NORTHWEST ENVIRONMENTAL ADVOCATES

October 6, 2020

Miranda Magdangal
Office of Water and Watersheds
U.S. Environmental Protection Agency, Region 10
1200 Sixth Ave., OWW-135
Seattle, WA 98101 *Via email only*: magdangal.miranda@epa.gov

Re: **Total Maximum Daily Loads (TMDLs) for the Deschutes River and its Tributaries: Sediment, Bacteria, Dissolved Oxygen, pH, and Temperature July 31, 2020 TMDLs for Public Comment**

Dear Ms. Magdangal:

This letter constitutes the comments of Northwest Environmental Advocates (NWEA) on the U.S. Environmental Protection Agency's (EPA) draft Total Maximum Daily Loads (TMDLs) for the Deschutes River and its Tributaries: Sediment, Bacteria, Dissolved Oxygen, pH, and Temperature July 31, 2020 TMDLs for Public Comment (July 31, 2020) (hereinafter "TMDLs").

As a general matter, we find that EPA's proposed TMDLs are flawed because they rely on the Washington Department of Ecology's flawed 2015 Deschutes River temperature TMDLs. NWEA has challenged these TMDLs in federal court, *see NWEA v. EPA*, Case No. 2:19-cv-02079 (W.D. Wash. Dec. 23, 2019). The First Amended Complaint in that case sets forth NWEA's allegations regarding why the temperature TMDLs approved by EPA are flawed.

In addition, we have the following comments:

- EPA fails to cite the definition of a TMDL that includes the tradeoff between point and nonpoint sources at 40 C.F.R. § 130.2(i). TMDLs at 1.1. This is important because it relates to whether EPA can find reasonable assurance that nonpoint source controls will be implemented such that point sources regulated under NPDES permits can be given greater wasteload allocations.

- In the description of the scope of TMDLs addressed by EPA, the agency fails to recognize its failure to have acted on the Ecology temperature TMDLs for such waterbodies as Mitchell Creek. TMDLs at 1.2.

- EPA cites WAC 173-201A-260(b), "When a water body does not meet its assigned criteria due to human structural changes that cannot be effectively remedied (as determined consistent with the federal regulations at 40 C.F.R. 131.10), then alternative estimates of the attainable water quality conditions, plus any further allowances for human effects specified in this chapter for when natural conditions exceed the criteria, may be used to establish an alternative criteria for the water body (see WAC 173-201A-430 and 173-201A-440)." TMDLs at 3.2.2. As the internal citations demonstrate, use of this narrative criterion requires formal adoption and approval from EPA before a site-specific criterion is applicable. It is unclear why EPA cites this provision if it is not using it; it is unclear if EPA is using it without going through a site-specific criterion adoption.

- Likewise, EPA's use of a predicted natural condition for temperature and dissolved oxygen violates section 303(c) of the Clean Water Act. *See e.g*., TMDLs at 3.2.6 (EPA applied the natural conditions provision for the Deschutes River upstream of Offutt Lake). In EPA's adoption of the natural conditions value as the applicable water quality criterion, it fails to evaluate whether this purportedly natural condition is protective of the designated and existing uses, which are also water quality standards the TMDL must meet. *See e.g.,* Dale McCullough *et al., EPA Issue Paper 5, Summary of Technical Literature Examining the Physiological Effect of Temperature on Salmonids* (May 2001). EPA's reliance on its approval of Ecology's 2015 Deschutes TMDLs that likewise rely on the natural conditions criterion renders this TMDL flawed. In neither the EPA nor the Ecology TMDLs do the agencies demonstrate that the predicted temperatures and dissolved oxygen levels are actually natural. One reason for this is the agencies' setting the input from tributaries to the Deschutes River at the applicable numeric criteria without any evidence that temperature or dissolved oxygen levels would not be lower or higher, respectively, of those criteria under natural conditions.

- While loading should be presented as a daily load, failing to consider fine sediment on a seasonal basis does not address the seasonality of how sediment is generated. TMDLs at 4.4.1.

- EPA fails to explain, other than to cite Ecology's 2015 TMDLs, why it views all bank erosion and the portion of loading from landslides not caused by the presence of unpaved roads to be "natural." TMDLs at 4.4.5. It is well known that landslides can be caused by other human activities, namely logging in landslide prone areas. Likewise, it is unclear why EPA finds that "all bank erosion" is *per se* natural.

