

# Northwest Environmental Advocates

Please see attached comment letter.

# NORTHWEST ENVIRONMENTAL ADVOCATES



July 5, 2024

Marla Koberstein  
Washington Department of Ecology  
P.O. Box 47696  
Olympia, WA 98504-7696

*submitted through comment portal only*

**Re: Proposed Updates to the Washington Water Quality Standards for Natural Conditions Provisions in WAC Chapter 173-201A**

Dear Ms. Koberstein:

Northwest Environmental Advocates (“NWEA”) finds this effort by the Washington Department of Ecology (“Ecology”) disappointing. In effect, most of what Ecology has proposed is a “trust us while we do the exact same thing we’ve been doing all along, except with some more paperwork.” Granted, it was not at all helpful that in its recent disapproval of Washington’s Natural Conditions Criteria (“NCC”), the U.S. Environmental Protection Agency (“EPA”) did not spell out all the reasons why it *should have* disapproved the NCC. *See* Letter from to Vince McGowan, Ecology, from Daniel Opalski, EPA, Re: *EPA’s Action on Revisions to the Washington State Department of Ecology’s Surface Water Quality Standards for Natural Conditions Provisions* (Nov. 19, 2021) at 8 (disapproval of WAC 173-201A-260(1) based solely on the provision’s failing to not expressly exclude human health criteria). In focusing on EPA’s position that NCC provisions cannot be used to change numeric criteria for human health outside the 303(c) process, EPA induced Ecology to ignore the real problems of its previously-approved NCC rules. But this current proposal demonstrates that Ecology itself is more than happy to keep its blinders firmly on rather than face the inadequacy of its past approaches and, therefore, its proposed future rules that are built on those past approaches. Ecology is also disingenuous. It states its strategy to update its natural conditions criteria is:

to ensure consistency with CWA recommendations, continue to protect endangered species, and address disapprovals of our natural condition criteria that had previously been approved by EPA.

*Proposed Updates to Natural Conditions Provision in Chapter 173-201A WAC Technical Support Document* (hereinafter “TSD”) at 21. In fact, Ecology has never used its clean water program to “protect endangered species” so it is literally impossible for it to “continue” to do so.

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In the comments below there are many specific references to use of the NCC for temperature. We intend for these comments to apply to the provisions of the proposed rule and the proposed guidance that pertain to dissolved oxygen as much as they do to temperature.

**I. ECOLOGY MISSES THE ELEPHANT IN THE ROOM: WHY EPA DISAPPROVED OREGON'S NATURAL CONDITIONS CRITERIA AND ECOLOGY'S MISGUIDED RELIANCE ON THE VARIOUS EPA GUIDANCE AND DECISION DOCUMENTS**

Ecology includes a section termed "Litigation" in its TSD. *Id.* at 19. Here, Ecology discusses the litigation that led to EPA's reconsideration and subsequent disapproval of various NCC provisions in Washington. Notably missing is equally if not more important litigation, over the NCC in Oregon's water quality standards. *See Northwest Environmental Advocates v. EPA*, 855 F. Supp. 2d 1199 (D. Or. 2012). Instead, Ecology merely alludes to EPA's having disapproved various NCC provisions in that state. *See, e.g.*, TSD at 32-33. While the discussion below addresses the technical reasons why the court found EPA's approval of the Oregon NCC was arbitrary and capricious, as an initial matter it held that narrative criteria may not supplant or supersede numeric criteria:

The EPA's approval of the NCC was arbitrary and capricious for a number of reasons. The first, and most important, is that the NCC supplants otherwise lawful water quality standards. The EPA characterizes the NCC as a narrative criteria utilized to supplement numerical criteria. Under the CWA's regulations, states should establish narrative criteria "where numerical criteria cannot be established or to supplement narrative criteria." 40 C.F.R. § 131.11 (b)(2). Because numeric criteria can be established, the relevant question is whether the NCC supplements narrative criteria. It does not. Instead the NCC supplants rather than supplements the numeric criteria by allowing Oregon to replace the numeric criteria (determined to be protective of salmonids) with a new numeric standard during the TMDL process. The replacement of one numeric standard with another less-protective numeric standard cannot be viewed as "supplementing" the first standard. Accordingly, the court finds that the NCC violates the CWA's § 303 (c) water quality standards review. *Ohio Valley Envtl. Coal.*, 279 F. Supp. 2d at 764.

*Northwest Environmental Advocates v. EPA*, 855 F. Supp. 2d 1199, 1217-1218 (D. Or. 2012). Nowhere does Ecology explain how its proposed NCC merely supplements rather than supplants the established numeric criteria in Washington's water quality standards.

**A. Ecology Errs in Ignoring the Litigation on Oregon's Natural Conditions Criteria and Subsequent EPA Disapproval of Oregon's Provision**

Ecology also does not explain EPA's technical reasoning for its having disapproved the Oregon NCC provisions. They are as follows:

The court's February 28, 2012 Opinion and Order held that the EPA's approval of the NCC was arbitrary and capricious. The Opinion and Order stated, inter alia, that: (1) the NCC "supplants rather than supplements" the Biologically Based Numeric Criteria, Opinion and Order at 26; (2) the NCC was based on a flawed assumption that historically higher water temperatures would protect salmonids now, *id.* at 27; (3) the NCC attempts to restore historically higher water temperatures without restoring other conditions that previously allowed salmonids to thrive, *id.*; and (4) there are "difficulties of estimating the historical water temperatures upon which the NCC depends," which is a "process rife with uncertainty." *Id.* The Opinion and Order also discussed NWEA's contention that the NCC only protected historically warmer waters without also protecting waters that were naturally cooler than the numeric criteria. *Id.* at 24. The court ruled that the EPA had "been unable to articulate a rational[] basis for its approval of the NCC." *Id.* at 27.

Letter from Daniel Opalksi, EPA, to Gregory Aldrich, Oregon Department of Environmental Quality ("DEQ"), Re: *Disapproval of Oregon's Water Quality Standards: Natural Conditions Criteria for Temperature OAR 340-041-0028(8); Statewide Narrative Natural Conditions Criteria OAR 340-041-0007(2)* (Aug. 8, 2013) (hereinafter "Oregon Disapproval") at 2. EPA disapproved the Oregon statewide narrative NCC on the same basis. *Id.*

The error made by Ecology now is not only ignoring the underlying court order that caused EPA to reconsider and then disapprove Oregon's NCC provisions and the EPA disapproval itself but also to ignore the fact that there never was a valid Section 7 consultation on the NCC pursuant to the Endangered Species Act ("ESA") because the court also held that biological opinion prepared by the National Marine Fisheries Service ("NMFS") was seriously flawed and by the time that NMFS had completed a new biological opinion, the NCC was no longer EPA-approved. See NMFS, *Endangered Species Act Biological Opinion on the Environmental Protection Agency's Proposed Approval of Certain Oregon Water Quality Standards Including Temperature and Intergravel Dissolved Oxygen* (Nov. 3, 2015) (hereinafter "NMFS Oregon BiOp") at 9, fn. 5 (the NCC was not a part of the proposed action). In other words, Ecology's self-comforting assurances that it evaluated "previous Endangered Species Act (ESA) Biological Opinions from the National Marine Fisheries Service and United States Fish and Wildlife Service to determine what additional considerations are needed to protect ESA-listed species in Washington" is without meaning because there was no such opinion for the now-disapproved Oregon NCC. TSD at 11. Similarly, Ecology states that it "evaluated information provided by EPA to Washington in past approval and disapproval decisions" but it failed to look at the disapproval for Oregon that would have provided far more direction. *Id.* It would be even more enlightening were Ecology to look at the parties' briefs submitted in the Oregon litigation, but it clearly did not do this either.

