North Coast Subbasins

TOTAL MAXIMUM DAILY LOAD (TMDL)
& WATER QUALITY MANAGEMENT PLAN (WQMP)

Response to Public Comments

Prepared by:
Oregon Department of Environmental Quality
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State of Oregon
Department of
Environmental
Quality

INTRODUCTION

This Response to Public Comments addresses comments received regarding the Draft North Coast Subbasins Total Maximum Daily Load (TMDL) and Water Quality Management Plan (WQMP) released in December 2002. Written comments were received during a public comment period that extended from December 12, 2002, through February 21, 2003. Oral comments were received during public hearings held on January 27, 2003 in Seaside, OR, and on January 29, 2003 in St. Helens, OR.

LIST OF INDIVIDUALS PROVIDING COMMENTS

The following individuals provided comments on the TMDL during the Public Comment Period. Oral comments were received and recorded at public hearings described above.

Commenter	Association	Comment Type
Pam & Jeffrey Birmingham	Basin Residents	Written
Bill Langmaid/Maggie Peyton	Nehalem Watershed Council	Written
Deanna Mancill	Neacoxie Watershed Committee	Written/Oral
M. Neff	Basin Resident	Written
Darrel Whipple	Clatskanie River Watershed Council	Oral
Helen Rueda	USEPA	Written
Chris Jarmer	Oregon Forest Industries Council	Written
Erin Madden	Northwest Environmental Defense Center	Written
Kevin Godbout	Weyerhaeuser – External Regulatory Affairs	Written
Ray Jaindl	ODA – Natural Resources Assistant Administrator	Written
Jim Paul	ODF – Forest Practices Section	Written
Chris Knutsen	ODFW – Asst. District Fish Biologist	Written
Bill Otto	ODFW – Hatchery Coordinator	Written

Responses to the comments

Following this Introduction is an index to the comments and DEQ's responses to those comments. The comments are summarized in the index to give context to the reader. The summarized comment may not represent the entire comment but will give the reader some guidance as to what the subject is. The number associated with each comment in the index is actually the number of the response to that comment. This was done because some comments have multiple parts and are not easily identified within the text. Following the index, all comments are included in their entirety, organized by commenter. We have included the full text of comments to guard against confusion over intent of the comment or the response. Responses immediately follow each comment and are in *italic* font to distinguish them from comments.

Changes to the Draft TMDL and WQMP

Changes were made to portions of the TMDL based on comments received from those listed above. Where changes have been made based on a comment, the change is indicated in the response to that comment. Some significant changes are:

1. The list of water quality limited waterbodies covered by the TMDLs was expanded to include waterbodies added to the State's 2002 revision of the 303(d) list, which was recently approved by EPA. All waterbodies in the North Coast Subbasins are subject to the allocations included in the TMDLs.
2. Chapter 8 of the Water Quality Management Plan (Reasonable Assurance) is now included in the TMDL document.
3. Many commenters expressed concern that the WQMP did not provide sufficient specificity in providing measures for meeting the allocations. The concern was that without specific measures that are linked to meeting the allocations, there is no reasonable assurance that water quality standards will be met. We have added more detail to the responsibilities of several of the Designated Management Agencies in both Chapter 8, Reasonable Assurance, and Chapter 9, Monitoring and Evaluation. In most cases these DMAs are responsible for large areas and apply measures based on existing rules. At the local level, DMAs are required to determine

application of practices on a project specific basis. The added information provides a coherent program with rules that require operators to protect water quality.

4. We have added a subsection to Chapter 7 of the WQMP entitled "ESTIMATE OF TIME TO MEET WATER QUALITY STANDARDS." Within this section we have provided explanations for the timeline, and the following milestones for meeting water quality standards:
   Bacteria:
   Achieve water quality standards in the rivers and Bays/Estuaries by 2010.
   Temperature:
   Milestone 1; Measurable increases in instream shade by 2020
   Milestone 2;Achieve instream temperatures that meet salmonid requirements by 2050
5. Three commenters expressed concern with the description of the ODF/ODEQ study entitled: "Sufficiency Analysis: A Statewide Evaluation of Forest Practices Act Effectiveness in Protecting Water Quality." We have replaced the descriptions of reasonable assurance and monitoring for forestry, and references to the "Sufficiency Analysis" with text provided by ODF.
6. Two commenters provided information regarding temperature impacts on Fishhawk Creek downstream of the dam at Fishhawk Lake. Data collected by ODFW and the Upper Nehalem Watershed Council have both demonstrated that the release of water from the surface of the reservoir causes warming downstream. A requirement to

Significant Changes to Allocations Resulting from Comments
There were several noteworthy changes in the expression of allocations and a change in the application of standards to another waterbody. In general, these affected only point source wasteload allocations for dischargers.

Allocations to wastewater discharges were extended to include wasteload allocations (WLAs) for expansion of existing discharges and for future growth. The WLAs in the Draft TMDL maintained current permit limits for each of the discharges based on the modeling result that loads from these discharges had no impact on water quality in receiving waters or in downstream shellfish harvest areas (in Nehalem Bay and Necanicum Estuary). The modeling also demonstrated that loads increased to two times the current permitted loads would not cause a violation of water quality standards more than 99% of the time during runoff events in Nehalem Bay and Necanicum Estuary. Permit limits will remain at water contact criteria as in existing permits. The difference between current permitted loads and twice the current permitted loads has been allocated to future growth and expansion. Any increase in loading from wastewater treatment plants would be a result of increasing flows as treatment capacity expands, and would require a new NPDES permit. No increase in loading from current levels will be allowed without a demonstration by modeling or other means that no impact on receiving waters will result from the increase.

The other change to allocations was the inclusion of CAFOs (confined animal feeding operations) in the wasteload allocation summary. CAFOs are considered permitted point sources and therefore should have a wasteload allocation rather than a load allocation. The terms of the CAFO permit do not allow discharge of wastewater from specified facilities into surface waters. The wasteload allocation for CAFOs is zero. A separate load allocation for pasture lands remains in the load allocation summary. There were no other changes made to allocations as a result of any of the comments. Text has been added in some other cases to help explain allocations.

A third change was made to the period when the spawning criterion would be applied in the North Fork Nehalem River. The Department of Fish and Wildlife had indicated that there is no evidence now or in the past of a run of Spring Chinook in the North Fork of the Nehalem River. After conversations with ODFW we have been assured that the distribution database will be revised to reflect this understanding. Although this will not alter the allocation to the North Fork Nehalem Fish Hatchery, the criterion will not be applied until later in the fall based on spawning of other salmonids. This is consistent with specific habitat use information provided by ODFW (Joe Sheahan) for Fall Chinook and Coho Salmon in the North Fork.

In reassessing the application of standards to the North Fork of the Nehalem, it became clear that we had misapplied the spawning criterion in developing wasteload allocations for two other point sources. According to ODFW data, Shoreline Sanitary District in the Skipanon River, and the City of Clatskanie WWTP discharge to waters that do not support spawning at any time. Spawning habitat is designated upstream of the influence of both of these facilities. As a result of this, wasteload allocations to meet the spawning criterion have been removed from the TMDL.

SUMMARY OF COMMENTS AND INDEX OF RESPONSES

Comments and Responses

PAM AND JEFFREY BIRMINGHAM

This is a wonderful document; well researched and well presented. Areas of concern are the impacts of forest operations on both private (governed by the Forest Practices Act [FPA]) and state managed (governed by the Northwest Oregon Forest Management Plan [FMP]) lands. The research in this draft document proves conclusively that past forest management practices and their approved harvest activities have had a significant, negative cumulative impact on water quality throughout the North Coast region. In our experience with Oregon Department of Forestry (ODF) forest management practices, we have come to realize that ODF encourages implementation of the minimum protection levels of public resources.

STREAM TEMPERATURES & SEDIMENTATION: While much attention has been given to the obvious need for protection and restoration of large Type F waterways, much of the supporting habitat such as headwater areas, small Type N streams and upland tributaries has been stripped bare of shade providing vegetation. Current research and monitoring results demonstrate the direct impact of forest harvest activities upon stream temperature and sedimentation. For an example regarding the correlation between forest harvest activities and stream temperatures, Table 2-1 (page 145 of Appendices) demonstrates that the temperature of tributaries has a direct influence upon the resultant temperature of the down-watershed mainstem streams. Therefore, any final plans should mandate that ODF's Best Management Practices (BMP) prescriptions **provide adequate streamside buffer strips for: Type F streams at 150-200 feet, Type N Perennial streams at 135 feet, and Type N Seasonal streams at 100 feet. The first 100 feet of all of these riparian buffer areas should be designated a true "no touch zone" (allowing no loopholes such as salvage logging practices, basal area quantification, and hardwood conversion practices), thereby allowing these riparian buffer areas to reach and maintain mature forest conditions in perpetuity.** Only through these consistent, region wide restrictions can we begin to reverse the cumulative damage done to our water resources.

Birmingham 1: *The temperature TMDL has determined that restoration and protection of system potential shade on all streams throughout the North Coast Subbasins planning area will reduce instream temperatures significantly. Our modeling provides an estimate of the potential effective shade throughout modeled reaches based on assumed buffer widths and densities. The true width of buffer needed to provide these levels of effective shade is still a matter of debate among experts and will be determined through continuing discussions among DEQ, ODA, ODF, and federal land managers.*

FOREST TOXIN APPLICATION: The only reference, albeit indirect, toward possible future safeguarding and monitoring of our state forest lands against the impact of forest toxins (biocides, herbicides, etc) is the reference within the WQMP section of this report, under Appendices, Chapter 4, Goals and Objectives, page 383. This reference, as stated, is not inherently sufficient to assure the people of Oregon that forest management (ODF) applications of toxins is planned to be qualitatively and quantitatively regulated by DEQ and/or EQC. **What is glaringly neglected therefore within this report is the attention to impacts of the use of biocides that have been and are being sanctioned by the Oregon Department of Forestry (ODF).** In order to have the Clean Water Act standards achieved within the North Coast region, this toxin issue must be incorporated within this planning process and addressed head-on.

Birmingham 2:*The Draft TMDL and WQMP address only temperature and bacteria in the North Coast Subbasins. Parameters other than these may be addressed in the future if there are indications that water quality standards are violated by anthropogenic sources of pollutants, such as toxics, affecting beneficial uses.*

In summation, please accept our congratulations regarding your department's production of this superlative and visionary document. Generally, it is a comprehensive and resourceful reference that will prove to be a benchmark concerning water quality standards within the North Coast region for the foreseeable future.

The only respectful recommendations that we urge you to consider are: additional inclusion of the qualification and quantification of introduced biocides (perhaps to be added within your "Implementation Plan for Non-Federal Forest Lands" section, currently commencing on page 407 of Appendix 1 of this document). These toxins, as introduced into the watersheds under the allowance of the forest practices as regulated by the Oregon Department of Forestry,

have impacts that must be recognized and monitored. With that additional component to your document, you will then have provided a complete water quality summary for the North Coast region. Secondly, we urge the DEQ to not compromise the water quality of the State of Oregon by allowing political pressure to drive decisions and management pathways.

Thank you for this opportunity to comment.

BILL LANGMAID, MAGGIE PEYTON– UPPER NEHALEM WATERSHED COUNCIL (UNWC)

Maggie and I just spoke on the phone and she asked me to write a statement about the temperature problems on Fishhawk Lake that should be considered public comment for the TMDL proposal. I don't have the proposal in front of me, so I can just comment on what I know about the actual conditions on Fishhawk Lake and Fishhawk Creek, a tributary of the Nehalem River that enters the Nehalem River in Sec 17, T 6N5W.

Monitoring data captured by the Upper Nehalem Watershed Council, and submitted to DEQ through the volunteer monitoring program, has consistently shown the Fishhawk Creek system to be temperature impaired. In 1998, data was gathered above and below the Fishhawk Lake using DEQ supplied Vemco dataloggers. The upstream site showed temperatures above 64 deg F for 37 days between 7/14/98 and 9/4/98. During that same period, the temperature below the lake was ALWAYS above 64 deg F, day and night. Daytime temperatures below Fishhawk Lake were above 64 deg F until 9/24/98.

In 2000, data was again collected for the same two sites, and the results were similar. Below the lake, temperatures were at or above 64 deg F day and night from 7/16/2000 through 8/13/2000, and above 64 deg at some point during the day from 7/7/2000 through 8/31/2000. Above the Lake, temperatures were above 64 deg F only 8 days, 7/29-7/31, 8/4-8/6, 8/8, and 8/9. This clearly shows that Fishhawk Lake has a definable influence on temperature within Fishhawk Creek.

In 2002, temperatures above Fishhawk Lake were over 64 deg F at some point during the day for only 12 days of the summer, while downstream of the lake the temperatures remained above 64 deg F from 7/9/02 through 8/2/02 and were partially above 64 from 7/7/02 all the way to 9/2/02.

Clearly this data shows that Fishhawk Creek is a temperature impaired system. As this system is anchor habitat for native salmon, it seems that it would be extremely important to include it in the TMDL as a system of special notice.

UNWC 1*: We have inserted a section in the Water Quality Management Plan presenting temperature data demonstrating the effects of the dam on Fishhawk Creek, and we will require the operators of the reservoir to develop a Temperature Management Plan.*

Thanks for the opportunity to comment on the draft TMDL for the North Coast Basins.

DEANNA MANCILL

Re: Draft Document, North Coast Subbasins, Total Maximum Daily Load, Water Quality Management Plan

Dear Mr. Nigg:
I support the DEQ adopting the draft document regarding water quality in the North Coast Subbasins. In particular, I am concerned about the pollution problems in Necanicum Watershed, which extends north to Sunset Lake.

The Oregon Department of Agriculture completed water quality studies between 1995-1997 along the beaches in Seaside and Gearhart, and found the fecal coliform count exceeded the maximum criterion of 14 MPN/100. The highest readings are always at the mouth of the Necanicum Watershed. Because the water quality on the beaches does not meet the Clean Water Act, commercially harvested shellfish cannot be shipped out-of-state. This has an huge financial impact on commercial shellfish harvesters. It effectively shuts the door on this industry.

