Riparian Rule Talking Points, Background, and Questions

Main Points

- *EPA's Support of Riparian Rule for small and medium fish-bearing streams*
- *Temperature guidance and importance of protecting cold water for fish.*
- *CZARA*
- *If needed, RipStream and Paired Watershed Studies*

Talking Points and Background Papers:

Attachment 1: Talking Points
Attachment 2: Back Pocket, Qs and As
Attachment 3: Importance of Protecting Cold Water: Temperature Guidance
Attachment 4: Riparian Rule and WQS
Attachment 5: Riparian Rule and CZARA
Attachment 6: Where Riparian Rules Apply
Attachment 7: RipStream and Paired Watershed Study

Logistics

June 19 EQC Meeting, Dalles, OR – Tony or Dave, Alan, and John
(EPA – 15 minute presentation with 30 minutes from state, and 15 minutes from ODFW)

June 23 BOF Meeting, Salem, OR – Dan, Alan, John, Peter, Rochelle, Jenny
(EPA - ~15 minute presentation with state and NOAA presentations)

Attachment 1: Talking Points for Forest Practices Riparian Rule Analysis & Protecting Cold Water Criterion: 6/19 EQC Meeting and 6/23 BOF Meeting

Overall

1. EPA supports the preliminary results of the sufficiency analysis that greater riparian buffers are needed for small and medium fish-bearing streams.
    a. Hundreds of peer-reviewed studies collected through development of Temperature Guidance support the need to preserve cold water.
    b. This will improve salmon habitat and help to keep cold water in the system.
    c. This is the getting to the end of a process that started with the Oregon Coastal Salmon Restoration Initiative, State's IMST, and Sufficiency Analysis in 1990s where peer-reviewed studies show the need for larger buffers on small and medium fish-bearing streams.
2. We commend OR for using published and peer reviewed scientific data in guiding the application of its nonpoint source rules and BMPS.

Temperature Guidance and Cold Water

1. In 2003, EPA issued the Region 10 Temperature Guidance as part of four year effort to identify temperature water quality standards that would protect and aid in the recovery of salmonid species in the Pacific Northwest.
    a. In developing the Guidance, EPA developed workgroups of technical experts in the field that reviewed hundreds of scientific studies, issued five technical peer-reviewed issue papers, and formed a multi-agency workgroup that assisted EPA in issuing two public drafts of the Guidance for public comment.
    b. The Guidance includes recommended numeric water quality temperature criteria to protect salmonid species in the Pacific Northwest.
    c. In addition, the Guidance recommends States and Tribes include provisions in their standards to prevent additional warming of rivers and streams with ESA-listed salmonids with summer maximum temperatures currently colder than the numeric criteria.
2. In 2003, Oregon adopted the numeric temperature criteria and the PCW criteria consistent with the EPA's Region 10 Temperature Guidance.
3. The following three primary points summarize the scientific and legal rationale of why EPA's Guidance recommended the cold water protection provision and why EPA believes the Oregon's PCW standard is an important element of the State of Oregon's standards to protect and aid in the recovery of ESA listed salmon and bull trout.
    a. First, as illustrated by the numerous 303-listed stream segments in Oregon as well as Washington and Idaho, human development has significantly warmed rivers and streams in the Pacific Northwest.
        i. This warming is identified by NOAA and FWS as a factor in the decline of ESA-listed salmon and bull trout and a limiting factor in their recovery.
        ii. Excessively warm river stream temperatures have truncated the number of stream reaches suitable for spawning and over-the-summer juvenile rearing as well as increased the stress on adult and juvenile migration in lower river segments during the summer months.
        iii. As such, the remaining suitable and optimal summertime salmon and bull trout habitat is believed to be critical to the survival of these species, and the principles of conservation biology indicate we should protect these last remaining areas from further thermal degradation, while we make progress on improving thermally degraded stream reaches.
        iv. Additionally, the predicted region-wide increase in stream temperature from climate change (1-2°C in the next 30 years) further highlights the need to avoid increasing stream temperatures in the remaining thermally suitable habitat for salmon and bull trout.

b. Second, increased warming upstream can further contribute to downstream exceedances of temperature standards.
    i. Numerous Temperature TMDLs show that in many cases, upstream reaches must be cooler than the numeric criteria in order to meet downstream criteria.
    ii. Oregon PCW serves to ensure that further contributions to downstream exceedances are avoided.
c. Third, the technical rationale in support of the numeric temperature criteria included assumptions about spatial variation in temperature patterns.
    i. For example, the numeric criteria are intended to be met at the lowest downstream extent of the use and temperatures upstream at higher elevations will generally be cooler.
    ii. This is why EPA recommended numeric temperature criteria at the "upper end" of the optimal range for certain life stages of salmonids in the Temperature Guidance.
    iii. The numeric criteria were challenged in court as not being sufficiently protective and the spatial technical assumptions associated with numeric criteria were an important aspect in EPA's defense and the court's upholding of the numeric criteria.
    iv. The PCW provision is an important provision that supplements the numeric criteria to ensure the spatial patterns associated with the numeric criteria are attained.

Attachment 2: Back Pocket Information, Qs and As

Water Quality Standards

What is the construct behind the PCW?

1. PCW was included by the State to meet several goals:
    a. Added protection of stream thermal complexity including cold water refuges to offset criteria at the upper end of optimal;
    b. To meet antidegradation requirements or preservation of water of higher quality waters than the criteria; and
    c. Protection of downstream waters, which must be considered pursuant to federal implementing regulations when criteria are established.

What is the biological basis of the PCW standard?

1. The PCW standard was developed based on hundreds of peer-reviewed scientific studies that showed the importance of cold water for healthy aquatic life.
    a. These showed that thermal diversity and a natural thermal regime were essential.
    b. Scientific studies show that without sufficient cold water, fish diseases can increase…

Is PCW an essential component for EPA to approve Oregon's temperature WQS?

1. EPA determined that PCW was a necessary component of Oregon's temperature standards, when we approved their standard in 2004.
    a. We can't speculate on whether a differently written narrative could be approvable by EPA.
    b. The State has authority to submit new and/or revised standards for EPA's 303(c) review and approval process; ESA review of the protectiveness of new or revised standards would take place as part of any approval process.
    c. The WQS program is delegated to the State of Oregon's Department of Environmental Quality, and the Department makes decisions regarding implementation of NPS authorities to meet water quality standards.

Will EPA promulgate a WQS if PCW were not included in the State's submission of a new temperature WQS?

1. EPA can't speculate on whether a differently written narrative could be approvable by EPA.
2. However, if there were no PCW in a new temperature water quality standard, it would likely bring into play all the numeric criteria.
    a. That is, since the current numeric criteria are on the higher end of the biological scale because of PCW, if there were no PCW, it might be necessary to have colder numeric criteria to ensure that fish uses were protected.
    b. We might also need to reexamine the location and timing of salmon spawning.
3. EPA would need to consult with the Services, and are in fact, currently consulting with the Services on the numeric criteria as required under court order in 2012.

Washington has a 2.8°C cap for nonpoint sources. Why is Oregon's so much lower?

1. At the time that the 2.8C cumulative cap for NPS activities was submitted to EPA, we did not act on it (in 2008) since it concerned the regulation of NPS's – therefore, it is not in effect for CWA purposes, but it is used for state regulation of NPS.

2. Regarding the 0.3°C cap, the cap triggers Tier 2 review which identifies whether discharge to a Tier 2 water should be allowed. On the face of WA's standard, it does not prohibit increased discharge to the waterbody – the outcome, however, depends upon how Tier 2 review is implemented in WA. The rule language itself does not appear to limit implementation cumulatively, instead it is "per source". Therefore, if this is the case, it does not strictly meet the minimum requirements of the antideg regulations. EPA approved the antidegradation language in 2007.
3. WA's HUA is cumulative, but it is for waters within 0.3C of criteria or *warmer* than criteria, not like PCW is in place for waters *colder* than criteria. OR also has an HUA for waters warmer than criteria.

How do PCW and Anti-Deg Work?

1. The Protecting Existing Cold Water provision is included in the temperature guidance because the workgroup felt that the Antidegradation Policy and program would not offer with certainty that salmonid streams and rivers with waters colder than the numeric criteria would be protected from warming up to the criteria.
    a. Antidegradation Policy only ensures a process for considering whether water quality better than what the standards call for warrants protection.
    b. The PCW provision ensures that waters colder than the standard in streams with T&E species, critical habitat, or necessary for meeting downstream criteria are protected.

CZARA-Related

What are the respective authorities/obligations on the issue of forest management and protecting water quality?

