since the comment does not include how the rate of decay was estimated, it cannot be evaluated. The SOD in Elk Creek was estimated through calibration of the water quality model. The determined SOD rate was estimated to be 2.5 g/O2/m2 (2.0 g/O2/m^2 is a value typically measured in Oregon water bodies). It is a reasonable assumption that elimination of upsets at the Drain waste water treatment plant located directly upstream of this reach and reductions in wet weather nonpoint source organic loading resulting from the bacteria TMDL, will lead to the modest reductions in SOD necessary to meet water quality standards during the summer. A dynamic model which traced organic material in the water column and sediment over the course of a year would be necessary to evaluate the exact allocations of organic matter in time and space. This level of effort is not appropriate at this time given that the resulting allocations will likely not require action beyond that which is already required by the bacteria TMDL. If after implementation of the bacteria TMDL, DO concentrations have not improved in the referenced reach, additional sampling and analysis will be necessary to determine more refined allocations.

79. Commenter (13)
Do we know this TMDL will improve the water quality of the South Umpqua River?

Response
This TMDL is based on a large amount of data collected by the USGS and ODEQ, the analytical tools used to determine allocations were appropriate, ODEQ staff have been trained in the use of the tools, and similar efforts have resulted in dramatic water quality improvements (e.g. the Tualatin TMDL). This information is the basis for the conclusion the TMDL will improve water quality. ODEQ's best predictions are that the daily maximum pH is going to drop from 9.7 to 8.7 under critical conditions at the South Umpqua River at Melrose Bridge and the daily minimum DO is going to increase from 6.2 to 7.0 mg/L. There will be also an 85% reduction in the amount of attached algae at

this site. Currently, 91% of the South Umpqua River has daily maximum pH greater than 8.8. Under TMDL conditions this will drop to 8%.

80. Commenter (13)
Phosphorus Limits:
We recommend phosphorus limits be expressed as a monthly average limit. These load allocations need to be allocated fairly between all sources of pollution. Anthropogenic, groundwater and background non-point sources of phosphorus should be investigated further with additional testing.

Response
WLAs will be converted to monthly and daily limits using a statistical method which is based on the variability of the effluent, the probability basis, and a confidence interval.

81. Commenter (13)
There is an error on Pg. 4-61, critical flow period is July-September, shoulder months are May, June, October.

Response
The document has been updated.

82. Commenter (13)
All of the point sources with NPDES permits on the South Umpqua River Basin need to be referenced in the TMDL.

Response
In the draft, all NPDES permit holders with permits to discharge are identified except holders of NPDES stormwater general permits. We believe it is not necessary to include the list of stormwater permit holders in the Umpqua Basin. In addition, the list of NPDES stormwater permit holders is large and changes often. Currently there are 135 holders of NPDES stormwater permits in the Umpqua Basin. Interested persons can go to the ODEQ Website below for current permit information:
http://www.deq.state.or.us/wq/wqpermit/wqpermit.htm

83. Commenter (13)
We support water quality trading as a tool to achieve water quality goals. We should explore, with DEQ, how trading can be used as a tool to accommodate growth within the basin.

Response
ODEQ agrees that trading can be an important planning tool in this and other basins. We will be pleased to discuss trading options at any time. There are more opportunities for trading with some parameters like temperature than for other parameters like phosphorus. Please see the DEQ's Water Quality Trading Internal Management Directive (January 2005) at http://www.deq.state.or.us/wq/wqPolicy/WQIMDTrading.pdf

84. Commenter (1)

p. 6-7; Paragraph 3; Sentence 2:

"…J.C. Headwaters estimated that 8.5 kg/year was introduced through the use of artificial baits."

Looking at Table 6.5 on page 6-9 it seems that this refers to total phosphorus. That should be stated if it is the case. The sentence should also discuss the estimated amount of nitrogen being introduced through fish bait to the lake.

Response 84a
The document has been edited to include total phosphorus and nitrogen inputs from fish bait.

p.6-11; Model Simulation; Bullet 7
"Sensitivity analysis showed that…"
This bullet refers to material that has not been previously discussed in the TMDL such as studies at East Lake and the previous rotenone treatment. It would be desirable to explain these things in the text of the TMDL.

Response 84b
The document has added text to direct the reader to additional information available on studies and previous rotenone treatment.

p.6-12; Load Allocations; Table 6.7
The allocations for fish bait are substantially higher than the current estimated loads. (Nitrogen: 85 kg/yr current load to a 254 kg/yr LA = 199% increase; Phosphorus: 8.5 kg/yr current load to a 70 kg/yr LA = 724% increase). It seems like this might be a typo, but if it is not, what is the rationale for this high load allocation for fish bait?

Response 84c
The fish bait loading rates increase from current levels due to an anticipated increase in angling effort/hours to near 1975 levels. The fish bait loading rates reflect 1975 values extracted from table 16, page 54 in the appendix for Diamond Lake. Additional text has been added to the TMDL to clarify the sources and amounts of nutrients.

85. Commenter (14)
Diamond Lake Restoration
Diamond Lake lies upstream of the Project. PacifiCorp actively supports the current efforts to achieve long-term improvements in the lake's water quality. As discussed with DEQ, However, PacifiCorp is concerned that, in the short term, these efforts could increase the downstream loading of nutrients and other pollutants to Lemolo Lake and other Project waterbodies. This, in turn, causes PacifiCorp to be concerned that it might be held responsible for any resulting adverse effects.

Neither the draft TMDLs nor the draft Water Quality Management Plan (WQMP) addresses the potential downstream water quality effects of the efforts to restore Diamond Lake and to achieve the proposed Diamond lake Aquatic Weeds and pH TMDL (ch.6). PacifiCorp believes that the Umpqua TMDLs should at least evaluate the potential for downstream water quality effects resulting from the eradication of tui chub and other aquatic life in the lake. If such an evaluation has been performed, it should be referenced in the TMDL. Otherwise, the efforts to restore the lake could inadvertently create water quality problems downstream, including within the Project. If such downstream effects are reasonably likely, the TMDL should include provisions to prevent or correct those effects.

In addition, PacifiCorp appreciates DEQ's willingness in past discussions of this issue to consider how PacifiCorp's concerns regarding its responsibility for any adverse effects could be allayed. In your December 2, 2005 email to PacifiCorp, you pointed to a statement in DEQ's internal management directive for TMDL implementation: "Entities required to submit a TMDL Implementation Plan are not responsible for pollution arising from land management activities that occur outside of their jurisdictional authority." Although this provision is not strictly our concerns, as well as any concerns of other point or nonpoint sources downstream of Diamond Lake. For example, the final Diamond Lake Aquatic Weeds and pH TMDL could include a statement such as the following:

Any downstream pollutant loadings or adverse water quality conditions resulting from the restoration, management, or use of Diamond Lake that are not addressed in this TMDL or another Umpqua Basin TMDL will be addressed through a future TMDL in establishing such a TMDL or TMDL revision are that downstream sources would not be held responsible for correcting water quality problems caused by additional pollutant loadings resulting from the efforts to restore Diamond Lake.

PacifiCorp recognizes that DEQ cannot make a binding commitment regarding a future TMDL or TMDL revision. The proposed language, however, would help to allay somewhat the concerns of PacifiCorp and other downstream sources by setting forth DEQ's intentions and expectations.

Response
The Diamond lake FEIS, of which ODEQ was a cooperating agency, addresses monitoring and water quality sampling plans to assess any impacts on water quality relative to the Diamond Lake restoration process. The TMDL has been modified to reference that information.

Future TMDL iterations for the Umpqua Basin would address unforeseen downstream adverse water quality conditions related to the Diamond Lake restoration with the intent that downstream affected entities and parties would not be held responsible for correcting water quality problems caused by excess additional pollutant loadings from upstream activities such as the Diamond Lake restoration activity.

86. Commenter (1)
We recognize that while the Draft Water Quality Management Plan is being developed by DEQ as part of the TMDL process, the Plan builds on components developed by groups and agencies who have related management responsibilities and authorities (designated management agencies, DMAs). Therefore, EPA's comments on this Plan are directed not only to ODEQ, but also toward the applicable DMAs.

Response
So noted.

87. Commenter (14)
Designated Management Agency
The draft WQMP describes PacifiCorp as a "designated management agency." *See* Draft WQMP, table 7.6 at 7-57 to 7-58. PacifiCorp is also the *only* private entity listed as a "Responsible Participant." *See id.* At 7-55. although these designations do not appear to impose any additional obligations on PacifiCorp, PacifiCorp is concerned that the designations are inaccurate and inadvertently give a misleading impression of the relative influence of the North Umpqua Hydroelectric Project on basin water quality.