I can speak firsthand on what I have observed in Neacoxie Creek, part of the Necanicum Watershed. At "G" Street, in Gearhart, there are elevated reading of E. coli. The report mentions septic systems as a possible source. There are 3 cesspool systems along G Street, all within 500 feet of the creek. There are many more systems like this in Gearhart.

Last spring I observed a herd of cows grazing in Neacoxie Creek south of Del Rey Beach access. When I contacted the Oregon Fish and Wildlife about the rules regarding livestock in creeks, it seems the State of Oregon has no oversight. A property owner could ask for assistance to fence off the creek with Clatsop Soil and Water Conservation, but it's not a mandatory program.

Going beyond the scope of this study and the testing of water temperature, E coli and fecal coliform, I believe man-made pollutants also impact the health of the watershed. There was no information regarding runoff from parking lots, that flow into local rivers.

Mancill 1*: Urban runoff was included as a source in the modeling of bacterial contamination in the Necanicum, Nehalem, and Clatskanie Watersheds in the TMDL. A load allocation was developed for each of the basins for this landuse, which includes runoff from parking lots, road surfaces, and other urban uses. The Water Quality Management Plan requires urban areas in the basin to develop stormwater management plans to address these sources. Although the impetus for developing these plans is meeting load allocations in the TMDL, other water quality parameters will also be addressed.*

Recently, I had made a complaint to the Clatsop County Planning Department about an illegal wrecking yard, in existence for five years, operating in a freshwater wetland next to Mill Creek, which flows into the Necanicum Estuary. The county stalled inspecting the site for four months, just long enough for the property owners to remove all the cars, and cover the mess with many dumptruck loads of sand. The inspection happened last week. Today, once again, old wrecked cars are being reintroduced onto the site. The County did not have a representative from the DEQ on this visit and the polluted soil is still there.
We have forwarded this letter to several agency representatives with responsibilities for ensuring compliance with existing laws.

I am advocating for educating property owners on maintenance of on-site septic systems and bringing failing systems up to state code. Cattle should not be allowed to pollute our creeks. Landowners need to be encouraged to utilize private and government conservation programs. Protecting and restoring riparian vegetation along streambanks, as well as maintaining adequate setbacks from wetlands to improve water quality are goals I have.

Mancill 2*: We have forwarded your comments regarding on-site septic systems and livestock management to individuals in DEQ and the Oregon Department of Agriculture responsible for investigating complaints of this type. DEQ will be following up on potential on-site system impacts to these waterbodies in the coming years.*

I am the chairwoman of the Neacoxie Watershed Committee. However, my views are my own personal opinion. Thank you.

M. NEFF

Mr. Nigg
I don't know what can be done about it, but during salmon season you have a thousand fishermen urinating in the Tillamook area streams on a daily basis. And there's more during steelhead season.

Respectfully

Neff1: *Although the Tillamook area streams are not covered by the current TMDL, but this issue is presumably pertinent in any basins where there are salmon and fishers. The current TMDL is directed only at bacterial indicators that would generally not be associated with urine. Although urine in high concentrations would result in potential ammonia toxicity, there is little reasonable basis for assuming that the amount of urine reaching the stream directly would not be diluted by relatively large instream flows of water. Related to this, however is the*

likelihood that people defecate near streams and that this may continually erode into and contaminate surface waters with fecal bacteria.

We have forwarded this comment to the Oregon Department of Fish and Wildlife and will discuss their educational approach for fishers to ensure water quality protection.

DARREL WHIPPLE

I am a taxpayer in the parks and recreation district in Clatskanie. I am interested in Clatskanie River and its water quality. I'm concerned that it's a water quality limited stream by the measurement of DEQ, and I am looking for a path to get it to good quality water. I'm impressed with the presentation tonight by Eric Nigg and his willingness to answer lots of questions about the TMDL program of DEQ and the Water Quality Management Plan that follows that. I am pretty optimistic that if the state can apply these tools, the TMDLs, to our local rivers and streams such as the Clatskanie, the allocations and so forth they have identified, that the water quality will be improved and it will be suitable for salmonid species and perhaps for swimmable waters.

Thank you for the opportunity to speak.

HELEN RUEDA - USEPA

Following are the Environmental Protection Agency's (EPA) comments on the draft temperature, pH and biological criteria Total Maximum Daily Loads (TMDL) and Water Quality Management Plan (WQMP) for the North Coast Subbasins, released for public comment on December 12, 2002.

This draft document presents TMDLs and WQMPs for the North Coast Subbasins and the analysis utilized in developing the TMDLs. In general, EPA finds the information presented in the TMDLs to be presented in a clear and complete format and inclusive of all the statutory and regulatory components required of TMDLs. The following comments provide some suggestions on minor changes, which would clarify the TMDLs. In addition, comments are presented on how improvements can be made to the WQMP to make it more effective in guiding implementation efforts to restore water quality.

EPA would like to acknowledge the effort that went into developing this TMDL. Oregon's temperature modeling efforts are a model for other states, and this TMDL shows the state's commitment to improving and expanding its water quality modeling.

Following are comments on specific elements of the TMDL and WQMP:

2002 303(d) Listings

Since the issuance of this draft TMDL, DEQ has completed it's 2002 303(d) List and submitted it to EPA. This List includes several waterbody segments impaired for bacteria and temperature which were not on the 1998 303(d) List. Since this draft TMDL addresses all perennial streams in the noted subbasins, we recommend that the TMDL specifically include in Table 1, all waterbodies listed on the 2002 List. In addition, if DEQ wishes EPA action on all waters identified as impaired by the 2002 list, this should be identified in DEQ's submittal letter.

EPA 1*: DEQ will include a list of all 2002 303(d) listings for temperature and bacteria within the North Coast Subbasins TMDL planning area in the final TMDL. We will also request in our submittal letter that EPA approve the TMDLs for these newly listed waterbodies as well as those previously listed..*

Bacteria TMDL

p. 93; Table 25: It would be desirable to have some information on how the load capacities and load allocations were derived. A sample spreadsheet of calculations in the appendix would be helpful. Also, a handful of graphs showing how empirical equations were derived would be helpful.

EPA 2*: The loading capacity is defined as the maximum predicted 90-day median and 90th percentile loads after load allocations using the mathematical model described in Appendix B. The model is based on flow and pollutant accumulations from small spatial subunits distributed throughout the subbasins. The maximum load for each landuse was determined by reducing storm runoff concentrations and direct loading until the shellfish criteria were not exceeded for the model period of September 1995 through March 2002. The model used a daily time step, but a 90-day moving window to calculate the median and 90th percentile statistics. There is not a spreadsheet that calculates these values. We have added text to the description of Loading Capcity determination to clarify this.*

p. 93; Waste Load Allocations: CAFO's are required to obtain NPDES permits to cover their direct discharge to surface waters. As such, they are considered point sources and should be given a WLA. As the NPDES regulating CAFOs require that there be no direct discharge from these operations, a zero WLA should be assigned. As DEQ noted in the Tualatin River Subbasin TMDL, the area addressed by this permit is limited to the confined portion of the operation and does not necessarily include the pasturelands associated with the operation. Thus, any bacterial loading from the non-confined areas should be included in a separate load allocation.

EPA 3*: DEQ will indicate in the Wasteload Allocation sections of each subbasin that CAFOs receive a wasteload allocation of zero (0) as is required by the NPDES general permit. The Wasteload Allocations to CAFOs include the immediately surrounding pasturelands associated with the operation. Surrounding pasturelands were estimated by assuming that the 0.5 acres was associated with each adult animal. Therefore, an estimated 650 acres in the Nehalem subbasin and 440 acres in the Necanicum subbasin are associated with CAFOs. For analyses and allocation purposes, pastureland associated with CAFOs received an allocation of zero (0) and is differentiated from pastureland not directly associated with CAFO facilities. Load allocations for these pasturelands will remain in the load allocation tables in each subbasin.*

p.94; Table 27: The Load Allocations would be more useful for implementation and monitoring if they were broken down into finer units than the whole subbasin.

EPA 4*: The model is developed by applying the concentrations that ultimately became the load allocations to the entire watershed, then iteratively decreasing the concentrations until the water quality criteria were met everywhere. There are no fine scale allocations in this approach. Separate allocations were developed within the Nehalem River subbasin to address different source, dilution and decay characteristics. This resulted in separate load allocations for upper and lower watershed areas. River systems in the other subbasins were generally smaller, with urban and agricultural landuses isolated in relatively small areas. In general, we prefer having consistent allocations for the simplicity of implementation – i.e., livestock operators don't have to determine which of the allocations is theirs. Moreover, there is no indication the significant differences in allocations would result from a site specific approach to modeling.*

p. 337; paragraph 1: It would be good to see the actual graphs where the empirically derived equations were developed.

EPA 5*: We have included a graph of the flow-salinity regression including the equations.*

<u>Other Comments</u>

p. 393; Chapter 8 - Reasonable Assurance: This section or some reference to this section should be included in the TMDL, not only the WQMP. It is a required element of a TMDL.

EPA 6*: We have inserted the Reasonable Assurrance section into the TMDL document.*

WATER QUALITY MANAGEMENT PLAN
(Prepared by EPA Region 10, Office of Ecosystems and Communities)

The purpose of Section 303(d) of the Clean Water Act is restoration of waterbodies not meeting water quality standards. Listing, analysis, and TMDL development are critical preliminary steps. The implementation plan, however, is the key to getting measures on the ground where needed in order to meet specific targets and goals laid out in the TMDL. We are pleased that development of WQMPs is an integral part of Oregon's TMDL process.

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.

The North Coast Subbasin TMDL covers lands within Oregon's Coastal Nonpoint Management Area under Section 6217 of the Coastal Zone Reauthorization Act Amendments of 1990. 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. These areas include harvest in high risk, landslide prone areas, riparian protection, and cumulative effects. Our concerns about harvest in landslide prone areas have been further exacerbated by a recent Board of Forestry rule that removes the Board's requirement to review and approve timber sales in these areas. The preponderance of monitoring, assessment, and research efforts demonstrate that Oregon's existing forest practice rules will not adequately protect water quality or recover fisheries. The WQMP for the North Coast Subbasins TMDL does not provide additional management measures or recommendations that address well documented concerns about the Forest Practices Act (FPA) with respect to riparian protection, harvest in landslide prone areas, and cumulative effects. Therefore, we encourage DEQ to work with ODF to initiate North Coast Subbasin forest practice rule changes or to begin statewide rule revisions to ensure that forest management practices in Oregon will meet TMDL targets and WQS.

EPA 7*: DEQ and ODF have recently completed work to assess the sufficiency of current forest practices to ensure water quality standards are met. A number of recommendations have been made to change forest practice rules to enhance protection of various measures of water quality, including temperature and sedimentation. We will continue to work with ODF to assess the adequacy of forest practices to protect water quality.*

Although we recognize the role of sedimentation in controlling channel morphology, and therefore temperature, there has been no detailed analysis of sources of sediments or landslide rate in our analyses. Landslide analyses conducted for parts of the Coast Range indicate a high risk of landslides overall due to the generally steep topography. Studies are varied in their conclusions regarding the impact of forestry practices on landslide risk. Still, there seems to be consensus that harvest practices increase the rate of landslides relative to unharvested, well-vegetated or mature areas, particularly when forest roads are included as a source. The magnitude of the increase in rate of landslides and the volume of sediments delivered varies widely among studies. However, as indicated by the Rosgen analysis in the Temperature Technical Appendix, most of the Nehalem subbasin met expected morphological characteristics with respect to dimension, pattern and profile. Moreover, the difference between current channel widths and system potential channel widths was not that great for most of the modeled reaches.

The Draft North Coast Subbasins TMDL is a scientifically sound analysis of appropriate data, establishing a connection between landscape condition and water quality. The TMDL translates loads into understandable and achievable surrogate targets, such as bacterial concentrations in runoff from a variety of land uses, site potential effective shade, and stream morphology aspects. As such, the TMDL is a primary mechanism to ultimately meet water quality standards. It is an excellent tool for improving overall watershed health and provides the basis for this Water Quality Management Plan.

At present, the WQMP is a general framework, identifying DMAs and programs, and laying out a pathway for more detailed planning and tracking. As such, it has only general, conceptual ties to the TMDL load allocations. We understand that this document is a first iteration of a compilation of more detailed implementation plans. Because the responsible programs and agencies run on separate tracks, it is not clear what the unifying mechanism is that would consistently look at the watershed as a whole, piecing together the eight DMA implementation plans. From this WQMP, we cannot even get an idea whether or not the DMAs coordinate with each other in these watersheds.

EPA 8*: This is one of the main challenges, especially given the area and diverse nature of the watersheds that flow separately to the ocean and Columbia River. The Department, pending available resources, plans to address coordination in a variety of ways. Our general approach to implementation is through a watershed approach with coordination among parties with overlapping responsibility for protection and implementation. We have added information to the Reasonable Assurance and Monitoring and Evaluation Chapters that describes appropriate feedback mechanisms that will report implementation progress to DEQ. We will also work closely with watershed*

councils and estuary partnerships (Columbia and Tillamook Bay) that play a role in coordination. The Department will develop a more detailed monitoring and reporting plan to assess implementation accomplishments and difficulties as they are identified. Division 340-42 provides strategies for achieving allocations. Details are in specific implementation plans which are referenced in the WQMP or will be developed by DMAs. The Department will also use a basin approach when it reviews and updates the TMDL and WQMP starting with the North Coast in 2005 and Lower Columbia Subbasins in 2006.

Figure 2 (p. 391) indicates that a full implementation and monitoring plan will be submitted by the end of 2003. We expect that the next iteration of the WQMP will more fully describe commitments, roles, and processes that will be put in place to analyze information in order to judge whether adjustments in the plans are needed.