Ecology's reliance on the 2003 EPA Regional Guidance is also misguided because that guidance pre-dates the Oregon litigation. See TSD at 39, 40; EPA, *EPA Region 10 Guidance For Pacific Northwest State and Tribal Temperature Water Quality Standards* (April 2003) (hereinafter

“Regional Guidance”). To provide a feel for why EPA’s past approvals of the use of NCC-derived criteria were so flawed (in both Oregon and Washington), one only need look at EPA’s approval of Oregon’s Umpqua TMDL that was based on that state’s now-disapproved NCC. One example of the superseding, purportedly “natural,” temperatures was 32.5° C, as demonstrated here:

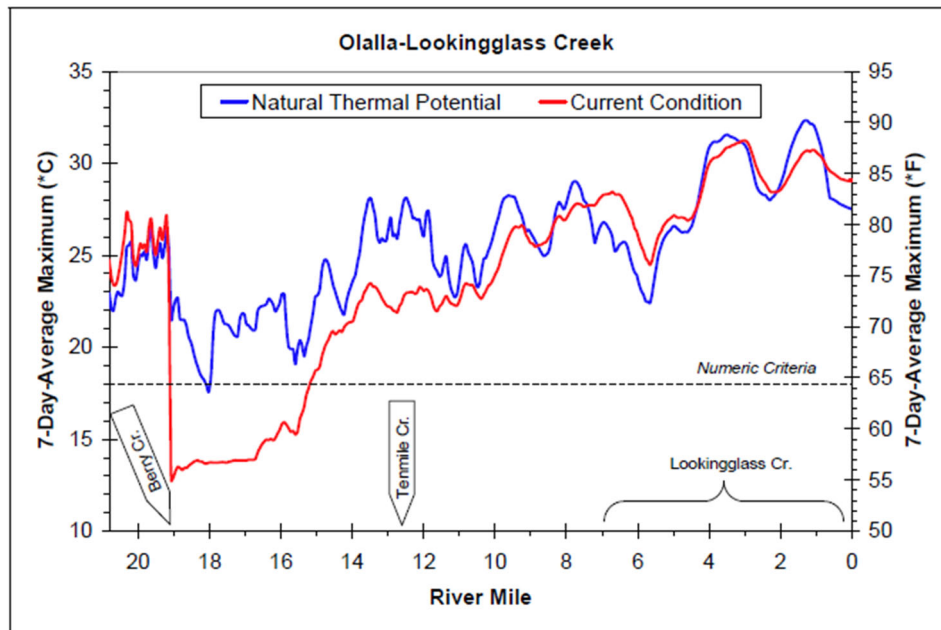


Figure 3.21 Olalla-Lookingglass Creek temperature simulation results.

Oregon DEQ, *Chapter 3, Umpqua Basin Stream Temperature TMDL* at 3-59.<sup>1</sup> It is very much worth noting that 32.5° C is, according to EPA’s Regional Guidance and Ecology, lethal to salmon within seconds. Regional Guidance at 33 (“Exposures of less than 10 seconds can cause instantaneous lethality at 32°C (WDOE, 2002).”). This, as well as other examples, none of which were evaluated by the federal court in the Oregon case or by EPA in its Oregon disapproval, demonstrates that just because an agency has deemed a temperature “natural” through modeling does not in any way mean that it has correctly made that determination. Salmonids could not have lived, let alone thrived, in the NCC-derived temperatures.

In any event, Ecology ignores all the points made in EPA’s disapproval of Oregon’s NCC, as enumerated in the quotation from the disapproval above. Instead, it relies on some sort of willful disconnect between the language of the NCC provisions that assure the supplanting result will reflect “natural” conditions and the reality of how those NCC provisions are used.

<sup>1</sup> To be sure, Oregon DEQ noted that “[n]atural thermal potential was not modeled during the salmon and steelhead fish use period.” Umpqua TMDL at 3-58. Nevertheless, other tributaries in the basin were modeled during periods of fish use and temperatures were also not safe for salmon. See, e.g., *id.* at 3-60 (natural thermal potential for the South Umpqua River reaches 29° C).

## **B. Ecology Incorrectly Relies on Some Past EPA Decisions and Guidance**

In its discussion of the now-disapproved Washington general NCC provision, Ecology cited EPA's general approval of these provisions in its biological evaluation ("BE") from 2007:

EPA stated that it views criteria based on natural conditions to "be fully protective of salmonid uses, even if the natural conditions are higher than the numeric criteria for some waterbodies, because the pollutant level prior to human impacts clearly support healthy salmonid populations" (USEPA, 2007). Therefore, even if natural conditions criteria would result in pollutant levels that cause adverse effects to salmonids, those effects would be viewed as naturally occurring adverse effects.

EPA also noted that the CWA regulatory framework ensured Washington's natural condition provisions are appropriately implemented. Under the CWA, EPA is required to approve or disapprove Washington's TMDLs and CWA 303(d) listing of impaired waters. In both cases, EPA has the authority to disapprove or reject Washington's submittals if natural condition determinations are inconsistent with the adopted criteria. Further, these actions may also include ESA consultation. In addition, EPA can review NPDES permits in Washington to determine consistency with the natural conditions criteria, and if inconsistent and not addressed by the state following EPA's objection, EPA's oversight authority over the NPDES program could result in EPA federalizing the permit.

EPA concluded that the provision may affect all the listed species addressed in the BE as it could apply anywhere in the state. However, because the effects are natural and not attributable to the provision itself, EPA concluded that approval of the provision is not likely to adversely affect endangered species.

TSD at 17 (emphasis added). This accurately summarizes EPA's assertions in its biological evaluation. See EPA, *Biological Evaluation of the Revised Washington Water Quality Standards* (April 10, 2007) (hereinafter "EPA 2007 BE") at 171. However, all of this "logic" is flawed, and Ecology is misguided to rely upon it. First, the assertion that a temperature derived from a model is necessarily natural was discussed in Section I.A, *supra*, with the example of the Umpqua TMDL in Oregon. Examples from Washington are found *infra*. Second, EPA's position set out in this biological evaluation (and elsewhere) that it can ensure the protectiveness of the NCC outcome in the TMDL approval process is disingenuous at best. In its opening brief in a subsequent Oregon case, pertaining to EPA's approval of Oregon's use of the NCC in temperature TMDLs, EPA said the opposite:

NWEA contends that EPA's approval of the temperature TMDLs was arbitrary and capricious because they "simply do not analyze whether Oregon's new natural condition criteria will protect cold-water species," a designated use that is

one component of Oregon's approved water quality standards. This contention fails for several reasons.

Once again, NWEA premises its claim on the erroneous argument that the TMDLs establish new water quality criteria. As discussed above, the TMDLs apply the previously approved water quality standards, which include the narrative criteria – the NCC.

NWEA also errs to the extent it suggests that TMDLs must analyze whether criteria are sufficient to protect designated uses. . . . Thus, the CWA section 303(c) process for establishing water quality standards – not the section 303(d) process for establishing TMDLs based on those standards – determines whether water quality criteria protect designated uses.

\* \* \*

For EPA to not have relied on the NCC to evaluate the TMDLs would have been contrary to law. Accordingly, NWEA's claim that EPA improperly relied on the NCC must be rejected.

*Northwest Environmental Advocates v. EPA*, Civil No.: 3:12-cv-01751-AC, EPA's Brief in Opposition to Plaintiff's Motion for Summary Judgment and in Support of EPA's Cross-Motion for Summary Judgment, at 20-22 (Feb. 13, 2015) (internal citations omitted) (emphasis added). To put a fine point on it, there is no evidence anywhere in Oregon or Washington that EPA has evaluated whether a state has properly calculated NCC-derived supplanting criteria in a TMDL because its position is that is a standards issue, not a TMDL issue. Third, EPA almost never engages in Endangered Species Act ("ESA") consultation on TMDLs. To the best of our knowledge, there has never been such a consultation for Washington TMDLs with the exception of EPA's own 1991 Columbia River Basin Dioxin TMDL. Last, EPA's assertion that it is the water pollution "effects" that are natural and "not attributable to the provision itself" is a pretzel-like argument. A provision that misleads regulators into finding anthropogenic effects to be non-anthropogenic is, indeed, attributable to the provision itself. Moreover, it fails to account for other natural conditions, as the court in the Oregon NCC case found and EPA cited in its disapproval of Oregon's NCC.

Lest there be any lingering question about whether EPA does, in fact, continue to look over Ecology's shoulder pursuant to either the Clean Water Act or the Endangered Species Act, EPA has made abundantly clear that it does not, as recently as 2020. EPA developed TMDLs for the Deschutes River basin upon its disapproval of some Ecology TMDLs. See EPA, *Total Maximum Daily Loads (TMDLs) for the Deschutes River and its Tributaries Sediment, Bacteria, Dissolved Oxygen, pH, and Temperature* (July 31, 2020, rev. Aug. 6, 2021). In these TMDLs, EPA relied, *inter alia*, upon the then-existing NCC. See, e.g., *id.* at 13-14, 36-37. In a memo to the file pertaining to these NCC-based TMDLs, EPA wrote:

The establishment of a TMDL is not an agency action for purposes of ESA consultation because the TMDL merely implements effective applicable water

quality standards under the Clean Water Act (CWA) and EPA has no discretion to alter those standards for the benefit of protected species. The Clean Water Act does not grant EPA the discretion to approve or establish a TMDL at a level of protection that is different than the applicable standard in order to benefit ESA listed species and critical habitat.