- EPA claims that in modeling the river upstream of Offutt Lake it "found that the numeric criterion in the portion of the river upstream of Offutt Lake would not be met, even when all input values were set to natural levels." TMDLs at 6.1. It states further that it "uses Ecology's temperature TMDLs and associated riparian shade targets for the Deschutes

River (found in EPA-approved 2015 Deschutes TMDLs) as the baseline for these dissolved oxygen ("DO") TMDLs. Improving riparian shade will result in cooler stream temperatures that will directly improve DO levels by allowing the water to hold more oxygen, as well as indirectly improve DO levels by decreasing primary productivity[.]" We agree that improving riparian shade will result in cooler temperatures that will help DO levels. But, as EPA goes on to state, the 2015 Deschutes TMDLs for temperature developed by Ecology and approved by EPA only "identify shade targets and establish the thermal heat loads for the *mainstem of the Deschutes River*." *Id.* (emphasis added.) Determining the natural temperature of the Deschutes River is not a process that can be accomplished by addressing the shade cast on the Deschutes River alone, ignoring its tributaries and the vast stream network that flows into those tributaries. Without evaluating that network—typically at least 70 percent of stream miles are above salmonid habitat—EPA cannot rely on a finding that Ecology has determined the natural temperature of the Deschutes River.

- EPA cites four criteria that were built in to Ecology's "natural conditions temperature scenario" in which Ecology simulated "full, dense, old-growth forest" along "the riparian corridor," and the associated lower temperatures and decrease in sedimentation that would be associated with that forested riparian corridor. TMDLs at 6.2. In addition, EPA states that Ecology "assumed that water temperature standards will be met (or better) with the restoration of shade along the tributary corridors and headwaters" allowing for the use in the model of water temperatures set at the numeric criteria as the inputs for river headwaters and all tributaries. This, of course, is a false assumption. First, the 75-foot and Forest Practice Act riparian buffers called for in the 2015 Deschutes TMDL are not the equivalent of "full, dense, old-growth" forest. Second, the TMDL cannot simultaneously claim credit for calculating a natural condition temperature and dissolved oxygen level and then undercut that natural condition by calling for nonpoint source controls that would not produce those natural conditions. Third, Ecology did not simulate full, dense, old-growth forest. Last, Ecology did not analyze the entire watershed that drains to the Deschutes River.

- Spawning is a designated use that must be protected throughout the Deschutes River basin. *See e.g.*, 2015 Deschutes TMDLs at 5. EPA's TMDLs fail to demonstrate that the intragravel dissolved oxygen levels sufficient to protect the beneficial uses will be met by either Washington's dissolved oxygen numeric criteria or by any superseding natural conditions criteria established in the TMDL. The National Marine Fisheries Service ("NMFS") has raised this concern and it has not yet been addressed:

  > Under section 7(a)(1) of the Endangered Species Act, Federal agencies shall utilize their authorities in furtherance of the purposes of the Endangered Species Act, including the conservation of endangered and threatened species. The EPA has determined that the conservation

> measures described below are in furtherance of the goal of conserving endangered and threatened species and are part of EPA's action analyzed in this opinion.
>
> 1. Dissolved Oxygen Criteria - Ecology has committed to review their DO criteria and initiate rulemaking to revise the standards to 11 mg/L by July 2008, unless they can demonstrate that the current 9.5 mg/L criteria will not lead to adverse effects to incubating salmonid eggs.

NMFS, *Endangered Species Act Section 7 Formal Consultation and Magnuson-Stevens Fishery Conservation and Management Act Essential Fish Habitat Consultation for the Washington State Water Quality Standards – Environmental Protection Agency's Proposed Approval of Revised Washington Water Quality Standards for Temperature, Intergravel Dissolved Oxygen, and Antidegradation Statewide consultation (Feb. 5, 2088) (hereinafter "NMFS 2008 BiOp") at 15: see also id*. at 13 (referring to the dissolved oxygen numeric criteria as "interim"), 110 – 111 (EPA's approval of the interim dissolved oxygen standard is not expected to cause a measurable decline in salmonid populations because it has a "limited scope and duration of the action (2007 to 2009)").

- There are numerous instances when the readability and usability of the TMDLs would be enhanced by including the addition of percentage reductions that are needed. For example, Tables 9 and 27, for example, should show percentage reduction of the targets and the existing loads. Similarly, it is ironic that the very last two pages of Appendix E include Figures 26 and 27 that demonstrate TN and TP reductions upstream of Offutt Lake for three sites require 77 to 92 percent and 60 to 92 percent, respectively, but this information does not appear to appear in the main TMDL document. Table 37 would be more useful if it included a column on the difference between the existing and future effective shade. Table 41 presents the effective shade target but it does not present the existing shade information and the percentage difference, both of which could be helpful indications of how much change is needed in the so-called practical measure.

- Use of data that date to 2003 and 2004—over 15 years ago—demonstrates the TMDL is of questionable value and EPA does not even say whether it thinks these data are still valid. TMDLs at 6.3.1.

- EPA states that "many [hatchery] facilities" use settling basins. It fails to point out that many do not and in many cases, settling basins have fallen apart and cannot be used. TMDLs at 6.3.2. If EPA does not know whether these hatcheries have and use settling basins, it should not speculate.