1. Water quality standards apply to the waterbody, not the regulated source. In terms of ensuring compliance with WQS, OR has the authority to regulate NPS in their state statutes, and ODEQ, in particular, has the authority to enforce the laws on OR's books.
2. CZARA requires that the State have an approvable program in place for nonpoint programs in the coastal areas for forestry.
    a. EPA and NOAA determined that the State did not have adequate programs in place for riparian buffers on medium, small and non-fish bearing streams, because they caused water quality standard violations.
    b. These were based on the State's IMST (1999) and Sufficiency Analysis (2002).
    c. These have also been confirmed by the State's Ripstream studies.

Does this riparian rule process relate to the NOAA/EPA proposal to disapprove the State of Oregon's coastal nonpoint pollution control program, if so, how?

1. While Oregon has made incremental progress in improving forest practices to protect water quality, numerous studies show that current forest practices are not sufficient to meet water quality standards.
2. By providing better protection for fish-bearing streams, the Riparian Rule will be very important for helping the State satisfy its remaining Coastal Nonpoint Program requirements.
3. As you likely know, EPA and NOAA announced our proposed funding that Oregon has failed to submit an approvable coastal nonpoint program for a 90-day public comment period this past December. Currently, we're reviewing all public comments and supporting documents.
4. If after our review, NOAA and EPA's proposed decision stands and the federal agencies find that Oregon has failed to submit an approvable program, the new Riparian Rule will be critical for the state to quickly address any lingering programmatic gaps.
    a. This would allow the state to reverse a "disapproval" decision without long-lasting impacts to its federal funding.
5. If NOAA and EPA find that the State has established the necessary management measures for a fully approvable coastal nonpoint program, the agencies would need to issue another public notice, and the BOF's Riparian Rule would become part of the record for this action.

How do ODF and DEQ identify the geographic extent of the Protecting Coldwater Criterion, including where throughout the state (including eastern Oregon) the PCW standard is in force? [State answer] **How far upstream of reaches covered by the PCW standard should any riparian rule be applied to ensure we're not sabotaging our ability to meet the standard?**

Is the concept of drafting the rule keyed on where the PCW standard has been established a legally defensible approach to meeting our Clean Water Act obligations?

1. We support the approach that the State is proposing on where the riparian rules should apply.
2. The State has discretion to apply its Riparian Rule for nonpoint sources.
3. For CZARA, the Riparian Rule is very important to address gaps in the forestry program.
4. We commend OR for using published and peer reviewed scientific data in guiding the application of its nonpoint source rules and BMPS.
5. We feel OR's application of the riparian rules is to the highest priority areas; however, we encourage OR to consider applying the rules more broadly to ensure restoration and protection of aquatic life.

Ripstream/Paired Watersheds Study

What are EPA's opinions on the Paired Watershed Study and Ripstream?

1. Ripstream is current, peer-reviewed research.
    a. Field data collection efforts associated with the Ripstream project took place over a 9- year period from 2002 through 2011.
    b. The Ripstream project has resulted in two peer reviewed scientific publications in 2011 (Groom et al 2011a and Groom et al 2011b) which directly address the effects of harvest activities on stream shade and other riparian variables and the effect of these riparian changes on stream temperature over the long term to support salmonid populations.
    c. These studies were directly designed to help inform potential OFPA riparian harvest rule review.
    d. They support the IMST (1999) and Sufficiency Analysis (2002) work both of which also looked at the adequacy of OFPA riparian buffers.

2. Though the Paired Watershed Study done by the Watershed Resource Center has done some good work, one of 14 published studies are related to the rule revision.
    a. The study is from Kibler et al. (2013), and it is important to point out that the field data collection effort associated with this project was from 2002 to 2006.
    b. Note that the data collection effort associated with the Kibler study (i.e., 2002 through 2006) uses data collected contemporaneously with that of the Ripstream project (i.e., 2002 through 2011).

3. The paired watershed study looks at Hinkle Creek and the Alsea River.
4. The Hinkle Creek study published in Kibler et al (2013) showed that 3 of the four treatment reaches had stream temperature increase resulting from harvest activities.
    a. These three stream segments had slash deposited on the stream surface (which is not allowed in the rule) which resulted in some amount of shading.
    b. The measured temperature increases were 1.1, 0.6, and 0.7°C increase for these sites.
    c. These would have been even higher if not for the slash on the stream.
    d. Actual canopy reductions were only 20%, so if harvest had been at OFPA levels, there would have been

even higher temperature increases.

e. In addition, it was found that flows increase in all of these sites as a result of harvest activities and thus the increased flows muted the effect of harvest on bulk stream temperatures at these sites. This is a short-term effect.

5. The fourth site had slash completely covering up the stream (not allowed in OFPA) and therefore shade levels were scarcely reduced following treatment.

f. That fact, in combination with higher flows following harvest, resulted in the stream getting much cooler following harvest at this site (+1.6*C).

g. Thus, the result associated with this study is not a valid evaluation of the effects of allowable forest harvest activities on stream temperature.

6. When temperatures were measured at the watershed outlet, and all four stream were combined, it is not surprising that temperatures did not increase at the watershed outlet (i.e., warm water + cold water = water that does not change in temperature).

h. This, in fact, supports the need for colder water to counteract the warm waters coming from harvested areas. It shows warmer waters resulting from such practices need to be offset by shading or another way to provide colder waters.

i. A true test of the effects of the harvest activities (no slash on the stream surface and extensive canopy reduction per OFPA rules) would most likely result in much greater temperature increase.

Attachment 3: Importance of Protecting Cold Water: Temperature Guidance

1. High water temperatures are a major factor harming salmon.
    a. Those endangered and threatened ESA salmonids, indeed all salmonids need cold water to survive.
    b. Numerous scientific studies completed over the last two decades, document the detrimental impacts to salmon and trout from high temperatures and the loss of cold water habitat.
    c. These studies indicate that high temperatures are a major factor contributing to salmon decline (*PNW Temp Guidance, p. 10*).
    d. The high quality, thermally optimal waters that do exist are likely vital for the survival of ESA-listed salmonids (*PNW Temp Guidance, 2003, p.32*).

5. Background on Temp Project
    a. Knowing that high temperatures threaten and endanger salmonid species in Oregon and elsewhere in the PNW, EPA undertook the Temperature Project from 2000-2003.
    b. EPA assembled an interdisciplinary team of water quality specialists, fish biologists, hydrologists, geomorphologists, ecologists, and other scientists from multiple agencies and organizations from the Pacific Northwest.
    c. The goal of the project was to use the most recent scientific studies to develop guidelines for establishing water quality standards for the protection of northwest salmon and trout.
    d. These guidelines incorporated the science of the salmon biology, behavior, and life history with the science of the thermal dynamics and structure of northwest streams and river to develop to determine what types of temperatures and thermal regimes salmon need to survive and thrive.
    e. Six scientific papers synthesized information from hundreds of studies to provide the scientific and technical foundation for the Guidance.
    f. The papers and Guidance were reviewed by two independent, interdisciplinary scientific peer review panels.

6. The Temperature Project concluded that the most important factors for salmon are cold water and a return to a natural thermal regime. The Temperature Guidance laid out a mix of numeric and narrative criteria to serve as anchor points across a stream system to protect and restore the natural thermal regime.

7. Two major assumptions were built into the WQS for temperature.
    a. The first major assumption of the temperature WQS is that water cools as you go upstream or put another way, water is colder in the headwaters and gradually warms as you move downstream.
    b. Sources of cold water such as headwater streams are integral to a functional natural thermal regime.

c. The second major assumption, is that water cools as you progress seasonally from summer to winter/spring.
d. In other words due to colder seasonal weather, cold water will be delivered during the late spring and early fall ("shoulder seasons") when salmonid spawning and fry emergence occurs.

8. Based on these two assumptions the temperature guidance chose numeric temperature criteria for the various life stages that were on the *higher* end of optimal, *assuming* that colder water occurs upstream and other times of the day and year, especially critical shoulder season months.
    a. The Guidance assumed that if you apply the numeric criterion to the lowest downstream extent of the use, the fish would have sufficient waters at optimal temperatures available upstream.
    b. So PCW and cold water in upstream areas is necessary for the numeric criteria to be fully protective.

9. Although EPA was challenged on our approval of DEQ's temperature WQS, EPA prevailed in 2012 on the numeric water quality standards because of how the temperature standard worked as a whole to restore the natural thermal regime. Cold water delivered downstream spatially and seasonally was key to the U.S. District Court upholding the biological basis behind the numeric criteria.

10. Existing cold water helps ensure that downstream temperatures are able to meet standards.

11. With climate change raising stream temperatures and thus reducing salmon habitat, protecting areas with cold water is even more critical.

12. The Protecting Existing Cold Water provision is included in the temperature guidance because the workgroup felt that the Antidegradation Policy and program would not offer with certainty that salmonid streams and rivers with waters colder than the numeric criteria would be protected from warming up to the criteria.
    a. Antidegradation Policy only ensures a process for considering whether water quality better than what the standards call for warrants protection.
    b. The PCW provision ensures that waters colder than the standard in streams with T&E species, critical habitat, or necessary for meeting downstream criteria are protected.

