

UPPER SOUTH FORK OF THE COQUILLE RIVER

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

Response to Public Comment

Prepared by:
Oregon Department of Environmental Quality
January, 2001



State of Oregon
Department of
Environmental
Quality



**Upper South Fork of the Coquille River
Total Maximum Daily Load (TMDL)
& Water Quality Management Plan (WQMP)**

Response to Public Comment

January 19, 2001

Introduction

This Response to Public Comment is to address comments received on the Draft Upper South Fork Coquille River TMDL and WQMP. Many of the comments received from different individuals or organizations overlap. This responsiveness summary document attempts to combine similar comments and provide a single response where appropriate. Grammatical and formatting errors are not addressed here but corrections are made in the documents. In addition to comments, many specific questions were raised. These are addressed separately at the end of the summary document to the extent possible. DEQ appreciates the time and effort that all the commentors put into reviewing the documents. All comments have been considered by DEQ and, where appropriate, have been addressed in the final documents that will be submitted to the Environmental Protection Agency along with a copy of this responsiveness summary. EPA will then either approve or disapprove the TMDL.

Background

The public comment period on the proposed submittal of the Upper South Fork Coquille River Total Maximum Daily Load (TMDL) & Water Quality Management Plan (WQMP) opened on September 29, 2000 and extended through December 1, 2000. Two formal public hearing were held in Coquille, Oregon on November 2 and 15, 2000. Informational sessions were held just prior to each hearing. The comments received by DEQ were submitted orally and in written or electronic mailed form.

The TMDL document, appendices, and WQMP document were available for downloading from DEQ's web site throughout the comment period. Hard copies of the documents were also available for viewing at all public libraries in Coos County, at the United States Forest Service office in Powers, and at DEQ's Offices in Coos Bay and Portland. Copies of the documents were also provided to those individuals who requested individual copies.

List of Commentors

Comment #	Code	Comments Received From	Date Received	Media
01	PTMA	Pacific Timber Marketing Agency	12-1-00 CB	E-mail
02	EPA	Environmental Protection Agency	11-29-00 CB	E-mail
03	OCA	Oregon Cattleman's Association	11-29-00 CB	E-mail
04	ODFW	Oregon Dept. of Fish and Wildlife	12-1-00 CB	E-mail
05	ODFW1	Oregon Dept. of Fish and Wildlife (Coos Bay)	11-27-00 CB	Mail
06	OFIC	Oregon Forest Industries Council	11-29-00 CB	Mail
07	TIFFR	The Institute for Fisheries Resources	12-1-00 CB	Mail
08	DT	David Tilton	11-16-00 HQ	Mail
09	SS	Sandra Stauffer	11-2-00	Written and oral
10	SS1	Sandra Stauffer	11-15-00	Written and oral
11	TTC	The Timber Company	11-2-00	Written and oral
12	LG	Leo Grandmontagne	11-2-00	Oral
13	LG1	Leo Grandmontagne	11-15-00	Oral

General

The Draft Upper South Fork Coquille River TMDL and WQMP reviewed during the public comment period represented several years of data collection, data analysis, public participation, and document development. This project represents a cooperative effort between the United States Forest Service (USFS), Georgia Pacific (GP, now DBA The Timber Company), and the Department of Environmental Quality. The USFS and GP directly manage the area encompassed within this assessment. This cooperative work led to the release of a draft TMDL and WQMP for the Upper South Fork Coquille River for public review and comment. The years of hard work and investment of time by numerous individuals is very much appreciated by DEQ and led to the best document DEQ could put forward for public review and comment. The numerous comments received are thoughtful and led to changes that improved the TMDL and WQMP and will undoubtedly lead to clear implementation of the TMDL and ultimate attainment of water quality standards.

This scale of TMDL and WQMP was selected to facilitate this type of coordinated, locally driven assessment. As previously stated, the land managers in the area developed an assessment adequate to support TMDL development. This early effort was meant to assist South Coast Basin partners to embrace the TMDL process and lead into work in more diverse land ownership's and inclusive of larger point sources. This effort enabled the development of a TMDL assessment and WQMP for streams listed as water quality impaired for temperature. Other water quality parameters are addressed but with less rigor.

The range of comments DEQ received from local, state and federal agencies, environmental interests, industrial organizations, stakeholder organizations, researchers, and individuals reflect the interest in this TMDL and WQMP. Sometimes the comments are competing and represent different views of the Clean Water Act, State authority, the strength of the scientific knowledge, and the ability of designated management agencies to implement the TMDL. All in all, the comments resulted in improvement of the TMDL and WQMP.

Prior to responding to specific comments, DEQ needs to make a few general statements:

- Water quality in the Upper South Fork of the Coquille River is impaired. Water quality can be improved and sensitive beneficial uses provided improved support. The TMDL and WQMP are the avenues and tools to start on a path of improving water quality – a requirement of the Clean Water Act and Oregon Law and, more importantly, a necessity if we are to protect this valuable resource and save imperiled salmon species.

The science used to develop the TMDL is well established and supported in the scientific literature. As with any analysis, there is some uncertainty. As time goes on, we will seek to continue to understand this uncertainty and be able to address it. Those participating in the development of this TMDL and WQMP and those providing comments have helped to provide more certainty on the outcome of implementing actions to address the allocations in the TMDL. While more data collection and analysis prior to finalizing the TMDL and WQMP might shed additional light on some of the issues, in DEQ's opinion it would not significantly alter the conclusions and would only delay implementation of needed improvement in the area.

- Some on the ground forest management activities will need to be adjusted if we are to meet the goals of the Clean Water Act and water quality standards in the Upper South Fork of the Coquille River. DEQ recognizes that change is difficult and expects that this TMDL and WQMP coupled with ongoing actions to review Forest Practice Act management measures for adequacy will provide a foundation for reasonable and logical approaches to this change.
- State and federal agencies along with private landowners responsible for implementing allocations in the TMDL need to be able to adjust their programs and implementing mechanisms over time. That is why DEQ is using an adaptive management approach for this TMDL. We recognize there needs to be a mechanism for changing the TMDL and WQMP as we learn more while at the same time moving forward with implementing measures that will lead us down the path of improving water quality. The adaptive management language in the TMDL and WQMP make it clear that there is a mechanism for change and periodic review of the TMDL and WQMP.

- Much concern has been raised regarding how site potential vegetation will be applied on the ground and whether it means there cannot be any human activity within riparian areas. DEQ’s analytical approach demonstrates the importance of shade in controlling warming water temperatures. DEQ recognizes that active management within riparian areas will continue. DEQ is not advocating unmanaged vegetation growth in riparian areas and understands that non-management may result in the establishment of certain climax conditions that promote invasive species, create opportunities for disease, and may encourage unwanted fire. Riparian management, however, must also target the production of healthy, long-term riparian vegetation consistent (as much as practicable) with the site potential effective shade.

TMDL Summary

Geographic Description – Section 2

Comment – (Commentor 2) Please clarify whether the TMDL is applicable to all streams or only perennial streams. This should be reflected in Table 1 and in Section 2, Geographic Description.

Response – Change to document

Comment – (Commentor 2) Table 2, page 7 provides a list of both 303(d) listed segments and other streams evaluated during the development of the TMDL. It would be helpful if listed segments were differentiated from non-listed segments and if the listed segments were identified utilizing the same segment boundaries as in the 1998 303(d) List.

Response – Change to document

Comment – (Commentor 2) Since this TMDL and WQMP only address the upper portion of the South Fork Coquille watershed, it is recommended that the title be modified to “Upper South Fork Coquille TMDL and WQMP”.