- We agree that "effects of excess nutrient loading may occur during multiple times of the

year" because sediment and plant matter release nutrients. TMDLs at 6.4.1. It does not follow, however, that this seasonal variation can be addressed, as EPA proposes, through "flow-variable nutrient TMDLs." *Id.* That analysis merely states that the lower the flow, the lower the loading allowed, meaning that it is aiming for the same concentration. *See e.g.* TMDLs at 6.4.2; *see also id*. at 7.4.5.2 (EPA states that for each nutrient TMDL for named tributaries, a single load allocation ("LA") is established for all nonpoint sources, including natural background, and concludes that allocations "scale like the TMDLs shown in Figure 9 and increase during periods of greater streamflow/stormwater runoff."). Aiming for the same concentration does not have the effect of aiming for ensuring that nutrient loading does not build up in sediments and plant matter that subsequently release those loads in times and places unrelated to the flows and with an adverse impact. The response of algae and plants to nutrient additions typically is non-linear because somewhere between approximately 10 and 60 percent of total nitrogen ("TN") and total phosphorus ("TP") are adsorbed to particulates or taken up by biota. While DO critical conditions are during warmest periods, nutrient critical conditions when N and P are released are not necessarily during these same periods. All that Table 31 and Figure 5 demonstrate is that concentration is the result of water volume and pollutant load, which is essentially the same as having the TMDL establish criteria for TP and TN, which are concentrations, not loads.

- For margins of safety ("MOS") and load allocations, EPA discusses the conservative assumptions built into the model for shade and heat loads but at no point does it discuss the role of TN and TP in combining with warm stream temperatures to produce lowered DO levels. TMDLs at 6.4.4 & 6.4.5. The lack of explanation of the MOS for nutrient loading also undercuts the allocations because "[s]ince the MOS is implicit, the LAs are equivalent to the TMDLs for TN and TP." TMDLs at 6.4.5. The same comments apply to the TMDLs for tributaries. TMDLs at 7.4.1, 7.4.2.

- That "shade as a surrogate [for temperature] is a commonly-used approach" is not a rationale for using it here without providing further information that would make the surrogates completely usable. TMDL at 7.1.1. The principle of surrogate measures, as set out by the federal advisory committee to EPA in 1998 was that "TMDLs with surrogate measures should guide actions (regulatory and/or voluntary) necessary to achieve water quality standards" and that where they are used, "a higher degree of implementation specificity and stronger procedures for follow-up monitoring and evaluation may be required." EPA, Report of the Federal Advisory Committee on the Total Maximum Daily Load (TMDL) Program (July 198) at 34. What would improve these TMDLs immeasurably is if EPA used the model to determine what riparian buffers would accomplish the task of meeting the TMDLs load allocations. Instead, the TMDL drifts off like a "whistling Pete" firework, starting with a bang and ending with a whimper.

- The dissolved oxygen and pH analysis for the named tributaries covered in the TMDLs suffer from the same faulty analysis as that for the Deschutes River. TMDLs at 7.1.2.

- Oddly, EPA states that for the tributaries it used "ecoregionally derived targets for total nitrogen and phosphorus for all tributary waterbodies impaired for DO and pH," but in discussing the TN and TP targets for the Deschutes River, it did not explain the derivation of the concentration "targets." TMDLs at 7.1.2.

- EPA identifies the "targets" for each tributary as a surrogate measure based on effective shade "because it is the primary factor influencing stream temperature in the tributaries." TMDLs at 7.2. EPA ignores that the 2015 Deschutes TMDL itself found in addition to shade's primary role (4.5°C), river temperatures were significantly affected by a combination of microclimate (0.7°C), channel width (1.3°C), headwater and tributary temperatures (0.4°C), and baseflow (0.3°C), for a total of 2.7°C. *See* 2015 Deschutes TMDL at 40. Moreover, the phrase "system potential riparian vegetation," a "species generally expected to be Douglas Fir," does not meet the definition of a surrogate measure because it is not readily translated into the field, where riparian buffers are measured as heights, widths, and densities. Without translating the so-called loads of shade into real world surrogate measures that can be used in the field, EPA has fallen well short of the purpose of a TMDL.

- In Table 35, EPA refers to "water quality targets," a phrase not defined in the TMDL regulations, including concentrations of TN and TP that "correspond to EPA recommendations for the Puget Lowlands Level III ecoregion based on reference conditions." We agree with the use of the ecoregion values. Concentrations, however, are not loads so EPA's mixing of effective shade percentages as surrogates for temperature loading and concentrations of nutrients all in one category of "targets" is mixing a numeric equivalent of a water quality standard with a TMDL. That the underlying criteria violated here are for DO and pH is irrelevant; a concentration is still not a load.