\* \* \*

EPA's authority to approve or establish a TMDL does not go beyond the scope of TMDL statutory and regulatory requirements. If EPA is reviewing or establishing a TMDL, CWA Section 303(d)(1)(C) requires that the TMDL implement the existing applicable standard. Accordingly, the CWA does not grant EPA the discretion to approve or establish a TMDL at a level of protection that is different than the applicable standard in order to benefit ESA-listed species and critical habitat.

Memorandum from Miranda Magdangal and Leah Brown, EPA, to Administrative Record for the Deschutes River TMDLs, Re: *Endangered Species Act ESA Section 7 Consultation Analysis for Total Maximum Daily Loads TMDLs for the Deschutes River and its Tributaries* (June 19, 2020) at 2. In light of EPA's opinions in the context of an NCC-based TMDL, it is absurd for Ecology to continue to assert that EPA maintains any oversight over how Ecology will use its NCC in the future.

Ecology cites the EPA 2007 biological evaluation to assert that the previous temperature "criteria are intended to restore thermal refuges to protect sensitive native salmonids" when there is no more evidence of criteria's—or any other action taken by Ecology—being used to identify the sufficiency of or call for the restoration of thermal refugia. TSD at 52. This reference only serves to highlight Ecology's complete failure to address the need for refugia, and other forms of habitat complexity such as sufficient large woody debris, in those places where natural temperatures really did exceed the numeric criteria. The word "refuge" or "refugia" shows up exactly zero (0) times in the Performance and Implementation documents that are a part of this rulemaking. See Ecology, *Rule Implementation Plan Chapter 173-201A WAC, Water Quality Standards for Surface Waters of the State of Washington Natural Conditions Criteria* (May 2024) (hereinafter "Implementation Plan"); Ecology, *A Performance-Based Approach for Developing Site-Specific Natural Conditions Criteria for Aquatic Life in Washington* (May 2024) (hereinafter "Performance Guidance"). The need to address the very complexity called out by the Oregon court and EPA's disapproval of the Oregon NCC was set out long ago by EPA:

When using natural background maximum temperatures as TMDL targets and to set TMDL allocations, the TMDL assessment document should assess other aspects of the natural thermal regime including the spatial extent of cold water refugia (which, generally are defined as waters that are  $\geq 2^{\circ}\text{C}$  colder than the surrounding water), the diurnal temperature variation, seasonal temperature variation (i.e., number of days at or near the maximum temperature), and shifts in



the annual temperature pattern. Findings from this assessment should be integrated into the TMDL and its allocations to the extent possible. For example, if possible, TMDL allocations should incorporate restoration of the diurnal and seasonal temperature regime and cold water refugia that reflect the natural condition. If it is impracticable to address these impacts quantitatively through allocations, then the TMDL assessment document should qualitatively discuss the human activities that modify these aspects of the natural thermal regime. Plans to implement the TMDL should include measures to restore and protect these unique aspects of the natural condition.

EPA believes it is particularly important for the TMDL itself or the TMDL assessment document to address the above aspects of the natural thermal regime for waterbodies where the natural background maximum 7DADM temperature exceeds 18°C and where the river has significant hydrologic alterations (e.g., dams and reservoirs, water withdrawals, and/or significant river channelization) that have resulted in the loss of temperature diversity in the river or shifted the natural temperature pattern. For example, there may be situations where the natural background maximum temperatures exceed 18°C, but historically the exposure time to maximum temperatures was limited due to the comparatively few number of hours in a day that the water reached these temperatures, the comparatively few number of days that reached these temperatures, and plentiful cold water refugia from cold tributary flows and hyporheic flow in alluvial floodplains where salmonids could avoid the maximum water temperatures.

Regional Guidance at 38. Nonetheless, Ecology ignores this entire issue.

Bizarrely, Ecology cites EPA's biological evaluation for the point that "[t]wo species, the bald eagle and marbled murrelet, are significant piscivores that could be affected by a reduction in prey base (mainly salmonids)." TSD at 53. This ignores EPA's own finding that there were "five predator species" including "three marine mammals (stellar sea lion, humpback whale, and killer whale)" that could be affected indirectly through reduced prey. EPA 2007 BE at 172-173. Ecology conveniently ignores the endangered Southern resident killer whale by mentioning the species exactly once in its TSD, in a list of threatened and endangered species, as if mentioning this species on the verge of extinction—including from lack of sufficient salmonid prey—is some form of analysis and protection. TSD at 19; *see also id.* at 57-58 (Ecology nearly identical discussion about dissolved oxygen). At least Ecology had the sense to say that southern sea otters and two turtle species "could be considered" as affected by the proposed marine dissolved oxygen standards, after citing the same EPA biological evaluation stating that EPA made a no effect determination. *Id.* at 58.

Citing and relying on EPA's past no effects determinations is rather silly. First, these determinations were made prior to the court's order on the Oregon NCC and EPA's subsequent disapproval of Oregon's NCC. Second, EPA says very clearly in the biological evaluation that no substantial prey decrease could occur because "[n]on [sic] of these standards that are being

approved are a substantial deviation from water quality limits derived from the literature that are found to be protective of salmonids.” EPA 2007 BE at 173. Ecology should ask itself: How are NCC-derived criteria consistent with the scientific literature substantiating the protectiveness of biologically-based criteria?

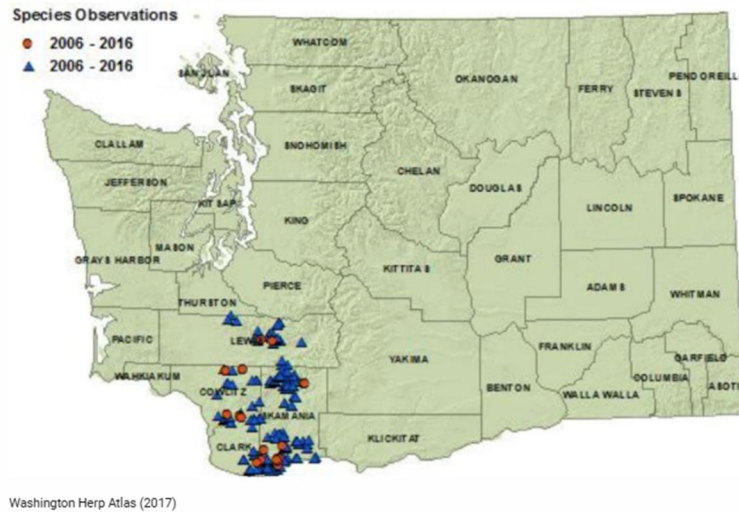
## **II. WILL THE CRITERIA DERIVED FROM A NATURAL CONDITIONS CRITERIA PROTECT DESIGNATED AND EXISTING USES?**

Before discussing whether NCC-derived criteria will be protective under the proposed rules, we note that when EPA established its guidance on numeric criteria, it called for meeting the criteria at the lowest downstream point for which the uses were being protected, thereby underpinning an assumption that the upstream waters would be colder than the applicable numeric criteria. *See* Regional Guidance at 33 (“the recommended criteria in this guidance are based in part on the assumption that meeting the criteria at the lowest downstream point at which the use is designated will likely result in cooler waters upstream.”). Despite this assumption, Ecology does not identify waters that are not meeting numeric criteria on this basis, *i.e.*, expecting upstream waters to be cooler. Ecology’s failure to regulate on the basis of this assumption results in less protection for aquatic species throughout the process of monitoring, 303(d) listing, modeling, and establishing NCC derived criteria. If Ecology wants to ensure that its proposed rules are sufficient, it will address this ongoing failure.