Response – Change to document

Comment – (Commentor 2) Table 3 of the WQMP appears to have different waterbody segments than Table 8 of the WQMP. However, both are referenced in this section as providing the applicable shade targets. It would be preferable if the same segmentation was utilized throughout.

Response – Table 3 of the WQMP summarizes the condition assessment. The Johnson and Rock creek watershed assessments provide results depicted in segmented detail. Note that the Buck Creek assessment identifies Buck Creek as fully recovered.

Table 8 of the WQMP summarizes Water Quality Objectives and loading capacities (LC), (Projects shade values based upon lack of disturbance). Here Johnson and Rock creek LC's are depicted as watershed objectives. This represents a reach length weighted

average value for the watershed. LC and current conditions are given in great detail in Appendix A, Shadow Modeling, for specific reach segments. Buck Creek is not included in Table 8 as it has been identified as fully recovered in Table 3.

Comment – (Commentor 3) DEQ is stretching the TMDL allocations to include nonpoint source streams that do not have point source discharges. All streams in the basin are not on the 303(d) list and further, all streams cannot be assessed equally. Describe how DEQ justifies taking such liberties as inclusion of "all streams" without clearly documenting the combined and separate influences of natural background, nonpoint sources, and point source additions.

Response - As we look at water quality limited water bodies, the TMDL must address the source of that impairment. To the extent that upstream sources are contributing to the impairment, then the TMDL must capture these sources. Our analysis clearly shows that upstream sources of stream warming have a downstream effect for some distance.

This TMDL assessment identified natural conditions that influence natural background temperature regimes. The assessment then identified deviations from background resulting from non point sources and point sources

Comment – (Commentor 4, 7) Expressed concern regarding the effectiveness of splitting sub-basins into several separate units when similar water quality concerns exist throughout the basin.

Response - Change to document – additional narrative provided

The 1996 TMDL completed for the Coquille River addresses dissolved oxygen only and applies only to the mainstem segment of the Coquille River.

The decision was made to approach the South Fork Coquille TMDL assessment in two discrete segments (two discrete 5th field watersheds). It was determined that working from headwaters downstream represented a valid approach to TMDL assessment. This decision was based upon a number of factors.

- Significant changes in channel morphology occur in the lower South Fork. Unlike the upper South Fork unit the lower South Fork unit channel is deeply incised and active and severe bank erosion is occurring. Sediment loading from the upper unit can and has likely had influences on the lower unit channel morphology. This channel condition is limiting to vegetation management.
- Water temperatures dramatically increase below the upper unit. Determination of potential water quality improvements from the upper unit will allow an improved and focused lower unit assessment.
- Assessment at the 5th field level better supports 7th field planning for restoration and enhancement activities.

Information generated in the upper unit assessment is critical to the lower unit assessment. Conducting these assessment sequentially will provide guidance and improved focus to the lower unit assessment.

Information generated in the upper South Fork assessment will be the starting point for the lower unit assessment. It will provide valuable information regarding what improvement might be realized and what water quality improvements might be expected from the upper unit. The upper unit provides the dominant influence on the water quality regime in the lower mainstem of the South Fork.

The lower unit assessment will focus on mainstem channel instability, subsequent lack of vegetation, and water consumptive uses. Objectives to achieve improved channel stability, vegetative buffers, and augment flows will be defined. The lower unit assessment will also focus upon mainstem tributaries as the primary juvenile summer rearing habitat and the refugia that they provide in a heated mainstem.

The lower unit channel and riparian assessments are currently underway and scheduled for completion in 2002. Information gleaned in the upper unit assessment will be integrated. As land use diversifies, management planning will expand to encompass these uses.

This approach is in no way intended to undermine the concept that a stream is a continuum where one part of the system relies on others to function correctly. Management plans will recognize this connectivity and reflect basin wide concerns and corresponding management needs. DEQ will continue to develop its TMDL's and WQMP's based on the basin connectivity philosophy.

Temperature Standard – Section 3

Comment – (Commentor 1) questions the validity of the temperature standard as applied to the South Fork. The Commentor indicates that no historical data is available to determine what the temperatures were in the South Fork historically.

Comment – (Commentor 3) Page 4. This document suggests that the TMDL for water quality in this instance is a document to address fisheries concerns. Delete the statement and rewrite it to reference water quality as described by the Clean Water Act.

Comment – (Commentor 7) The 64° standard may be a good target for the lower Coquille but the 55° standard should be applied to the upper South Fork. This would integrate a biological margin of safety.

Comment – (Commentor 7) TMDL management schemes should be particularly conservative to provide a cooling system for the lower reaches. Pushing the upper basin TMDL to near the DEQ maximum would ... require lower basin landowners to offset upper basin water quality problems.

Comment – (Commentor 7) Without knowing historical conditions it is safest to assume that we are responsible for re-establishing temperatures as close to the optimum rather than to focus on eliminating anthropogenic effects.

Response to five comments above - This TMDL shows that under site potential conditions 64 degrees may not be attainable, the fact that water exceeds 64 degrees means that no measurable increase due to anthropogenic activities applies. DEQ has determined that attainment of site potential conditions for shade meets the **no measurable surface water temperature increase resulting from anthropogenic activities requirement.**

It is clear that salmonid fish rearing is a beneficial use in the upper South Fork Coquille River and the proper standard is being applied to protect this beneficial use. Because the temperature standard focuses on the sensitive beneficial use of juvenile fish rearing improvements realized in water quality will benefit fishery resources.

Waters within the upper South Fork Coquille River exceed 64 degrees and a improved temperature regime can be attained by providing increased shade and improving stream structure as is identified in the TMDL. DEQ will continue to evaluate whether all feasible steps to improve water quality are implemented and the results are realized.

Comment – (Commentor 9) Temperature criteria for trout are cited but there does not appear to be temperature data at sites where trout are found.

Response – No bull trout are present in the area, hence the standard pertaining to bull trout is not applicable. Achieving goals identified in this TMDL will result in improved habitat for resident trout as well as juvenile salmonids.

Comment – (Commentor 9) Explain the statement “No data was available for use in determining system compliance with temperature criteria designed to be applied at time and in waters that support salmon spawning, egg incubation, and fry emergence from the egg and from the gravel”. Have spawning and/or rearing areas believed to be in jeopardy been identified ? Is monitoring (salmon counts, temperature) being conducted at these sites this year ?

Response - Change to document – additional narrative provided - The TMDL was developed to ensure that water is as cool as possible by ameliorating management caused sources of stream heating. The TMDL sets load allocations for solar radiation which establishes effective shade targets needed to meet those load allocations. The load allocations are based on the site potential shade (removal of solar loading) that can potentially be achieved for given stream segments. The effective shade targets, when met, would ensure no increase in water temperature due to anthropogenic sources of stream heating. Meeting the salmonid spawning criteria is therefore an objective of the TMDL. DEQ is in the process of collecting data to determine if temperature spawning criteria are being met. Attainment of desired conditions identified in this TMDL will

result in the attainment of the most optimum temperature regimes for spawning, egg incubation, and fry emergence that the area is capable of producing.

Problem Assessment – Section 4

Comment – (Commentor 7) The TMDL is silent regarding the need for increasing channel depths. The document ignores upland sources of large wood. When and in what manner will large woody debris be placed ?

Comment – (Commentor 3) What other management options has DEQ considered that could cool the river water?

Comment – (Commentor 7) Was instream flow augmentation a viable restoration action for this area ?