Attachment 4: Riparian Rule and WQS

1. The goals of the Clean Water Act are to protect and restore our nation's waters. WQS standards apply to the waterbody, and therefore to all regulated sources, point and nonpoint.

2. Enforceability of controls under CWA is federally mandated only for PS; however states can and do enforce for NPS. Without enforcement for all sources that contribute largely to a pollution problem WQS will not be attained, and waters will become more and more frequently listed and/or remain 303d listed.

3. Briefly, OR's temperature standard was derived from EPA's Pacific Northwest Temperature Guidance (2003). This Guidance, in turn, was based upon hundreds of studies on salmonid life stages' biological thresholds for temperature—where injury and mortality are prevented in the target organism.

4. Biologically-based pollutant criteria, including the temperature criteria, are chosen to be protective of the defined uses for the streams; in this case, to support an aquatic life use - fish.
    a. It does not make sense to choose criteria that do not protect the use or result in unacceptable mortality or injury to the use such that the goal cannot be achieved.
    b. The goals are to protect and restore the aquatic life populations as defined by State rules and approved by EPA.

5. The temperature criteria identified in the guidance and adopted by Oregon work together to encompass the thermal complexity of streams.

6. PCW was included by the State to meet several goals:
    a. added protection of stream thermal complexity including cold water refuges to offset criteria at the upper end of optimal;
    b. to meet antidegradation requirements or preservation of water of higher quality than the criteria; and
    c. protection of downstream waters, which must be considered pursuant to federal implementing regulations when criteria are established.

7. While the numeric criteria are from the upper ends of the ranges found to be protective of the aquatic life uses, the protecting cold water narrative, and other narratives, enable such criteria to be fully protective.
    a. Fish are reliant on cold water areas ('refuges') for maintaining a healthy life cycle.
    b. Together, the criteria protect the bulk stream temperatures from being too warm in the short and long term, so that fish can survive.
    c. The colder waters enable the population as a whole to not only survive but to be self-propagating.

8. The State determines how and where it will apply its Riparian Rule for nonpoint sources, but it is consistent with the PCW WQS for the regions of the state thus far identified.

a. Although EPA does not have all the information on how this is being implemented yet since OR is still developing its methods, from what we know, they do seem to overlap with the areas identified under the narrative use for protecting cold water.
b. Although we do see the areas identified by the State as priorities for protection, we would encourage the state to consider the suite of criteria for which the riparian rules may be necessary (the PCW is just one of the temperature criteria that applies), and for other areas of the state where the science shows that the rules are necessary, as more information is developed.
c. For antidegradation, the PCW provision is at least minimally consistent with the Clean Water Act antidegradation standard Tier 2 (waters of as or higher quality than criteria) requirements.
d. It is also necessary for ensuring protection of downstream waters, as required by federal implementing regulations.

9. Per Oregon's approved rule language that is in effect for CWA purposes, the PCW applies at the point of maximum impact where salmon, steelhead, and bulltrout are present. Waters can only be exempted from the provision if:
    a. There are no threatened or endangered salmonids currently inhabiting the water body;
    b. The water body has not been designated as critical habitat; and
    c. The colder water is not necessary to ensure that downstream temperatures achieve and maintain compliance with the applicable temperature criteria.

10. There is no map of PCW currently adopted into standards.
    a. It is a narrative and applies to a subset of the mapped designated uses that were adopted into Oregon's regulations.
    b. The numeric temperature criteria apply where the associated uses have been designated in the maps adopted into Oregon regulations.
    c. There are year-round fish uses as well as spawning use maps for criteria that apply for specific times of year.
    d. There are typically two maps per basin unless no salmonid uses occur in a particular basin.

11. Other aquatic life, beyond salmonids, are sensitive to temperature, however, OR identified salmonids as the most sensitive to temperature, and so salmonids (salmon, steelhead, trout, and bull trout) comprise the uses that currently designated in the maps for OR waters.

12. Re ODEQ's question about whether the PCW narrative could be changed to be more ambiguous narrative than the Board of Forestry interprets, and not pegged to ambient waters colder than summer maxima,
    a. PCW was deemed a necessary component of Oregon's temperature standards and was approved as such by EPA in 2004.
    b. We cannot speculate on whether a differently written narrative could be approvable by EPA – we would have to see such a narrative.

c. The State has authority to submit new and/or revised standards for EPA's 303(c) review and approval process; ESA review of the protectiveness of new or revised standards would take place as part of any approval process.
d. The WQS program is delegated to the State of Oregon's Department of Environmental Quality, and the Department makes decisions regarding implementation of NPS authorities to meet water quality standards.
e. If the State feels that site-specific conditions should dictate that a different criterion should apply at a particular place, it can always submit a site-specific criterion to EPA's 303(c) review and approval process.

Attachment 5: Riparian Rules and CZARA

1. Under the Coastal Zone Act Reauthorization Amendments of 1990, coastal states that participate in the voluntary National Coastal Zone Management Program are required to develop a Coastal Nonpoint Pollution Control Program (or Coastal Nonpoint Program) that describes the programs and enforceable mechanisms they will use to implement a suite of management measures to prevent and control polluted runoff in coastal waters.
    a. The goal of the Coastal Nonpoint Program is to ensure management measures are in place to achieve and maintain water quality standards and protect designated uses.
    b. EPA and NOAA jointly administer the Coastal Nonpoint Program and states must submit their coastal nonpoint programs to NOAA and EPA for approval.
    c. If EPA and NOAA find that a state has failed to submit an approvable program, the federal agencies must withhold a portion of the funding the state receives under Section 306 of the Coastal Zone Management Act, which supports implementation of the state's coastal management programs, including providing important funding and technical assistance to local communities, and Section 319 of the Clean Water Act which supports Oregon's statewide Nonpoint Source Program, including OWEB restoration grants and TMDL development.

2. Oregon is one of eleven coastal states and territories participating in the National Coastal Zone Management Program that do not have fully approved coastal nonpoint programs. The 23 other states have received full approval for the coastal nonpoint programs.

3. As you likely know, EPA and NOAA announced our proposed finding that Oregon has failed to submit an approvable coastal nonpoint program for a 90-day public comment period this past December.
    a. Currently we are carefully reviewing all public comments and supporting documents received before making a final decision about the approvability of Oregon's program.
    b. Of the 85 comments received, ** supported our proposed finding that Oregon had not submitted an approvable program while ** opposed the proposed decision.
    c. ** other commenters recognized that Oregon needed to do more to protect coastal water quality, drinking water, and fish and wildlife habitat but did not feel withholding funding, as the statue requires, was the right approach.

4. NOAA and EPA are required to make a decision on the approvability of Oregon's Coastal Nonpoint Program at this time based on the terms of a settlement agreement with the Northwest Environmental Advocates.
    a. In 2009, they sued NOAA and EPA for failing to make a decision about Oregon's program.

b. The settlement agreement originally stated that NOAA and EPA would make a final decision by May 15, 2014.
c. Given the volume of comments received, the federal agencies are negotiating additional time.
d. We are committed to making a final decision by January 30, 2015.

5. In NOAA/EPA's December 20, 2013 proposed finding, the agencies found that Oregon had failed to submit an approvable coastal nonpoint program.
    a. NOAA/EPA noted Oregon's program currently falls short in three areas related to water quality impacts from forestry, septic systems, and new development.
    b. Oregon must address these issues before NOAA and EPA can fully approve the state's coastal nonpoint program.

6. For example, related to forestry, before NOAA and EPA can fully approve Oregon's program, the state needs to adopt additional management measures for forestry that:
    a. provide better protection for small and medium sized fish bearing streams and non-fish bearing streams;
    b. protect landslide prone areas;
    c. more effectively address the impacts of forest roads, particularly legacy roads; and
    d. ensure adequate stream buffers for application of certain chemicals,

7. While Oregon has made incremental progress in improving forest practices to protect water quality, numerous studies, some funded by the state, show that current forest practices are not sufficient to meet state water quality standards.
    a. The studies indicate that current Oregon Forest Practices Act riparian buffers can result in increased stream temperatures above state water quality standards that are set to protect endangered salmon.
    b. The studies have also identified harmful impacts to salmon and water quality from forest roads and harvesting on high-risk landslide prone areas.

8. By providing better protection for fish-bearing streams, the Riparian Rule will be very important for helping the state satisfy its remaining Coastal Nonpoint Program requirements.
    a. While NOAA and EPA may need to finalize its decision regarding the approvability of Oregon's Coastal Nonpoint Program before the BOF completes the riparian rule making process, the agencies will be tracking the process closely and the outcome of the rulemaking process will still likely have an impact on Oregon's Coastal Nonpoint Program.