### **A. All Criteria Must Fully Protect Designated and Existing Uses**

Ecology repeatedly states, correctly, that all criteria, including those derived through an NCC process, must be “fully protective of designated and existing uses.” *See, e.g.*, TSD at 12, 14 (EPA regulations require that criteria protect the most sensitive designated uses), 25 (“EPA notes that so long as these site-specific criteria have firm scientific basis and protect designated uses, the resulting criteria could be more or less stringent compared to adopted numeric criteria and still meet CWA requirements.”); 40 C.F.R. §§ 131.11, 131.12(1). The problem is that Ecology provides literally no insight as to whether or how it will ensure that the derived purportedly natural criteria are, in fact, fully protective, not only of aquatic species in general but threatened and endangered species. As demonstrated above, the fact that the output of a model says something is “natural” does not make it so. In the guidance that it proposes to incorporate by reference in the proposed new rules, that is the guidance that is to provide this assurance of protection, Ecology merely nods to but does not actually address the issue. *See, e.g.*, Performance Guidance at 10 (a project QAPP must provide “[h]ow spatial and temporal variability will be addressed in any model or models to ensure that natural condition estimates protect designated and existing uses.”), 17 (the model used must “[i]dentify criteria outcomes that are fully protective of the designated or existing uses.”), 25 (the model must “[p]rotect designated and existing uses by removing all human-caused impacts and pollution to the water of interest.”), 26 (“Further, criteria values developed using the performance-based approach must protect existing and designated uses in downstream waters and must not cause degradation of downstream receiving waters.”). None of these are anything but assertions of the law; not a single proclamation by Ecology explains how it will comply with this fundamental requirement





Washington Department of Fish and Wildlife, Species & Habitats, Species in Washington, *Cascade torrent salamander*, available at <https://wdfw.wa.gov/species-habitats/species/rhyacotriton-cascadae#desc-range>. “This salamander is sensitive to temperature variation . . . . Temperature sensitivity and limited dispersal ability makes this species potentially sensitive to climate change.” *Id.* They are aquatic. *Id.* It is fair to assume this description matches the temperature needs of the southern torrent salamander, *Rhyacotriton variegatus*. Suitable habitat temperatures for this latter species is 6.5 – 15.0° C. See Hartwell Welsh, Jr. and Amy Lind, *Habitat Correlates of the Southern Torrent Salamander, Rhyacotriton variegatus (Caudata: Rhyacotritonidae)*, in *Northwestern California*, 30 *Journal of Herpetology* 385 (1996) at 395 (table 5). It is not our job to determine the protective temperatures for this and other related salamanders but there is plenty of evidence for Ecology to read. See, e.g., U.S. Forest Service, *Conservation Assessment for the Cascade Torrent Salamander (Rhyacotriton cascadae) Version 1.0* (Feb. 2011), available at <https://www.fs.usda.gov/r6/issssp/downloads/xvertebrates/ca-ha-rhyacotriton-cascadae-201102.docx> at 13 (“Torrent salamanders are specialized for life in cold water and cannot survive where water temperatures are too high. Thermal tolerances for *Rhyacotriton* spp. are among the lowest for amphibians (Bury 2008). In laboratory experiments, *R. olympicus* selected water between 12–14°C (Jones et al. 2005) and earlier descriptions (Stebbins and Lowe 1951) noted that *Rhyacotriton* spp. seek relatively slow water and that they are rarely found out of water or on ground that is not saturated. Likewise, Pollett et al. (2010) found that *R. cascadae* were almost absent from streams where water temperatures were  $\geq 14^{\circ}\text{C}$  for  $\geq 35$  consecutive hours.”). Likewise, Ecology’s sister agency has much more information on the existing uses of amphibians in Washington’s waters. See WDFW, Species & Habitats, *Amphibians and reptiles of Washington*, available at <https://wdfw.wa.gov/species-habitats/amphibians-reptiles>. Ecology should not wait until these species are listed as threatened or endangered pursuant to the ESA before it decides to protect them under the Clean Water Act. See, e.g., 80 Fed. Reg. 56423 (Sept. 18, 2015) (Cascade torrent salamander identified as undergoing a status review).

## **B. Superseding Higher Temperature Criteria Require Mitigation**

Had Ecology reviewed the Oregon NCC court opinion and subsequent EPA disapproval discussed in Section I.A, *supra*, and reviewed the NMFS biological opinion for the Oregon standards that did not include an NCC provision, it would have learned something else about temperatures that exceed the biologically-based numeric criteria. Ecology would have found a discussion about the role of thermal refugia pertaining to Oregon's 20° C migration criteria. Specifically, the Oregon numeric migration criterion initially was found acceptable to the federal agencies only because it included narrative criteria that provided for cold water refugia and a seasonal thermal pattern. Oregon and EPA had asserted that TMDLs would be used to identify thermal refugia. *See* NMFS Oregon BiOp at 174. As, in fact, the Oregon Department of Environmental Quality did not carry out the thermal refugia narrative in its TMDLs, the migration criterion was later determined to cause jeopardy to threatened and endangered species, and a reasonable and prudent alternative specifically pertaining to cold water refugia was required. *See id.* at 174-176, 176 (“the narrative criterion pertaining to CWR does not, to date, appear to be an effective means for minimizing the adverse effects likely to be experienced by migrating salmon and steelhead under the 20°C migration corridor criterion.”), 269-271. Note that the prior invalidated biological opinion issued by NMFS did not find jeopardy for the migration criterion because the agency (naively) believed EPA and state assertions about the protections that would be provided by thermal refugia. Here, it is unclear why Ecology would think that any temperature in excess of 20° C, as well as some lower temperatures depending on the uses to be protected, that could be the outcome of an NCC modeling exercise, would be considered sufficiently protective on their own, without any other form of mitigation, such as but not limited to cold water refugia.

As the court found in the Oregon litigation, choosing purportedly natural temperatures is only one part of assessing whether the resulting temperature is protective of the beneficial uses. The court, and EPA subsequently, specifically found that “the NCC attempts to restore historically higher water temperatures without restoring other conditions that previously allowed salmonids to thrive.” Oregon Disapproval at 2. This reflected the court's findings on the Oregon NCC:

However, the fact that the NCC runs afoul of the CWA's regulations is not its only defect. The NCC is based on the assumption that if historical water temperatures protected salmonids then, the same water temperatures would protect salmonids now. This reasoning ignores or otherwise discounts the historical changes to salmonid populations and river conditions. The record clearly demonstrates that many of Oregon's modern waterbodies have undergone dramatic changes and are no longer the rivers they once were. *See, e.g.*, EPA 138 at 015789 (noting that the Willamette River has lost seventy-five percent of its shoreline and has lost side channels offering rearing habitat). The NCC attempts to restore one aspect of Oregon's historical water conditions (higher temperatures in some waterbodies) without restoring the other conditions that allowed salmonids to thrive. Compounding this problem are the difficulties of estimating the historical water temperatures upon which the NCC depends. Despite the fact that Oregon is

required to use the best scientific data available to due so, it is a process rife with uncertainty. The EPA has been unable to articulate a rational[] basis for its approval of the NCC.

*Northwest Environmental Advocates v. EPA*, 855 F. Supp. 2d at 1218.

There are many different types of stream complexity at different geographic scales that salmonids would have relied upon to escape the higher water temperatures. But Ecology’s proposal makes no attempt to assure any of them. For example, there is no reference to the role that beavers historically played in creating that thermal diversity. To explain this, we incorporate by reference NWEA’s comments on Washington’s 2022 draft Section 319 Nonpoint Plan in which we discussed the role of beavers and ecological site potential. *See* Letter from Nina Bell, NWEA, to Ben Rau, Ecology, Re: *Washington’s Water Quality Management Plan to Control Nonpoint Sources of Pollution Draft for Public Review, Including Voluntary Clean Water Guidance for Agriculture Chapter 12 Riparian Areas & Surface Water Protection* (Dec. 20, 2022) at 6–9.

### **III. WILL THE CRITERIA DERIVED FROM THE NATURAL CONDITIONS CRITERIA BE “NATURAL”?**

An absolutely essential attribute of an EPA-approvable NCC should be its ability to assure that the resulting, superseding criteria will truly reflect natural conditions. There is, unfortunately, nothing in any of Ecology’s supporting documents to this rulemaking that provides that assurance. With few exceptions, Ecology’s proposal is to throw more words at the problem and to not provide the up-front assurances that are inherent in the concept of a “performance-based approach” but, rather, to wanly note that it will be the project-specific quality assurance protect plan (“QAPP”) that will provide the assurances. But a QAPP is not a water quality standard, future QAPPs will not be incorporated by reference into this proposed rule, and the use of QAPPs to figure out what will be done define the very *down-the-road approach* that flies in the face of an *up-front performance-based approach*. Ecology is still opting for the very we-know-it-when-we-see-it approach that it has been using all these years in its now-disapproved NCC. That is not a water quality standard. *See Northwest Environmental Advocates v. EPA*, 268 F. Supp. 2d 1255 (D. Or. 2003) (disapproving spawning criteria because criteria are meaningful and enforceable only if the state has designated when and where these particular uses may occur).