DEQ's TMDL rules define a "designated management agency" as "a federal, state or local government agency that has legal authority over a sector or source contributing pollutants.

OAR 340-042-0030(2). PacifiCorp is not a government agency and has no regulatory control over other sources. Therefore, it should not be listed as a designated management agency in table 7.6 or elsewhere. Moreover, expressly listing only PacifiCorp, and no other private entity, as a "Responsible Participant" could unintentionally suggest that PacifiCorp is the primary private source of water quality problems in the basin.

PacifiCorp is fully committed to working with DEQ and other entities in the basin to improve water quality and fully committed to implementing its obligations under the North Umpqua Settlement Agreement, the FERC license, and the section 401 certification. PacifiCorp respectfully submits, however, that the specific references to it on pages 7-55 through 7-58 of the draft WQMP are inappropriate and should be deleted.

Response
The comment is correct and the reference to PacifiCorp as a Designated Management Agency has been corrected.

Since the draft TMDL was released, ODEQ's final 2004-2006 303(d) list has been completed and released to the public, and the listings related to the hydropower system and its operation have been moved from Category 5, TMDL needed, to Category 4, Water Quality Limited, Other Control Measures in Place. There will be no TMDLs developed for these former listings, and PacifiCorp will not be listed as a Responsible Participant in the final version.

88. Commenter (21)
The WQMP should establish more clearly what regulatory mechanisms exist and will be applied to ensure that appropriate control actions are taken, and must include adequate authority for intergovernmental cooperation. CWA, § 303(e)(3)(E). The CWA explicitly states that TMDLs must include adequate authority and implementation. CWA, § 303(e)(3)(E) and (F). Management under these authorities has proven ineffective in protecting water quality. The TMDL and WQMP, however, rely on them for implementation purposes. The WQMP expressly relies on these authorities to provide reasonable assurance of implementation. The DEQ relegates monitoring of best management practices and management actions to DMAs. Therefore, the power to make

changes, where necessary, is taken away from DEQ and instead retained by the agency charged with the implementation of the particular law. Thus, the DEQ sacrifices its authority to ensure attainment of water quality standards by relying on these authorities. This approach ignores the flaws in these management authorities and also fails to place the burden of attainment of water quality standards squarely on the TMDL and WQMP. Reliance on these regulatory mechanisms for implementation of the TMDL is tantamount to a failure to attain water quality standards.

Response
Primary authority for water quality implementation on agricultural lands resides with the Department of Agriculture based on what is commonly called Senate Bill 1010, the Agricultural Water Quality management Area Planning statute (ORS 568.900 – 568.933). Primary responsibility for meeting water quality standards on forest land resides with the Department of Forestry through its Forest Practices Act.

If implementation by these agencies is ineffective, ODEQ has authority to petition the Board of Agriculture or the Board of Forestry for changes to improve water quality.

89. Commenter (1)
p. 7-19 to 7-49; Partnerships for the Umpqua Rivers Action Plan Recommendations:
This is a wonderful tool for restoration of private ownership lands in the Umpqua Watershed. It is clear that a great deal of work and stakeholder participation went into this project. The breakdown of specific implementation actions needed in each subwatersheds will be helpful for improving water quality. In particular, the detail in the Deer Creek implementation section takes good steps to assess sources and restore beneficial uses.

It would be helpful if the following terms were clarified in the document:
Percent canopy cover is used throughout this section. The figure on page 7-24 talks about percent canopy cover over the stream. Does percent canopy cover in the rest of this section refer to percent canopy cover over the stream as well?

Throughout this section the amount of canopy cover used as a target is 50%. The TMDL allocations from effective shade vary by location. Is the intent to eventually integrate in the TMDL allocation to this tool?

Throughout this section the size of the riparian buffer is described in relation to trees. Is this measure based on tree height or tree canopy diameter? It would be good to clarify.

pp. 7-56 to 7-70; Tables 7.6 through 7-8
This is very useful information.

Response
In the Partnership for the Umpqua River (PUR, formerly Umpqua Basin WSC) documents, the term "percent canopy cover" always means percent canopy cover over the stream.

To our knowledge, the PUR has no plans to update or change the assessments and the organization does not want to be part of the regulatory process.

Relative to the question about the description of riparian areas in terms of trees, the measure does not incorporate tree height or tree canopy but simply indicates how many rows of trees there are along the streambank.

90. Commenter (1, 20)
Commenter (1)
p. 7-74; Reasonable Assurance; Non-Point Sources; DMA: Oregon Department of Forestry; paragraphs 1& 2:

The preponderance of monitoring, assessment and research efforts demonstrate that Oregon's existing forest practices rules are not likely to adequately protect water quality or recover fisheries. The December 2000 ODEQ/Oregon Department of Forestry (ODF) Temperature Sufficiency Analysis found that there are water quality impairments due to forest management activities even with Forest Practices Act (FPA) rules and BMPs in place. An October 2002 ODEQ/ODF Temperature Sufficiency Analysis indicates that for some medium and small streams current riparian management area prescriptions for Western Oregon may result in short-term temperature increases. In addition, EPA analysis of the data from the ODEQ/ODF shade study demonstrates that harvest allowed under the FPA in Riparian Management Areas (RMAs) can significantly reduce shade below the levels necessary to achieve DEQ temperature TMDL load allocations for Westside streams. With respect to protecting beneficial uses such as salmonid spawning and rearing habitat, the September 1999 Independent Multidisciplinary Science Team (Technical Report 1999-1) found that the OR Forest Practice rules (including riparian buffers) are not adequate to protect depressed stocks of wild salmonids.

The Umpqua Basin TMDL covers lands within Oregon's Coastal Nonpoint Management Area under CZARA 6217. EPA and NOAA made a determination that additional management measures are needed to strengthen Oregon's forest practices with respect to several areas critical to water quality protection. Critical areas include harvest in high risk, landslide prone areas, riparian protection and cumulative effects. These concerns were reiterated in EPA's testimony on the Oregon FPA rulemaking to the Board of Forestry in 2004 and 2005.

We encourage ODEQ to work with ODF to initiate Umpqua Basin specific forest practices rule changes (under OAR 629-635-0120 Watershed Specific Practices for Water Quality Limited Watersheds and Threatened and Endangered Aquatic Species) if the Statewide FPA rulemaking process is unable to adequately address riparian, landslide, and cumulative effects issues. We continue to support the use of voluntary measures that provide greater protection than the FPA rule requirements. We believe that a combination of strengthened regulatory measures and voluntary measures will be needed to ensure that forest management practices in Oregon meet TMDL targets and water quality standards.

Response
As mentioned in the comment, ODF and ODEQ completed Forest Practices Act Sufficiency Analysis (Sufficiency Analysis) in October 2002 pursuant to our 1998 Memorandum of Agreement. The Sufficiency Analysis identified a series of recommendations to highlight general areas where current forest practices could be improved in order to better meet the goals and objectives of the Forest Practices Act and in turn provide added assurance of meeting water quality standards statewide.

Since July 2003, the Board of Forestry has been considering possible riparian rule revisions and voluntary measures that take into account recommendations from the Sufficiency Analysis, the advisory committees and the IMST, as well as additional recommendations from Oregon Department of Fish and Wildlife (ODFW), ODEQ, and other stakeholders. ODEQ has been working closely with ODF during the rulemaking process and has encouraged the Board of Forestry to continue to consider the riparian rulemaking as a priority.

ODEQ plans to continue working with ODF and the Board of Forestry for formal rule adoption of their proposed riparian protection rules. At this time, ODEQ is not recommending to our Environmental Quality Commission to petition the Board of Forestry to consider developing a Forest Practices Basin Rule for the Umpqua Basin. Rather, we encourage ODF to develop and conduct BMP effectiveness monitoring as funds allow to better refine loading estimates from the forested landscape. Further, because there are uncertainties associated with the effectiveness of FPA measures along small streams as mentioned in comments, ODEQ continues to encourage ODF to work with land owners to implement voluntary measures to further control heat loading.