Response to three comments above from TMDL summary page 9 - Assessment of the elevated summertime stream temperatures attributed to anthropogenic causes in the upper South Fork sub-basin included the evaluation of the following parameters:

1. Channel widening (increased width to depth ratios) that increases the stream surface area exposed to energy processes, namely solar radiation,
2. Riparian vegetation disturbance that compromises stream surface shading, riparian vegetation height and density (shade is commonly measured as percent effective shade),
3. Reduced summertime base flows that result from instream withdrawals per instream water rights.

Since consumptive water uses within the forest boundary account for less than one percent of the total low flow discharge at the forest boundary, water withdrawals above the Forest boundary in the upper South Fork Coquille sub-basin are not considered a major contributor to stream temperature increases.

The effects of sediment on channel form (and eventually temperature) were identified and analyzed with historic air photos and direct field measurement of width to depth ratios and pool depth. The objective was to find areas where aggradation and channel widening have occurred and to what extent are they recovering. The primary focus was on specific low gradient reaches along the mainstem of the South Fork Coquille and the lower portion of Rock Creek. These are reaches where channel widening has occurred and considerable amounts of solar radiation hit the water surface. Less shade is attainable on these wider channels. It should be noted that most stream reaches within the South Fork Coquille above the Forest Boundary have significant sediment transport capacity for sand and gravel sized materials. Consequently, the effects from these sediment sizes are likely seen lower in the system.

This TMDL analysis determined that management related sediment will have an impact on channel width to depth ratios in the system, although the largest impacts will likely be realized below the Forest Boundary, and that efforts to reduce management related

inputs will need to be implemented. Some channel width to depth ratio improvements are predicted in the assessment area, the benefits of which are housed in *Margin of Safety* and as such were not utilized in modeling future conditions.

Analysis presented in this TMDL will demonstrate that developed solar loading capacities will ensure attainment of narrative State water quality standards. Specifically, the link between shade surrogate measures (allocations) for solar radiation loading capacities and water quality attainment will occur via two processes:

1. Remove human (anthropogenic) solar radiation contributions from temperature dynamics in the upper South Fork Coquille sub-basin, and
2. Restore riparian reserves that function to protect stream morphology and encourage bank building processes in severe hydrologic events.

Large wood placement is discussed in the habitat modification section of the WQMP as well as in Appendix D of the WQMP.

Problem Assessment – Section 4 (data collection)

Comment – (Commentor 1) I see no temperature data taken at other times during summer months or even during a 24- hour time frame indicating how much a stream may heat in a given period and no data indicating that any real scientific research on the water temperature in this region was ever conducted.

Comment – (Commentor 11) Concerned that flow information is not depicted with temperature data on WQMP page 13.

Comment – (Commentor 1) This draft needs representation of good use of science. Models should indicate realistic temperatures and how temperatures may shift due to any and all circumstances. Data collection is incomplete and related historical information has not been included.

Response to three comments above - An extensive data set has been developed through time to characterize summer temperatures in this area. Continuous monitoring devices allow the collection of voluminous data sets that represent 24 hour, daily (hourly, ½ hour) temperature regimes for summer months at various sites. This raw data is often summarized, statistics evaluated, and information generated. Early monitoring efforts lacked some of the coordination and TMDL focus that most recent efforts have accomplished. Temperature data depicted on page 13 of the WQMP is provided as a summary of results from past monitoring efforts. Raw data sets are too large for inclusion in this document. Although flow information is available for pairing with some of these historical temperature data sets, it is not available for all of them.

In 1998 a more intensive and coordinated monitoring effort was designed and implemented. This allowed for the collection of consistent temperature and flow data sets that were coupled with channel and riparian assessments to develop this TMDL. This temperature data generated in 1998 was utilized for Heat Source modeling.

Comment – (Commentor 1,8,11) Would like a clear definition of the methodology/protocols used in collection of temperature and flow data. I would like information on deployment sites with regards to depth and flows.

Response – Temperature devices are deployed in stream riffles to represent mixed stream temperatures. Other sites may provide warmer or cooler waters in the system. Staff seek to keep the device at least 8-12” deep throughout the period of deployment.

Comment – (Commentor 1) Where is the data explaining why the temperature at Foggy Creek was so much lower than that of Coal Creek? Was it perhaps geographic? Where is your science?

Response - Mainstem temperatures at the Foggy Creek confluence are lower than mainstem temperatures recorded at the confluence of Coal Creek. Even under future condition scenarios this remains true. Longitudinal heating and natural channel widening (decreasing shade potential) provide the major influences on this condition.

Comment – (Commentor 3) The 1994 transect survey lacks a proper report for sampling procedures and gives no notation about confidence of the data. These surveys have been found to be of little value in determining integrity of a stream reach. The visual assessments are of little value in this process due to their inherent subjectivity and high error compared to the field sampling conducted to verify the presence and/or absence of parameters regarding siltation, soil erosion, and channel characteristics. Appendix C of the WQMP should be deleted.

Response – The sampling protocol is available as part of the complete macroinvertebrate sampling report. Only summary statistics are shown in this appendix. The USFS disagrees that the macroinvertebrate monitoring has little value. It is one of many accepted tools for evaluating biological conditions of a stream.

Comment – (Commentor 10) Table 1 page 3 TMDL summary In addition to identifying road construction and timber harvest, should include mention of other aspects of timber management (site preparation, planting, and intermediate treatments, including herbicide and fertilizer application. Killing deciduous vegetation can raise temperatures.

Response - Change to document – additional narrative provided Table will be revised to reflect timber harvest and related silvicultural activities

Comment – (Commentor 11) Concerned that adequate data including air temperatures was not collected at each site. Concerned regarding the use of weather data from Powers station alone.

Response – DEQ believes that sufficient data has been collected to verify violation of water quality standards, to reasonably identify the causes of pollution which are contributing to water quality standards violations, and to construct water quality models to support the assignment of waste load and load allocations. Although valuable, the

collection of additional data would have consumed additional time and resources and would not, in DEQ's opinion, have changed the conclusions. Future monitoring efforts to validate and monitor implementation of this TMDL will seek to expand air temperature monitoring to address this concern.

Problem Assessment – Section 4 (Longitudinal Heating)

Comment – (Commentor 6) Recognize that upstream thermal influences have downstream effects over a very limited time and distance.

Comment – (Commentor 3) DEQ should explain what this longitudinal heating profile means. The theory suggests that all streams heat more and more as you get closer and closer to the mouth of the streams. Yet, there are great differences between streams temperatures based on 2 miles from the mouth or 8 miles from the mouth. Why aren't all streams the same temperature at 8 miles from the mouth? What causes these differences and what is different between streams to cause some to be warmer than others at specific longitudinal miles? More discussion is needed in this section.

Response to two comments above - The heat transfer processes that control stream temperature include solar radiation, longwave radiation, convection, evaporation, and bed conduction. This is discussed on pages 10 and 11 of the TMDL summary.

Longitudinal heating can be reflected in an increase of daily maximum temperatures as discussed in this TMDL. In addition, data sets indicate the thermal influences on the daily low temperatures, and time spent within these lower end temperature regimes, can have lasting negative effects as a result of longitudinal heating.

A depiction of an actual longitudinal profile for the upper South Fork is provided in the WQMP on page 15.

Longitudinal stream temperatures vary as a result of all of the variables depicted in the table on page 42 of appendix C.

Surrogates – Section 5

Comment – (Commentor 3) The WQMP does not define the areas that will affect the streams. It is unclear if the plan intends to treat areas 5 miles from the stream the same as areas 5 feet from the stream.