9. There are two main ways the rulemaking process will intersect with EPA/NOAA's decision process for Oregon Coastal Nonpoint Program:

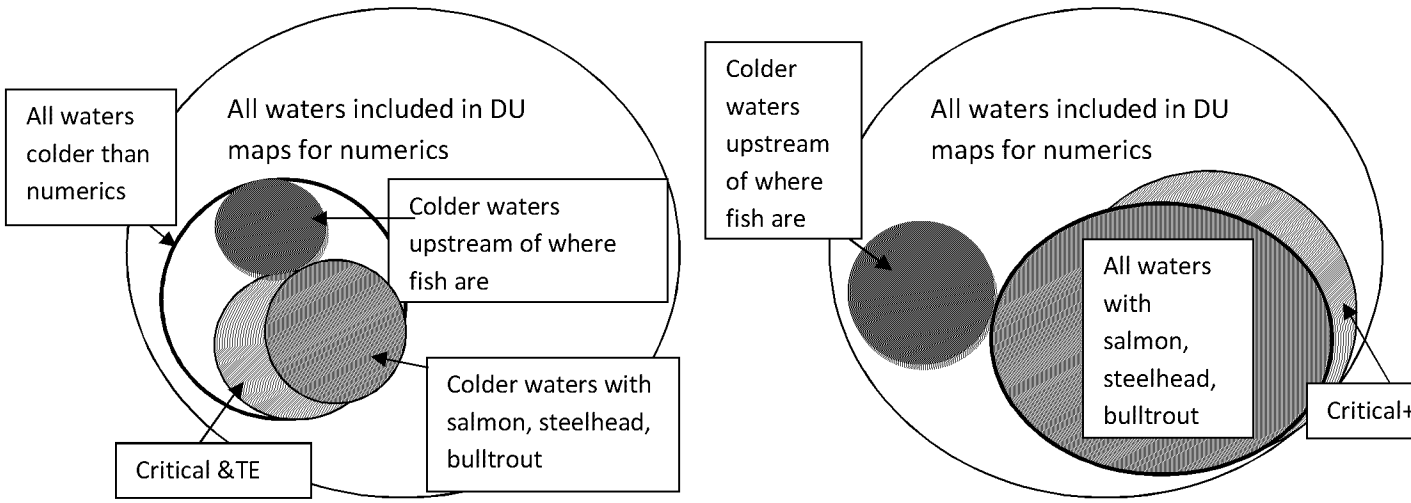
a. If, after carefully reviewing public comment and the state's March submission, NOAA/EPA's proposed decision stands and the federal agencies make a final finding that Oregon has failed to submit an approvable program, the new Riparian Rule will be critical in enabling the state to quickly address any lingering programmatic gaps, so that the state could reverse the "disapproval" decision without long-lasting impacts to its federal funding.
b. If NOAA/EPA find that the State has established the necessary management measures for a fully approvable coastal nonpoint program, the agencies would need to issue another public notice on our proposed decision to fully approve Oregon's program and provide an opportunity for the public to comment on this proposed decision. The BOF's Riparian Rule making process would become part of the record for this action.

Attachment 6: Where Riparian Rules Apply

1. We support the approach that the State is proposing on where the riparian rules should apply.

2. We commend OR for using published and peer reviewed scientific data in guiding the application of its nonpoint source rules and BMPS.
3. We feel OR's application of the riparian rules is to the highest priority areas; however, we encourage OR to consider applying the rules more broadly to ensure restoration and protection of aquatic life.

ODEQ application of riparian rules (per conversation w/ODEQ): colors indicate where 1. PCW applies, 2. Where riparian rules are understood to apply



Attachment 7: RipStream and Paired Watershed Studies

RipStream

1. Ripstream is current, peer-reviewed research.
    c. Field data collection efforts associated with the Ripstream project took place over a 9-year period from 2002 through 2011.
    d. The Ripstream project has resulted in two peer reviewed scientific publications in 2011 (Groom et al 2011a and Groom et al 2011b) which directly address the effects of harvest activities on stream shade and other riparian variables and the effect of these riparian changes on stream temperature.
    e. These studies were directly designed to help inform potential OFPA riparian harvest rule review.
    f. They support the IMST (1999) and Sufficiency Analysis (2002) work both of which also looked at the adequacy of OFPA riparian buffers.

2. The Ripstream project showed that the temperature increase was up to 2.3*C, which is not a small increase.

3. It is also important to point out that the harvest levels in this study were often well below allowable levels set in the OFPA rules.
    a. The results clearly showed that the temperature response was greater as the riparian harvest levels were closer to the OFPA target levels at private sites.
    b. For example, the average temperature increase for the 6 sites which the harvest levels were near the OFPA target levels was approximately 1.7 *C (ranging from 1.1 to 2.3).

4. The other sites associated with this study left many more trees in the riparian zone and the temperature increase was lower as a result. It could be assumed that the temperature response in these other sites would be similar to that of the sites which harvested close to OFPA limits if they have harvested to these limits.

5. In additions, several of these same authors are currently about to submit another scientific peer reviewed article for publication on this same topic (i.e., Davis, LJ, J Groom, and M Reiter. In review. A Newton's Law of Cooling for modeling downstream temperature response to timber harvest).
    a. Many of the same authors of this study have also developed other literature topics associated with this project (i.e., **1)** Meleason, Mark; Groom, Jeremy; Dent, Liz. 2013. A simulation framework for evaluating the effect of riparian management strategies on wood in streams: an example using Oregon's state forest riparian management regulations.
    b. Anderson, Paul D.; Ronnenberg, Kathryn L., eds. Density management for the 21st century: west side story. Gen. Tech. Rep. PNWGTR-880. Portland, OR: U.S. Department of Agriculture, Forest Service, Pacific Northwest Research Station:136–147.
    c. Dent, L., D. Vick, K. Abraham, S. Schoenholtz, and S. Johnson 2008. Summer Temperature Patterns in Headwater Streams of the Oregon Coast Range. Journal of the American Water Resources Association, Vol 44. Number 4.)
    d. The authors are anticipating to produce additional peer reviewed documents from this project in the upcoming years.

Paired Watershed Study: Hinkle Creek and the Alsea

1. OFIC commentators infer that the research associated with the Watershed Research Cooperative (WRC) (http://watershedsresearch.org/) usurps all information associated with the Ripstream project.
    a. The most relevant research paper associated with this project is from Kibler et al. (2013), and it is important to point out that the field data collection effort associated with this project was from 2002 to 2006.
    b. OFIC comment inferred incorrectly that more recent research is, by definition, inherently better than research conducted further in the past.
    c. It is important to note that the data collection effort associated with the Kibler study (i.e., 2002 through 2006) uses data collected contemporaneously with that of the Ripstream project (i.e., 2002 through 2011).

2. It is also important to note that, although there has been a lot of good work with the Watershed Research Cooperative studies (i.e., one (1) undergraduate research paper, fourteen (14) masters theses, four (4) PhD theses; and 10 (ten) peer reviewed research articles), **much of it is not relevant to the issues associate with riparian rule revision**.
    a. For example, the undergraduate research paper, most of the master thesis work, and some of the PhD thesis work, was "methods development" research and not directly related to the issues associated with water quality, or the effects of riparian management on these parameters.
    b. Similarly, some of the Journals developed as part of this effort is not directly relevant methods development topics (i.e., (1) Pit tagging retention rates, (2 and 3) two of the articles covered statistical methods to address data autocorrlation, (4) diet and food availability of four bird species).

3. However, there were a few documents which did cover topic at least partially relevant to issues brought up in this OFIC document, however none of the results associated with these studies directly, or indirectly, refute any of the findings associated with the Ripstream, SA and IMST report.

4. The Hinkle Creek study (Kibler et al 2013) showed that 3 of the four treatment reaches had stream temperature increase resulting from harvest activities.
    a. These three stream segments had slash deposited on the stream surface (which is not allowed in the rule) which resulted in some amount of shading and thus reducing the amount of expected temperature increase expected at these sites (They measured 1.1, 0.6, and 0.7*C increase for these sites).
    b. For example, the canopy closure of the overhanging vegetation (measured at waist height using a densiometer) over these streams was reduced by 84% following treatment, which indicates that the trees were removed, which resulted in greater levels of solar load.
    c. However, canopy cover measured using digital photograph 6 in above the stream surface, resulted in an average decrease of only 20% (ranging from 4 to 29%).
    d. The authors concluded that it was slash placed on the stream between these two measurements are resulting in the lack of shade.

e. In addition, it was found that flows increase in all of these sites as a result of harvest activities and thus this increased flows muted the effect of harvest at these sites.

5. The fourth site had slash completely covering up the stream and therefore shade levels barely reduce following treatment.
    a. That fact, in combination with higher flows following harvest, resulted in the stream getting much cooler following harvest at this site (+1.6*C).
    b. Thus, the result associated with this study is not a valid evaluation of the effects of forest harvest activities on stream temperature.

6. Because of these problems with the study, it is not surprising that temperatures did not increase at the watershed outlet (i.e., warm water + cold water = water that does not change in temperature).