Commenter (20)
Under current Oregon Revised Statues, a forest operator conducting, or in good faith proposing to conduct, operations in accordance with best management practices is considered in compliance with State water quality standards. Reliance upon the Forest Practices Act best management practices to comply with the water quality standards provides a valuable service to the forest landowner by ensuring a measure of regulatory certainty, while also providing a mechanism for adaptive management to occur under the auspices of the Board of Forestry and Environmental quality Commission processes. As a designated management agency, the ODF is committed to continuing to work with the DEQ to ensure the best management practices under the Forest Practices Act continue to meet water quality standards to the maximum extent practicable, and to utilize such best management practices as the TMDL Water Quality Management Plan for non-federal forestlands.

As described in the comments submitted on previous draft TMDLs (see attached), there continue to be significant technical issues with the TMDL process and methodology in general, many of which apply to the Umpqua Basin. The DEQ is also encouraged to consider a reexamination of the water quality standards, specifically related to temperature, as there continues to be substantial concerns over the technical credibility

and feasibility of the temperature standard and associated criteria. The resolution of these issues would help to better ensure a TMDL process that would gamer a greater level of understanding, acceptance and support among the range of stakeholders in the Basin.

Finally, given the recognition of the Forest Practices Act as the current statutory and policy framework for meeting water quality standards on non-federal forestlands, the ODF is supportive of the implementation plan for non-federal forestlands included as part of the Water Quality Management Plan. ODF is also committed to continuing to engage in substantive discussions with DEQ staff regarding TMDL model assumptions and possible water quality standard revisions that give more consideration to current scientific understandings of the dynamic nature of forest ecosystems.

Response
Modeling for temperature TMDLs in general focuses on larger streams where fish use is more common. Modeling the first and second order streams have not been done for TMDL development because of its technical difficulty and significant workload. Because of that gap in analysis, DEQ recognizes that supplemental monitoring or analysis to determine appropriate protection (which may involve measurement other than effective shade) is essential to address forestry community concerns.

This information is also important in order to understand the relationship between forest practices, TMDL Load Allocation (TMDL LA) and water quality standards in those streams. In addition, a better understanding of the influence of forest management at a landscape level on water quality and use protection would help improve our TMDL process.

From ODEQ's perspective, collaboration between ODEQ and ODF staff is the key to developing information needed to resolve issues associated with non-fish bearing and small fish bearing stream protection. ODEQ encourages ODF staff to help us figure out an effective way to determine whether FPA BMPs meet Water Quality Standards and TMDL LA.

91. Commenter (20)
Note: Commenter 20 submitted a copy of their comments originally submitted in response to the public comment period on the Willamette Basin TMDL.

Response
Please refer to the response to comment on this submittal in the Willamette TMDL process.

Although ODEQ understands there is still professional discourse over the issues of modeling approaches, system potential conditions, etc., we believe the approach used to develop the Umpqua TMDL is appropriate, and protective.

92. Commenter (1)
The Attachment D 303(d) Listings
The following listings that are not being addressed by these TMDLs are not italicized:

South Umpqua:		
Beaver Creek	Mouth to Beaver Lake RM 0-2.1	Sedimentation
Jackson Creek	Mouth to Headwaters RM 0-25	Sedimentation
South Umpqua River	Jackson Creek to Castle Rock RM 80-102.2	Sedimentation
Umpqua:		
Calapooya Creek	Mouth to Oldham Creek RM 0-18.7	DO Spawning
Elk Creek	Mouth to Yoncalla Creek RM 0-25.9	DO Spawning

It might be good to sort the Umpqua listings out into several tables. Ones addressed by these TMDLs and ones not being addressed and remaining on the books and ones being addressed through other actions.

Response
The tables have been updated to reflect the 2004-2006 303(d) list and sorted per the comment.

93. Commenter (21, 16, 18)
The Because instream flows play such an integral role in determining whether water bodies that are water quality limited for temperature will attain standards and because instream flows are an integral component of determining the total loading capacity of a stream, the TMDL is incomplete without an analysis of this issue. Clearly as flow increases, water temperature changes are less pronounced, even with increased solar radiation loading. While the TMDL does provide a map of withdrawals within the basin, the TMDL does not adequately assess the *effects* of water diversions and groundwater withdrawals on stream flow in the stream segments covered by these documents. Map at TMDL, Appx 2 page 12. Furthermore, the TMDL does not adequately address the anthropogenic causes of low flow on the Umpqua River, specifically the PacifiCorp Hydroelectric Project.

The TMDL should address whether the existing flows are sufficient to maintain the beneficial uses and if not, how they will be restored. A more clearly defined and credible plan needs to be in place to handle the future water quantity issues that are already affecting the basin. At the very least, the TMDL should note at what flow the TMDL is no longer valid. Changes in use in the basin could very quickly reduce the flow to levels that make the proposed load allocations and wasteload allocations worthless. By failing to address these issues, the TMDL is flawed and cannot show that the standards will be achieved. By using surrogate measures, the TMDL avoids the issue altogether as far as water flows are necessary for dilution of pollution loads. An understanding of instream flow is critical to assessing the impacts of diffuse pollutants like bacteria and temperature.

Commenter 16
Other
One issue that has not been addressed in this TMDL is the issue of people withdrawing ***more*** water from the river than they have been allocated. With the documented low flow conditions in the South Umpqua it is important that withdrawals do not exceed water rights and that Douglas County discharge an amount of water from their reservoirs equal to purchased water rights plus the flow of the creek feeing the reservoirs. I would like to see a section of this plan that discusses the need to prevent over withdrawals and proposes actions that the Water master's office and Douglas County can take to maintain the maximum flow available at all times.

Commenter (18)
Also, over usage of water pumping from the basin in the dry season is a concern that doesn't seem to be addressed.

Response
Modeling and impacts on water quality parameters used current critical flow periods for determining loads. The DEQ does not regulate water withdrawals.

Condensed information from Oregon Water Resources Department:
The Oregon Water Resources Department (OWRD) through the District 15 Watermaster's office is the state agency responsible for regulating water use in the Umpqua Basin. When there is not enough water to supply the demand of all rights which wish to use water, the Watermaster distributes the available supply according to the prior appropriation doctrine. OWRD also follows up on specific complaints regarding overuse and takes the appropriate enforcement action when warranted. The Watermaster's office works with local watershed councils and other groups to promote water conservation and public awareness about the limitations on use contained in water rights.

There is generally not enough flow in the South Umpqua system during the late summer and fall to meet the demand of all water right holders. This is particularly the case for instream water rights on the South Umpqua River and tributaries. Regulation for these instream water rights requires shutting off hundreds of junior diversions in the South Umpqua Basin in order to leave water in the South Umpqua River. While this may not result in the instream right being met, it does result in stream flows dropping at a slower rate than would otherwise be the case.

Douglas County holds rights to store water in both Galesville and Ben Irving Reservoirs. These rights only allow storage when all other senior downstream rights are being met (including instream water rights). Individuals, municipal suppliers and industry can purchase stored water from these reservoirs by obtaining a contract from the County or through the Lookingglass Olalla Water Control District. The Watermaster's office works closely with Douglas County and the District to insure that the correct amounts of storage are being released to meet contractual obligations and protect natural flow.

94. Commenter (16)
I would like to discuss my concerns in person with appropriate DEQ staff members prior to DEQ's official response and I am willing to meet at you convenience.

Response
The public comment period closed April 24th.

95. Commenter (11)
Numerous comments were received by the Union Cattlemen's Association. The submitted comments and DEQ responses as applicable are noted below the comment submitted.

Union County Cattlemen's Association reviewed the proposed Umpqua Basin TMDL and is submitting the attached comments as part of the public comment process. Many of the TMDL stream reaches identified in TMDLs and WQMPs do not meet the criteria described in the Clean Water Act (CWA) as appropriate stream segments required to have a TMDL. The proposed Umpqua Basin TMDL does not reflect that Oregon Department of Environmental Quality (ODEQ) has conducted the TMDL assessments according to the law.

> "There are no point sources in the Smith River watershed, so all observed loading must be caused by non point sources. The Reedsport Landfill is the only point source in Scholfied Slough which could be a source of bacteria. However, the discharge monitoring report indicates that the average wet weather flow is 0.14 MGD with an average effluent concentration of 6 fecal coliforms/100 ml (winters of 2002 and 2003). Therefore, non point sources dominate loading to Scholfield Slough. The data do not support further identification of non point sources in the Smith River or Scholfield Slough."