Comment – (Commentor 6) Site potential proposed buffers are not necessary to achieve temperature control on forest land. Riparian buffers with parameters less than site potential provide adequate temperature controls. Riparian areas are dynamic and shade standards must reflect spatial and temporal variability.

Comment – (Commentor 3) Attached is a chart and description of a BTU comparison made against stream temperatures taken in the Grande Ronde River at the same time the

solar loading measurements were made. It is indicative that the DEQ model has an error. Perhaps the "assumptions" regarding the importance of shade should be changed. We suggest finding other "surrogates" in order to create a margin of safety and assurance that the standards will in fact be met sometime in the future. There is no assurance that the planned shade components will produce cooler streams.

No chart was received as part of this public comment. An attachment was present that lacked content. We are unable to comment on this concern. Surrogates are addressed in the response below.

Response to three comments above - The assessment found in the WQMP is presented in a manner consistent with the definition of effective shade in this TMDL (i.e. the percent reduction of potential solar radiation load delivered to the water surface). This provides an alternative target (or surrogate) which relates to stream temperatures, in this case, an 82% reach weighted average reduction in potential solar radiation delivered to the water surface (i.e. 82% effective shade). By implementing this TMDL, anthropogenic activities relating to stream heating will be eliminated. (TMDL Summary page 14)

The effective shade target does not disallow riparian management but sets a target for watershed effective shade from site potential. In some instances, on small streams young vegetation may provide densities increased above that provided by mature vegetation. This TMDL sets an effective shade target. It does not speak to the width of buffer required to achieve this value. This might vary dramatically throughout the landscape.

Comment – (Commentor 6) Variance in riparian areas across the landscape does not seem to be recognized in the resulting shade targets. Riparian areas are dynamic and shade standards must reflect spatial and temporal variability.

Comment – (Commentor 1) Have you factored in the loss of deciduous shade density as a result of your preference to conifers?

Comment – (Commentor 12) Expresses concern regarding setting goals for coniferous dominated stands. Streams need some sunlight, especially on winter.

Comment – (Commentor 1) I hear talk of growing 200' conifers and no mention of how much time it takes to achieve this.

Comment – (Commentor 7) Citing desired future conditions, which may or may not be achievable, as the margin of safety is not a legitimate use of that concept.

Response to five comments above – Site potential vegetation in a significant portion of the assessed area was mixed coniferous and deciduous stands. Effective shade was not set based upon a coniferous monoculture as a future site potential.

Future riparian conditions held shade densities to 70 % and site potential tree heights were held to 120' for much of the basin to reflect mixed stands (TMDL summary appendix A). In addition, shade curves (WQMP appendix A) determine that the system effective shade is achieved on many streams at tree heights of 120'. The WQMP has a good discussion of this on page 15 and 16.

Recovery times and interim benchmarks are identified on page 30 in table 10 of the WQMP.

Effective Shade Targets – Section 5

Comment – (Commentor 2) last paragraph, p. 11 An additional statement may be warranted at the end of this paragraph which explains that the attainment of site potential conditions during the hottest period of the summer should also result in maximum shading and more natural temperature patterns during the other months of the year.

Response – Clarified in document

Comment – (Commentor 3) If it's the sun causing the heating, then maybe DEQ and EPA should think about what this implies. How much light is present with 70% shade? Might this be too dark for other kinds of life? Is it possible that achievement of shade levels throughout the basin between 50-70% might harm another plant or aquatic species? Consideration of plant community changes has not been considered with increased shading on the stream reaches indicated by the model.

Response - DEQ biomonitoring data collected throughout the coast range and TMDL data demonstrate that high levels of shade correlate to healthy riparian function, stable macroinvertebrate and salmonid populations and lower stream temperatures. The only biologic communities that experience detriment from high shade levels are non-native warm water species and perhaps excessive primary productivity (periphyton), both of which are undesirable. Additionally, natural disturbances and vegetation patterns will undoubtedly provide a varied landscape, both within and outside riparian areas.

Comment – (Commentor 7) Site specific treatment areas provided in Appendix E is good but not sufficient. Each tributary should be accounted for.

Response – Although this TMDL sets a reach weighted target of 82 % effective shade, appendix A of the TMDL summary reflects reach specific information. This very detailed assessment of riparian condition will be utilized to review specific areas for treatment in the future. Some preliminary sites flagged for evaluation are identified in the WQMP appendix E. Effective shade targets for specific reaches range from 61 % to 96 %.

Comment – (Commentor 3) What elements have been used to justify site potentials that can support vegetative components suggested in the model output...Appendix A?

Where are the natural conditions that must be used to make land management prescriptions to ensure the plan can be implemented with success?

Response - Site potential vegetation determinations were made by identifying and quantifying the characteristics of shade for mature mixed riparian stands found in the watershed.

Loading Capacities and Allocations – Section 5

Comment – (Commentor 2) second paragraph, last sentence, p. 11 The scenario described herein provides for 100% of the loading capacity to be allocated to natural background. As such, it is not accurate to state that “no thermal loads are available for allocation”. We suggest modifying this sentence to read “... no thermal loads are available for allocation to anthropogenic sources in this system.”

Response – Clarified in TMDL Summary.

Comment – (Commentor 2) third paragraph, last sentence, p. 12 We suggest this sentence be modified to read: “Therefore, the loading capacity will be set at the site potential vegetative state and no thermal load will be available to allocate to anthropogenic sources.”

Response – Clarified in TMDL Summary.

Comment – (Commentor 2) Load Allocations The TMDL appears to allocate 100% of the loading capacity to natural sources, 0% to federal forest activities and 0% to private forest activities. Since allocations need to be made to specific sources, these allocations should be provided in the document. They may be presented either as a percent of the loading capacity or as BTU’s per day. These allocations would apply to all steams.

Response – Clarified in TMDL Summary page 12 paragraph 3.

Comment – (Commentor 2) Table 1, p. 3 states that no loads were allocated in the TMDL. This should be changed to reflect the above - 100% of the load to natural sources, 0% to federal forest activities, 0% to private forest activities.

Response – Clarified in TMDL Summary.

Comment – (Commentor 2) Application of Loading Capacity and Allocations It might be helpful to explain how the reach weighted shade targets and the reach specific shade targets will be applied. Is the expectation for a waterbody to attain the reach-specific shade target presented in Table 3 and 8 of the WQMP or 82% effective shade as specified in the second paragraph on p. 13?

Comment – (Commentor 2) Effective Shade Surrogate Measures (Allocations) The percent shade allocation applicable to stream segments not specifically listed in Table 8 of the WQMP should be specified.

Response - Clarified in TMDL summary page 13. LC and current conditions are given in great detail in Appendix A, Shadow Modeling, for specific reach segments. The paragraph at the top of page 16 in the WQMP explains how streams were selected for assessment based upon significant flow contributors.

Comment – (Commentor 2) The column of Table 8 which contains the allocations should be specified (projected value, 4th column).

Response to four comments above – Clarified in TMDL Summary page 14.

Comment – (Commentor 2) It would be helpful if the text noted that the last column in Table 8 identifies the party or parties responsible for attaining the allocation.

Response – Clarified in TMDL Summary page 16.

Point Source

Comment – (Commentor 7) Gravel extraction and small scale dredging within this area is of considerable concern. Specific restrictions should be developed for these activities to protect water quality.

Comment – (Commentor 9) Where were instream temperature taken in reference to suction dredging operations ? How many dredges were operating last year ? Who monitors their activities ?

Response - A waste load allocation was not designated for recreational mining, the only point source activity occurring within the assessed area. No gravel extraction occurs in this upper unit.