7. A true test of the effects of the harvest activities (no slash on the stream surface) would most likely result in much greater temperature increase.

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Riparian Rule Talking Points, Background, and Questions

Main Points

- *EPA's Support of Riparian Rule for small and medium fish-bearing streams*
- *Temperature guidance and importance of protecting cold water for fish.*
- *CZARA*
- *If needed, RipStream and Paired Watershed Studies*

Talking Points and Background Papers:
Attachment 1: Talking Points
Attachment 2: Back Pocket, Qs and As
Attachment 3: Importance of Protecting Cold Water: Temperature Guidance
Attachment 4: Riparian Rule and WQS
Attachment 5: Riparian Rule and CZARA
Attachment 6: Where Riparian Rules Apply
Attachment 7: RipStream and Paired Watershed Study

Logistics

June 19 EQC Meeting, Dalles, OR – Tony or Dave, Alan, and John
(EPA – 15 minute presentation with 30 minutes from state, and 15 minutes from ODFW)

June 23 BOF Meeting, Salem, OR – Dan, Alan, John, Peter, Rochelle, Jenny
(EPA - ~15 minute presentation with state and NOAA presentations)

Attachment 1: Talking Points for Forest Practices Riparian Rule Analysis & Protecting Cold Water Criterion: 6/19 EQC Meeting and 6/23 BOF Meeting

Overall

1. EPA supports the preliminary results of the sufficiency analysis that greater riparian buffers are needed for small and medium fish-bearing streams.
    a. Hundreds of peer-reviewed studies collected through development of Temperature Guidance support the need to preserve cold water.
    b. This will improve salmon habitat and help to keep cold water in the system.
    c. This is the getting to the end of a process that started with the Oregon Coastal Salmon Restoration Initiative, State's IMST, and Sufficiency Analysis in 1990s where peer-reviewed studies show the need for larger buffers on small and medium fish-bearing streams.
2. We commend OR for using published and peer reviewed scientific data in guiding the application of its nonpoint source rules and BMPS.

Temperature Guidance and Cold Water

1. In 2003, EPA issued the Region 10 Temperature Guidance as part of four year effort to identify temperature water quality standards that would protect and aid in the recovery of salmonid species in the Pacific Northwest.
    a. In developing the Guidance, EPA developed workgroups of technical experts in the field that reviewed hundreds of scientific studies, issued five technical peer-reviewed issue papers, and formed a multi-agency workgroup that assisted EPA in issuing two public drafts of the Guidance for public comment.
    b. The Guidance includes recommended numeric water quality temperature criteria to protect salmonid species in the Pacific Northwest.
    c. In addition, the Guidance recommends States and Tribes include provisions in their standards to prevent additional warming of rivers and streams with ESA-listed salmonids with summer maximum temperatures currently colder than the numeric criteria.
2. In 2003, Oregon adopted the numeric temperature criteria and the PCW criteria consistent with the EPA's Region 10 Temperature Guidance.
3. The following three primary points summarize the scientific and legal rationale of why EPA's Guidance recommended the cold water protection provision and why EPA believes the Oregon's PCW standard is an important element of the State of Oregon's standards to protect and aid in the recovery of ESA listed salmon and bull trout.
    a. First, as illustrated by the numerous 303-listed stream segments in Oregon as well as Washington and Idaho, human development has significantly warmed rivers and streams in the Pacific Northwest.
        i. This warming is identified by NOAA and FWS as a factor in the decline of ESA-listed salmon and bull trout and a limiting factor in their recovery.
        ii. Excessively warm river stream temperatures have truncated the number of stream reaches suitable for spawning and over-the-summer juvenile rearing as well as increased the stress on adult and juvenile migration in lower river segments during the summer months.
        iii. As such, the remaining suitable and optimal summertime salmon and bull trout habitat is believed to be critical to the survival of these species, and the principles of conservation biology indicate we should protect these last remaining areas from further thermal degradation, while we make progress on improving thermally degraded stream reaches.
        iv. Additionally, the predicted region-wide increase in stream temperature from climate change (1-2°C in the next 30 years) further highlights the need to avoid increasing stream temperatures in the remaining thermally suitable habitat for salmon and bull trout.

b. Second, increased warming upstream can further contribute to downstream exceedances of temperature standards.
    i. Numerous Temperature TMDLs show that in many cases, upstream reaches must be cooler than the numeric criteria in order to meet downstream criteria.
    ii. Oregon PCW serves to ensure that further contributions to downstream exceedances are avoided.
c. Third, the technical rationale in support of the numeric temperature criteria included assumptions about spatial variation in temperature patterns.
    i. For example, the numeric criteria are intended to be met at the lowest downstream extent of the use and temperatures upstream at higher elevations will generally be cooler.
    ii. This is why EPA recommended numeric temperature criteria at the "upper end" of the optimal range for certain life stages of salmonids in the Temperature Guidance.
    iii. The numeric criteria were challenged in court as not being sufficiently protective and the spatial technical assumptions associated with numeric criteria were an important aspect in EPA's defense and the court's upholding of the numeric criteria.
    iv. The PCW provision is an important provision that supplements the numeric criteria to ensure the spatial patterns associated with the numeric criteria are attained.

Attachment 2: Back Pocket Information, Qs and As

Water Quality Standards

What is the construct behind the PCW?

1. PCW was included by the State to meet several goals:
    a. Added protection of stream thermal complexity including cold water refuges to offset criteria at the upper end of optimal;
    b. To meet antidegradation requirements or preservation of water of higher quality waters than the criteria; and
    c. Protection of downstream waters, which must be considered pursuant to federal implementing regulations when criteria are established.

What is the biological basis of the PCW standard?

1. The PCW standard was developed based on hundreds of peer-reviewed scientific studies that showed the importance of cold water for healthy aquatic life.
    a. These showed that thermal diversity and a natural thermal regime were essential.
    b. Scientific studies show that without sufficient cold water, fish diseases can increase…

Is PCW an essential component for EPA to approve Oregon's temperature WQS?

1. EPA determined that PCW was a necessary component of Oregon's temperature standards, when we approved their standard in 2004.
    a. We can't speculate on whether a differently written narrative could be approvable by EPA.
    b. The State has authority to submit new and/or revised standards for EPA's 303(c) review and approval process; ESA review of the protectiveness of new or revised standards would take place as part of any approval process.
    c. The WQS program is delegated to the State of Oregon's Department of Environmental Quality, and the Department makes decisions regarding implementation of NPS authorities to meet water quality standards.

Will EPA promulgate a WQS if PCW were not included in the State's submission of a new temperature WQS?

1. EPA can't speculate on whether a differently written narrative could be approvable by EPA.
2. However, if there were no PCW in a new temperature water quality standard, it would likely bring into play all the numeric criteria.
    a. That is, since the current numeric criteria are on the higher end of the biological scale because of PCW, if there were no PCW, it might be necessary to have colder numeric criteria to ensure that fish uses were protected.
    b. We might also need to reexamine the location and timing of salmon spawning.
3. EPA would need to consult with the Services, and are in fact, currently consulting with the Services on the numeric criteria as required under court order in 2012.

Washington has a 2.8°C cap for nonpoint sources. Why is Oregon's so much lower?

Comment [KD1]: I think this is an important question to answer. But the 'answer' is a little hard to follow.

1. At the time that the 2.8C cumulative cap for NPS activities was submitted to EPA, we did not act on it (in 2008) since it concerned the regulation of NPS's – therefore, it is not in effect for CWA purposes, but it is used for state regulation of NPS.

2. Regarding the 0.3°C cap, the cap triggers Tier 2 review which identifies whether discharge to a Tier 2 water should be allowed. On the face of WA's standard, it does not prohibit increased discharge to the waterbody – the outcome, however, depends upon how Tier 2 review is implemented in WA. The rule language itself does not appear to limit implementation cumulatively, instead it is "per source". Therefore, if this is the case, it does not strictly meet the minimum requirements of the antideg regulations. EPA approved the antidegradation language in 2007.
3. WA's HUA is cumulative, but it is for waters within 0.3C of criteria or *warmer* than criteria, not like PCW is in place for waters *colder* than criteria. OR also has an HUA for waters warmer than criteria.

Comment [KD2]: I am assuming this .3C refers to WA and not OR; but since it is not clear I suggest rewording it to be clear that this is 'WA's .3'. I suggest providing a brief statement as to what WA's .3 provision is and then explain how it works.

How do PCW and Anti-Deg Work?

1. The Protecting Existing Cold Water provision is included in the temperature guidance because the workgroup felt that the Antidegradation Policy and program would not offer with certainty that salmonid streams and rivers with waters colder than the numeric criteria would be protected from warming up to the criteria.
    a. Antidegradation Policy only ensures a process for considering whether water quality better than what the standards call for warrants protection.
    b. The PCW provision ensures that waters colder than the standard in streams with T&E species, critical habitat, or necessary for meeting downstream criteria are protected.