- EPA cites the 2015 Deschutes TMDLs for the proposition that "lack of riparian vegetation is the primary source of elevated water temperatures in the Deschutes watershed," but ironically does not point out that those TMDLs do not address the "watershed" but, rather, merely the Deschutes River. TMDLs at 7.3.2.1. EPA further states that Ecology's "model identified channel morphology and microclimate as important secondary factors," in elevating water temperatures, failing to point out that each of those secondary factors along with baseflow, tributaries, and headwaters were individually found to contribute more than the allowable cumulative human contribution of 0.3ºC above the applicable criteria. EPA concludes that "achieving target shade conditions will also improve the secondary factors," because they are "inherently linked to the condition of the riparian vegetation." We agree, there is some inherent linkage.

However, EPA is incorrect in concluding that a TMDL "target" based on "system potential shade" is the same as that which is required to remove all human warming caused by the so-called secondary factors. EPA does not evaluate whether either the simulated riparian vegetation in Ecology's model or the riparian vegetation buffers that are deemed adequate to meet the load allocations for temperature in the 2015 Deschutes TMDLs are sufficient to achieve the temperature benefits associated with the so-called secondary influences. EPA does not identify the width of the riparian buffer it has in mind to cast this system potential shade so it does not compare that expected width of vegetation with the width that is required to not mobilize TN and TP loading from streamsides by "filtering nutrients from overland flow and groundwater." EPA's filtering is just conceptual. But the role of the TMDL is to quantify the conception, which EPA does not even attempt to do. Instead, EPA engages in platitudes: "Many sources that reduce riparian shade also may contribute excess nutrients to the impaired tributaries." TMDLs at 7.3.2.2.

- Figures 7 and 8, while helpful, merely compare TN and TP concentrations of water quality samples to the concentration targets from EPA guidance, demonstrating that, as EPA writes, "nonpoint sources contribute excess loads of TN and TP to all tributaries." TMDLs at 7.3.3.2. It then presents the loading of these pollutants from stormwater sources. Since loads, set out in Tables 39 and 41, cannot be readily read against concentrations, the meaning of this is lost.

- We disagree that "the practical measure for meeting the TMDL is attainment of the percentage of effective shade necessary to meet the heat load." TMDLs at 7.4.4.1. Where impacts on the riparian vegetation involve cutting trees (e.g., logging), EPA does not explain how an effective shade percentage is a "practical measure." After the trees have been cut down, the remaining shade can be measured to see if it is adequate but it is not a practical measure to protect and restore water quality, which is the purpose of the TMDL. In addition, while Table 41 shows the existing head load and the TMDL limits, it does not provide the information on the expected temperature of the five waterbodies on the list, despite EPA's having used the TMDL to supersede the numeric criteria using the natural conditions criterion for temperature.

- EPA's analysis of dissolved oxygen and pH for the named tributaries suffer from the same problems as its analysis of the Deschutes River. TMDLs at 7.4.4.2, 7.4.5, 7.4.5.1.

- EPA states that for reasonable assurance it is relying on the implementation plan component of the 2015 Deschutes TMDLs, which it states identifies the conservation of existing riparian buffers and establishment of additional forested buffers as the most critical action needed[.]" TMDLs at 8. For example, in fact, Ecology's plan identified the riparian buffers required by the Forest Practices Act for commercial logging lands, and buffers of 75-feet for perennial waters and 35-feet for constructed ditches,

intermittent streams, and ephemeral streams. *See* 2015 Deschutes TMDLs at 116. These only apply to named rivers and streams. Therefore, when EPA claims that its TMDL and the state's TMDL "rely on riparian vegetation being at its fullest potential," it is mischaracterizing what Ecology established as the goal of the TMDL's implementation, which is not riparian vegetation at its "fullest potential" and not across the watershed. These called-for riparian buffers are Ecology's statement of the equivalent of the phrase "full site potential vegetation" or the effective shade load allocation and/or targets set out in EPA's TMDLs, yet EPA has not demonstrated that they are equivalent. (The 100-foot setback of livestock watering facilities for control of fecal sources is the only other numeric best management practice set out in Ecology's TMDL.) Vague and unmeasurable statements included in the implementation plan for that TMDL that EPA characterizes as "cultivating cropland so it minimizes soil and nutrient loss," are not the basis for a belief that nonpoint sources will be controlled sufficiently to meet the load allocations of this TMDL. Furthermore, that the long-awaited and much delayed Budd Inlet TMDL is, apparently, once again, "under development," and that Ecology "plans to re-engage the Deschutes stakeholder group" once again is not the basis for a reasonable assurance finding. EPA's parroting of Ecology's statement in the 2015 Deschutes TMDL that "'Ecology will consider affected stakeholders in compliance if all appropriate BMPs have been implemented and are being operated and maintained correctly by 2030,'" provides no assurances because the only "appropriate BMPs" established beyond the platitudes of the 'do a better job' type are the livestock watering setback and the riparian BMPs discussed above. Since no analysis has been conducted to see if these numeric BMPs are adequate to meet the load allocations, and the remainder are vague hints to do the right thing, this statement wholly undercuts the value of the TMDLs. And without numeric BMPs, there is no way for Ecology to judge whether what is in place in 2030 is adequate to meet the TMDL or not. EPA errs in relying on the 2015 Deschutes TMDLs.