The misidentified segments in the current TMDL documents are ones that do not have any point source discharges or point source permits and they should not be included in the TMDL. Non point segments for inclusion could be those segments adjacent to a point source TMDL if DEQ can justify their inclusion, but they should not have a TMDL set as though they were a point source stream segment. The inclusion of the Smith River sub basin for the Temperature TMDL assessment should be reconsidered. There are no point source permits in that drainage that suggests it should have a TMDL written.

1. TMDLs described in Clean Water Act are aimed at 303(d) listed streams that cannot attain the standards due to the additional stressor of a "point source", which when combined with non point source plus natural background sources causes the stream segment to exceed applicable water quality criteria. DEQ is stretching the TMDL allocations to include non point source streams that do not have point source discharges. All streams in the basin are not on the 303(d) list and further, all streams cannot be assessed equally.

2. ORS 468B.110 is the statute that tells Oregon DEQ that it can only do what the EPA is able to do under the federal Clean Water Act when it comes to TMDLs. Where EPA cannot create non point source only TMDLs and enforce them against non point sources under the CWA (Pronsolino Case), Oregon DEQ cannot do it under state law either because ORS 468B.110 sets Oregon DEQ jurisdiction over TMDLs to coincide exactly with federal EPA jurisdiction over TMDLs.

3. The TMDL stream reaches identified do not meet the criteria described in the Clean Water Act as an appropriate stream required to have a TMDL. Therefore non point streams should not have a TMDL set as though it were a point source stream segment.

Response
ODEQ believes the intent of the Clean Water Act and recent court opinions affirm the requirement for TMDLs on NPS water quality limited streams.

4. It is inappropriate to use an agricultural water quality management area plan (ORS 568.900-933) to provide a reasonable assurance that a TMDL load allocation for agriculture will be met. Under current law a load allocation developed in the establishment of a Total Maximum Daily Load (TMDL) is "attributed" to non point sources and background. It is not assigned to them (OAR 340-041-0006(19)).

Response
There is no longer a rule OAR 340-041-0006(19) owing to a revision of Division 41 several years ago. The cited definition for "Load Allocation" is currently at OAR 340-041-0002(29) and simply equates this "attribution" to a load allocation.

A definition of science is needed in this document. Also, reference material used as an appeal to authority needs to be strengthened by reading and using studies that make an application of the physical laws. Modeling is a useful tool in taking a quick first look, but lacks methodology and statistical analyses required in scientific endeavors.

Fundamental science is generally (there are exceptions) not interested in how a specific system behaves. Rather, the goal of science is to discover the fundamental laws of Nature, which means we are interested in finding that few set of rules that apply to all objects and systems in the Universe. The Laws of Physics are the same everywhere and for everything

Science is "the systematic enterprise of gathering knowledge about the universe and organizing and condensing that knowledge into testable laws and theories." This definition possesses two key words: systematic and testable. Systematic ensures an organized, well thought out procedure for conducting science. Testable requires that the research and information must be valid and consistent when peer-reviewed.

Response
We have ensured that this TMDL and all of our work is consistent with this view of science as it is applied to environmental protection.

TMDLs are by their nature applied science. The most thorough understanding of physical, chemical and biological processes are brought together as appropriate, and pollutant loadings that will protect beneficial uses are estimated. These are not experiments, rather they are predictions based on the science and mathematics of water physics and chemistry.

EDITOR'S NOTE:

FOR THE REMAINDER OF COMMENTER NUMBER 11'S COMMENTS, IN ORDER TO MAINTAIN CONTINUITY WITH THE FORMATTING THUS FAR IN THE DOCUMENT AND TO AVOID CONFUSION, THE FONT AS IDENTIFIED IN COMMENTER #11'S ORIGINAL INTRODUCTION HAS BEEN ALTERED:

- **DRAFT TMDL-REFERENCED TEXT HAS BEEN CHANGED TO UNDERLINED, NORMAL FONT**
- **#11'S COMMENTS REMAIN NORMAL FONT**
- **DEQ RESPONSE IS ITALICIZED**
- **DEQ RESPONSES ARE NUMBERED RELATIVE TO THE COMMENTS RAISED IN THIS SPECIFIC COMMENT SECTION FROM COMMENTER 11. E.G. 95-1.**

95. Commenter (11)

Chapter 1

1. Page 1 - II
Listings based on the water contact recreation standard occur throughout the basin, for Elk Creek, Calapooya Creek, Deer Creek, the South Umpqua River and the mainstem Umpqua River. In general, non point sources account for most of the observed bacteria standard violations. Wastewater treatment plants were given wasteload allocations based on the water contact recreation standard of an average of 126 E. coli organisms per 100 milliliters.

Loading capacity and non point source load allocations were determined for various streamflows.

Different load allocations were therefore determined for high flows, wet, midrange, dry and low flows. Studies by DEQ during storms indicated that forested lands do not contribute any significant bacteria load to streams in the Umpqua Basin, but agricultural, rural residential and urban lands as well as possible turbulence releasing bacteria from stream sediments were the sources of bacteria. Since relative contributions could not be determined from the data, the load allocations for non point sources were allocated to all non point sources.

Comment
How will DEQ determine whether ODF or the Urban or ODA component of the TMDL needs to make changes to meet the TMDL goals? When will the non point source allocation be separated so that Forest Practices or Urban ordinances or agriculture 1010

rules have to be strengthened? Refer to page 1-7 "*It is possible that after application of all reasonable best management practices, some TMDLs or their associated surrogates cannot be achieved as originally established.*" How will ODEQ determine if one of the accompanying plans or ordinances is preventing attainment versus an inappropriate surrogate is preventing attainment? This is unclear in the Chapter 1 discussions.

Response 95-1
It is the responsibility of the Designated Management Agencies to ensure that the components of their plans are implemented and to determine their effectiveness through studies and monitoring. ODEQ has the authority to conduct studies jointly with other state agencies to determine the sufficiency of rules for protection of water quality standards (i.e., a "sufficiency analysis"). Similarly, urban areas that fall under the phase 1 Municipal Separate Storm Sewer Systems (MS4) will develop their plans under permit from ODEQ and will be required to monitor runoff water and the effectiveness of controls in preventing pollution. These agreements and permit requirements will be the basis of determining pollutant control effectiveness and ultimate potential water quality.

2. Page 1- IV
In Elk Creek, analysis indicates that sediment oxygen demand is the source of dissolved oxygen deficits during the summer. Sediment oxygen demand is the process that results from excessive loads of organic materials that feed biochemical activity occurring in stream bottoms, particularly those stretches where slow velocity has allowed river sediments to collect. In these situations, reducing organic solids to prevent the buildup of sediments is expected to reduce sediment oxygen demand and therefore improve dissolved oxygen levels. Allocations to point and non point sources therefore target organic solids.

Comment
The paragraph is unclear. "Sediment" should be defined. Sediment generally refers to inorganic soil particles that are in the bottom of a stream, which would not have an oxygen demand. What organic solids are you referring to and where do they originate? If you are not referring to inorganic sediments then it is not clear what is meant in this paragraph and it should be rewritten.

Response 95-2
Merriam-Webster's online dictionary defines sediment as "the matter that settles to the bottom of a liquid." This is clearly inclusive of matter that is both organic and inorganic. Moreover, there is a chemical interaction with inorganic particles that should not be ignored. We believe the plain meaning of "sediment" makes its use appropriate in the current context.

3. Chapter 1, Page 5
Implementation of TMDLs is critical to the attainment of water quality standards. The support of Designated Management Agencies (DMAs) in implementing TMDLs is essential. A DMA is any agency or entity responsible for affecting water quality through its management of land and/or water. In instances where DEQ has no direct authority for

implementation, DEQ works with DMAs on implementation to ensure attainment of water quality standards. The DMAs in the Umpqua Basin include: US Forest Service, Bureau of Land Management, Oregon Departments of Agriculture and Forestry, Douglas County, and the cities of Roseburg, Myrtle Creek, Canyonville, Glendale, Sutherlin, Oakland, Reedsport, Yoncalla, Drain, Winston and Green. These agencies have developed or are in the process of developing implementation plans and/or are operating under NPDES permits.

Comment
EPA cannot directly enforce non point sources within a TMDL. Oregon statutes does not identify where ODEQ can directly enforce non point source contributions. Oregon statute does provide enforcement of a agriculture water quality management rule (See TMDL plan, Chapter 7, page 86, SB 1010).