CZARA-Related

What are the respective authorities/obligations on the issue of forest management and protecting water quality?

1. Water quality standards apply to the waterbody, not the regulated source. In terms of ensuring compliance with WQS, OR has the authority to regulate NPS in their state statutes, and ODEQ, in particular, has the authority to enforce the laws on OR's books.
2. CZARA requires that the State have an approvable program in place for nonpoint programs in the coastal areas for forestry.
    a. EPA and NOAA determined that the State did not have adequate programs in place for riparian buffers on medium, small and non-fish bearing streams, because they caused water quality standard violations.
    b. These were based on the State's IMST (1999) and Sufficiency Analysis (2002).
    c. These have also been confirmed by the State's Ripstream studies.

Does this riparian rule process relate to the NOAA/EPA proposal to disapprove the State of Oregon's coastal nonpoint pollution control program, if so, how?

1. While Oregon has made incremental progress in improving forest practices to protect water quality, numerous studies show that current forest practices are not sufficient to meet water quality standards.
2. By providing better protection for fish-bearing streams, the Riparian Rule will be very important for helping the State satisfy its remaining Coastal Nonpoint Program requirements.
3. As you likely know, EPA and NOAA announced our proposed funding that Oregon has failed to submit an approvable coastal nonpoint program for a 90-day public comment period this past December. Currently, we're reviewing all public comments and supporting documents.
4. If after our review, NOAA and EPA's proposed decision stands and the federal agencies find that Oregon has failed to submit an approvable program, the new Riparian Rule will be critical for the state to quickly address any lingering programmatic gaps.
    a. This would allow the state to reverse a "disapproval" decision without long-lasting impacts to its federal funding.
5. If NOAA and EPA find that the State has established the necessary management measures for a fully approvable coastal nonpoint program, the agencies would need to issue another public notice, and the BOF's Riparian Rule would become part of the record for this action.

How do ODF and DEQ identify the geographic extent of the Protecting Coldwater Criterion, including where throughout the state (including eastern Oregon) the PCW standard is in force? [State answer] **How far upstream of reaches covered by the PCW standard should any riparian rule be applied to ensure we're not sabotaging our ability to meet the standard?**

Is the concept of drafting the rule keyed on where the PCW standard has been established a legally defensible approach to meeting our Clean Water Act obligations?

1. We support the approach that the State is proposing on where the riparian rules should apply.
2. The State has discretion to apply its Riparian Rule for nonpoint sources.
3. For CZARA, the Riparian Rule is very important to address gaps in the forestry program.
4. We commend OR for using published and peer reviewed scientific data in guiding the application of its nonpoint source rules and BMPS.
5. We feel OR's application of the riparian rules is to the highest priority areas; however, we encourage OR to consider applying the rules more broadly to ensure restoration and protection of aquatic life.

Ripstream/Paired Watersheds Study

What are EPA's opinions on the Paired Watershed Study and Ripstream?

1. Ripstream is current, peer-reviewed research.
    a. Field data collection efforts associated with the Ripstream project took place over a 9- year period from 2002 through 2011.
    b. The Ripstream project has resulted in two peer reviewed scientific publications in 2011 (Groom et al 2011a and Groom et al 2011b) which directly address the effects of harvest activities on stream shade and other riparian variables and the effect of these riparian changes on stream temperature over the long term to support salmonid populations.
    c. These studies were directly designed to help inform potential OFPA riparian harvest rule review.
    d. They support the IMST (1999) and Sufficiency Analysis (2002) work both of which also looked at the adequacy of OFPA riparian buffers.

2. Though the Paired Watershed Study done by the Watershed Resource Center has done some good work, one of 14 published studies are related to the rule revision.
    a. The study is from Kibler et al. (2013), and it is important to point out that the field data collection effort associated with this project was from 2002 to 2006.
    b. Note that the data collection effort associated with the Kibler study (i.e., 2002 through 2006) uses data collected contemporaneously with that of the Ripstream project (i.e., 2002 through 2011).

Comment [KD3]: Was this study effort peer reviewed/published? I thought that it wasn't so it might be important to mention that it wasn't PR to further draw out the difference bet/ the 2 studies.

3. The paired watershed study looks at Hinkle Creek and the Alsea River.
4. The Hinkle Creek study published in Kibler et al (2013) showed that 3 of the four treatment reaches had stream temperature increase resulting from harvest activities.
    a. These three stream segments had slash deposited on the stream surface (which is not allowed in the rule) which resulted in some amount of shading.
    b. The measured temperature increases were 1.1, 0.6, and 0.7°C increase for these sites.
    c. These would have been even higher if not for the slash on the stream.
    d. Actual canopy reductions were only 20%, so if harvest had been at OFPA levels, there would have been

even higher temperature increases.

e. In addition, it was found that flows increase in all of these sites as a result of harvest activities and thus the increased flows muted the effect of harvest on bulk stream temperatures at these sites. This is a short-term effect.

5. The fourth site had slash completely covering up the stream (not allowed in OFPA) and therefore shade levels were scarcely reduced following treatment.

f. That fact, in combination with higher flows following harvest, resulted in the stream getting much cooler following harvest at this site (+1.6*C).

g. Thus, the result associated with this study is not a valid evaluation of the effects of allowable forest harvest activities on stream temperature.

6. When temperatures were measured at the watershed outlet, and all four stream were combined, it is not surprising that temperatures did not increase at the watershed outlet (i.e., warm water + cold water = water that does not change in temperature).

h. This, in fact, supports the need for colder water to counteract the warm waters coming from harvested areas. It shows warmer waters resulting from such practices need to be offset by shading or another way to provide colder waters.

i. A true test of the effects of the harvest activities (no slash on the stream surface and extensive canopy reduction per OFPA rules) would most likely result in much greater temperature increase.

Attachment 3: Importance of Protecting Cold Water: Temperature Guidance

1. High water temperatures are a major factor harming salmon.
    a. Those endangered and threatened ESA salmonids, indeed all salmonids need cold water to survive.
    b. Numerous scientific studies completed over the last two decades, document the detrimental impacts to salmon and trout from high temperatures and the loss of cold water habitat.
    c. These studies indicate that high temperatures are a major factor contributing to salmon decline (*PNW Temp Guidance, p. 10*).
    d. The high quality, thermally optimal waters that do exist are likely vital for the survival of ESA-listed salmonids (*PNW Temp Guidance, 2003, p.32*).

5. Background on Temp Project
    a. Knowing that high temperatures threaten and endanger salmonid species in Oregon and elsewhere in the PNW, EPA undertook the Temperature Project from 2000-2003.
    b. EPA assembled an interdisciplinary team of water quality specialists, fish biologists, hydrologists, geomorphologists, ecologists, and other scientists from multiple agencies and organizations from the Pacific Northwest.
    c. The goal of the project was to use the most recent scientific studies to develop guidelines for establishing water quality standards for the protection of northwest salmon and trout.
    d. These guidelines incorporated the science of the salmon biology, behavior, and life history with the science of the thermal dynamics and structure of northwest streams and river to develop to determine what types of temperatures and thermal regimes salmon need to survive and thrive.
    e. Six scientific papers synthesized information from hundreds of studies to provide the scientific and technical foundation for the Guidance.
    f. The papers and Guidance were reviewed by two independent, interdisciplinary scientific peer review panels.

6. The Temperature Project concluded that the most important factors for salmon are cold water and a return to a natural thermal regime. The Temperature Guidance laid out a mix of numeric and narrative criteria to serve as anchor points across a stream system to protect and restore the natural thermal regime.

7. Two major assumptions were built into the WQS for temperature.
    a. The first major assumption of the temperature WQS is that water cools as you go upstream or put another way, water is colder in the headwaters and gradually warms as you move downstream.
    b. Sources of cold water such as headwater streams are integral to a functional natural thermal regime.

c. The second major assumption, is that water cools as you progress seasonally from summer to winter/spring.
d. In other words due to colder seasonal weather, cold water will be delivered during the late spring and early fall ("shoulder seasons") when salmonid spawning and fry emergence occurs.

8. Based on these two assumptions the temperature guidance chose numeric temperature criteria for the various life stages that were on the *higher* end of optimal, *assuming* that colder water occurs upstream and other times of the day and year, especially critical shoulder season months.
    a. The Guidance assumed that if you apply the numeric criterion to the lowest downstream extent of the use, the fish would have sufficient waters at optimal temperatures available upstream.
    b. So PCW and cold water in upstream areas is necessary for the numeric criteria to be fully protective.

9. Although EPA was challenged on our approval of DEQ's temperature WQS, EPA prevailed in 2012 on the numeric water quality standards because of how the temperature standard worked as a whole to restore the natural thermal regime. Cold water delivered downstream spatially and seasonally was key to the U.S. District Court upholding the biological basis behind the numeric criteria.