#### **A. Washington TMDLs Demonstrate Ecology Does Not Identify Natural Temperatures**

Washington’s past TMDLs demonstrate that the purported natural temperatures derived pursuant to its now-disapproved NCC based on models and the use of those models that Ecology fully intends to continue using, are not reliable for determining natural temperatures. One such TMDL is for temperature in the South Fork Nooksack River watershed. *See* Ecology, *South Fork Nooksack River Temperature Total Maximum Daily Load Water Quality Improvement Report and Implementation Plan* (Feb. 2020) (hereinafter “SF Nooksack TMDL”). Here we are lucky

enough to have had the involvement of the Nooksack Indian Tribe. As a result of the Nooksack Tribe's request, Ecology ran its model with variations to the inputs pertaining to natural conditions as follows:

- Cooler headwater and tributary temperatures.
- Decreased channel width.
- Increased effective shade due to increased vegetation height and riparian buffer width.
- Enhanced hyporheic exchange.
- The combined impact of all four alterations

*Id.* at 125. "The largest effect was seen from increased vegetation height and wider buffers. Combining all scenarios results in meeting numeric water quality criteria in portions of the river." *Id.* That is, by changing the assumptions being inserted into the model, the model demonstrated that the NCC did not need to override the biologically-based criteria in all the portions of the river that Ecology had said it would. The rationale for using the cooler headwater and tributary temperatures as alternative assumptions was as follows:

This scenario is intended to estimate the potential effect of intact riparian vegetation in tributary catchments (e.g. if there were no forestry activities in upland areas of the watershed). An intact riparian corridor in these catchments would potentially cool down tributary and headwater inputs. In the absence of a watershed model we cannot estimate the exact magnitude of stream temperature cooling. The 20% reduction is used to simply assess the effect of cooler temperatures beyond the range used in the original sensitivity analysis.

*Id.* at 126. Similarly, the riparian buffer and vegetation was altered as follows:

Based on recommendations from the Nooksack Tribe, the Shade Model inputs were altered to assume that climax vegetation, with a vegetation height of 290 ft., was achieved everywhere within a 218-foot buffer (TMDL Scenario 5, which is being used to estimate the TMDL allocations, assumes a 150-ft buffer and 166-ft SPV tree height). 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).

An increase in the buffer width from 150-218 ft. (75% of the new vegetation height) was also included in this scenario based on expert input from the Nooksack Tribe scientists, and based on information derived from FEMAT (1993).

*Id.* at 127-128. The results “show that the combined variations in the natural condition would result in summer critical condition temperatures which are cooler than or equivalent to the numeric criterion. Individually, increased vegetation height and buffer width had the largest effect while enhanced hyporheic exchange had the smallest effect.” *Id.* at 129. These results were set out in the TMDL:

**Table 33. Estimated maximum stream temperatures along the mainstem for natural condition variation model runs.**

Condition	Average Maximum Stream Temperature (°C)		
	All Reaches	Headwaters to Reach 28 (WQS Change <sup>10</sup> )	Reach 28 to Outlet
TMDL Scenario 5 -7Q10 Critical conditions	18.7	17.8	19.6
Cooler headwater and tributaries	18.0 (-0.7)	16.9 (-0.9)	19.0 (-0.6)
Decreased Channel Width	18.1 (-0.6)	17.2 (-0.6)	18.9 (-0.7)
Increased SPV height and buffer width	17.5 (-1.2)	16.7 (-1.1)	18.2 (-1.4)
Enhanced hyporheic exchange	18.6 (-0.1)	17.8 (-0.0)	19.3 (-0.3)
<i>Combined natural condition variations</i>	<i>15.8 (-2.9)</i>	<i>15.1 (-2.7)</i>	<i>16.4 (-3.2)</i>

*Id.* at 129-130.

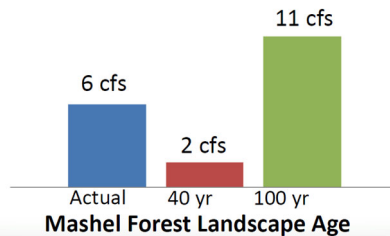
Regardless of the outcome of this evaluation, Ecology concluded that these new, cooler, temperatures were not the superseding (or not necessary) natural thermal potential temperatures. *Id.* at 138 (“Loading capacity for the mainstem of the SFNR can be approximated using the 100-year system potential scenario (scenario 5) under critical low-flow (7Q10) and air temperature conditions (90th percentile of the hottest week for each year of record). This scenario assumes 100-year SPV within the 150-ft buffer, tributaries and headwaters at or below the numeric water quality criteria, and microclimate effects of reduced air temperature.”). Scenario 5 did not even account for “[t]he effect of human activities on stream hydrology and channel geomorphology (e.g. geometry, hydraulics, hyporheic exchange, groundwater flow) on stream temperatures.” *Id.* at 125. Instead, Ecology argued that only in the future “[t]he extent to which the larger tree heights are applicable should be verified as part of implementation, and Load Allocations should be adjusted to include taller trees and wider buffers where applicable as an adjusted estimate of natural conditions.” *Id.* at 128. In other words, Ecology explicitly rejected identifying superseding temperature criteria based on the NCC that assumed no forestry activities in upland areas of the watershed. In none of its rulemaking documents has Ecology explained how it will zero out these upstream effects, not only on shade, channel morphology, downstream sedimentation and the like but on the effect of logging on reducing watershed flows. *See, e.g.,* Timothy Perry and Julia Jones, *Summer streamflow deficits from regenerating Douglas-fir forest in the Pacific Northwest, USA*, *Ecohydrology* 1-13 (2016) (average daily streamflow in summer in basins with 34- to 43-year-old plantations of Douglas-fir was 50 percent lower than streamflow from reference basins with 150- to 500-year-old forests dominated by Douglas-fir,





**Can longer forest harvest intervals increase summer streamflow for salmon recovery?**

**Simulated September Minimum Daily Flow**  
Average for 2006-2014



*Id.* at 37. EPA concluded: “VELMA results indicate that establishment of older (>80 yr?) forest landscapes could substantially increase summer low flows compared to the present-day Mashel watershed.” *Id.* at 38. There are plenty of other published papers that confirm this conclusion. In addition, EPA found that current logging practice rotations produce more sediment and “[l]ess large wood detritus for spawning and rearing habitat, prey species,” namely the complexity that accompanied natural water temperatures. *Id.* at 50.

**B. Washington TMDLs Demonstrate Ecology Does Not Make Superseding NCC Targets Sufficiently Clear to be Considered Criteria**

In other Washington TMDLs, Ecology uses the NCC to derive purportedly natural temperatures but is vague about what the resulting target is. The Palouse TMDL is an example. To start with, the Palouse TMDL omitted all non-shade anthropogenic inputs. *See Palouse TMDL* at 45. Making the point discussed immediately above, Ecology stated that “tributaries were modeled only as inputs into the mainstem Palouse River, with a specified flow and temperature. Separate temperature models were not created for tributaries, and system potential temperatures were not estimated. However, it is expected that larger temperature reductions are possible in the tributaries than in the Palouse River with the implementation of system potential riparian vegetation.” *Id.* at 44. Next, it did not provide superseding criteria but, rather, a wide range of possible temperatures that the TMDL was aiming to achieve. *See id.* at 41 (“A system potential temperature is estimated for both a critical climactic condition, represented by July 6-12, 2007, and for a critical low-flow condition, represented by August 25-31, 2007. The system potential temperature approximates natural conditions.”), 43 (“Moderate reductions in water temperature are predicted for hypothetical conditions with system potential mature riparian vegetation. Potential reduced maximum temperatures under critical conditions are still predicted to exceed both the 17.5°C and 20 °C criteria and the 22°C salmonid lethality limit. However, under the more moderate summertime conditions represented by August 25-31, 2007, system potential mature riparian vegetation is expected to result in maximum temperatures that do not exceed 22°C on many parts of the Palouse River.”). The NCC results, presented as ranges are set out in two referenced graphs, one of which is shown here:

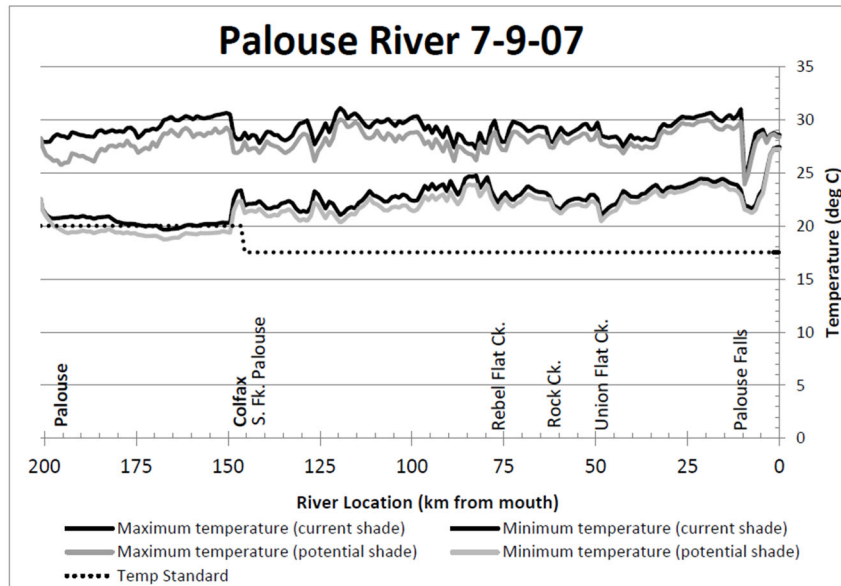


Figure 17. Predicted 7-day maximum and minimum temperatures in the Palouse River for July 6-12, 2007.