EPA 9*: We have changed the water quality management plan timeline (Figure 2, WQMP) to reflect a longer planning period. The purpose of this change is to reflect that the only DMAs that will need to develop management plans are the counties and towns/cities that will be required to develop stormwater management plans. Though the populations of these towns are smaller than the limit for inclusion in Phase II MS4 Stormwater Rules, DEQ has been requiring development of these plans elsewhere in the North Coast Basin, and has been assisting small cities in obtaining funding for planning. Development of these plans will take more time, and funding is presently unavailable. Existing management plans for state roads, forestry and agriculture under the auspices of ODOT, ODF and ODA, respectively, are described in the reasonable assurance section, and are appended to the WQMP. Many of the identified DMAs are NPDES permittees, whose allocations will be addressed directly in their permits and associated temperature and bacterial management plans as appropriate. The timeline for these permit revisions has also been extended slightly.*

The adaptive management section describes a general scenario. Part of the work of adaptive management is determining whether or not the planned implementation is achieving desired results and if not, whether adjustments are needed on the ground. How will that part of the work be done? In some parts of the document it says that plans will be reviewed every year, in others, every five years, and in another, that modifications are expected to occur on an annual or more frequent basis.

Pages 373 and 391 indicate a review process in the fifth year (2007) in preparation for potential revision of the TMDL. The Plan also states that DMAs will submit annual reports on September 30 of each year. The accountability implied by this reporting requirement is good. Is there a plan for what will be reported on and how it will be evaluated? [There is reference on p.399 to a plan in Appendix X, which is not included in the Draft.] What is the history of reporting and evaluation of those reports resulting from other TMDLs? We believe that a coordinated annual review of progress with representatives of all DMAs present would be the most effective and efficient process to review reported data and technical information.

EPA 10*: The tracking of progress toward meeting water quality standards is done through a combination of subbasin-scale water quality monitoring and monitoring of the effects of individual projects, where possible. Ongoing monitoring will continue through DEQ's ambient monitoring network and through continued funding of watershed councils. The ambient monitoring program will continue to track water quality at integrating stations in North Coast Basin Rivers. This will provide a large scale view of water quality and over time will capture improvements or the lack thereof. Water quality monitoring will also continue through watershed councils on a finer scale than ambient monitoring, and project implementation monitoring is required as a part of grant funding for restoration projects. The ODF has a continuing forest practices monitoring program that will provide a basis for determining compliance and sufficiency of practices in the future (similar to what has recently been completed – see Chapter 8: Reasonable Assurance). ODA has begun monitoring the occurrence of prohibited conditions as defined in the North Coast Basin Agricultural Water Quality Management Area Plan (ODA 2000) and associated statutes. The information from these sources are generally required to be reported annually or biennially. Along with reports from cities as stormwater improvements are made, this information will allow DEQ to assess implementation as the TMDLs are reviewed every 5 years or as needed. We have provided additional explanatory text in the Resonable Assurance and Monitoring Sections of the WQMP to clarify these reporting and assessment issues.*

<u>Temperature Specific Comments</u> -

Page 117 and following pages of the Draft TMDL give a good synopsis of relevant factors that affect stream temperature dynamics. As noted in the TMDL, stream temperature increases as stream width increases. Widening of stream channels is often caused by increases in sediment bed load. Therefore we suggest elaborating on the role excess sediment plays in altering channel morphology, specifically channel width and near stream disturbance zone width.

EPA 11*: As the TMDL and Temperature Technical Appendix suggest, most of the mainstem and major tributaries in the Nehalem River subbasin were at expected levels of channel morphological features. Although most reaches had some degree of widening, much of this is apparently a legacy condition from past practices. We expect that current rules governing forest and agricultural practices will offer increased protection of riparian areas, and ongoing analysis of landuse practices will continue to improve them. Still we have added to Section 3.1.9.2 some discussion of the causes of impairment of channel morphology.*

We also emphasize that cumulative impacts are important throughout the entire hydrologic system of the watershed. The idea is to prevent heating as much as possible throughout the watershed and to maintain or restore natural landscape hydrologic functions that tend to keep cold water cold. Contributing factors like groundwater input, future increased in-stream flow, reductions in human-induced sediment, and changes in channel morphology are important and we are pleased to see that many have been recognized in this document. Because of the cumulative nature of temperature dynamics, the role of small and intermittent streams should also be factored into protection and recovery planning.

There is another factor worth mentioning. It is becoming more widely recognized that the spatial and temporal patterns in aquatic temperature conditions are important, particularly for salmonids, which need well-connected, well-distributed cold water areas throughout the aquatic system. That concept is an important one to recognize and articulate because it affects decisions on which protection and recovery actions will be undertaken and where.

EPA 12*: The analysis of temperature throughout the basin was designed to address current water quality criteria. Although meeting these criteria is the stated goal of the TMDL, the temperature allocations are designed to provide the coolest water that can be expected in the system (i.e., system potential). Allocations are made for the entire basin, including small and intermittent streams, and we expect implementation to include these features as well. We believe the characteristics listed above will accrue along with cooler average temperatures.*

Minor Editorial Comment:

p. 52, Table 11. Reference for point sources loads should point to Table 12 (not 11). Also the significant figures used for the background solar radiation overstate precision of estimate!

EPA 13*: We have corrected this. The allocations are now expressed in exponential notation, but precision is still exaggerated somewhat to express the difference between the total loading and that allocated to background. The change highlights the relatively small proportion of the total loading resulting from point sources.*

CONCLUSION

We commend you for the efforts you have made to date and look forward to the submittal of the final TMDLs in the near future. If you have any questions regarding comments on the draft TMDL, please contact me at 503-326-3280. Questions regarding comments on the WQMP may be addressed to Teena Reichgott at 206-553-1601.

ERIN MADDEN -- NORTHWEST ENVIRONMENTAL DEFENSE CENTER (NEDC)

Dear Mr. Nigg:

The following comments are submitted on behalf of the Northwest Environmental Defense Center (NEDC) regarding the North Coast Subbasins Draft Total Maximum Daily Load (TMDL) and Water Quality Management Plan (WQMP). Water quality throughout Oregon is severely degraded as evidenced by the inclusion of over 1500

impaired or threatened waterbodies on the state's § 303(d) list. The water quality of the North Coast Subbasins directly affects salmonid species listed under the Endangered Species Act (ESA), 16 U.S.C. §1531 et seq., historically viable trout populations, diverse recreation opportunities, and estuary habitat. Thus, it is essential that the TMDL and WQMP are specific, technically sound and enforceable to ensure attainment of water quality standards into the future, as well as protecting and restoring viable populations of anadromous fish. DEQ undoubtedly faces a difficult task in improving water quality conditions where non-point source pollution places such a major role in water quality limitations. Unfortunately, the draft TMDL and WQMP fail to fully address these concerns. The following comments examine several issues that DEQ must address in order for the TMDL and WQMP to be effective and sound.

I. Introduction

A TMDL must assess all related impacts to water quality and beneficial uses of water quality limited waterbodies. The WQMP must also propose tangible and concrete actions that can be monitored and which must be enforced. The DEQ clearly acknowledges the designated beneficial uses in the North Coast Subbasins. TMDL, Table 6, at 31 and Table 17, at 76. The Clean Water Act (CWA), 33 U.S.C. § 1251 et seq., requires the protection of these beneficial uses through the establishment of water quality standards—both numeric and narrative. 33 U.S.C. § 1312(a). The DEQ also clearly lists the applicable water quality standards now being violated in the North Coast Subbasins. A TMDL is required where, as in the case of the North Coast Subbasins, water quality standards are not being met. 33 U.S.C. § 1313(d). The TMDL must determine the "loading capacity" of the watershed, which is the maximum amount of pollution loading that a waterbody can absorb without violating water quality standards. 40 CFR § 130.2(f). The TMDL must then consider point, non-point, background, and future pollution sources and determine the load and its allocations necessary to bring the watershed into compliance with water quality standards. Undoubtedly, the DEQ faces a difficult task in balancing the various uses in the North Coast subbasins and protecting and restoring vital salmon habitat.

The TMDL and WQMP should contain a series of analytical steps aimed at restoring water quality, including a comprehensive assessment of the condition of the watershed, followed by an accurate assessment of pollution inputs, succeeded by allocations of the maximum amount of pollutants that may be present in the waterbody while still ensuring the attainment of water quality standards, and concluding with an effective implementation plan to reduce pollution inputs to the extent necessary to meet water quality standards. The TMDL and WQMP have the potential to become powerful tools with useful results in the preservation and restoration of Oregon's waterways and must not be looked at as hoops to jump through. While the TMDL represents a number of improvements over earlier TMDL's in the state, there is considerable room for improvement in order to truly protect and restore the waters of the North Coast.

II. THE TMDL FAILS TO ADEQUATELY ASSESS AND ADDRESS WATER QUALITY STANDARDS AND BENEFICIAL USES

The DEQ properly identifies the geographic scope of the TMDL's application and recognizes that the causes of water quality violations are numerous and varied. However, the TMDL neither recognizes nor assesses the interrelated nature of beneficial uses. Further, it fails to adequately address water quality limitations, as well as their various interrelated causes. Such an analysis is necessary to ensure that the state meets the requirements of the Clean Water Act through proper load allocation in the TMDL that will ensure attainment of applicable water quality standards.

A. The TMDL does not address pollution, in addition to pollutants.

Oregon water quality standards include various narrative criteria related to pollution, rather than just being limited to control of pollutants. Standards pertain to physical, biological, and chemical parameters in the ambient water column. As the TMDL and WQMP make clear, these subbasins suffer from pollution impairments other than temperature, including low summer flows, increased sedimentation and loss of riparian vegetation. However, neither document provides much explanation of the specific causes of this pollution, nor any definitive means for fixing the problems. If the intent of the TMDL surrogate criteria is to avoid a narrow approach and use a more appropriate basin-wide analysis, then the assessment of the relevant criteria should be equally holistic. Therefore, a more useful approach would be to consider the interplay among the various water quality limiting factors, including

flow modification, loss of groundwater infusion, habitat impairment and other non-point source pollution. Consistent with the goals of TMDL development and the intent of Section 303 of the Clean Water Act, DEQ should make a more through analysis instead of ignoring issues critical to the attainment of standards.

Flow and Habitat Modification

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.

The TMDL and WQMP fails to assess the effects of water diversions and groundwater withdrawals on stream flow in the stream segments covered by these documents. Although the TMDL acknowledges "*it is likely* that…low flows in the lower portions of the drainage are impacted by upstream diversions," it fails to adequately assess this variable and its impact on temperature. TMDL at 19 (emphasis added). In fact, the DEQ admits that except for the Nehalem River, the agency lacks data on historical flow for the subbasins. *Id*. Moreover, the TMDL provides flow data for only one year for stream segments in the Nehalem subbasin. TMDL at 148-49. Such limited data is inadequate to ensure stream flow variables are accounted for in allocating loading among point and non-point sources. 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. This TMDL avoids mention of stream flow almost entirely in its analysis of beneficial use support and load allocations.

NEDC 1*: The TMDL used all existing flow information in analyzing temperature accumulation and modeling current and potential temperatures. There is a very good historical flow record for the Nehalem River and the calculated low flow statistics are considered robust. Flow statistics in other tributary watersheds were based on this long-term record and measured relationships between tributary flow and mainstem flow. These relationships are as accurate as we can make them and provide the most appropriate characterization of flow in the subbasin.*

The TMDL should provide a map, or at least a geographic list, of all locations within the basin where water withdrawals occur. The TMDL must also account for the reductions in flow and/or the reduction of cooling groundwater flow from non-point sources. In particular, the TMDL should address the effect of insufficient upland vegetation, loss of stream bank stability, water diversions, and groundwater withdrawals. Without this analysis, the TMDL will not be able to properly set load allocations. Non-point sources are the primary cause of water quality limitations in the subbasins. TMDL at 7. To the extent that land management activities, such as logging, are responsible for altering instream flows, modifying habitat supporting beneficial uses, or contributing to water quality violations, controls on these non-point source activities are just as necessary as controls on any point source.

NEDC 2*: Diversions of flow were considered in the analysis and modeling of current and potential temperature in the Nehalem Subbasin. There is a map of all diversions in the subbasins area (Figure 2-17) in the Temperature Technical Appendix. All permitted diversions in the watershed were added back to the flow on a site-specific basis for scenario modeling of the system potential temperature. The restoration of all diversions to river flow was a conservative element of the modeling in that all diversions do not remove water from the river simultaneously. The results of this "potential flow" modeling scenario indicated that, even with a volume equal to the total of all diversions replaced in the river (a situation that overestimates potential flow), there was no significant improvement in system potential temperatures (Figure 29 of Draft TMDL).*

Groundwater inflows were identified where possible using FLIR (forward-looking infrared radiometry). The end result of restoring riparian vegetation and channel morphology to system potential on groundwater flow is uncertain. Though infiltration of water increases with riparian and forest maturation, so does transpiration from the trees. However, by assuming groundwater flow was absent unless observed, its contribution to cooling instream was minimized. This is a conservative element in the modeling. Any increase in groundwater flow that accompanies restoration will lower temperatures.

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 subbasins. 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.

NEDC 3*: The TMDL for temperature is designed to determine the amount of anthropogenic heat that the river can absorb without violating water quality criteria. The critical period is defined as the time when instream temperatures are highest and flows throughout the basin are lowest. Point source discharge loading is calculated assuming a 7Q10 low flow. System potential shade and channel morphology surrogates will result in well-shaded river reaches at all flows. Temperatures will be similar to those modeled at low flows and will be lower during periods with flows higher than the measured low flow.*

There was a 60-year-long record of flow from a gage in the lower Nehalem River watershed. This position in the watershed integrates flows over the entire watershed and provides a clear view of historical flow conditions. There is no indication in this record (Figure 3, page 19 of the Draft TMDL) that flows have decreased over time, and given current water rights rules, there is little-to-no chance additional permits will be granted for large withdrawals of surface water during the critical period.

Though mainstem and tributary reaches modeled in the TMDL are not apparently adversely affected by low flows, smaller streams with significant local diversions may be. DEQ will continue to work with the Water Resources Department through Division 33 rules to limit additional surface water diversions and with local water services in development of Source Water Protection planning that also address flows needed for fisheries.