10. Existing cold water helps ensure that downstream temperatures are able to meet standards.

11. With climate change raising stream temperatures and thus reducing salmon habitat, protecting areas with cold water is even more critical.

12. The Protecting Existing Cold Water provision is included in the temperature guidance because the workgroup felt that the Antidegradation Policy and program would not offer with certainty that salmonid streams and rivers with waters colder than the numeric criteria would be protected from warming up to the criteria.
    a. Antidegradation Policy only ensures a process for considering whether water quality better than what the standards call for warrants protection.
    b. The PCW provision ensures that waters colder than the standard in streams with T&E species, critical habitat, or necessary for meeting downstream criteria are protected.

Attachment 4: Riparian Rule and WQS

1. The goals of the Clean Water Act are to protect and restore our nation's waters. WQS standards apply to the waterbody, and therefore to all regulated sources, point and nonpoint.

2. Enforceability of controls under CWA is federally mandated only for PS; however states can and do enforce for NPS. Without enforcement for all sources that contribute largely to a pollution problem WQS will not be attained, and waters will become more and more frequently listed and/or remain 303d listed.

3. Briefly, OR's temperature standard was derived from EPA's Pacific Northwest Temperature Guidance (2003). This Guidance, in turn, was based upon hundreds of studies on salmonid life stages' biological thresholds for temperature—where injury and mortality are prevented in the target organism.

4. Biologically-based pollutant criteria, including the temperature criteria, are chosen to be protective of the defined uses for the streams; in this case, to support an aquatic life use - fish.
    a. It does not make sense to choose criteria that do not protect the use or result in unacceptable mortality or injury to the use such that the goal cannot be achieved.
    b. The goals are to protect and restore the aquatic life populations as defined by State rules and approved by EPA.

5. The temperature criteria identified in the guidance and adopted by Oregon work together to encompass the thermal complexity of streams.

6. PCW was included by the State to meet several goals:
    a. added protection of stream thermal complexity including cold water refuges to offset criteria at the upper end of optimal;
    b. to meet antidegradation requirements or preservation of water of higher quality than the criteria; and
    c. protection of downstream waters, which must be considered pursuant to federal implementing regulations when criteria are established.

7. While the numeric criteria are from the upper ends of the ranges found to be protective of the aquatic life uses, the protecting cold water narrative, and other narratives, enable such criteria to be fully protective.
    a. Fish are reliant on cold water areas ('refuges') for maintaining a healthy life cycle.
    b. Together, the criteria protect the bulk stream temperatures from being too warm in the short and long term, so that fish can survive.
    c. The colder waters enable the population as a whole to not only survive but to be self-propagating.

8. The State determines how and where it will apply its Riparian Rule for nonpoint sources, but it is consistent with the PCW WQS for the regions of the state thus far identified.

a. Although EPA does not have all the information on how this is being implemented yet since OR is still developing its methods, from what we know, they do seem to overlap with the areas identified under the narrative use for protecting cold water.
b. Although we do see the areas identified by the State as priorities for protection, we would encourage the state to consider the suite of criteria for which the riparian rules may be necessary (the PCW is just one of the temperature criteria that applies), and for other areas of the state where the science shows that the rules are necessary, as more information is developed.
c. For antidegradation, the PCW provision is at least minimally consistent with the Clean Water Act antidegradation standard Tier 2 (waters of as or higher quality than criteria) requirements.
d. It is also necessary for ensuring protection of downstream waters, as required by federal implementing regulations.

9. Per Oregon's approved rule language that is in effect for CWA purposes, the PCW applies at the point of maximum impact where salmon, steelhead, and bulltrout are present. Waters can only be exempted from the provision if:
    a. There are no threatened or endangered salmonids currently inhabiting the water body;
    b. The water body has not been designated as critical habitat; and
    c. The colder water is not necessary to ensure that downstream temperatures achieve and maintain compliance with the applicable temperature criteria.

10. There is no map of PCW currently adopted into standards.
    a. It is a narrative and applies to a subset of the mapped designated uses that were adopted into Oregon's regulations.
    b. The numeric temperature criteria apply where the associated uses have been designated in the maps adopted into Oregon regulations.
    c. There are year-round fish uses as well as spawning use maps for criteria that apply for specific times of year.
    d. There are typically two maps per basin unless no salmonid uses occur in a particular basin.

11. Other aquatic life, beyond salmonids, are sensitive to temperature, however, OR identified salmonids as the most sensitive to temperature, and so salmonids (salmon, steelhead, trout, and bull trout) comprise the uses that currently designated in the maps for OR waters.

12. Re ODEQ's question about whether the PCW narrative could be changed to be more ambiguous narrative than the Board of Forestry interprets, and not pegged to ambient waters colder than summer maxima,
    a. PCW was deemed a necessary component of Oregon's temperature standards and was approved as such by EPA in 2004.
    b. We cannot speculate on whether a differently written narrative could be approvable by EPA – we would have to see such a narrative.

c. The State has authority to submit new and/or revised standards for EPA's 303(c) review and approval process; ESA review of the protectiveness of new or revised standards would take place as part of any approval process.
d. The WQS program is delegated to the State of Oregon's Department of Environmental Quality, and the Department makes decisions regarding implementation of NPS authorities to meet water quality standards.
e. If the State feels that site-specific conditions should dictate that a different criterion should apply at a particular place, it can always submit a site-specific criterion to EPA's 303(c) review and approval process.

Attachment 5: Riparian Rules and CZARA

1. Under the Coastal Zone Act Reauthorization Amendments of 1990, coastal states that participate in the voluntary National Coastal Zone Management Program are required to develop a Coastal Nonpoint Pollution Control Program (or Coastal Nonpoint Program) that describes the programs and enforceable mechanisms they will use to implement a suite of management measures to prevent and control polluted runoff in coastal waters.
    a. The goal of the Coastal Nonpoint Program is to ensure management measures are in place to achieve and maintain water quality standards and protect designated uses.
    b. EPA and NOAA jointly administer the Coastal Nonpoint Program and states must submit their coastal nonpoint programs to NOAA and EPA for approval.
    c. If EPA and NOAA find that a state has failed to submit an approvable program, the federal agencies must withhold a portion of the funding the state receives under Section 306 of the Coastal Zone Management Act, which supports implementation of the state's coastal management programs, including providing important funding and technical assistance to local communities, and Section 319 of the Clean Water Act which supports Oregon's statewide Nonpoint Source Program, including OWEB restoration grants and TMDL development.

2. Oregon is one of eleven coastal states and territories participating in the National Coastal Zone Management Program that do not have fully approved coastal nonpoint programs. The 23 other states have received full approval for the coastal nonpoint programs.

3. As you likely know, EPA and NOAA announced our proposed finding that Oregon has failed to submit an approvable coastal nonpoint program for a 90-day public comment period this past December.
    a. Currently we are carefully reviewing all public comments and supporting documents received before making a final decision about the approvability of Oregon's program.
    b. Of the 85 comments received, ** supported our proposed finding that Oregon had not submitted an approvable program while ** opposed the proposed decision.
    c. ** other commenters recognized that Oregon needed to do more to protect coastal water quality, drinking water, and fish and wildlife habitat but did not feel withholding funding, as the statue requires, was the right approach.

4. NOAA and EPA are required to make a decision on the approvability of Oregon's Coastal Nonpoint Program at this time based on the terms of a settlement agreement with the Northwest Environmental Advocates.
    a. In 2009, they sued NOAA and EPA for failing to make a decision about Oregon's program.

b. The settlement agreement originally stated that NOAA and EPA would make a final decision by May 15, 2014.
c. Given the volume of comments received, the federal agencies are negotiating additional time.
d. We are committed to making a final decision by January 30, 2015.

5. In NOAA/EPA's December 20, 2013 proposed finding, the agencies found that Oregon had failed to submit an approvable coastal nonpoint program.
    a. NOAA/EPA noted Oregon's program currently falls short in three areas related to water quality impacts from forestry, septic systems, and new development.
    b. Oregon must address these issues before NOAA and EPA can fully approve the state's coastal nonpoint program.

6. For example, related to forestry, before NOAA and EPA can fully approve Oregon's program, the state needs to adopt additional management measures for forestry that:
    a. provide better protection for small and medium sized fish bearing streams and non-fish bearing streams;
    b. protect landslide prone areas;
    c. more effectively address the impacts of forest roads, particularly legacy roads; and
    d. ensure adequate stream buffers for application of certain chemicals,

7. While Oregon has made incremental progress in improving forest practices to protect water quality, numerous studies, some funded by the state, show that current forest practices are not sufficient to meet state water quality standards.
    a. The studies indicate that current Oregon Forest Practices Act riparian buffers can result in increased stream temperatures above state water quality standards that are set to protect endangered salmon.
    b. The studies have also identified harmful impacts to salmon and water quality from forest roads and harvesting on high-risk landslide prone areas.