- EPA cites to an unnamed 2015 document that claims it will "conduct effectiveness monitoring and evaluate progress towards milestones at 5 year intervals, and that adaptive management will be applied to adjust the actions required and try new strategies if necessary" without irony, despite the fact that this year, 2020, is the five-year interval since Ecology completed the Deschutes TMDL and there is no evidence of such a progress evaluation's having been started let alone completed. TMDLs at 8. Then EPA hints that it has something it won't show the public: "Ecology outlined a schedule to evaluate TMDL implementation and has communicated to EPA its commitment to adjusting it as necessary if significant improvement in water quality is not shown." If EPA thinks that this is so essential, why is it not an attachment to the EPA TMDL?

- Since EPA concludes that "the baseline restored riparian shade and effective heat loads established in the *2015 Deschutes TMDLs* will be essential for meeting the DO water quality standards," Section 6.4.2., and those temperature TMDLs do not demonstrate that

they will achieve temperature standards, EPA's reliance is faulty.

- In its analysis of Capitol Lake Designated Use Evaluation, EPA erred in not considering the beneficial uses that are protected in Capitol Lake as existing uses. TMDLs at Appendix B. Existing uses are protected under Tier I of the antidegradation policy. WAC 173-201A-310 (Tier 1); WAC 173-201A-020 (definition of Existing uses). In addition, the state determined the designated uses (and applicable criteria for core summer salmonid use) for Capitol Lake. *See* Ecology, *Deschutes River, Capitol Lake, and Budd Inlet Temperature, Fecal Coliform Bacteria, Dissolved Oxygen, pH, and Fine Sediment Total Maximum Daily Load Technical Report Water Quality Study Findings* (June 2012) at 20. EPA changed the core summer salmonid use for Capitol Lake (and its tributaries) to the salmonid spawning, rearing, and migration use. EPA cannot unilaterally change that state determination; instead, the state must pursue a Use Attainability Analysis. While Ecology calculated the detention time of Capitol Lake based on data from 1991 to 2001, EPA reached far back in time to include data from 1946. The detention time from 1946 is irrelevant to Capitol Lake because the dam that created the lake was built in 1951. *See* Washington State Department of Enterprise Services (DES), *Frequently Asked Questions* (hereinafter "FAQ") (last accessed Oct. 2, 2020). In addition, while according to the DES, "[t]oday, the lake is about 21 percent smaller and it holds roughly 60 percent less water than it did in 1951," due to the approximately 35,000 cubic yards of sediment from the Deschutes River that are deposited in the lake annually, EPA failed to take a reasonable step to use updated lake surface area in calculating the detention time in order to attempt to remove Capitol Lake from Ecology's lake criteria for DO while using updated flow data through 2019. Moreover, although EPA is using both data that pre-date the dam and those that reflect a much smaller lake than after it was created (from 2019), it is not developing a TMDL that will be useful into the future when there is a significant likelihood that the DES will employ strategies to "manage sediment accumulation and future deposition," *i.e*., DEQ will likely dredge the lake in the future, which will reduce the retention time once again. *See* FAQ. EPA must release the data it used to make these calculations, explain why its proposed TMDL has any relevance to likely future conditions of Capitol Lake when dredging and measures to prevent future deposition have occurred, and address the future lake volume in the TMDLs' margin of safety. EPA should also collect accurate data on the surface area of Capitol Lake, which it says is missing.

- It is an error on EPA's part to develop a TMDL for TP and TN for 2012 Listing ID No. 47756 on the Deschutes River between the Lake Lawrence Tributary and Reichel Creek and omit the waters of Lawrence Lake itself, which is listed as impaired for TP, and Lake Lawrence Creek, which is listed as impaired for DO, both of which obviously are sources to the Deschutes River and that need to be controlled.

- EPA errs in developing a TMDL for TP in the Deschutes River that is intended to be

protective of Capitol Lake by only analyzing the DO requirements for Capitol Lake and ignoring the fact that Capitol Lake is impaired for TP, *see* Listing No. 22718. EPA errs in not evaluating the role of Deschutes TP's contribution to Capitol Lake's TP impairment that Ecology has determined is the primary source of impairment to Budd Inlet's DO levels. *See* Ecology, *Butt Inlet TMDL Update [to] Deschutes Advisory Group* (May 18, 2017).

- There is no TMDL when EPA's only analysis is that "[i]mplementation measures to control sediment loads will support the needed reductions in nutrient loads." TMDLs Appendix E at 11.