Recreational mining is conducted within the watershed and is considered a point source activity. It is the only point source activity present in the assessment area. As currently conducted, the assessment indicates that this activity is not effecting riparian and/or channel conditions. This activity is currently managed under the 0700J General NPDES Permit. The DEQ is charged with generating, issuing, monitoring, and enforcing conditions contained within the 0700 permit for this activity. No waste load allocation was established. Point source influences were determined to contribute no thermal pollutant load to the system. This is also discussed on page 17 of the WQMP.

Temperature monitoring within this system has been conducted in riffle features. This monitoring has been conducted to characterize water temperature regimes and not directly targeted at the monitoring of recreational mining activities. Channel widening was assessed in these areas.

Margin of Safety – Section 6

Comment – (Commentor 7) How will unexpected or catastrophic changes effect future condition projections?

Response – From page 15 TMDL Summary - It is understood that human and natural disturbances will likely occur within riparian stands in the future; however, these changes would be very difficult to predict or model. Given the likelihood of future riparian area disturbances, especially from flood and/or fire, the “target” shade increase values predicted by the SHADOW model should be assumed to be a goal, based on the potential of undisturbed riparian stands to develop shade.

Comment – (Commentor 7) We question a margin of safety that assumes groundwater flow to be zero. Doesn’t this approach seek to sweep away groundwater thermal loading, excuse the failure to monitoring groundwater temperatures, and provide an excuse not to protect groundwater ?

Comment – (Commentor 10) Implicit margins of safety are too large. Groundwater and overhang should be better developed.

Response - Every effort was made to minimize simple assumptions and to maximize data collection and analysis. The descriptions of near stream vegetation, channel morphology, hydrology, atmospheric parameters and stream temperature are the best that planned data collection efforts could accommodate.

There were no locations where specific ground water sources or saturated riparian soils were determined to be measurably cooling the upper South Fork River temperatures. Thus, ground water was assumed to be zero in the modeling effort. There are diffuse groundwater contributions to the upper South Fork River that are extremely important and provide localized cold water refugia for the fishery.

The Margin of Safety discussion on page 14 states - Shadow model inputs defaulted to zero % vegetative overhang values. Small stream channels with high shade densities are likely accurately evaluated even with this default because they are easily shaded. In the wider segments of this system, low flow wetted width meander into and out of overhang areas is likely underestimated.

In other words, realistic shade values were produced even with a model default to zero overhang. We feel that the shadow assessment accurately reflects basin shade condition and that the default to zero overhang does not introduce significant underestimation of existing or future shade values.

Reasonable Assurance of Implementation – Section 8

Comment – (Commentor 7) The monitoring and adaptive management mechanism needs to be formally established as part of the TMDL and WQMP.

Comment – (Commentor 7) A clearer connection needs to be drawn between failures to meet TMDL and actual management and monitoring.

Response - Page 17 of the TMDL summary discusses adaptive management and monitoring relationships.

Heat Source Modeling - Appendix C

Comment – (Commentor 1) Heat Source modeling is based upon one day of data. The day selected had extremely high ambient air temperatures recorded at the selected weather station. A plan should not be based upon one day-extreme temperature model.

Response - Temperature TMDL's require assessment of the period of the year when water quality is affected. The warmest day of the year was selected for this project. The date selected will not always be the warmest day of the summer season. Future efforts modeling will focus around days providing the most comprehensive flow and temperature data sets. Choosing a time of maximum ambient solar loading assures that solar loading and resulting stream temperature will likely be lower than those show in the model in any other season, any other time of day, and in any other stream within the basin.

The day selected for Heat Source predictive modeling was not above the 90th percentile of recorded highs. Therefore it represented a valid data set for use in TMDL development. Weather data for this day was only applied to Heat Source predictive modeling. The plan is based upon shade recovery potential derived from the existing and site potential shade assessments

Comment – (Commentor 12) Concern regarding Heat Source modeling for only one day from only one year of record.

Response - The model was calibrated to one day's worth of measured data. Simulation of any other condition of flow or weather is possible, but these conditions were held constant in the future condition simulations to simplify the modeling section. Additional modeling to specific conditions of interest is encouraged.

Comment – (Commentor 3) A very serious flaw and misstep of DEQ in using the model is that evidence is lacking in the ability of the model to predict beyond a specific day or reach. This is important, since one of the key elements in science is *reproducibility*.

Response - The model's reproducibility has been demonstrated with validation data sets (second season's weather/flow conditions substituted into pre-calibrated model to see if the temperature predictions match the temperature data recorded during that second time period). The model's simulation has also been compared to same-day FLIR temperature data in other areas of the state with excellent agreement.

Comment – (Commentor 3) We draw your attention to the ONE DAY 24 hour "thinned" data. Where is the detailed analysis for random days throughout the season/year, which shows that this model makes legitimate and reproducible predictions? If it cannot make reproducible predictions how is it a useful tool for making informed scientific decisions about the health of the stream at ALL TIMES?

Response – “Thinned” refers to the fact that some loggers were set up to record on both the half-hour and the hour. Only observations taken on the hour were used, so that each day of record had 24 data points (rather than 48). The model was calibrated to the seasonal worst case conditions so that expected solar loading and instream temperatures at any other time of the year will likely be lower.

Comment – (Commentor 3) The TMDL document for the South Fork Coquille TMDL is not written clearly using explanations and descriptions that allow the reader to understand the steps taken to conclude what the TMDLs are. Bits and pieces of the modeling used to determine the TMDL are given without enough explanation to determine how appropriate the modeling is for a temperature allocation. The narratives cause the readers to take leaps of faith in the generalized statements regarding causes of elevated thermal pollutants and affect on beneficial uses. Oregon Cattlemen recommend re-writing this document, strengthen the literature citations, and rely on actual data rather than the model predictions.

Response - The existing Heat Source 6.0 model is the best tool we have for the job we were required to do. There is no way enough data could be collected to account for every conceivable condition of flow, weather and time of year. Modeling is the best (in fact the only) approach which allows us reasonable understanding of how the system might react to decisions we make today. However, to assure that the model simulations are reasonable, it is always recommended that instream temperatures continue to be monitored so that true instream conditions can be measured and compared to simulated conditions.

Comment – (Commentor 10) As the Heat Source model is flawed, the exact improvements predicted by the model cannot be guaranteed and cannot be used as the basis for standard making.

Response - Field data for the existing and potential riparian shade values was developed in great detail. It is from this information that solar loading values were derived for this TMDL. Heat Source modeling has been conducted to generate information about potential standards attainment only, and has not been utilized in setting TMDL loads. Heat Source modeling was not expanded within this project because of limited resources.

Future iterations should provide additional information regarding the reproducibility of the predictive modeling within this basin. Promulgation of standards is not planned based upon Heat Source modeling contained within this document.

Comment – (Commentor 3) Without a clear, readable document, the public cannot follow DEQs approach to the creation of TMDLs. DEQ discusses modeling scenarios using graphs, images, and tables. The public cannot interpret the meaning of the graphs and tables shown in the document, without the data used to make the graphs, figures and images. DEQ also does not provide adequate information to indicate how valid the modeling is in regards to the local conditions. Calibration of a model is NOT the same as validation. DEQ should provide a validation of the modeling in the field in order to demonstrate the model is usable in its current form. The model was not verified by measuring sites with the various shading regimes prescribed in the model.

Comment – (Commentor 7) Neither the USFS Shadow Model nor the Boyd Heat Source model was indicated as having been validated by independent science review. Until these models are validated through independent peer review as well as in practice, it is an extremely risky practice to completely rely on them.