Response 95-3
TMDLs developed by ODEQ in Oregon are issued as Department Orders, and are therefore enforceable under state law. It is the clear intention of ODEQ, as adopted in the TMDL Rule (OAR 340-042-0080) to designate the Oregon Department of Agriculture as the DMA and rely on Agricultural Water Quality Management Plans and enforcement of associated rules for implementation of the TMDLs.

Comment
The Oregon Department of Agriculture has primary responsibility for control of pollution from agriculture sources. We disagree. The sentence should state: The Oregon Department of Agriculture has the authority to implement plans and enforce rules for control of pollution from agriculture sources.

Response 95-4
The Department of Agriculture, as the designated management agency (DMA), has the responsibility to implement the TMDL (control pollution from agricultural sources). The State legislature gave authority to ODA through ORS 568.900 -568.933 (commonly referred to as SB 1010) to develop Agricultural Water Quality Management Plans with input from local advisory committees and implement the plans and associated rules to meet water quality standards and TMDL load allocations on agricultural lands.

Comment
The Umpqua Water Quality Management Plan states (Chapter 7, page 9 of the plan) that:

The Umpqua Basin LAC studied Senate Bill (SB) 1010, SB 502, ORS 468(b), and the Coastal Zone Management Act. They worked to develop a plan for the Umpqua Basin, which would place all regulation concerning water pollution in one plan, with Oregon Department of Agriculture as the agency responsible for the enforcement of the Umpqua Basin Administrative Rules. Briefly, SB 1010 provides the authority for the Oregon Department of Agriculture to develop local water quality plans and rules. SB 502 provides that all issues relating to agricultural water pollution will be handled by the Oregon Department of Agriculture and ORS 468.025 is Oregon Statute passed by the

legislature that states no person shall cause pollution of the waters of the State of Oregon1. In addition, in Oregon, Oregon Department of Agriculture had the responsibility for developing a plan for the Coastal Zone Management Act and regulations relating to pesticide use. Placing the responsibility for all of the above with Oregon Department of Agriculture is intended to avoid having agricultural producers be required to deal with multiple agencies, and to have a consistent policy of enforcement for all water quality regulation relating to agriculture.

SB 1010 was written to address runoff from agriculture lands. SB 502 provided specific authority to Oregon Department of Agriculture to regulate issues relating to water pollution but we do not agree that it amended ORS 568.900-568.933.

Response 95-5
ODEQ does not believe the cited passage states that ORS 568 has been amended by SB502. We do believe that the intent of the SB1010 Plans is to ensure agricultural practices control pollutants to the extent necessary to meet water quality standards. OAR 603-090-0030 states that: "Agricultural water quality management area plans shall describe a program to achieve the water quality goals and standards necessary to protect designated beneficial uses related to water quality, as required by state and federal law."

These standards for the protection of designated beneficial uses are the adopted water quality standards for Oregon. As TMDLs are developed to determine pollutant limits required for meeting these same water quality standards, there is nothing inconsistent with a plan meeting both water quality standards, as specified in rule, and meeting the limits in a TMDL.

To that end, ODA has adopted basin-specific rules that set the enforceable foundation for meeting water quality standards. We remain committed to assisting ODA in these efforts.

Comment
ODEQ has authority to regulate point source pollutants through the NPDES permits including CAFO and AFO permits which relate to agriculture activities. We disagree that ODEQ can expect to achieve the goals and standards of the TMDL through ORS 568.900-568.933.

Response 95-6
See response 95-5 above.

4. Chapter 1, Page 1-7 & 1-8
Implementation plans are plans designed to reduce pollutant loads to meet TMDLs. DEQ recognizes that it may take some period of time—from several years to several decades--after full implementation before management practices identified in a WQMP become fully effective in reducing and controlling certain forms of pollution such as heat loads from lack of riparian vegetation. In addition, DEQ recognizes that technology for controlling some pollution sources such as non point sources and storm water is, in many cases, in the development stages and will likely take one or more iterations to develop

effective techniques. It is possible that after application of all reasonable best management practices, some TMDLs or their associated surrogates cannot be achieved as originally established.

Comment
It should also be stated that some standards may not be appropriate for all stream reaches and some streams may have been listed and included in the TMDL where data was insufficient or of poor quality.

Response 95-7
It is a common misperception that numeric criteria are the basis of TMDL allocations under all circumstances. Oregon's water quality standards for all parameters covered by this set of TMDLs allow natural conditions to determine what the appropriate local conditions are. As such there is no conflict between what is achievable and what a standard requires. In these TMDLs as in most of our other efforts, and particularly for temperature, we have developed allocations for each waterbody based on their natural potentials. This issue is covered in the TMDL.

5. (DMA)
Implementation plans will address how human activities will be managed to achieve the TMDL surrogates. It is also recognized that full attainment of pollutant surrogates (system potential vegetation, for example) at all locations may not be feasible due to physical, legal or other regulatory constraints. To the extent possible, implementation plans should identify potential constraints, but should also provide the ability to mitigate those constraints should the opportunity arise. For instance, at this time, the existing location of a road or highway may preclude attainment of system potential vegetation due to safety considerations. In the future, however, should the road be expanded or upgraded, consideration should be given to designs that support TMDL load allocations and pollutant surrogates such as system potential vegetation.

Comment
An implementation plan cannot regulate human activities. They can regulate the results of activities if the activities discharge pollutants. Non point source contributions under the CWA are managed using best management practices. Best management practices are not regulated, but are voluntary adaptive management techniques designed to curb runoff. We think the paragraph above should be rewritten and clarification provided about the role of the DMAs. A TMDL is a requirement of ODEQ and is not necessarily something that can be delegated to others but must be done without the force of law. ODEQ's rules explain the actions ODEQ will take, but the law does not state that the DMA's must enforce a TMDL and human activities because ODEQ says it must.

Response 95-8
Many human activities are directly regulated, and the broad array of "DMAs"in the TMDL include those with specific permit requirements as well as those that may adopt ordinances or rules, all of which can regulate activities and are not voluntary. Best management practices are not synonymous with voluntary measures; they are required in

many management plans that are required by permits (e.g., CAFO and MS4) and they are enforceable.

Where nonpoint source pollutants are concerned, policies allow adaptive management of sources, with the intent of fostering voluntary adoption of appropriate practices. Ultimately, there is a regulatory backstop to these voluntary measures, in that failure to apply appropriate practices to prevent pollutants entering water may result in enforcement action by one or more agencies.

Chapter 2

6. Even without genetic Bacteria Source Tracking, however, watershed groups can use existing technologies such as the Colilert system to do more refined testing to identify specific sources of bacteria. These methods, together with implementation of Best Management Practices and further testing, are expected to result in a significant decrease in fecal bacteria in Umpqua Basin streams.

Comment
A study conducted in 3 watersheds in Ferry County Washington revealed that water quality standards for bacteria, at times, might be exceeded in the absence of livestock sources and other human influences. They found that avian, deer and elk, and rodents had the greatest influence on high counts of fecal bacteria throughout the testing years. These non point source contributions are unlikely to be influenced by any adaptive management scenarios.

7. Comment The Clean Water Act
(CWA) directs DEQ to write a TMDL for streams on the 303(d) list that are not meeting the state standards when all efforts to implement the latest and best technology have not corrected the pollution problem. This suggests that only certain streams should have a TMDL written. A TMDL is aimed at streams (stream segments) that have a point source discharge and the waters where a permit has been issued to discharge are mixed with contributions from several sources **and the capacity of the stream to carry the pollution is exceeded**.

Response 95-9
See above response number 95-1.

Comment
We would like ODEQ to read, consider and include analysis described in the following scientific literature.

Gibbons, R. 2003. A statistical approach for performing water quality impairment assessments. JAWRA 39:841-849.

Robertson, D.M. 2003. Influence of different temporal sampling strategies on estimating total phosphorus and suspended sediment concentrations and transport in small streams. JAWRA. 39:5:1281:1308

Smith, E., Y. Keying, C. Hughes and L. Shabman. 2001. Statistical assessment of violations of water quality standards under section 303(d) of the clean water act. Environmental science and Technology 35:606-612.

Response 95-10
The TMDL is based on appropriate sampling and statistical techniques. Because no specific issues with the TMDL methodology are presented in the above comment, no additional considerations or analyses are necessary at this time.

8. Comment
A stream's carrying capacity is made up from 2 sources: natural background and non point sources. ODEQ has been calculating TMDLs by subtracting the TMDL amounts from the carrying capacity of a stream and ending up with a background amount without scientifically separating the intertwined non point source and natural contributions.