- Approximating rates for wetland and barren land uses for TP and TN based on the State of Minnesota is highly questionable. TMDLs Appendix E at 24. At a minimum, EPA does not explain why soils and streams in Minnesota are in any way related to those in Washington. The appendix states that the EPA ecoregion reference levels are: TP for the Cascades and Lower Puget Level II Ecoregions are 0.00906 and 0.0195 mg/L, respectively and TN for the Cascades and Lower Puget Level II Ecoregions are 0.055 and 0.340 mg/L, respectively. TMDLs Appendix E, Tables 4 and 5. While we have not looked at the Minnesota citations, we do know that a similar study included data from the Corn Belt of the Midwest and the 25th percentile of its compilation was up to 3.26 mg/L of TN and up to 0.63 mg/L of TP, which are much higher than the applicable ecoregions here. *See* Miltner, R.J. (2011) *Technical Support Document for Nutrient Water Quality Standards for Ohio Rivers and Streams. Draft (December) Ohio EPA Technical Support Document*. Moreover, EPA's reliance on *White et al.* (2015) is substantial but there is no discussion about why EPA relies on it to override what *Herrera* (2007) said about export coefficients. Even so, the report concludes that: "Forests, the largest land use category, were estimated to contribute 48 – 57 percent of upland TN loading at the river outlet and near Reichel Creek, respectively. Similarly, forests constitute 21 – 53 percent of upland TP loading at the same locations." TMDLs Appendix E at 24. So, while the appendix makes clear that forests are the primary source of both TN and TP, there is no analysis that supports the EPA conclusion that riparian buffers that will provide full potential shade will likewise control nutrient pollution to meet the TMDLs. TMDLs Appendix E at Figures 10 – 13.

- EPA both failed to evaluate the shade allocations to achieve nutrient reductions and the riparian buffers in Ecology's 2015 Deschutes TMDLs for adequacy to meet temperature standards. *See e.g.*, William Ehinger *et al., Type N Hard Rock Study Stream Temperature/Shade [Presentation to TFW Policy Committee]* (Oct. 5, 2017); William T. Peterjohn *et al., Nutrient Dynamics in an Agricultural Watershed: Observations on the Role of A Riparian Forest*, 65 Ecology, 5 at 1466 (Oct. 1984); John Neiber *et al., Evaluation of Buffer Width on Hydrologic Function, Water Quality, and Ecological Integrity of Wetlands*, Minnesota Department of Transportation Research Services (Feb.

2011); Bernard W. Sweeney *et al., Riparian deforestation, stream narrowing, and loss of stream ecosystem services*, 101 PNAS 39 (Sept. 28, 2004) at 114132; Bernard W. Sweeney *et al., Streamside Forest Buffer Width Needed to Protect Stream Water Quality, Habitat, and Organisms: A Literature Review*, Journal of the American Water Resources Association (JAWRA) 50(3): 560-584 (June 2014); Paul Adamus, *Effects of Forest Roads and Tree Removal In or Near Wetlands of the Pacific Northwest: A Literature Synthesis* (Dec. 2014); Bernard W. Sweeney *et al., Resurrecting the In-Stream Side of Riparian Forests*, 136 Journal of Contemporary Water Research & Education 17-27 (June 2007); Aimee P. *McIntyre et al., Effectiveness of Experimental Riparian Buffers on Perennial Non-fish-bearing Streams on Competent Lithologies in Western Washington* (Sept. 2018); EPA, *Interim Riparian Buffer Recommendations for Streams in Puget Sound Agricultural Landscapes (Originally proposed as federal Option 3 for the Agriculture Fish and Water (AFW) Process, March 2002) Guidance* (Oct. 28, 2013 Final); Seth Wenger, *A Review of the Scientific Literature on Riparian Buffer Width, Extent and Vegetation* (revised edition, March 5, 1999); R. Richard Lowrance *et al., Waterborne Nutrient Budgets for the Riparian Zone of an Agricultural Watershed*, 10 Agriculture, Ecosystems and Environment 371-384 (1983); R. Richard Lowrance, *The potential role of riparian forests as buffer zones* (1996); Nick Haycock *et al., Buffer zones: their processes and potential in water protection*, Harpenden (UK): Quest Environmental, 128-33 (1996); Roxane S. Palone, *Chesapeake Bay riparian handbook: a guide for establishing and maintaining riparian forest buffers*, US Department of Agriculture, Forest Service, Northeastern Area State and Private Forestry (1998); Calvin D. Perry, *et al., Watershed-scale water quality impacts of riparian forest management,* Journal of Water Resources Planning and Management, 125(3), 117-125 (1999).

- While EPA does not state what vegetation height Ecology used to calculate natural shade in the Ecology model, Ecology did. *See* 2015 Deschutes TMDL at 40 ("Height was based on the tallest existing vegetation in the system (50m), excluding some very tall conifer stands (60m)."). That 50 meters, or 164 feet, does not represent the "full, dense, old-growth forest" that EPA claims the TMDL calls for and/or assumes in the model. *See e.g.*, Ecology, South Fork Nooksack Temperature TMDLs (2020) (approved by EPA on May 6, 2020) ("The climax vegetation height of 290 ft (88.4 mm) was chosen to represent not the 100-year site potential value, but rather the estimated natural/ old-growth/climax conditions for a fully forested natural riparian buffer of primarily Douglas fir trees. This climax vegetation height is applied to all riparian vegetation and was chosen based on an analysis of Douglas fir heights from field work across the state of Washington (Grah, 2014)."). Taller trees and an increased buffer than was used in the model were demonstrated to produce greater shade, *see id*. at 128 (Fig. 65), leading one to the obvious conclusion that the assumptions in the Deschutes TMDL model are not representative of natural conditions as they purport to be and certainly not of the "full, dense, old-growth forest" of EPA's description.