Non-Point Sources

The TMDL should identify all the specific sources for which allocations of the TMDL are being made. 40 C.F.R. § 130.2. Although the TMDL acknowledges that agriculture, logging and urban development "have altered stream morphology and hydrology," little information about the extent of these alterations is provided. TMDL at 38. 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 even 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 in the North Coast Subbasins where non-point sources play a major role in water quality violations. TMDL at 7. 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. In particular, in addition to merely listing loss of riparian vegetation as a condition which "*may result*" in increased temperature in the WQMP, the TMDL should analyze and discuss the actual effects of insufficient vegetation in upland areas and lack of streambank stability along with sparse or non-vigorous vegetation in riparian areas in order to ensure attainment of water quality standards in the future. When addressing non-point sources, it is extremely important that hazard areas be identified and prescriptions intended to control the loading from them devised. Neither activity has been performed in this TMDL or WQMP.

NEDC 4*: Nonpoint source contributions of heat result from less than system potential shade and channel morphology. Rather than not having made "an effort to address even the most significant of these locations," analysis of these and their underlying characteristics was fairly exhaustive, with measures every 100 feet along the Nehalem River and its five major tributaries. Measures of vegetation cover (Figures 3-17 to 3-34) and composition, gradient (Figure 3-3 to 3-7), topography (Figure 3-40), channel width (Figure 3-8) are provided in the Draft Temperature Technical Analysis appended to the TMDL. All of this information is required by the model on a fine scale, and was included in the Draft document. This information is available to Designated Management Agencies, watershed councils, private landowners and others interested in protection and restoration activities.*

Information in the TMDL will be used to prioritize efforts, but to a great extent the entire basin needs the same full protection. Existing riparian vegetation is protected by the forest practices act, SB1010 agriculture plans, and county planning ordinances. Enforcement of these rules is critical to maintaining progress in restoration. Allowing these areas to grow through time and protecting them from future human-induced disturbance is the appropriate

treatment. Restoration on private lands will largely be done on a voluntary basis as funding is available. Local groups (e.g., watershed councils) have been working toward this end both preceding and following adoption of TMDLs, and where available have used TMDL analytical products to prioritize their efforts. These priorities are determined based on many factors including landowner interest and funding.

B. The TMDL does not address all relevant water quality parameters.

Beneficial Uses:

The Department fails to adequately consider all relevant beneficial uses of the Northcoast subbasins. The TMDL contains a list of beneficial uses, which highlights which uses are sensitive to a specific pollutant. See e.g., TMDL at 76. However, the lists are incomplete and oversimplified. For example, in the temperature TMDL, fishing (a beneficial use) is temperature dependent because there will be reduced fish populations with higher temperatures. Yet, fishing is not highlighted as a temperature-dependent use. Similarly, Private/Public domestic water supplies and Aesthetic Quality are temperature, as well as bacteria level, dependent uses because higher temperatures and bacteria levels, increase algae blooms and decrease clarity.

NEDC 5*: We have made the change to Table 6, indicating that fishing is a temperature-sensitive beneficial use. Salmonid fish use is considered the most sensitive beneficial use due to the relatively low temperatures required to maintain healthy populations. TMDLs are determined to protect the most sensitive beneficial use under the assumption that all less sensitive beneficial uses will also be protected.*

The Department must consider the impacts of the various pollutants and the interactions between uses. Without this analysis, the basin-wide picture will be flawed and incomplete. DEQ's assumptions regarding the uses have implications for the entire TMDL.

Temperature:

According to the TMDL, an average of over 50% of heat loading comes from anthropogenic non-point sources. TMDL at 38. However, without any analysis of the specific causes of such loading (besides noting that riparian vegetation disturbance and its effects to channel morphology are the main culprits) or any enforceable measures to implement reductions, the TMDL allocates 0% of heat loading to non-point sources. TMDL at 52. Without such an analysis, it is entirely unclear how the DEQ will ensure, or even attempt to ensure, this allocation is met. The WQMP is equally devoid of measures to bring non-point source heat loading to zero. As noted above, an analysis of factors such as water diversions, loss of groundwater infusion, habitat modification and loss of meander would provide a more complete picture of the causes of temperature violations in the subbasins by integrating both obvious and more remote factors into the calculation.

NEDC 6*: The TMDL includes a detailed, fine-scale analysis of heat loading from nonpoint sources throughout the subbasin. It is clear from that analysis that about half the heat loading occurs naturally and the remaining half (basinwide) results from anthropogenic modifications to the environment in the form of vegetative removal and resulting changes to channel morphology. Measures that will improve/restore these conditions are contained in the Forest Practices Act and the Western Oregon State Forests Management Plan (Oregon Department of Forestry) and in Agricultural Water Quality Management Area Plans (Oregon Dept. of Agriculture). Current conditions in these watersheds largely reflect practices prior to adoption of new forest practice rules and pollution prevention and control measures. These plans are also adaptive, so modifications will be made to them as needed.*

Additionally, the use of mixing zones for determining wasteload allocations for point sources is improper in streams that are already water quality limited for temperature. The TMDL must allow for **no measurable surface water temperature increase resulting from anthropogenic activities**. OAR 340-41-445(2)(b)(A). Of particular concern, is the failure to leave any explicit reserve capacity in the load allocations, allowing for expansion of existing point sources and future point sources where no measurable temperature increase beyond the edge of the mixing zone occurs. However, it is unclear whether current technology or some other factor sets the "no measurable temperature increase" at <.25 degrees. Streams, which already exceed water quality standards for temperature, cannot dilute point source heat discharges in order to meet the water quality standards.

NEDC 7*: Point source allocations require there be no measurable temperature increase in water temperature at the edge of a defined mixing zone. This is true whether the stream is in compliance with temperature criteria or not. New or expanded sources will be held to the same limit of no measurable increase. As streams cool, point sources will be held to increasingly lower effluent limits to ensure they meet this limit. "Measurable Temperature Increase" is defined in Oregon Administrative Rules as an increase in stream temperature of more than 0.25°F. This limit is based on the reliability of modern electronic thermometers and variability of instream temperature measurements.*

Bacteria:

Although the TMDL states that fecal bacteria is the pollutant causing impairment in the subbasins, it is unclear whether the DEQ understands the specific sources of the bacteria. TMDL at 77. The TMDL notes that "human controlled sources demonstrably account for the greatest proportion" of bacteria in waterbodies. *Id*. However, the TMDL provides no documentation for this assumption. Moreover, the TMDL fails to provide adequate assurances or demonstrate that the causes of bacteria pollution are truly understood. In the Necanicum River, "bacterial contamination *appears to be entering the river* somewhere between Klootchie Creek and river mile 5." TMDL at 87. Sources in the Clatskanie River *are likely* to be urban runoff and "livestock operations or failing septic systems." TMDL at 89. In fact, the TMDL does not provide any definitive evidence of the causes of bacterial pollution for any of the water bodies covered by the document. Without such an analysis and determination, it is unlikely that load allocations will have demonstrable effects on bacterial levels in the waterbodies.

NEDC 8*: The source determination in the Bacteria TMDL was based on water monitoring associated with land uses along the streams. Surveys were conducted during both wet and dry weather. The exact source of any given bacteria sample is impossible to determine, and this level of determination is not required of the TMDL. By association with land uses and specific sources, DEQ and EPA have determined in this and other basins that landuses are associated with "typical" runoff concentrations. The reference to finding a source of bacteria between Klootchie Creek and River Mile 5 on the Necanicum River was in the context of a known source of bacterial contamination that was and is currently under enforcement by DEQ. The information provided implicated this source. In the Clatskanie subbasin, elevated concentrations were associated with areas that include both urban and livestock uses. A known source of contamination is this area (a large failing septic system) has recently been eliminated, and there is indication that concentrations have diminished.*

Of additional concern is the lack of implementation measures that will be used to stop CAFO discharges to waterbodies. Table 27, TMDL at 94, shows that CAFOs currently account for 10,000 counts of E.Coli per 100 ml in the Nehalem watershed. The TMDL reduces the E. Coli to 0 based on permit requirements, which prohibit CAFOs from discharging from confinement and manure areas. However, despite these permit requirements, which are already in place, CAFOs are discharging significant amounts of bacteria into the waterbody. The TMDL cannot arbitrarily reduce the CAFO discharge based on permit requirements, which are not currently being followed, without providing some analysis as to how these permits will be enforced.

NEDC 9*: Implementation measures that rely on existing rule structures (e.g., FPA or NPDES) are expected to be amended through time as there effectiveness is tested. CAFO permits are NPDES permits with provisions for specific parts of livestock operations. The permits generally limit the runoff of livestock maintenance and processing wastes in runoff to zero. Recently revised CAFO rules expand the definition of operations that may not result in runoff of wastes. The definition of these CAFO rules will also require many more operations to obtain permits. We expect these and other evolving rules to be the bulwark of water quality protection and implementation through time. Where permits are demonstrably ineffective in limiting pollutants from entering waters of the state and of the United States, there are remedies within the Clean Water Act.*

II. THE TMDL PROVIDES INSUFFICIENT INFORMATION ON SALMONIDS.

The TMDL should provide maps of both current and historic locations of salmon in the North Coast Subbasins. Salmonid spawning and rearing, as well as anadromous fish passage, are designated beneficial uses throughout the subbasins. TMDL, Table 6, at 31. The North Coast Subbasins TMDL lacks any specific information on the extent of historic salmonid use of the area, although maps of what we assume is current use is provided in Figure 6. TMDL at 32. In order to properly apply the requirement to protect existing uses, the DEQ must establish either the geographic areas where these sensitive species reside within the subbasins or apply site-specific criteria to the entire area to which the TMDL applies. No evidence of the geographic scope of salmon historic use is provided.

There should be an indication of the historic uses and range of the salmon within the basin to provide the public with an opportunity for meaningful public comments about the potential impact of the TMDL on salmon populations.

Moreover, it is unclear whether DEQ has applied the most sensitive use temperature requirement to the entire basin. This should be resolved in the Final TMDL in order to ensure proper protection of imperiled salmon species throughout the subbasins and help restore salmon, not just keep them from extinction. Although the TMDL does list a number of streams throughout the subbasin in Table 9, TMDL at 35, and the recorded 7-day average temperatures of those streams in summer 2000, the DEQ only highlighted those streams that exceeded the 64-degree criterion necessary for salmonid rearing. Little or no attention is given to ensuring stream temperatures are at or below 55-degree criterion necessary for spawning, egg incubation and fry emergence. Both criteria are essential elements of protecting and restoring salmon to the subbasins and compliance with these criteria must be fully analyzed in the TMDL.

NEDC 10*: Distribution and use information are provided by ODFW based on surveys by District Biologists. This information is vetted by ODFW prior to inclusion in the statewide database, and information is updated relatively frequently. The most recent information available was used in determining the distribution of and use by salmonids in the TMDL. These data are intended to represent not only known areas of use, but also potential areas of use based on habitat availability and passage. Reliable information of historical distribution and use is not available.*

DEQ applies the water quality criteria that protect the most sensitive beneficial uses for a given water body. Temperature TMDLs generally respond to violations of criteria defined for protection of salmonid migration, rearing, and spawning. Migration and rearing Load Allocations are applied basinwide to ensure these uses are protected (Sections 3.1.3 and 3.1.4 in Draft TMDL). Spawning criteria are applied at times and locations identified by ODFW as supporting that use for any species (Figure 6, Table 7, Draft Temperature TMDL). Wasteload allocations are designed to meet the migration and rearing criteria year-round and the spawning criterion based on the species present during the period of use. Load Allocations of system potential effective shade that are protective of migration and rearing will also be protective of spawning.

The TMDL determines that the sources of heat causing temperature standards violations are largely from anthropogenic nonpoint sources of heat, and allocates system potential riparian shade and channel morphology targets that will reduce temperature. The system potential temperature is the lowest temperature the waterbodies can attain in the absence of anthropogenic sources of heat. Excess temperatures during spawning periods in a given river are caused by the same deficiencies as during the critical period for migration and rearing. The load allocations for spawning are also system potential riparian vegetation and channel morphology, and the description of those conditions is the same regardless of the season. Wasteload allocations are provided separately for migration and rearing or spawning. Table 12, where wasteload allocations are presented in the Draft TMDL, has been revised to distinguish these separate allocations better.

III. TMDL ANALYSIS AND ELEMENTS

a. The Goal of the TMDL Must be Attainment.

The goal of any TMDL must be attainment of water quality standards. CWA § 303(d)(1). The North Coast Subbasins TMDL and WQMP treat attainment as if it is a theoretical construct, not a mandatory goal. Due to a lack of information regarding critical elements of water quality, as discussed previously, it is unclear exactly what will be required to restore the integrity of the water bodies or whether the TMDL will suffice. Although a number of tables in the TMDL and WQMP list the goals and objectives of the, there is little indication as to how these will be achieved. Obviously, achieving these goals in an area that suffers mainly from non-point source pollution is a difficult task. However, the CWA requires attainment and its implementing regulations make clear that the WQMP must include regulatory and voluntary actions that provide reasonable assurance that allocation will be implemented and actually achieve the load reductions. 40 C.F.R. § 130.32. Based on the use of mixing zones and allowing point source discharge above the attainment goals, TMDL, Table 12 at 53, it is questionable that even stringent and flawless application of the TMDL would yield the desired results.

NEDC 11*: The TMDL determines the loading rates that will meet water quality standards. We are confident that achievement of the load allocations requiring system potential shade and channel morphology will result in the*

coolest water temperatures attainable naturally. Point source discharges will not be allowed to cause a measurable increase in temperature outside of a defined mixing zone. The total load of all point sources that discharge in these subbasins is approximately 0.2% of the total heat loading capacity. Despite this, point sources will be required to reduce heat loading to streams at considerable expense.

The water quality management plan (WQMP) includes the enforceable regulations and measures to achieve the allocations defined by the TMDL. Current rules will protect existing vegetation and allow steady improvement of riparian areas in forested and agricultural lands with a legacy of riparian disturbance. The scope of restoration required to attain these new goals will be addressed as plans are updated following approval of the TMDL.