Response 95-11
The comment does not accurately describe our methods of determining loading capacity for any parameter. As an example, the loading capacity for temperature in this and other TMDLs was determined by estimating the Natural Thermal Potential (NTP) of a given modeled stream. Generally, this NTP was above various water quality criteria adopted in the standard for protection of the life histories of salmon and trout, but because it was the capacity of the stream, it became the criterion. To the extent the temperature standard allows, a small amount of heat load was allocated to point source discharges, nonpoint sources, and reserve capacity.

This natural background becomes the Loading Capacity to which are added allowable increases to reflect the allocated condition of the waterbody. Natural background generally is a nonpoint source, but is defined as the loading capacity where NTP exceeds water quality criteria. The other allocated nonpoint sources are associated with human activities.

ODEQ believes it has used appropriate methods in assessing water quality issues within the scope of this TMDL.

Comment
TMDLs are a necessary part of the permitting system for point sources. The permit a point source has to get to operate is called an NPDES permit (National pollution discharge elimination system). It can be described as a permit to pollute. It tells the point source how much of a pollutant the point source can add to the water. Before it can be issued the government must establish a TMDL for the water. The TMDL tells the government how much of a pollutant can be added to the water before the water will no longer meet the water quality standards.

The DEQ TMDL process creates an impossible task for non point source industries. Natural resource and ag management takes place over large areas and pollution

contributions from those activities do not occur at a rate nor in the volumes that point sources do. Measuring the contributions cannot take place easily…such as putting a container under a pipe and taking a sample from a precise location.

This is why the science theories and sampling techniques have to be correct. Science can separate non point contributions from natural background conditions, but it takes careful design and meticulous data analysis.

Response 95-12
We disagree that the TMDL creates an impossible task for nonpoint sources. ODEQ has analyzed the various components of loading and the analyses that determined loads, including natural and other nonpoint sources, are included in the documents.

9. Comment
The bacteria TMDL being conducted has a major flaw due to the sampling methods employed when getting field samples. The samples have not been tested to determine if they meet the requirement of "sample adequacy". Grab samples taken out of a large volume of water…..such as a stream…….must represent the entire stream. Also, samples taken on a monthly basis must be tested to ensure that the one sample represents the population throughout the month. If one sample on one day doesn't fall within the average for that month then more samples are needed to indicate if the population has been observed or if the one grab was merely due to chance.

Response 95-13
The estimation of potential future effects from field data should not be confused with the post hoc analysis of data to determine what happened retrospectively. We agree that sample adequacy (for precision) and representativeness are critical, but the adequacy of samples is defined by the need of the study. Data used for determining whether there had been violations of water quality standards over time have relatively modest requirements. Determining whether there had been a statistically significant difference between two times may have a greater need for precision and therefore sample size. Where differences between the standard and measured concentrations are large, the sample size requirement is lower because the necessary precision is less. Moreover, the claim that a sample will represent an entire distribution over some time period (e.g., a month) is contrary to the notion of representative sampling.

10. Comment
For DEQ to associate bacteria counts with runoff, runoff must also be measured. ODEQ should develop a method to sample whether the runoff is occurring at the rates the flow modeling suggests.

How are the bacteria getting into the water? If ag runoff is causing it they must take samples in the stream to show that the runoff isn't the same month to month but increases when the bacteria increases and vice-versa. The current method is unacceptable and merely a guess about where the bacteria originates. As a result little is known and due to poor procedures used during the filed sampling.

Response 95-14
ODEQ disagrees that the methods are not appropriate for estimating loads in various locales. The Load Duration method uses data and flow from a multiple year period and the full range of flows where possible. This provides not only an analysis of the flow conditions associated with water quality violations; it also provides a tool suggesting potential sources of bacteria. Highest concentrations of bacteria were associated with both urban and agricultural land uses.

Chapter 3 Temperature TMDL

Comment
If you add the natural background, plus non point source, and the point source discharge…..the total amount should not exceed what the stream is able to assimilate without harming the beneficial use.

An Example: In Oregon we say stream temperatures cannot exceed 64 ºF for the most sensitive beneficial use…salmon. The standard assumes that salmon will become sick, or weak, or die if the standard is violated.

Response 95-15
Oregon standards do not say the temperature cannot exceed 64°F. The standard includes a provision for a natural thermal potential for waters that naturally exceed the biologically based numeric criteria. The current standard also includes a human use allowance (HUA); a small amount of allowable temperature increase above the numeric criterion or natural thermal potential. Allocations in this TMDL are based on these components of the standard.

Comment
The Clean Water Act discusses temperature concerns in order to prevent excessive heating or cooling of streams due to **"discharges"** from industrial contributions which are under a permit and are allowed discharges from the operation into the stream. In order to ensure that the discharge can be handled by the stream CWA allows the permit to be written in terms of the discharge temperature and volume + the stream volume and temperature = a mixing zone that meets the standard downstream.

If the industry discharge was more than the stream could handle the permit would require the industry to cool the discharge and require a cooler substance into the stream so that when the mixing zone calculation was completed then the standard would not be violated.

11. Comment
DEQ's perception that shade will be effective in cooling stream water has been shown to contain serious flaws in understanding the physical laws that govern heating. DEQ has long maintained that the surrogate "shade" will change water temperatures, but the theory violates the fundamental physical laws governing how heating and cooling takes place on earth. Stream temperatures cannot be cooled or prevented from heating via riparian shade when the Physical Laws are applied. We suggest a review of the literature to locate studies that experimentally tests the application of the Thermodynamic Laws in a

watershed under natural environmental conditions. Measured water temperature should be compared to other components in the watershed in order to determine if the rates of heating are similar among the components based on the specific heat capacity of each.

Response 95-16
We disagree with the commenter's interpretation of our methods and the significance of solar radiation with respect to water temperature. The scientific underpinnings of the process ODEQ uses to estimate temperatures and heat loading have been reviewed by the state's Independent Multidisciplinary Science Team. The results of this review were very supportive of the approach, and members felt the model and its application in Oregon were both appropriate and effective. This review is available at: http://www.deq.state.or.us/wq/HeatSource/HeatSource.htm

Comment
DEQ assumes all streams are thermally polluted simply based on the life cycle of the fish. Water temperature is not governed by fish, but instead is governed by universal physical laws. Fish and other beneficial uses should be examined after the natural water temperatures are established. Where is the ODEQ data that establishes the natural thermal cycles for the Umpqua Basin?

Response 95-17
As indicated above, most of the allocations in this and most other temperature TMDLs ODEQ has issued are based on a determination of natural thermal potential temperatures rather than the numeric criteria included in the standard. This NTP is determined based on the very physical principles cited above. To the extent shade may reduce heat loading to surface waters, it is included in the estimation, but these effects vary widely among locations. Natural Thermal potential temperatures in the Umpqua Basin depart markedly from the numeric criteria in the standard as a result of this application of physical principles.

Chapter 7 Water Quality Management Plan

12. Comment
Many of the TMDL stream reaches identified in the TMDL and WQMP do not meet the criteria described in the Clean Water Act as appropriate stream segments required to have a TMDL.

The misidentified segments are ones that do not have any point source discharges or point source permits and they should not be included in the TMDL. Non point segments for inclusion could be those segments adjacent to a point source TMDL if DEQ can justify their inclusion, but they should not have a TMDL set as though they were a point source stream segment.

Response 95-18
See Response number 95-1.

Comment
It is inappropriate to use an agricultural water quality management area plan (ORS 568.900-933) to provide a reasonable assurance that a TMDL load allocation for agriculture will be met. Under current law a load allocation developed in the establishment of a Total Maximum Daily Load (TMDL) is "attributed" to non point sources and background. It is not assigned to them (OAR 340-041-0006(19)). The same would be true for Forest Practices and expecting that the FPA have new rules written to accommodate the TMDL experiment.

Response 95-19
See Response to commenter 11 initial item #4.

Comment
Ultimately statements made in the TMDL suggest that DEQ will revamp and revise as new ideas are formed and new technologies are implemented. While this makes some sense regarding waste treatment plants, point source discharges from industry, and other permitted discharges, we do not know of any technology that will hasten the stream temperature issues. We are also unaware of how new technologies will affect non point source contributions. We would like this clarified and would like discussion about this aspect of the TMDL efforts over time.

We are very concerned about the unintended consequences of land management activities intended to prevent contributions of pollutants to the stream, based on the limited explanations of how the natural environment and watershed system works and how the activities implied by the non point source contributions affect the system.