*Id.* at 42; *see also id.* at 43. These graphs show a range of temperatures, not criteria. The load allocations further demonstrate the circularity of the entire exercise and its extra-legal “know it when we see it” attributes. “The load allocation for the mainstem Palouse River below the Washington/Idaho state line, and the two miles of each study area tributary nearest its mouth, is the potential shade that would occur from system potential mature riparian vegetation.” *Id.* at 45.

Another type of unclear use of the NCC was in some TMDLs developed by Ecology and approved by EPA that specifically stated the results of modeling were being used by the TMDL under the NCC but did not constitute changes to the applicable criteria. For example, the Deschutes River TMDL stated that

When a water body does not meet its assigned criteria due to natural climatic or landscape attributes, the standards state that the natural conditions constitute the water quality criteria (WAC 173-201A-260 (1)(a)). This provision of the water quality standards is implemented by using the modeled natural condition as the TMDL target. Only after the allocations in this TMDL are fully implemented, or designated uses of the water body are being met will Ecology consider a formal rule change to adopt site-specific criteria, as provided by WAC 173-201A-430. At that point the natural condition, determined by empirical and modeled data, will be used to set new water quality criteria through a public rule-making process.

Ecology, *Deschutes River, Percival Creek, and Budd Inlet Tributaries Temperature, Fecal Coliform Bacteria, Dissolved Oxygen, pH, and Fine Sediment Total Maximum Daily Load*

*Water Quality Improvement Report and Implementation Plan – FINAL* (Dec. 2015) at 12-13. Under this approach, the NCC overrides the numeric criteria but puts nothing in its place, similar to what Ecology’s proposed new NCC would appear to do.

### **C. Ecology’s Proposed Performance-Based Approach Does Not Guarantee Better Outcomes Than Past TMDLs’ Use of the NCC**

Ecology summarizes the performance-based approach as “specify[ing] the procedures it uses to derive site-specific criteria (including methods, minimum data requirements, and decision thresholds) into its WQS regulation or other binding procedure document” because “EPA states that when ‘such a performance-based approach is sufficiently detailed and has suitable safeguards to ensure predictable, repeatable outcomes, EPA approval of such an approach serves as approval of the outcomes as well[.]’” TSD at 31. The two-fold problem arises here: there is nothing in this EPA description to ensure that aquatic species are fully protected and there is nothing in Ecology’s proposal that will “ensure predictable, repeatable outcomes.” This is primarily because Ecology seems to ask the question: if someone runs the same model with the same assumptions, will it have a predictable, repeatable outcome?<sup>2</sup> But that really is not the most important issue. The issue is whether different people would make the same assumptions because, as the saying goes, “garbage in/garbage out.”

Ecology very specifically takes a position that does not ensure a predictable outcome:

Ecology recognizes that unique characteristics of waterbodies may result in different, yet still firm scientifically, approaches taken to calculate natural conditions. Our proposed performance-based approach balances these items by providing project requirements (e.g., QAPP, model, elements) while also leaving details of such requirements within the projects themselves (e.g., model precision, amount of undisturbed vegetation of a stream). Every use of the performance-based approach must have a report detailing the evaluation, data usage, and criteria calculations. This report follows alongside the natural conditions criteria for subsequent use in any state or federal CWA action. This includes during public involvement, such as during draft TMDLs.

TSD at 66. Ecology’s proposal is to require that there are a QAPP, a model, and “elements,” but to “leav[e] details of such requirements within the projects themselves” and just to make sure that “all methods and assumptions made [are] documented.” *Id.* at 42, 66. There are only vague references to sensitivity testing. *Id.* at 42, 85 (it must be conducted); Performance Guidance at 17 (same); *id.* at 12 (asserting merely that conservative assumptions will be used). The details are precisely the issue when one is attempting to produce an outcome that is predictable and repeatable. The example of the South Fork Nooksack TMDL is a stark example of the difference in the results that occurs when different assumptions are plugged in to a model. The paperwork

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<sup>2</sup> It appears that Ecology thinks this is the issue. *See* Performance Guidance at 16 (“The model must allow for reproducibility of results.”).

that Ecology claims will be added—“a report detailing the evaluation, data usage, and criteria calculations”—is merely paperwork and likely not much more than Ecology already includes in TMDLs now that are based on the previous now-disapproved NCC. This is all business-as-usual with Ecology suggesting that more paperwork—produced *after* EPA’s hoped-for approval of the NCC, and *after* any ESA consultation—somehow makes this a performance-based approach that can be approved prior to its being used.

### 1. Upstream Water Inputs

Nothing in the documents provided by Ecology explains how the result of using the performance-based approach will ensure a sufficient level of protection. While the guidance referenced in the rule has lots of “elements,” it does not do anything substantive to ensure predictability of outcomes. *See* Performance Guidance. For example, the approach does not establish the key issue of how Ecology will determine the flows and temperatures (and other attributes) of water entering modeled rivers from tributaries. Ecology acknowledges that upstream waters *may* be among those that affect the “site of interest.” *See, e.g., id.* at 11, 12, 18, 22. Ecology does not say how it will consistently decide whether it is an “is” or “is not.” *See id.* at 12 (“data *may* be necessary to characterize the site of interest”; headwaters, tributaries and groundwater “*may* include applicable water quality data (e.g., dissolved oxygen, sediment characteristics, turbidity) (“This *may* also include information regarding nutrient fluxes (e.g., phosphorus, nitrogen, dissolved organic carbon), sediment fluxes, site alkalinity, or planktonic data”) (emphasis added). The guidance states that for modeling purposes, “[t]he flow and water quality information for any groundwater, tributaries, upstream inflows, and open boundary inflows must be set at estimated natural conditions of those waters based on readily available and credible information,” but it fails to say anything about what is meant by “readily available and credible information,” including how state law affects this definition,<sup>3</sup> and how the “estimated natural conditions of those waters” will be reliable and replicable. *Id.* at 17. It asserts that “[a]ny impacts by humans on tributaries which influence the site of interest,” “[l]oss of stream baseflow or other flow changes (e.g., stagnant conditions),” and “[d]ecreased groundwater availability due to human withdrawals, among other anthropogenic changes to groundwater, sedimentation, benthic vegetation, and residence times “must be accounted for and removed in the natural condition estimation” but it does not say how and to what extent this must be done. *Id.* at 19. That is, in current uses of models under the now-disapproved NCC, Ecology claimed to accomplish this outcome and yet the results were highly variable and therefore did not meet the requirements of a performance-based approach.

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<sup>3</sup> The guidance indicates that site photographs and various records may be used without explaining if these are required to meet Washington’s credible data law. *See* Performance Guidance at 14-15 (“Data sourced for water quality and site characterization is not limited to numeric datasets.”). The TSD discusses the state law but does not indicate in what instances Ecology might be precluded from using data or information. *See* TSD at 67.

## 2. Riparian Buffer Width Inputs

The guidance completely ignores the matter of what riparian buffer width will be assumed in determining what the purportedly natural temperatures and dissolved oxygen levels are. The word “width” literally does not appear in the document, which is ludicrous when one considers how much riparian buffer width is the central issue fought over with regard to logging practice regulations. Other references are exceedingly vague. *See id.* at 12 (a description of existing riparian conditions and vegetation “may include, but is not limited to, tree canopy cover data, system shade potential, any applicable stream buffer zones[.]”). System shade potential and “applicable stream buffer zones,” which sound more like a regulation than an on-the-ground measurement, are themselves inputs based on even more assumptions. Determining what constitutes the “system shade potential” is not obvious, again as already discussed. In evaluating the model riparian conditions, the guidance urges “[c]omparison of vegetation height or density to applicable reference sites” without explaining how this will be done and why it is reliable and replicable. *Id.* at 20. It asserts that “loss of riparian shade or other vegetation impacts along the shoreline due to human actions must be accounted for and removed in natural condition estimations,” but it does not mandate how this will be done, reverting instead to the paperwork solution: “The methods used must be documented.” *Id.* The only detail provided is in a footnote and pertains to system potential tree height. *See id.*, note 6.