Comment – (Commentor 3) Each of the regulatory scenarios found in the TMDL are based on a network of assumptions that require leaps of faith regarding their validity. Where is the legislative intent (Federal or State) that authorizes DEQ to impose subjective environmental policy on the citizens of Oregon rather than a factual, objective program that has been validated by experimentation? If DEQ believes the TMDL document is factual and based on science, then where is the validating experimentation?

Response to the three questions above - The model has previously been validated using appropriate data sets. A validation data set was not available in the Upper South Fork Coquille at the time of modeling. Validation is a useful exercise to show the robustness of a model's underlying assumptions, but is not required for each and every use of the model. Future monitoring efforts in this basin will serve to validate and/or fine tune modeling products.

DEQ's Heat Source model has been extensively peer reviewed by outside experts. That peer review resulted in some changes to the model but generally it was endorsed as a very good predictive model for temperature. Results of that peer review can be found at DEQ's website at: <http://waterquality.deq.state.or.us/wq/HeatSource/HeatSource.htm>.

References are cited in the draft TMDL and WQMP in order to provide documentation of where information used came from. These references are cited in accordance with standard practices for documenting sources in technical reports and publications. The draft TMDL does not rely solely on Ph.D. Dissertations or Master thesis. However, many times information is first published in that form because graduate students, under the supervision of University faculty members, do much academic research. Ph.D. and Master's research are peer reviewed by interdisciplinary committees prior to acceptance of the research and graduation of the students. In fact they generally receive as much or

more scrutiny than many technical journal publications. Therefore they are commonly referenced in the research literature by other academics as well as government and private sector technical reports.

The authority of the Environmental Quality Commission and DEQ are set out in Oregon Revised Statutes (ORS) 468B. In particular, ORS468B.075 states "The commission may perform or cause to be performed any and all acts necessary to be performed by the state to implement within the jurisdiction of the state the provisions of the Federal Clean Water Act, enacted by Congress, October 18, 1972, and Acts amendatory thereof or supplementary thereto, and federal regulations and guidelines issued pursuant thereto."

As to the assertion of the questioner that any actions contained in the TMDL or WQMP are arbitrary, this is clearly not the case. Arbitrary means determined by chance or by individual preference. The voluminous documentation contained in the TMDL and WQMP, demonstrates that the decisions and actions taken, whether the questioner agrees with them or not, are not based on chance or individual preference.

Comment – (Commentor 3) None of the models cited have considered all the factors that affect streams. The only thing models are capable of are addressing the assumptions that the modeler intends to "simulate" and usually generalize reality on the ground. Models are limited in having more than a few static, stable parameters to describe. None of these models used air temperatures or soil temperatures to verify the models ability to predict. None recognized differences in thermal environments due to elevational changes.

Response - All models do seek to simplify inputs. We select those inputs which truly affect the process that you are trying to model. Heat Source 6.0 has been shown to calibrate to measured data and has excellent predictive abilities (when compared to validation or FLIR data sets). Since air and soil temperatures are not at issue, the model does not seek to predict them. Energy can pass from the stream to the soil/air (or vice versa), and these pathways are taken into account in the model for calculation of the overall energy balance. The slight changes in temperature due to local elevation have been shown to be minor components in the overall energy balance.

Comment – (Commentor 3) The Boyd model clearly predicts unphysical (not to mention irrational and unreasonable) results in some instances. At the same time, there is no CONCRETE, WELL DEFINED statement of its limitations or when it can be trusted. You can't build "good science" around something that started out as "bad science."

Response - The DEQ model has been shown to accurately predict temperatures and we are confident of the results. Regardless, efforts will continue to collect instream data to assure that the South Fork Coquille is responding the way that the model has predicted. Not having all of the answers today is not the same as saying that our science is bad. As data is collected we will adjust the model inputs, if necessary.

Comment – (Commentor 3) None of the models account for changes in topographic elevation or the local climatic cycles during the period the models were developed. These two factors may have affected the sensitivity of the model output more than shade. At best, the conclusions of the model outputs can only be relevant in a world without elevational changes due to topography or atmospheric changes due to weather fronts moving into and out of the local areas.

Response - The model is calibrated to simulate conditions of a single 24 hour day. Long-term climate concerns are not relevant to estimating conditions for this limited time span. The weather from last week or from next week does not affect conditions on the day of the simulation. Precise elevation measurements are used in the model to establish stream gradient used in estimating the velocity of the stream within each segment. Also, topographic shading was accounted for within the model. The effect of energy scattering due to passage through the atmosphere is also taken into account.

Comment – (Commentor 3) The DEQ Boyd model uses the equation : heat energy per unit volume = (water temperature) *(water density) * (the specific heat of water) to describe the energy process. The equation is wrong. Instead of water temperature, the equation should reflect the change in water temperature. This mistake is critical to understanding the thermodynamic process. The change in water temperature describes the importance of time in the stream heating process.

Response - Not sure of the source of this particular equation. The model calculates the change in temperature with each time step (one minute) throughout the day. The model then calculates an equilibrium condition of solar loading for each segment for each minute of the day. Adding all of these energy inputs and outputs calculates the resulting stream temperature profile. The model then does a second iteration of all of these calculations to come up with the final output data. A temperature profile for each hour of the day is generated. Typically, only the 1600 (4 PM) temperature is reported because this is typically the warmest time of the day.

Additional Response to five comments above – There were many comments related to the Heat Source temperature model used in the TMDL.

1) 100% effective shade is not night time. 100% effective shade occurs when 100% of direct solar radiation is attenuated. Diffuse solar radiation provides light. Night time minimum stream temperatures are variable depending upon factors such as daily maximum temperature, stream surface area, flow volume, flow velocity, and atmospheric conditions. Local sunrise and sunset are known for any day of any year at any latitude and longitude. Local sunrise and sunset are included in the model, and zero solar radiation is occurring between sunset and sunrise.

2) The model can simulate temperatures for any day in question and documentation is provided that it is reproducible.

3) All parameters that affect stream temperature are accounted for in the methodology, which is referenced. The model calculates equilibrium conditions for segments which are 100 meters long.

4) The model was calibrated using stream temperature data from continuous monitoring instruments placed within the stream. Elevation is accounted for in multiple ways. It is used to describe the stream gradient at each modeled reach. It is also used when calculating the amount of solar radiation that can reach the stream surface at that elevation.

5) Data sets used in the effort were obtained from United States Forest Service and The Timber Company. These agencies performed data quality checks.

Comment – (Commentor 3) How is the 100% shade at night incorporated into the model? What is the influence of overnight lows on stream maximums?

Response - 100 % shade is not the same as a solar loading at midnight, which would be zero. Night time minimum stream temperatures determine if net energy movement is into or out of the stream. That determines if the stream heats or cools during the nighttime. Vegetative canopy will insulate the stream overnight reducing the diurnal fluctuation in stream temperature. So, riparian vegetation results in a reduction in the maximum temperature during the day and an increase in the minimum temperature over night.

Comment – (Commentor 6) Did the version of Heat Source utilized in this analysis incorporate comments made by OFIC in the Grand Ronde TMDL ?

Response - Heat Source Version 6.0 was utilized for this effort. Based on peer review including that provided by the OFIC, the model was determined to be a good predictor of stream temperatures. The model was modified as a result of the peer review which proceeded the Upper Grande Ronde TMDL. This version has not been revised since the receipt of OFIC comments made for the Grand Ronde TMDL.