DEQ should not go forward with this TMDL until more study has been conducted on the ground. It is quite likely that great harm will be inflicted on the system and the protection of the beneficial uses will not happen. DEQ should assess the appropriateness of each standard for the streams in the Umpqua basin.

Response 95-20
As stated above, water quality criteria have been developed throughout the basin for several parameters based on the potential natural levels given local conditions in the basin. We believe the concern for numeric criteria that are not being applied in the TMDL is moot with respect to the Umpqua Basin TMDL. ODEQ believes its approach, to calculate an estimate of potential conditions regardless of specific numbers adopted in our standards, is an honest and sensible way to develop water quality targets that are relevant and achievable.

The use of adaptive management of nonpoint source pollutants to ultimately meet water quality standards is intended to avoid what the commentors are concerned about. Practices will be applied as appropriate on a site-specific basis. If the practices are insufficient to meet standards, practices should be modified to increase protection.

Comment
The agency has not demonstrated the application of sound scientific theories which direct management activities that have to take place to bring water temperatures into compliance with the standards. ODEQ has little if any authority to make the agriculture 1010 rules bend to assist in meeting the TMDL. As we see things, 1010 rules cannot be enforced without evidence and the evidence that must be used must meet the burden of showing a probable cause of water pollution due to an agriculture activity. A 1010 rule is not a regulation about land activity, but is a water quality rule.

Response 95-21
See Response 95-15, above. Management of agricultural operations is the province of the agriculture community and the Department of Agriculture in Oregon. It is true that evidence is necessary for enforcement, but not for demonstrating a need for technical assistance. Agricultural Water Quality Management Area Plans were written with Pollution Prevention and Control Measures that specify conditions that cannot exist under the plan. The plans are intended to foster appropriate planning, with the intent that enforcement would be reserved for persistent and purposeful cases of mismanagement. However, it may not be necessary to demonstrate a water quality violation if these conditions are evident. Where it is clear that a water quality standards violation is occurring as a direct result of management or operations, ODEQ has the ultimate enforcement authority.

13. Chapter 7 Page 47
I. Monitoring – Source Identification
Because the precise source of fecal bacteria contamination is difficult to isolate through routine testing, the strategy to address bacteria begins with further investigation into potential non point sources. Currently efforts are underway in three watersheds to more clearly define where bacteria are coming from:

- In the Smith River watershed, both DEQ and the Smith River Watershed Council conducted bacteria sampling, as well as DNA testing to determine the host of the E. coli bacteria found in the sampling, which encompasses the estuary and lower Umpqua River as well as the Smith River;

- In the Myrtle Creek watershed, the Partnership for the Umpqua Rivers is conducting bacteria sampling to help identify sources contributing to the high bacteria levels that led to DEQ's recent listing of Myrtle Creek for bacteria standard violations;

- Throughout the Calapooya watershed, trained volunteer water quality monitors are collecting data to help understand the sources of bacteria which have led to the 303(d) listing of Calapooya Creek.

Comment
DEQ is saying 2 different things. First it says Smith River TMDL is for Temperature only. The bacteria analysis in the TMDL does not include the Smith River, yet in the plan the following was inserted regarding Smith River and it should be deleted or edited.

Response 95-22
The TMDLs does include bacterial allocations for Smith River. The TMDL does say that the temperature TMDL applies to streams throughout the Umpqua Basin. There is an analysis of Smith River bacterial concentrations and loading allocations in the section entitled "Umpqua River and Estuary."

Although the Smith River project was unable to assess bacteria loads from high flow events, sampling conducted at lower flow conditions provided information of a bacterial background aspect and that the Smith Watershed is relatively clean at low flows. The TMDL recognizes this information in that no bacterial load allocations were assigned at low flows.

14. Component 11 Monitoring Page 80-81
Except for special monitoring studies connected with the development of TMDLs, ODEQ's monitoring will not focus on specific monitoring for TMDL implementation.

Comment
It is apparent that ODEQ has delegated all of the TMDL monitoring tasks to other agencies.

Response 95-23
It is typical to require DMAs to monitor the effects of the operations they have authority over. ODEQ will continue to monitor water quality at a scale appropriate for status and trend assessments on a statewide basis. ODEQ will also continue to collect data as part of special studies and TMDL development. As TMDLs are revisited through time, reassessment of water quality conditions will be made through appropriate monitoring, including data collected by other agencies.

15. Water quality and landscape monitoring is being conducted by ODA to evaluate plan and rules effectiveness and in support of the plan and rules reviews. ODA will use all available data to assess instream concentrations of nitrate/nitrite, dissolved oxygen, total phosphorus, E. coli, TSS, and pH for trend monitoring. ODA is also collecting data from aerial photographs on landscape conditions such as types of riparian vegetation. Other ground-based data are being collected on streambank stability, shade, erosion, and vegetation use by livestock. These data can be consolidated to assess the condition of watersheds in the planning area.

Comment
As evidenced in a recent 1010 complaint in Union County, ODA does not have a monitoring program in place to assess water quality. After a complaint was filed, ODA attempted to enforce the local 1010 rules by conducting a visual inspection. The agency did not have information about site capability or streambank stability because they do not personnel who are assigned to conduct these activities. ODA was unable to enforce any changes on the private property under the local 1010 rule, because they did not have data available to prove a violation occurred.

In some cases where ODA is able to convince private landowners that there is a water quality violation without evidence, the agency works with the SWCD or federal NRCS to get a grant for the landowner who then makes changes to their land management. However, if evidence is never obtained to document the kind or amount of pollution from non point sources, then there is no way to know if the changes made on the land are effective. No amount of professional judgment can become a surrogate for empirical data obtained through methodical sampling methods to assess site-specific conditions.

Response 95-24
ODA does not monitor every landholding to determine compliance with an SB1010 Plan. The basis of these 1010 plans is outreach, technical assistance and complaint response. ODA will work with individual landowners to determine appropriate control practices for their land, as well as cooperating with SWCDs and Extension Agents to determine best practices for pollution control. Basin scale water quality patterns and compliance with standards will be determined by monitoring on a larger scale than the individual landowner.

Comment
It is inappropriate to use an agricultural water quality management area plan (ORS 568.900-933) to provide a reasonable assurance that a TMDL load allocation for agriculture will be met. Under current law a load allocation developed in the establishment of a Total Maximum Daily Load (TMDL) is "attributed" to non point sources and background. It is not assigned to them (OAR 340-041-0006(19)). The same would be true for Forest Practices and expecting that the FPA have new rules written to accommodate the TMDL experiment.

Response 95-25
See response to commenter 11 initial #4.

16. Other ground-based data are being collected on streambank stability, shade, erosion, and vegetation use by livestock.

Comment
A 1010 rule is not specifically aimed at livestock use and their impact on banks, shade, erosion or vegetation. The rules are intended to curb runoff from agriculture lands. The sentence on Page 80 should be rewritten to reflect the true meaning of the 1010 law.

Response 95-26
There is no such limitation in SB1010 or in the rules adopted to implement it. See Response number 95-5 also.

Comment
Where does section 319 of the CWA (funds to address use of voluntary BMPs) fit into this scenario? How are the 319 funds being allocated and what are the voluntary measures that have been implemented towards TMDL plans in basins where TMDLs have been approved? What role will the 319 funds play in the Umpqua Basin?

Response 95-27
319 funds are used to promote control of pollutants from nonpoint sources. These funds have been used for a variety of on-the-ground activities and restoration, including streamside vegetation restoration and protection, fish passage, channel restoration, special studies and others. The program is expected to work in the Umpqua as it has in other basins.

Comment
We appreciate the opportunity to comment on the Umpqua Basin TMDL documents. We look forward to seeing edits and revisions prior to issuing a final document.

Response 95-28
All DMAs, and all those who provided comment on the draft TMDL will receive notification regarding the final version of the TMDL and the response to comment.

Comment
What should the overnight low water temperatures be in order to establish a lower starting point for the water temperature increases at dawn? At what time does equilibrium temperatures become established? Was equilibrium considered in the modeling effort? What does the monitoring data show? How did the Heat Source model address the equilibrium points and when does equilibrium take place in the basin? Statistical testing of data already in the DEQ database should be conducted using the mathematical laws of probability.