Regulatory actions that will result in implementation of allocations are clearly identified in the Water Quality Management Plan. There is no provision in the CWA to require landowners or managers to restore riparian vegetation. Much of the work to be done will require the cooperation of and assistance to private landowners. DEQ and other state and federal agencies have been working with private groups and individual landowners both preceding and following adoption of TMDLs in basins throughout the state to restore riparian vegetation and habitat.

b. The TMDL and WQMP Provide an Inadequate Analysis of Time Frames For Attainment.

The WQMP provides that NPDES permits for point sources will be revised to address load allocation upon renewal, typically within one year of TMDL approval by EPA. This is essentially the only time frame for TMDL compliance provided in the WQMP or TMDL. The CWA implementing regulations require that the WQMP provide the date by which it will result in attainment and maintenance of water quality standards in the waterbodies and the basis for the determination. 40 C.F.R. § 130.32(c)(2)(iv). In addition, the WQMP must contain a list and description of "interim, measurable milestones for determining whether management measures or other control actions are being implemented." Id. at § 130.32(c)(2)(v). The North Coast Subbasins WQMP lacks both of these essential elements. Without a realistic time frame for attainment, the TMDL does not demonstrate that it will lead to attainment because if the time frame is too long, attainment may be impossible due to extinction of resident species. Additionally, if the time frame is too attenuated, there is no reason to believe that the goals of the TMDL will ever be reached.

NEDC 12*: We have added a subsection Chapter 7 to the WQMP entitled "ESTIMATE OF TIME TO MEET WATER QUALITY STANDARDS." Estimates of time for meeting standards and full protection of beneficial uses were made based on existing plans (bacteria) and estimates of vegetational growth (temperature) and are listed below. Bacteria estimates are based on the timeline above (Timeline for Implementation). Temperature and channel morphology improvements are dependent on growth of riparian vegetation (see Temperature Technical Appendix – Section 3.5.3) and other management actions. The longest-term treatment is restoration of riparian vegetation where needed to provide system potential shade. Vegetation should stabilize streambanks sooner than it will provide system potential shade, though restoration of channels will be an ongoing process. Time scales are approximate and implementation will occur as specific plans are implemented or developed, and as funding becomes available*

Bacteria: *Achieve water quality standards in the rivers and Bays/Estuaries by 2010.*

Temperature:

Milestone 1; Measurable increases in instream shade by 2020
Milestone 2;Achieve instream temperatures that meet salmonid requirements by 2050

Regarding non-point sources, the WQMP simply lists a number of state plans, agencies and statutes that require compliance with water quality standards. However, many of these plans and statutes have been in place for a period of years and waterbodies have remained water quality limited despite their existence and enforcement. Merely quoting from these plans and statutes is insufficient to meet the CWA requirements of providing a basis for a determination that waterbodies will attain water quality standards if the plans and statutes are followed. History shows otherwise.

The WQMP states that implementation will commence as soon as possible and that it may take "several years to several decades" to fully reduce and control pollution as required by the TMDL. TMDL at 371. These statements lack the specificity required by the CWA regulations, which call for the WQMP to provide a date by which it will result in attainment and maintenance of water quality standards. 40 C.F.R. § 130.32(c)(2)(iv). Moreover, the WQMP seems to leave room for failure before implementation has even begun. According to the WQMP, the TMDL may never be achieved, TMDL at 371, and may require revision. The WQMP leaves management planning to Designated Management Agencies (DMAs) and provides very little guidance to ensure the DMA plans will adequately implement the TMDL. Although the WQMP provides a list of management measures to assist DMAs in creating implementation plans, WQMP, Table 3 at 390, measures, such as "illegal dumping," parks, and "pet waste," are so vague that they provide almost no guidance at all. Moreover, it certainly does not suffice under the CWA regulations as a *description* of management measures that will be used to ensure compliance with wasteload allocations. 40 C.F.R. § 130.32(c)(2)(ii) (emphasis added). The WQMP should provide both a list and description of management measures in order to provide guidance to the DMAs in creating management plans. Moreover, these DMA management plans should be part of the TMDL and WQMP if implementation is the actual goal. They should not be put off for later planning and documentation. The TMDL should choose an allocation scheme that will result in the most accelerated progress toward attainment of water quality standards possible. The WQMP should identify those actions that are necessary to attain such allocations.

NEDC 13: *Rules defining the purpose and scope of WQMPs were recently adopted in OAR 340-42-0080. These rules state:*

> "Management strategies identified in a WQMP to achieve wasteload and load allocations in a TMDL will be implemented through water quality permits for those sources subject to permit requirements in ORS 468B.050 and through sector-specific or source-specific implementation plans for other sources. WQMPs will identify the sector and source-specific implementation plans required and the persons, including DMAs, responsible for developing and revising those plans."

The current WQMP defines the responsible agencies or entities and cites legal authorities that have been developed over time to protect water quality. Stating that a particular landuse is governed under the auspices of a State Agency (DMA) and its rules is appropriately specific in describing authority and responsibility of those DMAs. The rules associated with these plans have evolved over time and are currently much more stringent than when the bulk of landscape alterations were made. The management practices required by forest practice rules are recent relative to the current vegetational conditions in the North Coast Subbasins, which are largely a legacy of practices allowed prior to 1994. The first North Coast Basin Agricultural Water Quality Management Plan, containing Pollution Prevention and Control Measures and administrative rules to ensure compliance was adopted in 2000. NPDES permits for confined animal feeding operations (CAFO), and fish hatcheries have recently been revised to further ensure compliance with water quality standards. NPDES permits for point sources will be updated to reflect allocations in the TMDLs. These rules will continue to evolve as they are tested, with the endpoint at compliance with water quality standards. DEQ will be working with DMAs to refine and improve upon existing management plans and approaches. We would welcome the help of NEDC and other interested parties in making these refinements.

c. The Margin of Safety Must be Disclosed and Quantified and Cannot Merely Allege that Conservatisms Exist.

TMDLs must include a margin of safety that appropriately accounts for uncertainties associated with the relationship between water quality and load and wasteload allocations. 40 C.F.R. § 130.7(c)(1). The North Coast Subbasins TMDL claims to include conservatisms in the water quality analysis as the margin of safety (MOS) for temperature and bacteria. TMDL at 26. Although the TMDL references conservative estimates used in modeling, in order to be effective, the margin of safety must be more concrete.

The TMDL states that conservative estimates for groundwater inflow and wind speed were used in modeling temperature in the waterbodies. No evidence is provided as to how these "conservative estimates" relate to the models employed. With regard to groundwater inflow, the TMDL states that it was assumed to be zero, unless measured. However, regarding wind speed, the TMDL only acknowledges that it was assumed to "be at the lower end of recorded levels for the day of sampling." TMDL at 98. This is insufficient to ensure that actual conservative estimates exist in the modeling. Moreover, it is likely that the liberal assumptions in the use of mixing zones more than offsets any perceived conservative assumptions.

NEDC 14*: Thermal processes are discussed in detail beginning on page 119 of the Temperature Technical Appendix in the Draft TMDL document. Evaporative cooling is among the most important heat exchange processes and is dependent on wind speed and atmospheric pressure. Assuming windless conditions when there was wind would underestimate the cooling effect of evaporation. Groundwater flows generally have a cooling effect on receiving water. Assuming no groundwater inflow where it existed would underestimate its cooling effect. Groundwater inflows were estimated where observed in the Forward-Looking Infrared Radiometric survey, and are presented for the Nehalem subbasin in Table 3-9, on page 255 of the Temperature Technical Appendix in the Draft TMDL document.*

The TMDL employed three conservatisms in its bacteria modeling. First, the modeling assumed no salinity or temperature effects on bacteria decay in the Bay. However, the TMDL assumes, without any stated proof, that increased salinity is expected to decrease bacteria concentrations by speeding decay. TMDL at 98. Second, collection of fecal coliform is reported to occur under "adverse conditions." Id. Again, there is not proof that such collection conditions produce results, which "likely are higher than the daily mean value." Id. Finally, the flow-salinity relationship is based on samples collected below the water surface, which the TMDL assumes, relying on a 1974 study showing that the Bay acts as a partly mixed or layered system, provides a conservative estimate of the measured surface values of bacteria. Again, assumptions, but no proof of this conservative estimate is offered.

NEDC 15*: EPA provides guidance on determination of margins of safety for TMDLs. These MOS may be explicit or based on the use of conservative assumptions during analysis or modeling (EPA 2001).*

Temperature, salinity and sunlight are all strongly correlated with pathogen decay rates (EPA 2001). Estimated decay rates of fecal coliform bacteria in seawater are 100-1000 times higher than in freshwater. Therefore, excluding these factors in applying a decay rate to the concentration of indicator bacteria over time would underestimate decay, overestimating the concentration of bacteria at the endpoint of the model (e.g., Nehalem River at Wheeler). This resulted in lower load allocations for all land uses than would have been calculated with higher decay rates. Sampling during adverse conditions results in worst case, highest bacterial concentrations during environmental sampling. Outgoing tides are less diluted by saltwater, limiting decay and overestimating average concentrations. Higher estimates of concentration in the Bay resulted in lower load allocations to meet water quality criteria in the Bay.

The salinity-flow relationship was determined with samples collected at a relatively shallow depth over many years of monitoring. These data were used to determine dilution ratios during average conditions at a given flow rate. That Nehalem Bay is stratified or layered and therefore more saline below the sample depth means that more salt water is available for dilution than is estimated. Hydrography of Nehalem Bay may have changed subtly since the cited study was done, but we have no reason to believe the major physical properties of bay have changed. An underestimation of dilution would result in an underestimated assimilative capacity and hence lower than necessary allocations.

The burden of proving that the margin of safety is valid lies with DEQ. There should be at least some attempt to quantify the impacts of the assumptions. In the case of a water quality limited stream where the temperature might be lethal to protected species, a margin of safety should be very explicit. The margins of safety contained in the draft TMDL are insufficient and fail to comply with the letter or spirit of the law.

d. The determination of the loading capacity is flawed by the use of surrogates.

NEDC generally supports the surrogate approach as a method for providing a more useful analytic foundation for the development of individual TMDLs with regard to the development of pollution control actions and loadings. However, the approach can be easily abused to render the benefits of such a holistic approach useless. The North Coast Subbasins TMDL fails to make appropriate connections between the total loading capacities and allocations presented as surrogates and the necessary control actions. By failing to show the cause and effect of these allocations, the TMDL becomes little more than a perfunctory exercise.

NEDC 16*: Current heat loading, system potential heat loading, and nonpoint source heat loading are presented in several ways in the Draft TMDL. Most directly, these figures are presented in Table 10 and Figures 9, 10 and 11 for each modeled watershed. These are calculated by determining the total current loading, the loading capacity for the system (the amount of loading that would occur with no anthropogenic inputs), and subtracting to determine the reduction given removal of anthropogenic heat loading. These reductions are large and when achieved will result in temperatures that are natural for each watershed. Surrogate measures are included as translators of the load reductions that are included in the TMDL. Figures 25 through 27 present the heat loading and effective shade produced by riparian development in terms specific to solar aspect, channel width, and vegetational assemblage type. The reductions in heat loading and temperature modeled for each subbasin are directly linked through the model to these effective shade curves. The overall effectiveness of these reductions with respect to direct decreases in mainstem river temperatures is presented in Figures 29 through 34 as the relative percent of stream miles exceeding standards under current conditions compared to vast reductions in that mileage at system potential. Moreover, these shade characteristics are required throughout the subbasins and are expected to accrue through forestry, agriculture and county comprehensive plans as indicated in the WQMP.*

The use of surrogate measures are not linked to the importance of concrete and short timelines for attainment. There is little analysis of appropriate time frames and what steps must be taken to achieve goals within a set time frame. The TMDL (or the WQMP) must address the necessary level of effort to achieve the goals within a specified time frame. TMDL surrogates and criteria should consider existing conditions, create resilience in the system, lead to attainment in the shortest possible time frame and address *all* the needs and uses of the criteria.

NEDC 17*: The timeline for implementation of temperature controls is necessarily long. The requirement for growth of large (mature) trees in currently treeless areas as well as continued development of relatively young stands in riparian areas throughout the subbasins will take decades to achieve. These allocations are appropriate for protecting all uses affected by temperature. Where controlling statutes or rules protect riparian vegetation and streambanks, this implementation has already begun. Riparian restoration on private lands that are not covered by existing rules will be a greater challenge requiring landowner cooperation, public assistance, and county planning.*

e. Adaptive Management is inadequately explained and developed.

The WQMP discusses using adaptive management. However, there is nothing in the WQMP or TMDL that establishes how and when adaptive management will be employed except to say that if and when the WQMP has been fully implemented and the TMDL has not been achieved, the DEQ will revise the TMDL. TMDL at 373. The benefits of adaptive management need to be tangible and achievable, not merely allow for revision of the TMDL if water quality standards are not achieved through the implementation plan. In fact, based on the lack of defined management measures and failure to include a monitoring plan in the WQMP, it is likely that the TMDL will never be achieved. Adaptive management should not serve as a mechanism for revision of the TMDL. Instead, it should be the method by which loads and allocations are achieved.

NEDC 18*: The WQMP at the referenced section actually says that DEQ will review progress of the TMDL and WQMP on a 5-year basis, evaluate progress toward achieving TMDLs and implementing WQMP goals, that DEQ expects DMAs to also monitor their progress, that DMAs will be expected to develop benchmarks for attainment of TMDL surrogates in their implementation plans, and to revise components of their implementation plans to address deficiencies when management techniques are inadequate.*

Monitoring is specifically called for as one of the four essential elements of the Oregon Plan for Salmon and Watersheds as described in the Reasonable Assurance section of the WQMP (Chapter 8). This monitoring includes monitoring of DMA implementation as well as "biological and physical monitoring to determine water quality and salmon habitats and populations respond as expected to conservation and restoration efforts." We have added descriptions of monitoring programs of the North Coast Basin and how results are reported to Chapter 9 of the WQMP. Most of this monitoring is mandated by rules or long-term planning, but a considerable amount of monitoring of water quality and implementation will be done on a voluntary basis.