- EPA's report demonstrates that significant sources of nutrients are coming from some tributaries that drain the watershed that are not included in these TMDLs. TMDLs Appendix E, Figures 14, 15, 16.

- EPA's report purports to identify "natural condition water quality inputs for the headwaters, tributaries, diffuse groundwater inflows, and spring inflows." TMDLs Appendix E at 5.3.2. While EPA likely chose an appropriate means of identifying natural nutrient inputs, they have not identified natural conditions for temperature.

- EPA's conclusion that no nutrient reductions are needed downstream of Offutt Lake because reductions in temperature will be sufficient to meet the numeric criterion does not account for climate change impacts to temperature. EPA is well aware that these impacts will be significant. *See* Ecology, *South Fork Nooksack River Temperature Total Maximum Daily Load Water Quality Improvement Report and Implementation Plan* (Feb. 2020); EPA, *EPA Region 10 Climate Change and TMDL Pilot – South Fork Nooksack River, Washington, Final Project Report* (Sept. 2017); EPA, *Qualitative Assessment: Evaluating the Impacts of Climate Change on Endangered Species Act Recovery Actions for the South Fork Nooksack River, WA* (Oct. 2016); EPA, *Quantitative Assessment of Temperature Sensitivity of the South Fork Nooksack River under Future Climates using QUAL2Kw* (Oct. 2016); EPA, *Total Maximum Daily Load (TMDL) for Temperature in the Columbia and Lower Snake Rivers May 18, 2020 TMDL for Public Comment* (May 18, 2020).

- Deciding that the natural conditions override the 9.5 mg/L DO criterion upstream of Offutt Lake, and adding an additional drop in DO of 0.2 mg/L because it is allowed but not required, the report concludes that "the DO water quality criteria upstream of Offutt Lake range from 8.6 – 9.0 mg/L (Table 24)." TMDLs Appendix E at 5.5. This conclusion does not evaluate the impact on designated and existing uses of a new criterion, particularly (1) the combined impact of higher natural condition temperatures along with lower natural condition DO levels on fish metabolism and health; (2) the impact of climate change on both; and (3) the impact of the lowered natural condition criteria on intragravel dissolved oxygen levels, a concern with the numeric criteria. *See* NMFS 2008 BiOp at 15, 110 – 11 (NMFS expressing serious concerns about whether the interim DO criteria protect levels of IGDO in salmon redds.)

- The conclusion that the Deschutes River below Offutt Lake does not need nutrient reductions because minimum DO concentrations are approximately 0.4 – 1.0 mg/L above the numeric criterion is a flawed analysis because the numeric criterion for DO in this portion of the river is not protective of the designated uses. TMDLs Appendix E at 5.5.

- The choice of the lowest 1-day minimum DO criterion for headwaters and all tributaries to develop a TMDL scenario for the Deschutes River upstream of Offutt Lake is not

protective and EPA has not explained why that is an appropriate way to determine the natural conditions. TMDLs Appendix E at 5.5.

- EPA claims that it is developing TMDLs for "tributaries impaired for low levels of DO, temperature, and/or pH" but it has not, in fact, developed TMDLs for all tributaries that are contributing to the impairment of those parameters. TMDLs Appendix E at 5.5.

- The Deschutes River and Capitol Lake are designated critical habitat for Puget Sound Steelhead. *See* 81 Fed. Reg. 9252, 9303 (Feb. 24, 2016); 50 C.F.R. § 226.212(u)(14). EPA has not evaluated the natural conditions and allocations it has calculated for the Deschutes River and tributaries in these TMDLs pursuant to the Endangered Species Act.

Conclusion

To quote the Department of Ecology concerning other recent EPA TMDLs:

> Unfortunately, as a diet, EPA's [Columbia River Temperature TMDL] proposal basically says "just eat healthy" instead of describing how many servings of fruits and vegetables people should strive for.
>
> * * *
>
> We expected EPA to release a plan that would create a path for us to work together to address this regional problem. That didn't happen. EPA's plan lacks clear serving amounts for two of the major contributors: upstream sources and climate change.