Comment – (Commentor 10) Expresses major concerns with the Heat Source model portion of the TMDL. Model results have seemed to vary throughout the process, is the model run used in the TMDL the most accurate ? Is the output realistic ?

Response – Several versions of Heat Source modeling were generated during the development of this TMDL. The model output included within this TMDL is considered to be the most accurate and refined version. Additional data integrated into future iterations of this model should raise accuracy.

Appendix C includes the following statement: Like any model that attempts to “look into the future”, there is a disparity between what is predicted and what will actually come to pass. Our understandings of the processes that determine stream temperature are imperfect, and any predictions using them are similarly imperfect. Any resulting simulation of the future is less a diagram with survey point accuracy than a roadmap that

identifies only the most obvious landmarks. Roadmaps, however, are useful for planning a journey and navigating to a destination. While only the broadest suggestions of possible management strategies are suggested by the model, they should point us in the right direction.

Public Participation – Section 9

Comment – (Commentor 8, 11) Request document be sent to City of Powers and to Powers Public Library. Express concern that documents were not placed in Powers earlier and that meetings to inform public were not held in Powers.

Response – Copies of this document were provided to the Powers Library as well as to the City of Powers after this request was received. The draft document was made available during the TMDL Public Notice at the United States Forest Service Powers Ranger Station. It was not the intent to of DEQ to limit document access in Powers. Documents were mailed on upon request throughout the Public Notice period.

Comment – (Commentor 12) Wants to see submission delayed, more public input, and DEQ request assistance for data gathering. Sees no benefit to fish.

Response – The department feels that sufficient opportunity was allowed for public input. Those entities involved in land management activities in the area were directly involved in the development of this TMDL. As this TMDL process moved downstream into this more diverse landscape, inclusive of the City of Powers, all efforts will be made to involve as many land owners as possible. Hearings will likely be held in the Powers area.

The data set utilized was of sufficient quality to develop this TMDL. Improved data sets resulting from future monitoring activities will be incorporated into future iterations of this TMDL.

Cold water fishers will likely benefit from improved, cooler temperature regimes. Stream heating is only one of several well defined stressors for cold water fishery juvenile rearing.

Comment – (Commentor 12) Was Oregon Department of Fish and Wildlife involved in this ?

Response – The Oregon Department of Fish and wildlife did review and comment on the document, both informally and formally, but was not actively involved in document development.

Water Quality Management Plan

Comment – (Commentor 9) Did/will The Timber Company use the same data gathering protocols as DEQ ?

Comment – (Commentor 2) The monitoring plan for The Timber Company is thin. Will data from both federal and private lands be pooled and shared?

Response to two comments above - The Timber Company and the USFS have established a strong partnership through this effort. Element seven of the WQMP discusses proposed monitoring and evaluation. In addition, the TMDL summary discusses ongoing state agency efforts to monitor TMDL implementation. Every effort will be taken to coordinate monitoring plan development and implementation as possible.

All participants have shared and discussed applied monitoring protocols and data quality is felt to be consistent and of good rigor.

Comment – (Commentor 7) Other aquatic life, both game and non-game, need to be mentioned in this TMDL and WQMP, along with species that are dependent on aquatic life. (amphibians, predatory birds, macroinvertebrates.

Comment – (Commentor 7) Declining Lamprey populations should be mentioned in the WQMP and the WQMP should follow up on the recommendation contained within the Watershed Analysis to determine the reason for this population decline

Comment – (Commentor 7) Other listed species in the watershed should be mentioned.

Response to three questions above - The WQMP identifies a primary beneficial use for the study area as cold water biota. The intent of the document is not to provide a laundry list of affected species. Rather, the goal is to identify and quantify conditions that are adversely affecting beneficial uses, as well as treatments and timeframes for recovery.

Comment – (Commentor 7) The USFS should be more specific in the WQMP about potential silvicultural treatments in matrix areas.

Response – Federal forest management under the NW Forest Plan provides for large riparian buffer retention during upland harvest. No impact to effective shade is anticipated from this type of riparian management. Riparian enhancement activities shall have no impact on existing shade and should be designed to promote the achievement of effective shade targets.

Comment – (Commentor 7) The reason for USFS reserves should be stated.

Response - USFS late-successional reserves are managed to protect critical old growth habitat that supports old growth dependent species. Riparian reserves are managed to protect aquatic/riparian dependent species and processes.

Comment – (Commentor 1) Where in this plan have you included a time frame of reference to achieve the 64-degree goal?

Response – The plan identifies a future condition under which anthropogenic sources of warming would be removed. The time frame to reach these conditions or objectives is provided in Table 10.

Heat Source modeling appendix C of the TMDL Summary discusses predicted temperature standards attainment under these future conditions. In addition, the TMDL summary speaks to standards attainment in section 5, Water Quality Attainment.

Comment – (Commentor 2) Inclusion of the Water Quality Management Plan (WQMP) as part of a TMDL is valuable and progressive.

Some parts of the plan are not as strong. It is understood that the Oregon Forest Practice Rules will be used and the processes for revision will be supported. However, since the analysis of this basin gives specific site potential shade targets, there is an opportunity to use that information to plan forestry activity accordingly. The plan would be strengthened by more specificity in voluntary actions that are being encouraged to achieve the site specific targets .

Comment – (Commentor 6) WQMP should recognize proposed modifications to the Oregon Forest Practices Act. Evaluate information provided submitted by Oregon Department of Forestry to use in modifying the final TMDL and WQMP.

Comment – (Commentor 7) TMDL page 5, Protection and restoration measures prescribed by the Oregon Forest Practices Act are not adequate to build from. There are better management practices today from which to build (Oregon Plan, PFC). The current Forest Practices Act falls short of what is biologically necessary to protect and restore salmonids

Comment – (Commentor 9) Please explain the statement ‘ The Oregon Department of Environmental Quality has accepted the Forest Practices Rules as the WQMP for private forest lands and has signed an agreement with Oregon Department of Forestry that provides the basis for new rules, if needed, on a watershed by watershed basis’.

Comment – (Commentor 9) What role has Oregon Department of Forestry had in the developing this plan ? Will ODF and/or DEQ be involved in implementing and/or monitoring of this plan ?

Response to five comments above - The comments are correct that the Oregon Forest Practices Act is identified in statute as meeting water quality standards. It is also true that there is a process for determining the sufficiency of the Act in meeting water quality standards. This process is established in a Memorandum of Agreement between ODF and DEQ. The two agencies are in the process of completing this sufficiency analysis.

The MOA also describes how individual TMDLs can identify basin specific issues related to non-achievement of water quality standards from activities on state and private forests. If this occurs, the MOA describes how the two agencies, Environmental Quality Commission, and Board of Forestry will deal with any necessary basin specific changes to Forest Practices Act. ODF and DEQ intend to follow the requirements of the MOA.

ODF has primary responsibility for monitoring and reporting the effectiveness of given forest practices.

The Timber company has discussed the application of voluntary and discretionary actions to speed shade recovery and improve water quality on page 29 of the WQMP. These actions are applied on a case-by-case basis. The Timber Company has not discussed unit specific actions. This WQMP was first completed in 1998. Any discussion of site specific treatments at that time would be outdated at this time. This discussion was inserted to reflect, that in general, these voluntary actions are being implemented in addition to the Forest Practices Act.

Comment – (Commentor 2) Even though budgets are not yet known, projections of cost could be given to show the need, particularly where detail on proposed actions is known as in Appendix E.