The TMDL and WQMP are full of vague statements about achieving water quality standards and DEQ's ability to revise the allocations. They say very little about how monitoring and revision will be undertaken. In fact, expectations of DMA monitoring are the only reference to monitoring in the document. More concrete plans for

monitoring and possible revision are necessary to ensure compliance with the TMDL and ensure that water quality standards and beneficial uses will not be undermined by lack of information and monitoring. The WQMP provides no guidance to DMAs to develop monitoring plans. A basin-wide monitoring plan should be developed to ensure that the individual monitoring done by the DMAs will be comprehensive enough to effectively evaluate the impacts of the control measures. In addition, DEQ should set the benchmarks for attainment in conjunction with the DMAs. It is unlikely that sufficient incentive will exist to get the DMAs to comply in the necessary time frame to actually impart some improvements on the stream. Specifically, the TMDL and WQMP should evaluate the monitoring plan in light of the surrogate measures chosen and the requirements to meet water quality standards.

NEDC 19*: We have added descriptions of monitoring programs that are currently required of each of the major listed DMAs. These programs are required under state law and were established prior to the development of the current TMDLs. The programs have goals consistent with the needs of the TMDL, and implementation and effectiveness monitoring are components of these programs. There is a direct link between DEQ and the DMAs in determining effectiveness and providing recommendations for changes to land management practices.*

IV. THE WQMP IS NOT MERELY AN EXTENSION OF THE TMDL.

The TMDL and WQMP should contain concrete, defined, and realistic goals and methods by which to attain water quality standards in the North Coast Subbasins. This process should be used to fully identify and assess all water quality limiting factors in the waterbodies.

a. The WQMP is the action plan for the implementation of the TMDL.

A TMDL is a quantitative analysis of the allocations necessary to meet the water quality standards, and the WQMP is a plan for implementing the TMDL. As such they are two separate and distinct documents. The WQMP should be a plan for reaching, not revising the TMDL. The WQMP must contain substantive measures and actions items that will be taken to attain water quality standards within a waterbody. The WQMP should not provide an avenue to maintain the status quo, continuing actions that are detrimental to the subbasins. The WQMP process provides the DEQ with the opportunity to develop an explicit and comprehensive plan designed to meet the surrogate measures and allocations that have been theoretically explicated in a TMDL. Unfortunately, the DEQ has not taken this opportunity, and has turned the WQMP for this TMDL into a hypothetical exercise with little effect in correcting water quality problems in the subbasins. This WQMP fails to ensure compliance with water quality standards through implementation of the TMDL because it does little more than lay out goals and objectives, leaving actual implementation planning to DMAs. The main function of the WQMP should be to impose the means of developing actions that will achieve the standards. The plan should not concentrate on reworking the goals if the means are not enough – the plan should then tighten up the action plans. There must be concrete, tangible plans with schedules of implementation, summaries of the specific means to the accomplished goals, and identification of anticipated outcomes.

NEDC 20*: Implementation plans included in the WQMP exist for some DMAs, while others will be developed following adoption of the TMDL. This is a necessary ordering of effort since the implementation plans need to be responsive to the allocations contained in the TMDL. Waiting to develop the implementation plans, which in some cases will require funding that may currently be unavailable to DMAs (e.g., stormwater management plans for small cities) will only delay adoption of the TMDL and add uncertainty to the plans that must be developed. We would prefer to have all implementation plans in place, but this is not a requirement for approval of a TMDL and is not a practical reality. Oregon Administrative Rules define how TMDLs will be implemented and allow for development of specific management plans following adoption of a TMDL (OAR 340-042-0080). We have worked with the major DMAs in the North Coast Basin (ODF, ODA, and ODOT) to develop plans that include protective measures in anticipation of allocations, but expect these plans to be reviewed and modified through time to reflect more specific information contained in the TMDL. The recent Sufficiency Analysis for forest practices and an upcoming biennial review of Pollution Prevention and Control Measures in the North Coast Basin Agricultural Water Quality Management Area Plan are two examples of this ongoing assessment and adaptation of management plans.*

b. The TMDL and WQMP must be backed with authorities that assure implementation and compliance with water quality standards.

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). The TMDL cites several state statutes and memorandum of understanding as existing water quality management efforts applicable to the North Coast Subbasins. Management under these authorities has proven ineffective in protecting water quality. The TMDL and WQMP, however, rely on them for implementation purposes.

NEDC 21*: The TMDL and WQMP are consistent with the Clean Water Act and the Memorandum of Agreement (MOA) between EPA and DEQ. The CWA requires states to list impaired water bodies and to develop TMDLs for those waterbodies. The CWA requires that wasteload allocations derived in TMDLs be implemented through NPDES permits, which DEQ is doing. Other requirements control or direct certain aspects for dealing with nonpoint source load allocations. The MOA stipulates that load allocations for forestry be met by implementation of the Forest Practice Rules enforced by the Oregon Department of Forestry, and that load allocations to agriculture be met by implementation of Agricultural Water Quality Management Area Plans (AWQMAP) enforced by the Oregon Department of Agriculture (EPA/DEQ; IV,C). Where these rules and plans are inadequate in meeting load allocations, there are remedies in state law for updating and improving rules.*

The TMDL and WQMP rely on implementation plans whose current elements were not adopted when most of the current landscape alterations occurred. Rules in these plans are also subject to periodic review. Rules contained in the Forest Practices Act have been the recent subject of a sufficiency analysis to determine effectiveness for protection of water quality. Recommendations for improvements to the forest practice rules will be forwarded to the Board of Forestry. An AWQMAP for the North Coast Basin was developed prior to TMDL development. Rules in this plan (Appendix 2 in Draft WQMP) describe Required and Prohibited Conditions directed at controlling riparian vegetation removal, nutrient management, and livestock access to streams, among other aspects. Review of this plan is scheduled to occur presently and references to the TMDLs in the Basin will be added.

The WQMP expressly relies on these authorities to provide reasonable assurance of implementation. WQMP at 395. 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.

NEDC 22*: Rather than relegating this duty, DMAs are required to report implementation information while maintaining the responsibility of monitoring physical and biological factors required under the Oregon Plan. Monitoring is required of ODF under OAR 629-635-0110, which directs the ODF to report annually to the Board of Forestry to present monitoring findings and recommendations for changes to practices. ODA is required under OAR 603-090-0020(4).to monitor implementation and report to the Board of Agriculture at each biennial review of Agricultural Water Quality Management Area Plans.*

c. DEQ should consult with the National Marine Fisheries Service to ensure that the WQMP complies with the Endangered Species Act.

Because of the presence of threatened species within the North Coast Subbasins and the likelihood that pollution control measures will not be timely enough to prevent the further degradation of the species in question, DEQ should consult with the National Marine Fisheries Service to get input on possible methods of protecting this beneficial use of the waterbodies. Again, the goals of the TMDL must be kept in mind at every stage of the process. The WQMP has certainly not investigated all the possible controls available that would protect salmonids.

NEDC 23*: The National Marine Fisheries Service received copies of the TMDL and WQMP and chose not to comment. NMFS has commented on TMDLs with very similar situations and allocation types (see Reponse to Public Comments; Tillamook Bay Watershed TMDL) in the past. NMFS retains the opportunity to consult with other federal agencies (e.g., EPA) to determine whether the TMDL is appropriate. There is no legal provision for*

direct "consultation" as defined in the Endangered Species Act between NMFS and DEQ on TMDLs –that is a matter between the federal agencies. Regardless, we will continue to solicit input from agencies having Endangered Species Act interests in TMDLs.

V. CONCLUSION

Although the development of TMDLs and WQMPs is difficult, complex and time consuming, the process provides the DEQ with the opportunity to make significant and important strides towards enhancing and restoring Oregon's waterbodies in a healthy state. Clearly, the DEQ has seriously considered its statutory duties in creating a TMDL for such a diverse portion of the state's waterways. However, there is much room for improvement in ensuring the goals of the TMDL are implemented in a way that assures attainment of water quality standards. NEDC urges DEQ to revise the TMDL to include a more thorough assessment of all water quality impacts and revise the WQMP to provide for more definitive and enforceable implementation, including concrete timelines. Thank you for the opportunity to comment on the Draft TMDL and WQMP for the North Coast Subbasins.

KEVIN GODBOUT – WEYERHAEUSER CORPORATION

Subject: Weyerhaeuser Company Comments on the North Coast Subbasin Total Maximum Daily Load (TMDL) and Water Quality Management Plan

Dear Mr. Nigg:

Weyerhaeuser Company appreciates the opportunity to comment on the North Coast Subbasin Total Maximum Daily Load (TMDL) and Water Quality Management Plan. For the purpose of this TMDL, we will focus our comments on: (1) technical issues associated with the temperature TMDLs and determination of system potential shade; (2) the role of natural disturbance in the Nehalem River Subbasin and its impact on stream temperature; (3) relationship of the TMDL to the Oregon Department of Forestry (ODF) and Department of Environmental Quality (DEQ) October 2002 Statewide Evaluation of FPA Effectiveness in Protecting Water Quality, the "Sufficiency Analysis", and (4) the role of adaptive management in this TMDLs.

Technical Issues Associated with Determining System Potential and Temperature TMDLs

1. The temperature TMDL appears to assume that anthroprogenic modification of headwater stream riparian vegetation will increase temperature loading in stream segments in the lower reaches of a system.

   Willamette Industries (now Weyerhaeuser) contracted Western Watershed Analysts (WWA) to examine a number of current and potential future shade/temperature relationships of interest to Willamette in the Ecola Creek watershed. The primary objective of this exercise was to determine the extent to which riparian vegetation could be manipulated without causing measurable temperature increases in critical downstream reaches on large, medium and small Type F and Type N streams. To accomplish this, WWA employed Oregon's *Heat Source* temperature model to demonstrate the effects on water temperature resulting from several potential management strategies, including:

   - "Full shade" compared to current conditions.
   - Riparian harvest in headwater tributaries and its effect on downstream waters, including illustration of equilibrium and relaxation principles.
   - Harvest of hardwood conversion blocks, and
   .
   - Partial cutting in riparian zones.

   Heat Source illustrated that while the different management scenarios did cause a rise in stream temperature at the management site, the stream temperature remained below the state temperature standard and never increased above 17.8°. Most important, the *Heat Source* model demonstrated that generally within ½ kilometer below the study reach the stream temperature had lowered to perceptivity levels. This North Coast study indicates that even though forest harvest activities may increase stream temperatures in headwater streams, the increase is usually unnoticeable

a few kilometers downstream and any incremental increase in temperature occurs at levels lower then the state temperature standards.

Our study appears to be consistent with findings contained in the Sufficiency Analysis. The Sufficiency Analysis found that for some medium and small Type F and some small Type N streams, short-term temperature increase may occur at the site level and might be transferred downstream (see pages 4-6 of the Executive Summary). The Ecola Creek watershed study also confirmed that current forest practice protection requirements are adequate in ensuring attainment of state temperature at the site level. We suggest that DEQ modify its system potential modeling assumption that modification of headwater stream riparian vegetation will increase temperature loading in stream segments in the lower reaches of a system.

Weyerhaeuser 1*: The temperature standard has several components that together are designed to protect the most sensitive beneficial use of a given water body. One part of the standard disallows anthropogenic increases in instream temperature when there are threatened or endangered species present. We use the Heat Source temperature model to estimate the "no anthropogenic influence" temperature as system potential. As such, this estimate provides a target temperature attainable with all human influences removed. We depend on management plans and required or recommended practices to define the "no anthropogenic influence" condition, as this is the intended management condition. Monitoring through time and efforts like the sufficiency analysis recently completed by ODF and DEQ, provide a framework for assessing whether practices are protective of water quality parameters. Where practices are sufficiently protective and water quality criteria are not met, TMDLs and local criteria can be adapted to reflect real conditions. Where practices are found lacking, FPA rules may need to be adjusted accordingly.*

Although this comment is directed at non-fish-bearing streams, it acknowledges that temperatures did increase under the scenarios modeled and that, to some extent, temperature in a receiving stream increased for some measurable distance. Under the temperature standard, this small increase of short spatial duration is a violation of the narrative criterion for protection of threatened and endangered species. The cumulative effects of a number of N-type streams on a receiving F-type stream may cause a significant and more persistent increase. Moreover, it is likely that the disappearance of the measurable increase was a function of the relatively small flow in the type N stream and mixing in the receiving stream, essentially applying a mixing zone of ½ km below the confluence.

2. General Comments on the application of Heat Source v 6.2

As we understand, the DEQ Heat Source model is a reach scale model developed for smaller streams. It is not a basin level heat transport model and therefore is not suited for stream network analysis. Unless the latest version incorporated a basin level heat transport model, the system potential temperature predictions are likely incorrect. DEQ should clarify the capability of the reach scale model at the basin or stream network scale and address the limitations of this approach in the TMDL.

Weyerhaeuser 2*: Although Heat Source is a reach-based model, it has been used to simulate major tributaries and the mainstem Nehalem River. All simulation results from the tributaries were incorporated into the mainstem model, essentially taking into account much of the stream network at a subbasin level. In addition, small tributary flows and temperatures are included as mass transfer points in all Heat Source simulations. Heat Source is capable of simulating various sizes of fully mixed (i.e., not thermally stratified) streams.*

3. Nehalem Subbasin Section 3.1.9.2 development of channel morphology–surrogate measures

Stream width is an important component in stream heat transfer. The percent effective shade surrogate measures rely on both system potential land cover and potential channel morphology. To assess this, DEQ measured stream edges and the edge of shade-producing vegetation using digital orthophotos at a 1:5000 scale. The width between the two is the near-stream disturbance zones (NSDZ).