Ecology, Blog, What We Do, *EPA plan for Washington and Oregon rivers leaves salmon in hot water* (Aug. 19, 2020). In addition to the reasons listed above, EPA's TMDLs for the Deschutes River likewise fail to include clear serving amounts for upstream sources, namely the drainage basin, and to account for climate change in determining that dissolved oxygen levels in the Deschutes downstream of Offutt Lake will be protected based on temperature and to rely on temperature for the Deschutes upstream of Offutt Lake without taking climate change into account.

Sincerely,

Nina Bell
Executive Director

Attachments:

National Marine Fisheries Service, *Endangered Species Act Section 7 Formal Consultation and Magnuson-Stevens Fishery Conservation and Management Act Essential Fish Habitat Consultation for the Washington State Water Quality Standards – Environmental Protection Agency's Proposed Approval of Revised Washington Water Quality Standards for Temperature, Intergravel Dissolved Oxygen, and Antidegradation Statewide consultation* (Feb. 5, 2088)

Ecology, *Budd Inlet TMDL Update [to] Deschutes Advisory Group* (May 18, 2017)

Miltner, R.J. (2011) *Technical Support Document for Nutrient Water Quality Standards for Ohio Rivers and Streams. Draft (December) Ohio EPA Technical Support Document*

Ecology, *South Fork Nooksack River Temperature Total Maximum Daily Load Water Quality Improvement Report and Implementation Plan (Feb. 2020)*

EPA, *EPA Region 10 Climate Change and TMDL Pilot – South Fork Nooksack River, Washington, Final Project Report* (Sept. 2017)

EPA, *Qualitative Assessment: Evaluating the Impacts of Climate Change on Endangered Species Act Recovery Actions for the South Fork Nooksack River, WA* (Oct. 2016)

EPA, *Quantitative Assessment of Temperature Sensitivity of the South Fork Nooksack River under Future Climates using QUAL2Kw* (Oct. 2016).

EPA, *Total Maximum Daily Load (TMDL) for Temperature in the Columbia and Lower Snake Rivers May 18, 2020 TMDL for Public Comment* (May 18, 2020)

Ecology, Blog, What We Do, *EPA plan for Washington and Oregon rivers leaves salmon in hot water* (Aug. 19, 2020)

William Ehinger *et al., Type N Hard Rock Study Stream Temperature/Shade [Presentation to TFW Policy Committee]* (Oct. 5, 2017)

William T. Peterjohn *et al., Nutrient Dynamics in an Agricultural Watershed: Observations on the Role of A Riparian Forest*, 65 Ecology, 5 at 1466 (Oct. 1984)

John Neiber *et al., Evaluation of Buffer Width on Hydrologic Function, Water Quality, and Ecological Integrity of Wetlands*, Minnesota Department of Transportation Research Services (Feb. 2011)

Bernard W. Sweeney *et al., Riparian deforestation, stream narrowing, and loss of stream ecosystem services*, 101 PNAS 39 (Sept. 28, 2004)

Bernard W. Sweeney *et al., Streamside Forest Buffer Width Needed to Protect Stream Water Quality, Habitat, and Organisms: A Literature Review*, Journal of the American Water Resources Association (JAWRA) 50(3): 560-584 (June 2014)

Paul Adamus, *Effects of Forest Roads and Tree Removal In or Near Wetlands of the Pacific Northwest: A Literature Synthesis* (Dec. 2014)

Bernard W. Sweeney *et al., Resurrecting the In-Stream Side of Riparian Forests*, 136 Journal of Contemporary Water Research & Education 17-27 (June 2007)

Aimee P. *McIntyre et al., Effectiveness of Experimental Riparian Buffers on Perennial Non-fish-bearing Streams on Competent Lithologies in Western Washington* (Sept. 2018)

EPA, *Interim Riparian Buffer Recommendations for Streams in Puget Sound Agricultural Landscapes (Originally proposed as federal Option 3 for the Agriculture Fish and Water (AFW) Process, March 2002) Guidance* (Oct. 28, 2013 Final)

Seth Wenger, *A Review of the Scientific Literature on Riparian Buffer Width, Extent and Vegetation* (revised edition, March 5, 1999)

R. Richard Lowrance *et al., Waterborne Nutrient Budgets for the Riparian Zone of an Agricultural Watershed*, 10 Agriculture, Ecosystems and Environment 371-384 (1983)

R. Richard Lowrance, *The potential role of riparian forests as buffer zones* (1996)

Nick Haycock *et al., Buffer zones: their processes and potential in water protection*, Harpenden (UK): Quest Environmental, 128-33 (1996)

Roxane S. Palone, *Chesapeake Bay riparian handbook: a guide for establishing and maintaining riparian forest buffers*, US Department of Agriculture, Forest Service, Northeastern Area State and Private Forestry (1998)

Calvin D. Perry, *et al., Watershed-scale water quality impacts of riparian forest management,* Journal of Water Resources Planning and Management, 125(3), 117-125 (1999)

Dale McCullough *et al., EPA Issue Paper 5, Summary of Technical Literature Examining the Physiological Effect of Temperature on Salmonids* (May 2001)