ODEQ assumes that the temperature standard is correctly figured and can be scientifically supported. However, Brown, G.W. and Krygier (1970) forms the basis for most other statements that shade will cool water. Hurlbert (1984) noted that a model is a hypothesized process and its predictions of the state variables are the test consequences. Modelers call the process of comparing predicted and observed test consequences "verification" or "validation" and a valid model is one whose predictions are within a designated tolerance.

The model is an informed guess, a mixture of knowledge and error about a process of nature. Models are often tuned or calibrated, a process in which some of the model parameters are "fiddled with" to force better agreement between predicted and observed consequences. This serves as feedback for what is called model validation, which is not

the modeler's ability to hypothesize but rather his ability to fiddle. Modeling was never intended to function as a means to scientific knowledge. Its use in science is limited because it usually cannot predict to within established tolerances of a natural system.

Response 95-29
Modeling is an appropriate means of predicting the response of environmental variables under conditions different than currently observed. The difficulty is not that "established tolerances" are narrow, but that the environment varies so widely depending on myriad factors. This is why all models ODEQ applied to pollutant load estimation calculated the probalistic error of the estimate. Much of the effort in modeling involves reducing this error, and improving the quality of the estimate.

The prediction of (e.g.) temperature at a given time of a given day under conditions that do not currently exist requires use of a model. A retrospective analysis of historical data is limited both by data availability and the range of conditions that those data were collected under. The comment suggests that analysis of data alone should be used to determine what appropriate limits are, but this would not allow estimates based on any conditions unaffected by human sources of heat. The questions posed above will have different answers in different locations and times depending on these variables. The models used for developing pollutant limits water quality parameters in the Umpqua basin have proven robust, and take into account variables that have a significant influence on these water quality parameters.

96. Commenter (12)

1. TMDLs described in clean Water Act are aimed at 303(d) listed streams that cannot attain the standards due to the additional stressor of a "point source", which when combined with nonpoint source plus natural background sources causes the stream segment to exceed applicable water quality criteria. DEQ is stretching the TMDL allocations to include nonpoint source streams that do not have point source discharges. All streams in the basin are not on the 303(d) list and further, all streams cannot be assessed equally.

2. ORS 468B.110 is the statute that tells Oregon DEQ that it can only do what the EPA could do under the federal Clean Water Act when it comes to TMDLs. Where EPA cannot create nonpoint source only TMDLs and enforce them against nonpoint sources under the CWA (Pronsolino Case), Oregon DEQ cannot do it under state law either because ORS 468B.110 sets Oregon DEQ jurisdiction over TMDLs to coincide exactly with federal EPA jurisdiction over TMDLs.

3. The TMDL stream reaches identified to not meet the criteria described in the Clean Water Act as an appropriate stream required to have a TMDL. Therefore non point streams should not have a TMDL set as though it were a point source stream segment.

4. It is appropriate to use an agricultural water quality management area plan (ORS 568.900-933) to provide a reasonable assurance that a TMDL load allocation for

agriculture will be met. Under current law a load allocation developed in the establishment of a Total Maximum Daily Load (TMDL) is "attributed" to non point sources and background. It is assigned to them (OAR 340-041-0006(19)).

5. An example of where DEQ is saying twp different things. First it says Smith River TMDL is for Temperature only. The bacteria analysis in the TMDL does not include the Smith River, yet in the plan the following was inserted regarding Smith River and it should be deleted.

Response
Comments received from the Elk Creek Watershed Council posed some similar comments as received from the Union Cattlemen's Association. Comments number 1-5 above are duplicate to items 1-5 in the Union Cattlemen's Association submittal. Readers are directed to the responses above as they are the same.

Below are our comments on the TMDLs being proposed by DEQ. To preface these comments we do not believe that DEQ has the authority to regulate nonpoint source pollution. They were to advise, not regulate. That said here are our comments:

Chapter 7 Page 47
1. Monitoring – Source Identification

Because the precise source of fecal bacteria contamination is difficult to isolate through routine testing, the strategy to address bacteria begins with further investigation into potential nonpoint sources. Currently efforts are underway in three watersheds to more clearly define where bacteria are coming from:

- In the Smith River watershed, both DEQ and the Smith River Watershed Council (SRWC) are conducting bacteria sampling, as well as DNA testing to determine the host of the E. coli bacteria found in the sampling, which encompasses the estuary and lower Umpqua River as well as the Smith River;

- In the Myrtle Creek watershed, the Partnership for the Umpqua Rivers is conducting bacteria sampling to help identify sources contributing to the high bacteria levels that led to DEQ's recent listing of Myrtle Creek for bacteria standard violations;

- Throughout the Calapooya watershed, trained volunteer water quality monitors are collecting data to help understand the sources of bacteria which have led to the 303(d) listing of Calapooya Creek.

Response
ODEQ applauds these efforts. ODEQ is addressing the results of the Smith River Watershed Council study which has shown at low flows there does not appear to be a bacterial risk in the Smith River watershed. Acknowledgement of this data has been incorporated in the TMDL. These monitoring efforts will help guide the implementation of this TMDL. See responses number 16, 19, and 95-21 also.

6. The citizens of Elk Creek (CEC) and the Oregon Cattleman Association (OCA) as well as citizens of Smith River (CSR) entered into a 2-3 year study on the Elk Creek basin. We found "no" problem from bacteria entering the water coming off agricultural lands. As for temperature, the study we did proved that the temperatures are historically not anything that the Ag community is doing on their land. One of the things for your own information that we found is that shade (which OCA, CEC, or CSR have in any way believe that shade cools water) showed in our study to not be a problem in our basin. In fact, we have such good cover that we may be the model to meet. The data we took over a long period of time is far more extensive than the few samplings DEQ has taken. Along with the OCA/CEC study, the Elk Creek Watershed Council (ECWC) will be doing a DNA study to prove that if the bacteria are in the water that Ag is not the problem. We know that the geese alone have a bigger impact in our water than does Ag. As you know they have a very high E. coli output and they live here year round. The geese are not native species here but have become a real big problem over the last ten years. Something to consider also is that these geese are here year round and during the summer months we have very little water flow. As the geese use/abuse the water, the E. coli they put off settles to the bottom and attaches itself to soil. In the high flow events when DEQ says we exceed, the soils that have all that E. coli attached to it rolls up and is swept down stream. Don't blame that on Ag.

Response
ODEQ requested copies of the referenced Elk Creek study but, to date, has not received a copy or data. Therefore, the results of the study could not be considered in the TMDL. Agriculture was identified as one of the sources of bacteria, along with many other sources.

7. One of the things we have been pro-active at is to get a little more regulated flow for the basin. We have been pursuing and are still pursuing water impoundment in the form of the Milltown Hill Dam. The result will be that we will have better flows in the summer months which will lower water temperatures (which historically we cannot attain). As for bacteria, what was stored behind the dam during high flow events would help control the flooding across Ag land below. This will mainly help on the main stem which has the majority of the Ag lands.

Response
This is one of a number of ideas for improving water quality that should be evaluated during implementation phase of the TMDL.

8. We also have two developed cities (Drain and Yoncalla) as well as sewage lagoons for the Rice Hill area, within our basin. In high flow events they sometimes dump (and are forgiven for doing so by DEQ) excess into the streams. It is also our understanding that there are seepages and leaks during these high flow events. These same high flow events are when DEQ did their studies on the Elk Creek. Could the exceedance have been from these sources? Our point being that if the big contributors can be forgiven during these events, why are you after the small contributions (if any) of Ag. Why, if there is a problem, don't you forgive all contributors during these high flow events?

Response
The exceedances of the bacteria standard occur upstream of treatment facilities on Elk Creek. ODEQ has memorandum of agreements (MOAs) with facilities which do not meet required standards. These MOAs specify necessary upgrades and timeline for these upgrades. ODEQ does not "forgive" the treatment plant's contribution during these high flow events.

9. Now some common sense. If the problem only persists during high flow events (which as #6 and #8 reveals, we don't feel we are the problem) why don't you put out advisories to those recreationists who do use the water (we are yet to see any recreationists out in the high flow events). Does it not make more sense to do that than to regulate the thousands and thousands of Ag land producers? Let's put common sense back into government and let's quit spending so much money and spinning our wheels on fixing a problem that probably does not exist (i.e. the OCA/CEC study, OCA/CSR study, and the DEQ/SRWC DNA study).

Response
The Clean Water Act requires streams to be fishable and swimmable. Simple implementation measures of the bacteria TMDLs in other watershed on agricultural land have led to dramatic reduction in bacteria concentrations.