## 3. Tree Height Assumption Inputs

In many Ecology TMDLs, the determination of what riparian width to use to approximate natural temperatures is based on tree height. For example, in the 2008 Lower Skagit TMDL, “[t]ree heights (at 100-year site index) ranged from 37 to 53 meters. Riparian zone widths were estimated as 75% of average tree height (FEMAT 1993) and ranged from 28 to 40 meters[.]” Ecology, *Lower Skagit Tributaries Temperature Total Maximum Daily Load Water Quality Improvement Report* (July 2008) at A-156. In the South Fork Nooksack, as discussed in Section III.A, *supra*, increasing the vegetation height resulted in a wider riparian buffer, with a resulting different set of potential supplanting criteria, or use of the numeric criteria. *See SF Nooksack TMDL* at 127 (“An increase in the buffer width from 150-218 ft. (75% of the new vegetation height) was also included in this scenario based on expert input from the Nooksack Tribe scientists.”). Specifically, the TMDL noted that choosing tree height based on an age of 100 years limited the degree to which anthropogenic influences were actually removed from the model results:

The climax vegetation height of 290 ft (88.4 mm) was chosen [by the Nooksack Tribe] 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).

*Id.* Notwithstanding Ecology’s own experience, it has not addressed the problem in its guidance here. There is simply nothing definitive provided by Ecology and nothing that ensures that anthropogenic influences are entirely removed. The guidance provides a little input into how to determine the height (and nothing that ties the riparian width to heights). It suggests that reference sites can be used, “historical tree height comparisons,” and use of tree diameter data. Performance Guidance at 20. It is unclear what some of these items mean, how one approach would be chosen over another, what test there will be to ensure that the maximum tree heights under historical conditions are chosen, what Ecology would do where there are no extant trees, and most of all whether it will continue to use 100-year old tree heights with the full knowledge that doing so does not remove all anthropogenic heat influences. This is what it did in the past and its failure to acknowledge that fact damns its future.

#### **4. Geographic Scope**

Ecology states that “[t]he site boundary consists of the entire model domain” and that “[n]atural conditions criteria for each assessment unit will be derived based on the resolution of the model and the spatial and temporal variability of its predictions.” Performance Guidance at 9-10; *see also id.* at 17. This is not clear. The “entire model domain” is never defined in the guidance although the second part implies that Ecology will model every single waterbody to which it applies the NCC. It should clarify what this means because this could be a very significant question of resources. Alternatively, if Ecology is proposing that it will continue as it has, modeling mainstems and significant tributaries and attributing some natural characteristics to other watershed streams, then Ecology is not breaking any new ground here to explain how this is a performance-based approach that will provide replicable results.

#### **5. Channel Morphology**

Assumptions of channel morphology, along with related matters such as sedimentation that alters width:depth ratios is another area in which Ecology fails to ensure that results of a new NCC will be replicable. For example, the accounting for impacts to water quality that “must be accounted for and removed” “must be in the project specific QAPP.” Performance Guidance at 19. This includes “[l]oss of channel complexity.” *Id.* Likewise, it is the QAPP that identifies “[a]ll methods and procedures to characterize how these will be accounted for and removed” for the following “[i]mpacts by humans on boundary or initial conditions of the site”:

- Any impacts by humans on tributaries which influence the site of interest.
- Loss of stream baseflow or other flow changes (e.g., stagnant conditions)
- Decreased groundwater availability due to human withdrawals.
- Human recharge to groundwater that results in discharges that affect DO levels and nutrient concentrations in streams.
- Increased sedimentation, including fine sediment.
- Changes to benthic submerged aquatic vegetation.
- Changes in residence time of the system

*Id.* And this list is not even completed, as Ecology notes it “includes but is not limited to.” *Id.* How can a list that is not complete and kicks the determination of how these anthropogenic impacts will be accounted for and removed constitute a performance-based approach? There is no other discussion of making assumptions about sedimentation and no reference at all to changes in width:depth ratios of streams. There is literally one use of the word “logging” in the entire methodology on using the performance-based approach and it merely states there might be useful records from other agencies, but says nothing about how to assume that logging did not occur in a watershed in order to accurately determine a natural temperature. *Id.* at 15.

## 6. Data Gaps and Conservative Assumptions

Ecology’s discussion of “data gaps” is ludicrous. The guidance notes they “may be present.” Performance Guidance at 12. The sum total of the explication of how to address such data gaps—a significant issue in replicability—is as follows:

Any data gaps in the data compilation should be identified. If data gaps are filled (such as through estimation), or any data are estimated for the project, the process for doing so must be described in the project QAPP and final report, and its use must be supported with best professional and scientific judgement.

*Id.* at 15. This describes a process by which staff will make estimates and describe them later. It in no way explains how this process of making estimates will ensure that the outcome of “estimates,” also known as assumptions, will result in a replicable outcome. The output of a model is based on the assumptions that are put into it. Therefore, a description of how one is going to make those assumptions that merely says that the work will be done later is not a description of a performance-based approach. It is a description of how Ecology has worked under the previously now disapproved NCC. Likewise, the observation that “[c]onservative assumptions reflective of natural conditions will be made based upon sensitivity (range) testing” is too vague to ensure replicable results. *Id.* at 12.

Ecology leans hard on the idea that a QAPP is going to resolve all the problems with its weak performance-based approach. A future document that sets out various elements is simply not a performance-based approach. Moreover, Ecology proposes to incorporate this document by reference in the rule itself but the performance-based approach guidance refers to yet other guidance documents that Ecology can change at any time. *See, e.g.*, Performance Guidance at 11 (referring to Appendix A of Ecology’s Programmatic QAPP).

## IV. HUMAN USE ALLOWANCE

Ecology relies on EPA’s previous observations that not allowing the human use allowance (“HUA”) for temperature would be “unnecessarily restrictive” and “lead to unnecessary costly expenditures.” TSD at 53, quoting EPA’s 2007 BE. EPA also states that the HUA for temperature is, by definition, “insignificant because monitoring measurement error for recording instruments typically used in field studies is approximately 0.2°C to 0.3°C.” *Id.* at 53, quoting



EPA’s 2007 BE. Ecology never discusses, however, that the output of models using the NCC in TMDLs to determine natural conditions criteria is not affected by measurement error.

Take, for example, the Palouse TMDL where wasteload allocations made to the sole NPDES discharger are in increments smaller than 0.3° C:

**Table 12. Flow-conditional effluent temperature wasteload allocation for Palouse WWTP, based on month and river flow.**

Month	May	June	July	August	September	October	November-April*
Potlatch Q	Effluent Limits in degrees C						
0.2	20.1	20.2	20.2	20.2	20.2	20.2	20.1
0.4	20.2	20.3	20.3	20.3	20.4	20.3	20.1
0.6	20.3	20.5	20.5	20.5	20.5	20.5	20.2
0.8	20.5	20.6	20.7	20.7	20.7	20.7	20.3
1	20.6	20.8	20.9	20.9	20.9	20.8	20.3

Palouse TMDL at 52, Table 12 (partial). Take, for another example, the TMDL developed by Ecology and approved by EPA for temperature in the Pend Oreille River, which includes load allocations with two decimal places as follows;

**Table 11. Pend Oreille River reaches examined and their compliance with Parts 1 and 2 of the Washington State temperature criteria.**

Criteria	Reach	River Mile Segment	Criteria Met		Level of Criteria Exceedance (°C)*	
			2004	2005	2004	2005
Part 1- Washington State Pend Oreille River Temperature Criteria	Newport	88.0 - 84.4	Yes	Yes	=	=
	Dalkena	84.3 - 77.0	Yes	Yes	=	=
	Skookum	76.8 - 72.4	No	No	0.21°C	0.20°C
	Kalispel	72.3 - 63.7	Yes	Yes	=	=
	Middle	63.6 - 56.1	Yes	Yes	=	=
	Blueslide	56.0 - 47.7	Yes	Yes	=	=
	Tiger	47.6 - 36.4	No	No	0.44°C	0.51°C
	Box Canyon Forebay	36.2 - 34.6	No	No	0.95°C	0.93°C
	Metaline	34.4 - 27.1	No	No	0.58°C	0.17°C
	Slate	26.9 - 19.6	No	No	0.45°C	0.19°C
	Boundary Forebay	19.5 - 17.1	No	No	0.70°C	0.47°C
Boundary Tailrace	16.8 - 16.2	No	No	0.53°C	0.27°C	

Ecology, *Pend Oreille River Temperature Total Maximum Daily Load Water Quality Improvement Report* (Nov. 2011 rev.) at 73, table 11 (partial). Now, in that context, please explain how the derivation of an NCC need be limited to an increment of 0.3° C beyond the model-derived superseding NCC criteria.