Weyerhaeuser 3*: The width between shade producing vegetation on either side of the stream is the NSDZ. See Figure 28 on page 64 of Draft TMDL.*

DEQ developed the system potential for stream channels using Rosgen's stream classification to estimate the evolution of the stream system. Then near-stream disturbance zone widths were compared to targets developed by applying a Rosgen Level 1 stream classification to the basin. The Rosgen system does not provide a mechanism for predicting new channel forms in disturbed systems such as the Nehalem. The DEQ assessment found that most channels are in fair condition. However, conducting a near-stream disturbance zone assessment less then ten years after the Nehalem River experienced a greater than 100-year event, with a model not designed to predict new channel forms in disturbed systems, will likely result in the establishment of unrealistic steam channel targets.

Weyerhaeuser 4*: The latest Digital Orthophoto Quadrates (DOQs) available from USGS were taken just prior to the large storm events of 1996. These DOQs were used for the analysis of channel morphology and vegetational composition. Video taken of the entire length of the Nehalem River and large tributaries in 2000 did not indicate widespread channel form modifications from recent events. Given that the analysis was based on data prior to an unusually large disturbance event, and that channel forms in much of the basin were resilient to effects of that event, there is likely considerable time for natural restoration of channels before the next such event.*

The policy implications of establishing targets for stream channels as a precursor for determining systems potential are significant. It would require the modification of existing channel form and process to meet these targets. Does DEQ expect landowners to modify channel conditions to achieve system potential shade?

Weyerhaeuser 5*: Implementation of the allocations in the TMDL will occur through the measures included in the individual implementation plans for DMAs. In general, the features of these plans relevant to temperature allocations are protective of existing vegetation and channel forms, and of the development of system potential through time. There are no requirements in these plans for restoration of legacy conditions. Where appropriate and desirable, DEQ will encourage restoration through technical and financial assistance in areas with identifiable deficiencies.*

Text has been added to the TMDL and WQMP to clarify the roles of enforcement and voluntary measures in restoring system potential conditions.

4. Nehalem Subbasin Section 3.1.10 water quality standard attainment

Within this section, simulations to represent system to attain the temperature standard were conducted. According to the analysis, the Nehalem River (to just below confluence with Cook Creek) can attain a maximum daily stream temperature of 60-65ºF. Temperature data (USGS and EPA Storet) collected from 1960-1993 indicates that for 34 discrete July-August samples, only 32% of the temperatures were less than 65ºF in that area. The highest percent (24%) of the samples were between 68-70ºF.

It would seem that based on the disturbance history (e.g., Tillamook Fire, extensive channel modification in the 1900s) temperatures should be decreasing, but in fact have not significantly declined in the last 40 years. As noted in the discussion of the Ecola Creek Watershed study, any downstream impact associated with forest practices likely occurs at the site level while still maintaining attainment of the temperature standard. While there are ongoing natural and anthropogenic disturbances in Nehalem River, the warm temperatures in the lower portion of the river are more likely a result of the size of river or other physical parameters. This raises the probability that perhaps the lower portion of the Nehalem can not attain the state temperature standard. This situation may not be limited to the Nehalem.

Weyerhaeuser 6*: Although there has been substantial regrowth of streamside vegetation throughout the Nehalem Subbasin, the degree of effective shade is still well short of system potential conditions. As mentioned, the Nehalem River in the vicinity of the USGS stream flow gage at Foss is wide and will receive only partial shade even at system potential (refer to Figure 3-17, page 235 of the Temperature Technical Appendix to the TMDL). Given this natural condition, the provision of shade will require relatively mature canopies before a threshold of temperature improvements is reached. The temperature measurements have not indicated an improvement in part because natural restoration has not yet met that threshold.*

For instance, some coastal streams that flow through wilderness are not capable of attaining the temperature standard. For example, Drift Creek flows though the Drift Creek Wilderness area near Tidewater in Oregon. The

Drift Creek Wilderness contains one of the largest stands of old-growth forest in the Coast Range. Drift Creek drains both managed and unmanaged forest land. In the summer of 2001, two temperature probes were deployed at the southwest (downstream) corner of the Wilderness. Both monitoring sites were located within the Wilderness several miles below where Drift Creek enters the Wilderness. The lowest site had a maximum temperature of 70°F and a seven-day maximum of 66.7°F. A second site, located upstream, experienced a maximum of 67°F and a seven-day maximum of 65.5°F. (Ice et al., in prep.).

Weyerhaeuser 7*: We acknowledge that not all streams can meet the numeric criteria in the water quality standard for temperature. In fact we've developed TMDLs for several rivers that were not expected to meet these criteria in lower reaches even at system potential. While our measures of temperature and other physical characteristics are limited in Drift Creek, similar size creeks in the same region of the coast range are currently meeting the criteria (e.g. Little Nestucca River) or are expected to at system potential (Nestucca River and tributaries).*

The Role of Disturbance in the Nehalam River Subbasin

1. Nehalem Subbasin Section 3.5.3 near stream land cover–potential development

Disturbance is an integral part of this system. The Tillamook fire (1933) and subsequent Salmonberry, Cook and Humbug Creek fire (1945) destroyed a large extent of the near- stream land cover. The flood of February 1996 was greater than a 100-year event. Additionally, the Salmonberry and Cook Creek drainages have been and are susceptible to landslides. These type of landscape level disturbance events have impacted the natural environment so significantly that some vegetative types can not achieve their maximum potential; the disturbance has eliminated the biotic (plant) component and replaced it with physical components (bedrock).

Yet in developing assumptions for this TMDL, DEQ assumes that despite the severe level of natural disturbance, potential land cover types will survive and recover from a natural disturbance event. Further, the Agency concludes that potential near-stream cover, by definition, is the condition that meets Oregon's stream temperature standard, and is therefore, targeted in the TMDL. This potential near-stream vegetation is defined as mature 80-year-old conifer trees. We disagree that "system potential" shade existed across this landscape, that it occurred anywhere through time, and that 80-year-old conifer trees are the sole riparian condition necessary to meet the stream temperature standard.

Forested landscapes across Oregon were subject to intense, stand replacement storm events and fires at irregular intervals. Maximum system potential shade likely never existed in any one basin, let alone entire watersheds. Simulating "potential" vs. "current" conditions in graphic representations of shade is of no value without taking into consideration natural variations in shade development via disturbances like fire, insects, and wind.

Weyerhaeuser 8*: DEQ has not suggested that there is one type of stand that will provide the "right amount of shade." Rather, system potential was defined based on existing conditions and assuming tree heights and densities that were observable in each of the subbasins, and after discussions with professional foresters from the ODF and USFS. Shade curves were developed based on three stand types, with conifers, mixed conifer-deciduous assemblages, and deciduous stands. Historical analysis of stand age distributions suggest that large areas have alternated at various time scales between old mature forests and highly disturbed landscapes. This distribution of large, old trees has formed a patchwork through time throughout the Coast Range that varied with disturbance regime. Despite this dynamic range of landscapes, there were clearly extremely long periods of time (in human terms) when disturbance regimes allowed large tracts of land to achieve old-growth stature and age distributions.*

ODF provided background estimates for the historical distribution of stand ages in the recently released Sufficiency Analysis (ODF/ODEQ 2002). In these data, they estimate that between 55% and 70% of forests were older than 100 years, and 70% to 90% were older than 50 years. Reconstructions of stand ages in the Tillamook Forest suggest that prior to 1850, the Northern Coast Range was largely populated by older forests (>100 years, with a majority >200 years) and that these persisted until the Tillamook Burn series of fires beginning just prior to 1940 (Coulter etal, 1996). We believe that these forests would have provided system potential shade (by definition) and that they developed and persisted through long intervals between major and minor disturbances.

Moreover, allocations in the TMDL rely on vegetation younger than the forest age structure described above. The definition of system potential was based on reasonable estimates of mature tree height. Trees in the area of the Tillamook Burn fires are now approaching 50-80 year age classes and it is not unreasonable to expect them to persist for some time. Disturbances, as they occur, may trump efforts to restore natural water quality conditions. However, at historical rates, disturbance is likely to leave large tracts of forest undisturbed for periods sufficient to achieve system potential conditions.

The current temperature TMDL was developed to determine the loading capacity of the system for heat and focused on control of anthropogenic sources of heat loading in developing allocations. In any scenario that includes natural disturbance that reduces effective shade in the subbasins, anthropogenic loads will still be limited. The difference in that case would be somewhat higher instream temperatures.

Summary of historical distribution of forest types and associated shade (ODF 2002).

	Age of Riparian Forest (years)				
	0-3 (Stand Type 1)	4-50 (ST 2)	50-100 (ST 2-3)	100-200 (ST 3-4)	200+ (ST 4-5)
Portion of the Landscape Historically in this Age Class (adapted from Botkin et al. 1995)	**5-15%**	**10-15%**	**15-20%**	**15-20%**	**40-50%**
Portion of the Landscape Currently in this Age Class (data source: Robison et al 1999)	**4%**	**66%**	**17%**	**13%**	**0%**
Relative shade levels (based on forest succession dynamics)	**Very Low to Moderate**	**Moderate to Very High**	**High to Very High**	**Moderately High to High**	**Moderately High**

Utilization of the "Sufficiency Analysis" in preparing the North Coast Subbasin TMDLs

1. We are concerned with DEQ's explanation of the relationship between this TMDL and the Sufficiency Analysis. The Sufficiency Analysis takes a great stride forward in looking at water quality in the context of Oregon's forests as a whole and at various scale levels (landscape, subbasin, reach). Given that the North Coast subbasins encompass 1,600 square miles, it is clear that the issue of scale is significant for TMDL development. It also appears that the temperature TMDL was targeted at the subbasin/landscape scale, with inferences drawn to the reach scale. This same approach was utilized in developing the Sufficiency Analysis. Therefore, we would assume the Sufficiency Analysis findings relative to the evaluation of pollution control mechanism, recommendations and compliance and effectiveness monitoring is directly transferable to the North Coast subbasins temperature TMDL. We would encourage DEQ to review this TMDL in the context of the Sufficiency Analysis. Additionally, we would ask that the Designated Management Agency (ODF) view its role in implementing this TMDL in the context of the Sufficiency Analysis.

Weyerhaeuser 9*: We acknowledge that the discussion of the sufficiency analysis was outdated. We have adopted language provided by ODF in the WQMP. We agree that "the Sufficiency Analysis findings relative to the evaluation of pollution control mechanism, recommendations and compliance and effectiveness monitoring is directly transferable to the North Coast subbasins temperature TMDL." In general, the sufficiency analysis does not suggest that allocations in the TMDL should be altered or that implementation measures are inappropriate.*

The Role of Adaptive Management

1. We support the use of adaptive management and the use of compliance and effectiveness monitoring to demonstrate the attainment of state water quality standards. More specifically, we believe that monitoring of watershed scale effects relative to current practices along small Type N streams should be a priority to narrow the level of uncertainty. Additionally, the role of natural disturbance and its impact on the attainment of system

potential vegetation is another subject that could be addressed in the North Coast. We would encourage DEQ to move beyond its focus on the use of models in the development of TMDLs and support ODF's effort to implement a riparian monitoring program.

Weyerhaeuser 10*: The use of models is not inconsistent with ongoing monitoring of riparian areas and other water quality parameters. Modeling has provided targets for vegetation, channel morphology and temperature that may be expected under system potential conditions. Monitoring will be an ongoing process aimed at assessing environmental conditions and trends through time with respect to these targets. Both DEQ and ODF are engaged in monitoring of environmental conditions and implementation of water quality management plans (such as the Forest Practices Act). DEQ monitors streams directly and supports monitoring by private groups (e.g., watershed councils) throughout the state. We also have conducted intense surveys of temperature and environmental conditions (e.g., vegetation analysis) in preparation of TMDLs. In addition to modeling; TMDLs include a thorough assessment of pollutant sources, hydrology, geographical, vegetational and other features of a subbasin. ODF also monitors environmental conditions as well as the rate of compliance with forest practice rules and the effectiveness of the prescribed practices. This will continue through time and will form the basis of adaptive management and review of TMDLs in the future. Industry-funded research is being planned to address the specific case of non-fish-bearing headwaters, and it would be preferable for this work to be coordinated with other water quality monitoring in a given subbasin.*

Please accept these observations in the cooperative manner in which they are intended. Please feel free to contact me with your questions or concerns at (253) 924-3878.

CHRIS JARMER – OREGON FOREST INDUSTRIES COUNCIL (OFIC)

RE: Comments on the Oregon Department of Environmental Quality's Draft North Coast Sub-basins Total Maximum Daily Load (TMDL)

The Oregon Forest Industries Council (OFIC) appreciates the opportunity to comment on the Department of Environmental Quality's (DEQ) draft TMDL. OFIC has participated in the TMDL process on several previous occasions. We have commented and provided new information on draft TMDL's before, including the Coquille, the Grande Ronde, the Tualatin, Tillamook, and the Sucker Greyback.

OFIC supports comments made by Weyerhaeuser Company and those provided to DEQ by the staff at the Oregon Department of Forestry.

OFIC would like to make specific comments on the North Coast Sub-basins TMDL in four areas: 1) it's relationship to the "Sufficiency Analysis", 2) "system potential" shade, 3) the way the TMDL portrays differences between the Oregon Forest Practices Act and the State of Oregon's Northwest Oregon Forest Management Plan, 4) general document content.

OFIC is greatly concerned about DEQ's explanation of the relationship between the TMDL and the recently published ODF/DEQ "Sufficiency Analysis." That document is a great stride forward in looking at water quality in the context of Oregon's forests as a whole. OFIC hopes that ongoing discussions between ODF and DEQ since the draft TMDL was released have greatly enhanced DEQ's opinion of the document. OFIC hopes that DEQ will more positively portray the Sufficiency Analysis' role in the TMDL context.

OFIC 1*: We acknowledge that the discussion of the sufficiency analysis was outdated. We have adopted language provided by ODF in the WQMP. See response at* ***Weyerhaeuser 9****, above.*

While it appears that OFIC will lose the battle over "system potential" shade, it is worth repeating our concerns. OFIC disagrees with DEQ's contention that "system potential" shade existed across the landscape or that it occurred anywhere through time. Forested landscapes across Oregon were subject to intense, stand replacement storm events and fires at irregular intervals. Maximum "system potential" shade likely never existed in any one basin, let alone entire watersheds. Simulating "potential" vs. "current" conditions in graphic representations of shade is of no value without taking into consideration natural variations in shade development via disturbances like fire, insects, and

wind. DEQ's thinking here has evolved significantly over the past few years and we hope DEQ continues to improve the way shade is portrayed in the TMDL process.