8. By providing better protection for fish-bearing streams, the Riparian Rule will be very important for helping the state satisfy its remaining Coastal Nonpoint Program requirements.
    a. While NOAA and EPA may need to finalize its decision regarding the approvability of Oregon's Coastal Nonpoint Program before the BOF completes the riparian rule making process, the agencies will be tracking the process closely and the outcome of the rulemaking process will still likely have an impact on Oregon's Coastal Nonpoint Program.

9. There are two main ways the rulemaking process will intersect with EPA/NOAA's decision process for Oregon Coastal Nonpoint Program:

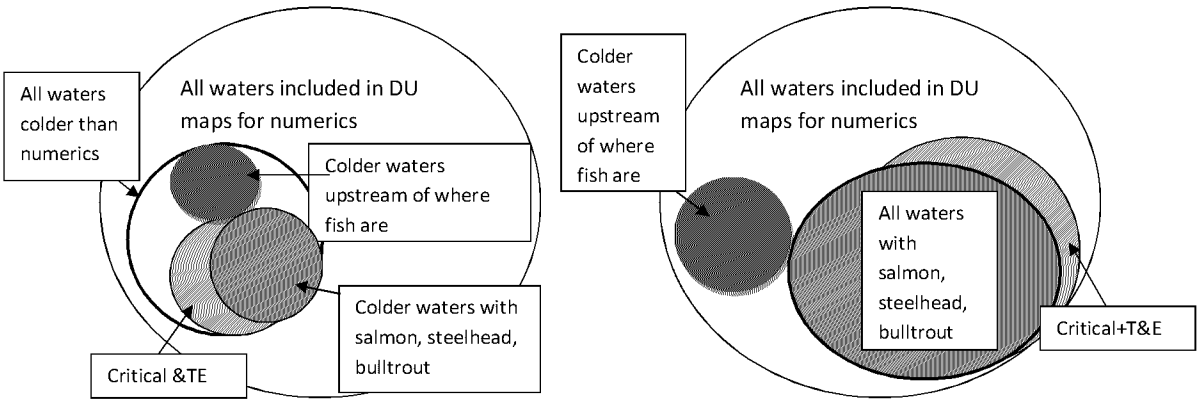
a. If, after carefully reviewing public comment and the state's March submission, NOAA/EPA's proposed decision stands and the federal agencies make a final finding that Oregon has failed to submit an approvable program, the new Riparian Rule will be critical in enabling the state to quickly address any lingering programmatic gaps, so that the state could reverse the "disapproval" decision without long-lasting impacts to its federal funding.
b. If NOAA/EPA find that the State has established the necessary management measures for a fully approvable coastal nonpoint program, the agencies would need to issue another public notice on our proposed decision to fully approve Oregon's program and provide an opportunity for the public to comment on this proposed decision. The BOF's Riparian Rule making process would become part of the record for this action.

Attachment 6: Where Riparian Rules Apply

1. We support the approach that the State is proposing on where the riparian rules should apply.

2. We commend OR for using published and peer reviewed scientific data in guiding the application of its nonpoint source rules and BMPS.
3. We feel OR's application of the riparian rules is to the highest priority areas; however, we encourage OR to consider applying the rules more broadly to ensure restoration and protection of aquatic life.

ODEQ application of riparian rules (per conversation w/ODEQ): colors indicate where 1. PCW applies, 2. Where riparian rules are understood to apply



Attachment 7: RipStream and Paired Watershed Studies

RipStream

1. Ripstream is current, peer-reviewed research.
    c. Field data collection efforts associated with the Ripstream project took place over a 9-year period from 2002 through 2011.
    d. The Ripstream project has resulted in two peer reviewed scientific publications in 2011 (Groom et al 2011a and Groom et al 2011b) which directly address the effects of harvest activities on stream shade and other riparian variables and the effect of these riparian changes on stream temperature.
    e. These studies were directly designed to help inform potential OFPA riparian harvest rule review.
    f. They support the IMST (1999) and Sufficiency Analysis (2002) work both of which also looked at the adequacy of OFPA riparian buffers.

2. The Ripstream project showed that the temperature increase was up to 2.3*C, which is not a small increase.

3. It is also important to point out that the harvest levels in this study were often well below allowable levels set in the OFPA rules.
    a. The results clearly showed that the temperature response was greater as the riparian harvest levels were closer to the OFPA target levels at private sites.
    b. For example, the average temperature increase for the 6 sites which the harvest levels were near the OFPA target levels was approximately 1.7 *C (ranging from 1.1 to 2.3).

4. The other sites associated with this study left many more trees in the riparian zone and the temperature increase was lower as a result. It could be assumed that the temperature response in these other sites would be similar to that of the sites which harvested close to OFPA limits if they have harvested to these limits.

5. In additions, several of these same authors are currently about to submit another scientific peer reviewed article for publication on this same topic (i.e., Davis, LJ, J Groom, and M Reiter. In review. A Newton's Law of Cooling for modeling downstream temperature response to timber harvest).
    a. Many of the same authors of this study have also developed other literature topics associated with this project (i.e., **1)** Meleason, Mark; Groom, Jeremy; Dent, Liz. 2013. A simulation framework for evaluating the effect of riparian management strategies on wood in streams: an example using Oregon's state forest riparian management regulations.
    b. Anderson, Paul D.; Ronnenberg, Kathryn L., eds. Density management for the 21st century: west side story. Gen. Tech. Rep. PNWGTR-880. Portland, OR: U.S. Department of Agriculture, Forest Service, Pacific Northwest Research Station:136–147.
    c. Dent, L., D. Vick, K. Abraham, S. Schoenholtz, and S. Johnson 2008. Summer Temperature Patterns in Headwater Streams of the Oregon Coast Range. Journal of the American Water Resources Association, Vol 44. Number 4.)
    d. The authors are anticipating to produce additional peer reviewed documents from this project in the upcoming years.

Paired Watershed Study: Hinkle Creek and the Alsea

1. OFIC commentators infer that the research associated with the Watershed Research Cooperative (WRC) (http://watershedsresearch.org/) usurps all information associated with the Ripstream project.
    a. The most relevant research paper associated with this project is from Kibler et al. (2013), and it is important to point out that the field data collection effort associated with this project was from 2002 to 2006.
    b. OFIC comment inferred incorrectly that more recent research is, by definition, inherently better than research conducted further in the past.
    c. It is important to note that the data collection effort associated with the Kibler study (i.e., 2002 through 2006) uses data collected contemporaneously with that of the Ripstream project (i.e., 2002 through 2011).

2. It is also important to note that, although there has been a lot of good work with the Watershed Research Cooperative studies (i.e., one (1) undergraduate research paper, fourteen (14) masters theses, four (4) PhD theses; and 10 (ten) peer reviewed research articles), **much of it is not relevant to the issues associate with riparian rule revision**.
    a. For example, the undergraduate research paper, most of the master thesis work, and some of the PhD thesis work, was "methods development" research and not directly related to the issues associated with water quality, or the effects of riparian management on these parameters.
    b. Similarly, some of the Journals developed as part of this effort is not directly relevant methods development topics (i.e., (1) Pit tagging retention rates, (2 and 3) two of the articles covered statistical methods to address data autocorrlation, (4) diet and food availability of four bird species).

3. However, there were a few documents which did cover topic at least partially relevant to issues brought up in this OFIC document, however none of the results associated with these studies directly, or indirectly, refute any of the findings associated with the Ripstream, SA and IMST report.

4. The Hinkle Creek study (Kibler et al 2013) showed that 3 of the four treatment reaches had stream temperature increase resulting from harvest activities.
    a. These three stream segments had slash deposited on the stream surface (which is not allowed in the rule) which resulted in some amount of shading and thus reducing the amount of expected temperature increase expected at these sites (They measured 1.1, 0.6, and 0.7*C increase for these sites).
    b. For example, the canopy closure of the overhanging vegetation (measured at waist height using a densiometer) over these streams was reduced by 84% following treatment, which indicates that the trees were removed, which resulted in greater levels of solar load.
    c. However, canopy cover measured using digital photograph 6 in above the stream surface, resulted in an average decrease of only 20% (ranging from 4 to 29%).
    d. The authors concluded that it was slash placed on the stream between these two measurements are resulting in the lack of shade.

e. In addition, it was found that flows increase in all of these sites as a result of harvest activities and thus this increased flows muted the effect of harvest at these sites.

5. The fourth site had slash completely covering up the stream and therefore shade levels barely reduce following treatment.
    a. That fact, in combination with higher flows following harvest, resulted in the stream getting much cooler following harvest at this site (+1.6*C).
    b. Thus, the result associated with this study is not a valid evaluation of the effects of forest harvest activities on stream temperature.

6. Because of these problems with the study, it is not surprising that temperatures did not increase at the watershed outlet (i.e., warm water + cold water = water that does not change in temperature).

7. A true test of the effects of the harvest activities (no slash on the stream surface) would most likely result in much greater temperature increase.