Response - This plan was originally submitted in 1998. It was meant to reflect proposed actions to ameliorate loss of riparian shade and sediment loading. Since the initial assemblage of this WQMP, implementation has been ongoing and will continue. Detail regarding ongoing proposed actions is available through the USFS and Georgia Pacific. Active implementation is occurring in this area.

Comment – (Commentor 2) WQMP Page 6, paragraph 2 - good description of the area and the history. Note that important mechanisms keeping water cool in the meadows of the upper watershed are likely to be in connectivity with hyporheic flows in the floodplain, low width to depth ratios where vegetation is plentiful and the floodplain is functional, and that beaver ponds and pools have cool waters a few feet below the surface. If these are the natural landscape processes of the area, it may be important to note them and be aware that site potential effective shade targets could be modified here if temperature dynamics are dominated by these other factors.

Comment – (Commentor 9) WQMP page 6 – What evidence do you have that beaver control will result in reduced temperatures ? Won't beaver removal adversely effect the trout population and other plants and animals using features of beaver habitat ?

Response to two comments above – The WQMP Page 6 simply references the presence of beaver and their impacts on channel morphology and riparian condition. Site Specific Treatments Appendix E does reference beaver control (protection from animal damage) as a treatment option. Additional monitoring conducted through the identified reach has revealed that these beaver complexes are not having adverse effects on water

temperatures and that riparian conditions identified in other areas of this watershed may have impacts upon temperature regimes.

As site specific treatments are developed, site specific data will be reviewed. These actions will allow site treatment to be adapted based upon additional information. Beaver control activities, if conducted, would be overseen by the Oregon Department of Fish and Wildlife. Beaver control is a treatment option but will not be applied here unless future data collection supports this action.

Comment – (Commentor 7) WQMP needs to include more information on roads (total mile length, ownership, subwatershed road densities, road survey and correction schedules. Road management recommendation in the 1995 Watershed Analysis should be included within the TMDL.

Response – This TMDL assessment focused upon those factors effecting stream temperatures. These included riparian condition and channel widening. Sediment loading can have adverse effects on channel width to depth ratios. Site specific sediment abatement treatments were incorporated from the 1995 Watershed Analysis (WA) and 1996 road failure assessment. This document was not meant to supersede or capture all information provided within the WA but to build on information from the WA to better focus on stream temperature. The effects of sediment loading are discussed in the WQMP page 34 under the channel form component.

Comment – (Commentor 9) Figure 4 page 10 – Blue lines are watershed boundaries, not streams per the legend. This needs corrected. Land use designations and potential harvest sites along streams should be included.

Comment – (Commentor 5) WQMP page 10 map – blue lines are not streams but subwatershed lines

Response to two comments above – Figure 4 will be edited so that the legend appropriately describes the map elements. The Matrix management theme (land use designation) shown in Figure 4 is where programmed timber harvest may occur. Streams within these boundaries are protected by riparian buffers, as described in the text.

Comment – (Commentor 9) Table 9 page 28 – Please explain active riparian area management.

Response – Activities qualifying as active riparian management are listed in Table 9. They include treatment that would increase growth rates of riparian stands, treatment that would insure long-term health of riparian stands, and treatment to promote reestablishment of conifers where they historically occurred. These treatments, when conducted, should have no immediate impact of existing stream shade.

Monitoring

Comment – (Commentor 7) Does evidence exist to indicate that sub-lethal effects due to temperature are occurring? Has disease monitoring been conducted in this watershed? Disease monitoring should be included in this plan.

Comment – (Commentor 7) Macroinvertebrate monitoring should get more attention in the monitoring program.

Response to two comments above - No specific disease monitoring is conducted by the USFS. Snorkel surveys have shown no (and likely would not detect) evidence of sub-lethal effects due to temperature. We do see changes in fish density with temperature and expect that fish are moving to more favorable conditions when available. Macroinvertebrate monitoring is part of the Forest's monitoring plan, but with many years between measurements.

Comment – (Commentor 7) Percent shade should not be the only variable monitored. Additional variables should be measured and included in the thermal load equation (depth, sediment size, embeddedness, and macroinvertebrates).

Response - Element number seven in the WQMP describes TMDL effectiveness monitoring planned by partners. In addition appendices discuss ongoing habitat and invertebrate monitoring efforts by the USFS.

This TMDL and margin of safety (MOS) represent the best estimate of how standards can be achieved. The components defined in the MOS will be used to guide monitoring and implementation planning (adaptive management). The TMDL process accommodates the ability to track and ultimately refine assumptions within the TMDL implementation-planning component.

The model input summary on page 42 TMDL Summary appendix C indicates that channel substrate, channel depth, and velocity are important parameters to gather additional field data for future model iterations.

Comment – (Commentor 7) Both the TMDL and WQMP are silent regarding water quality parameters that are linked to temperature (turbidity, suspended solids, dissolved oxygen, and pH). Permanent transects should be established for future monitoring. The monitoring plan does not extend to the entire watershed. And is not specific enough.

Response - Permanent monitoring sites have been established to represent this watershed and will be utilized to track the effectiveness of TMDL implementation. In large part these monitoring efforts will focus on stream temperature, riparian condition, and sediment source abatement.

As a result of this assessment more targeted temperature monitoring occurred in 2000. This type of ongoing site specific assessment has already helped to improve the understanding of stream temperature and riparian condition.

Every effort will be made in the future to gather water quality data to characterize other parameters. Improvements in stream shade and temperature regimes will likely result in improvements of other water quality parameters such as pH and dissolved oxygen. .

Comment – (Commentor 7) How will density of fish be monitored ? Will electroshocking be conducted ?

Response - Fish density evaluations on Forest Service administered lands are done by snorkel surveys. Electroshocking is not used.

Comment – (Commentor 9) Would like to see field studies inclusive of water quality monitoring to determine what impact herbicides and fertilizers have on the ecosystem. Concerns are raised about food chain, mortality, and habitat loss. Is there a better answer that herbicide spraying ? What is DEQ’s position on the use of herbicides and fertilizers within the area covered by this WQMP ?

Response - The Oregon Department of Forestry (ODF) is responsible for conducting monitoring to assure the effectiveness of management practices governing any forestry related activity. These management practices are designed to assure protection of water quality and other natural resources. Some chemical monitoring has been conducted by ODF, and the need to continue this monitoring is recognized and should be promoted. Alternatives to chemical application are often considered and applied, where practicable, by timber management entities.

Herbicide and fertilizer applications are allowed to occur under the Forest Practices Act. ODF provides oversight for these activities on private timber lands.

Editorial Comments

Comment – (Commentor 5) TMDL page 6 – Commentor suggests changing the word salmon to salmonid

Response - Document will be edited to reflect this change.

Comment – (Commentor 5) TMDL page 8 – Spring Chinook are not listed in the subbasin.

Response - Document will be edited to reflect this change.

Comment – (Commentor 5) WQMP page 20 – Is the participating timber company correctly identified (Georgia Pacific, The Timber Company, Plum Creek).

Response - These private lands have changed ownership since the initial development of this WQMP. The land manager has asked that the document reflect ownership as Georgia Pacific d.b.a. The Timber Company. The document so reflects this request.

Comment – (Commentor 5) WQMP page 20 – GWEB has been replaced by OWEB.

Response - Document will be edited to reflect this change in name.

Comment – (Commentor 3) There is no economic impact analysis provided. It must be included.

Response - An economic analysis is not a required component of a TMDL. Element 10 page 37 of the WQMP does provide a cursory discussion of costs and funding.

Comment – (Commentor 7) TMDL page 7 “Excessive summer water temperature “ sentence should strike the word “likely”.

Response - Document will be edited to reflect this change.