OFIC 2*: See reponse at* ***Weyerhaeuser 8****, and; disturbances resulting from fire, insects and wind will undoubtedly occur on some scale through time. The TMDL discusses shade as reach averaged effective shade, which takes into account variations within a reach. The TMDL is required to assess anthropogenic loading and impacts of reducing that loading as required to achieve water quality standards. The system potential approach used by DEQ identifies potential temperatures without anthropogenic influences. Though water quality criteria may not be achieved if natural disturbances reduce shade, that condition will be a natural characteristic of the landscape with no anthropogenic component.*

We acknowledge that disturbance plays a major role in determining stand age, structure, composition, and shade provision. We believe though, that the time scales pertinent to these characteristics are very long –longer than the vast majority of trees in the forests subject to the Tillamook Burn era fires have been alive. Discussions of appropriate levels of disturbance cannot ignore that riparian areas throughout much of the North Coast Basin forests are very young and are perhaps just beginning to provide the moderate level of shade attributed to young forests.

We disagree with the assertion that the level of shade simulated in the model does not exist and that it likely never has. We have measured shade of this magnitude among many of these forest riparian areas. The targeted shade levels are well within the observed values, and the stand sizes and ages are based on description of a mature stand of trees, for which we consulted local foresters. Mature stands were not based on maximum heights or densities, but on direct field observations and growth rate data indicating the advance of trees from early rapid- to later slow-growth phases. This data was considered for all the major species of forest trees present in the basin. The age of a mature stand is estimated at 70-100 years, based on these growth data.

OFIC also hopes that ongoing discussions between ODF and DEQ have cleared up the misunderstandings DEQ has of the State Northwest Oregon Forest Management Plan. DEQ poorly portrays the mechanics and implications of that Plan. DEQ needs to understand the full context of the Plan and any resultant HCP before it compares or contrasts any of its elements in a TMDL.

And finally, the WQMP seems unfairly focused on nonpoint sources. As an example, Chapter 5 of the WQMP cites the responsible parties and lists in bullet form the items for which each is responsible. Only agriculture and forestry are highlighted for "revisions", while other entities, including DEQ, are not. The clear inference here is that these two nonpoint sources "have work to do," while DEQ and the rest of the DMA's simply have to maintain the status quo. Clearly this is not the case. With respect to DEQ, its ongoing temperature and bio-criteria standards review and revision process is not even mentioned. Nor are the obvious implications to the allocations to be made or practices one might need to enact to meet them.

While it may appear that we are "nit-picking," the playing field for all sources—point, nonpoint (agriculture, forestry, AND urban) should be level. In essence, that is what a TMDL is all about. The process cannot function if some groups are less equal than others.

OFIC 3*: We intended no disproportionate treatment of any potential sources of pollutants in these TMDLs. We are adding responsibilities to some of the responsible participants listed. Specifically, we will add standards review and water quality monitoring to DEQs responsibilities; and development of stormwater management plans by small cities and counties. However, far from being disproportionate in application of allocations, the TMDL includes temperature and bacteria effluent limits for point source dischargers throughout the basin and load allocations to both urban and agricultural sources of bacteria. Load allocations to address temperature may fall heavily on nonpoint sources, but current loading is predominantly from nonpoint sources, and landuse in the basin is dominated by these source types, with approximately 97% of land in forestland and (to a much less extent,) agriculture.*

If you have any questions, please don't hesitate to call. Thank you for your time.

RAY JAINDL – OREGON DEPARTMENT OF AGRICULTURE

Re: Comments on the November, 2002 Draft North Coast Subbasins Total Maximum Daily Load (TMDL)

Thank you for the opportunity to review the Draft North Coast Subbasins TMDL. In general, this document is well written and does a very thorough job of explaining the water quality concerns of the subbasins. The load allocations are for the most part reasonable and well justified.

Our review of this TMDL leads us to believe it is accurate and consistent with our expectations. We do not have any noteworthy concerns about this document.

Thank you again for the opportunity to provide review and comments.

JIM PAUL – OREGON DEPARTMENT OF FORESTRY

The Oregon Department of Forestry (ODF) offers the following comments on the December 2002 draft of the North Coast Subbasins Total Maximum Daily Load (TMDL) and Water Quality Management Plan (WQMP). The comments focus only on the WQMP portion of the document specific to temperature. Consistent with recent exchanges between the ODF and DEQ, attached are updated versions of the nonfederal forestland's portion of the WQMP that the ODF and DEQ have agreed would be used to replace the language currently found in the December 2002 draft document. At a minimum, the "short version" (N Coast WQMPs NFFL short version 021303.doc) would replace the text in the draft that appears on p. 11 of the TMDL, pp.393-395 of Appendix D, and the "Forestry" section in Chapter 8 of the WQMP. To the extent that the DEQ sees a need for additional detail, some or all of the longer version (N Coast WQMP nonfederal forestlands 021303.doc) could also be used.

ODF 1*: We have replaced text in the WQMP with updated descriptions of the analysis of the effectiveness of forest practices recently completed by ODF and DEQ ("Sufficiency Analysis"), and of ODF Planning (Chapter 8) and monitoring (Chapter 9). We have also included an updated version of the Implementation Plan for Non-Federal Forest Lands (Appendix 1 to the WQMP).*

CHRIS KNUTSEN – OREGON DEPARTMENT OF FISH AND WILDLIFE

Re: Comments on North Coast Subbasins TMDL

Thanks for the opportunity for the Oregon Department of Fish and Wildlife, North Coast Watershed District to comment on the *Draft* North Coast Subbasins Total Maximum Daily Load (TMDL). Because the North Coast Watershed District does not extend into the Lower Columbia/Clatskanie River Subbasin, we have restricted our comments to the portion of the TMDL that affects the Upper Nehalem Subbasin, the Necanicum River Subbasin, and the Lower Columbia/Young's River Subbasin only. Our comments are as follow:

Page 22; Paragraph 2 (Salmonids):
Table 3 provides a summary of ESA listings for salmonids in the Oregon Coast and Lower Columbia ESU's. The table appears to be correct; however, the text in the paragraph immediately before the table indicates that there are "6 salmonid fish species" listed as *threatened* or *candidate* under the ESA. The number listed should be "seven", as that is what is represented in the table. It might also be more technically accurate to say "There are seven stocks listed as…", rather than using the word "species".

ODFW 1*: We have adopted the recommended change.*

Page 22; Paragraph 3 (Shellfish):
In the second sentence, the word "recreationally" should be replaced with the word "commercially".Both recreational and commercial harvest occur in Nehalem Bay.

ODFW 2*: We have changed the sentence to read:"Nehalem Bay currently has no oyster leases, but clams are harvested in the Bay for sale within Oregon and recreationally for personal consumption."*

Page 32; Figure 6:
The dates listed under the species headings appear to represent time of occurrence in the watershed throughout a composite of their life stages (*i.e.* spawning, rearing, migration). We recommend that you remove the dates and simply refer to Table 7 (Page 33) for those readers who are interested determining the time of occurrence. Our rationale for doing so is: (1) the dates don't match those listed in Table 7, and is therefore confusing, and (2) the dates don't indicate which life stages are occurring within the stated time range (whereas Table 7 does), and are therefore difficult to interpret.

ODFW 3*: The dates listed in the figure indicate the period when spawning and egg incubation through fry emergence occur by species. We have indicated this in the caption for clarity.*

Figure 6 also shows migration and spawning of spring chinook in the North Fork Nehalem. We realize that DEQ obtained this information from ODFW's Fish Distribution database; however, we have determined that the information provided is not accurate. We have no empirical evidence to indicate that the North Fork Nehalem has ever had a "run" of spring chinook salmon. The tidewater section likely has some use by adults from May through August prior to their entry into the South Fork (mainstem), and juveniles emigrating from the South Fork may rear in the tidewater section of the North Fork from as early as Late February through June. Any presence of adults above tidewater is probably limited to an occasional stray during years of unusually high summer flows. We will update our internal database to reflect these changes. For purposes of the TMDL, we recommend that Figure 7 reflect the changes as mentioned above.

ODFW 4: *Following additional discussions with ODFW headquarters, we have been assured that this alteration will be made to the ODFW database in the next version, and we concur with this change in use.*

We also recommend that within the *Winter Steelhead* figure, the blue line representing migration (only) in the lower mainstem, be replaced with a green line to represent migration and rearing. While rearing of winter steelhead juveniles in the lower mainstem may not be as high as other areas of the watershed, we do believe that rearing occurs within the reach. The map legend will no longer require an identifier for Migration.

ODFW 5*: This indication of migration only for winter steelhead is consistent with the most recent version of the ODFW distribution data.*

Page 33; Table 7:
Attached you will find two revised copies of Table 7. The first table (labeled, Revision 1) shows habitat use by salmonids at various life stages that includes estuarine use by rearing/migrating juveniles and adults. The second table (Revision 2) does not include estuarine use. In our opinion, the table that includes estuarine use, more accurately reflects the geographic distribution of salmonids affected by actions identified within the TMDL. However, if you choose to provide consistency with previously published coastal TMDL's, you may want to use Revision 2.

ODFW 6*: Rather than for consistency with prior TMDLs, we choose to include the non-estuarine version to reflect uses within freshwater reaches, as the temperature criteria addressed by the TMDL are applied to freshwater reaches. We based our periods of use on data obtained from ODFW (Joe Sheahan). Beginnings of use periods reflect the earliest a given species/run was believed to apply a given use in any of the North Coast streams for which we had data (Nehalem R., NF Nehalem R., Cook Cr., Salmonberry R., Necanicum R., Ecola Cr., Other N. Coast Tribs[Columbia to Nehalem). Of the changes recommended, we have reviewed this data and respond as follows:*

- *Winter Steelhead Migration - we have adopted the change – October through May (NF Nehalem and Salmonberry);*
- *Coho Migration - no change – NF Nehalem listed as mid-August to mid-January;*
- *Spring Chinook Migration – adopted change and revised further, May through September (Upper and Lower Nehalem R.);*
- *Spring Chinook Spawning – no change (Nehalem and Salmonberry Rivers);*
- *Fall Chinook Egg Incubation through Fry Emergence – partial change, October through December (NF Nehalem)*

Page 53; Table 12:
The 5th column in the table (Numeric Criterion or System Potential) appears to represent the spawning or rearing/migration standard that will applied for the Point sources listed. It might be less confusing if the column heading read as shown below, with a footnote indicating that the value is either the Numeric Criterion or the Modeled System Potential Criterion:

Rearing-Migration Criterion
Spawning Criterion

ODFW 7*: We have revised the table to address this confusion and indicate which criterion of system potential temperature is assumed for a given wasteload allocation. We have also included a column identifying the time period when the temperature criteria are applied to the point sources. This information may differ from that provided in Table 7, and can be found in the watershed specific habitat use information included in Appendix F of the final TMDL.*

We also reviewed the fish distribution maps (Figure 6; Page 32) to ensure their accuracy relative to spawning, rearing, and migration near the Point Source discharge sites listed in Table 12. Everything appears to be up-to-date with the exception of the comments previously provided regarding the presence of spring chinook in the North Fork Nehalem. Please be sure to update the allocations for ODFW's North Fork Nehalem Fish Hatchery based upon the revised spring chinook distribution information. To clarify, the earliest we would expect spawners of any stock in the North Fork Nehalem is October 1. There are rearing and migrant salmonids in the North Fork Nehalem throughout the year.

ODFW 8*: See ODFW 4, above. We have made the requested change. This will not change the allocation for the North Fork Nehalem Hatchery, but it will delay the time the spawning criterion is in effect from August 15 until October 1, when Coho and Fall Chinook are believed to spawn in the vicinity of the hatchery.*

General Comment Regarding Fishhawk Lake Dam:
The attached letter from Joseph Sheahan (ODFW) to Oregon Water Resources Department dated September 10, 1998 indicates that water discharged from Fishhawk Lake into Fishhawk Creek has exceeded 75^0 F during the summer. Over the past several years, we have been working with the Fishhawk Lake Recreation Club on developing water release strategies from Fishhawk Lake to protect downstream fishery resources. While we realize that DEQ does not regulate water discharges from the dam through their NPDES process, we suggest that the potential impact of outflow fromFishhawk Lake to downstream water quality at least be addressed in the TMDL. We were unable to find a reference to this potential problem within the draft document.

ODFW 9*: We will include a reference to Fishhawk Lake in the Water Quality Management Plan and require the dam's operators to develop a Temperature Management Plan. Data collected by both ODFW and the Upper Nehalem Watershed Council over several years have demonstrated an increase in temperature resulting from the dam. DEQ Biomonitoring staff have also measured lower diversity of insect assemblages downstream of the dam than upstream of the reservoir. Controlled release of bottom water has been successful in reducing downstream temperatures, and other operational practices have been proposed for mitigating temperature effects of the dam.*

Thanks again for the opportunity to comment. If you have any questions regarding any of the above, please feel free to contact me at (503) 842-2741.

WILLIAM OTTO – OREGON DEPARTMENT OF FISH AND GAME – HATCHERY COORDINATOR

Please consider these comments on the North Coast TMDL as it will have a direct effect on North Coast hatcheries operations as well as broader statewide implications.

Basically, meeting compliance with ongoing operations of our hatcheries and the feasibility of achieving the regulatory requirement of the TMDL.

We feel that the temperature standard found on page 27, section 3.1.1.2, paragraph 2, for salmonids is difficult if not impossible to achieve. I believe that serious review and discussion is needed for the standards to be met. Please consider these comments for review.

ODFWb 1*: We anticipate working with the North Fork Nehalem Hatchery and others in the state to more accurately characterize their effluents with regard to various parameters as identified in recently revised general NPDES permits. While the temperature standard is unlikely to become less stringent, the hatcheries' contributions and ability to control those contributions may become more clear with further study.*

REFERENCES

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