Ecology cites the U.S. Fish and Wildlife Service’s determination that “allowable increases in point sources contribute to the cumulative warming of the waterbodies and maintains degraded baseline conditions in areas where temperatures are already above optimal levels for bull trout” but then proceeded to ignore this concern entirely. TSD at 54. According to Ecology, NMFS simply did not discuss the HUA for temperature at all, except for lakes. *Id.* at 54. Failing to address the underlying superseding temperature is inconsistent with EPA’s guidance. See Regional Guidance at 28 (“EPA believes it is particularly important for the TMDL itself or the

TMDL assessment document to address the above aspects of the natural thermal regime for waterbodies where the natural background maximum 7DADM temperature exceeds 18°C and where the river has significant hydrologic alterations (e.g., dams and reservoirs, water withdrawals, and/or significant river channelization) that have resulted in the loss of temperature diversity in the river or shifted the natural temperature pattern.”). Ecology should assume that increments of temperature become more hazardous as assumed natural conditions temperatures rise and phase such allowable increases out accordingly in order to meet its purported goal of protecting aquatic species.

The NCC derived criteria must “reflect pre-climate change conditions when high quality data are available, and data selected for assessment of anthropogenic sources and impacts may be from a more recent timeframe than data used to estimate natural conditions.” TSD at 42.

Notwithstanding this effort to ensure that only the best data are used to derive superseding criteria, Ecology proposes to undermine this effort by giving an unknown human use allowance, not the one that is described in the various proposed rule changes. These are unknown because they do not take into account any human sources that are not “local or regional.” By definition, an unlimited amount of human-created climate change is not factored into the HUA. Neither is an unlimited amount of Canadian impact to dissolved oxygen levels in Puget Sound. *See* Implementation Plan at 10. Because the human use allowance is an integral part of the NCC, this addition creates an unknowable, non-replicable, and unprotective supplanting criteria to the biologically-based numeric criteria for temperature and dissolved oxygen. Seen another way, the proposal is to identify a purportedly natural condition and add to that any anthropogenic source of warming that is not local or regional (e.g., climate change) and then apply the HUA to that number. In this regard, the purported natural condition is not natural at all. Not only does this turn the concept on its head but it is inconsistent with EPA guidance. *See* Regional Guidance at 37 (“if a State or Tribe has a de minimis temperature increase allowance above natural background temperatures (see Section V.1.A), the TMDL allocations should be based on attaining the natural background temperature plus the de minimis temperature allowance (e.g., natural background temperature plus 0.25°C).”); *see also id.* at 38 (EPA concerns about NCC-derived criteria that exceed 18° C).

#### **A. Proposed Changes to What Human Actions are Included in the HUA**

Ecology “propose[s] to adjust the language regarding what actions are considered in the cumulative allowance.” TSD at 45. Ecology refers to this as proposing “to keep the prior human action cumulative value,” *id.* at 50, but the prior value did not restrict human contributions to only those from the United States and adjoining states. By building in an exception to what human impacts will be controlled through the HUA, Ecology’s assertion that it “reviewed published literature to ensure that the 0.3°C allowance would not harm aquatic life or their designated uses” rings hollow because it is, frankly, irrelevant. TSD at 54.

To illustrate the level of warming not included in the HUA but that will be included in real life, there are two regional TMDLs that assessed the impacts of climate change on warming of waters in the Northwest. In its temperature TMDL for the Columbia River, EPA found that past impacts

of climate change have “increased summer water temperatures in the Columbia and Snake Rivers by approximately 1.5°C since the 1960s.” EPA, *Columbia and Lower Snake Rivers Temperature Total Maximum Daily Load* (Aug. 13, 2021) (hereinafter “Columbia Temperature TMDL”) at 2, 36 (“the estimated increase in river temperatures since 1960 ranges from 0.2°C to 0.4°C per decade, for a total water temperature increase to date of 1.5°C ± 0.5°C.”). EPA estimated future climate change impacts relevant to Washington waters beyond the mainstem Columbia and Snake Rivers covered by the TMDL:

In the Methow River near Winthrop, Washington, average annual stream temperatures are projected to increase by 0.4°C to 0.8°C (early century to late century, respectively) in response to moderate emissions (CMIP3 A1B) (Caldwell et al. 2013). Similar increases ranging from 0.6°C to 1.7°C (early century to late century, respectively) are projected in response to moderate emissions (A1B) for watersheds in Washington, Oregon, Idaho, western Montana, and portions of British Columbia (Wu et al. 2012). Simulations by Mantua et al. (2010) for over 100 sites predict increases in stream temperatures in Washington ranging from approximately 1°C to 2°C for early century, 1°C to 4°C for mid-century, and 1°C to 5°C for late century. Results varied across sites and by CMIP3 emission scenario (low [B1] to moderate emissions [A1B]).

\* \* \*

Using the CMIP3 A1B (medium emissions) scenario and the NorWest spatial statistical network model, the Pacific Northwest regional August mean river temperatures are projected to increase by 0.7°C in 2040 and 1.4°C in 2080, compared to a baseline period of 1993 – 2011 (Isaak et al. 2017).

Beechie et al. (2013) used a coupled model, called the dominant river tracing-based stream flow and temperature model, to estimate flow and stream temperature in the Columbia River basin for future climate conditions (CMIP3 A1B). They predicted an increase in the maximum weekly mean temperature across the watershed of 1°C to 4°C for 2030 – 2069 and 2°C to 6°C for 2070 – 2099. They also predict that the number of stations where water temperatures are projected to exceed 21°C for more than nine weeks per year will increase dramatically by the end of the century.

*Id.*, Appendix G at 18. EPA also concluded that Columbia River “[t]ributary temperatures are predicted to increase between 0.6°C and 0.7°C relative to Columbia River temperatures.” *Id.* at 19. Nevertheless, “[c]limate change trends and heat sources in Canada and Idaho are not allocated a portion of the 0.3°C.” Columbia Temperature TMDL at 50. The climate change impacts swamp the HUA.

In the South Fork Nooksack TMDL, EPA and Ecology evaluated the impacts of climate change past and future but did not include that impact in the TMDL itself. SF Nooksack TMDL at 162 (evaluation of climate change is in Implementation Plan), 172 (same). The analysis was grim:

High water temperatures in the South Fork are detrimental to fish and other native species that depend on cool, clean, well-oxygenated water. Populations of Nooksack salmon, especially Nooksack early Chinook, have dramatically declined from historic levels. Growing evidence shows that climate change will exacerbate legacy impacts to temperature, hydrologic, and sediment regimes of the South Fork.

*Id.* at 162. Summarizing the studies completed by EPA, the TMDL found that climate change impacts have already far exceeded the HUA of 0.3° C: “Recorded air temperature monitoring in the vicinity of the South Fork has suggested a 1.3 °C increase from 1905 through 2010.” *Id.* at 164. Looking forward, the EPA studies “developed a total of 18 climate scenarios using scenarios 3 (Existing Vegetation) and 5 (100-year SPV plus microclimate effect) from the TMDL as starting templates to combine with high, medium, and low impact GCMs for climate conditions of the 2020s, 2040s, and 2080s (2 x 3 x 3 scenarios).” *Id.* at 176. The result of this analysis demonstrated that future climate change impacts would also far exceed the HUA of 0.3° C:

Restoration of full system potential riparian shading (i.e., desired future conditions) can help buffer against temperature increases; however, even with system potential shade, the critical condition maximum 7-day average stream water temperatures are expected to increase by 1.1 to 3.6 °C by the 2080s. In conjunction with this increase, the percent of stream miles in which critical condition water temperatures exceed levels identified as potentially lethal to salmon is predicted by the model simulations to increase dramatically—from about 18% at present to between 60% and 94% in the 2080s, depending on the climate model.

*Id.* at 176. Note that EPA did not use a scenario developed for the Nooksack Tribe discussed in Section III.A, *supra*.

Notwithstanding this projection, as with the Columbia River TMDL, the South Fork Nooksack TMDL did not allocate any of the HUA to future climate change. *Id.* at 178 (“the climate analysis does not change the TMDL allocations for the SFNR.”). The combination of past climate change and future climate change—ranging from 2.4 to 4.6° C—simply swamp the purportedly protective HUA (1.3° C + 1.1–3.6°C = a range of 2.4° C – 4.6° C). Ecology might argue that in the face of climate change, the HUA is barely detectible, but the reality is that it is being added to an as-yet-unknown purportedly natural criterion and, as defined by Ecology in this proposal, added to the effects of climate change. There is simply no analysis of how this set of unknown but high temperatures is going to be protective of aquatic species.

## **B. Proposed Changes to HUA for Dissolved Oxygen**

Ecology proposes a new version of the human allowance for insignificant exceedances of the natural condition dissolved oxygen criteria that includes either 10 percent of the NCC or 0.2 mg/L, whichever decrease value is smaller. TSD at 45. We support the concept of an increasingly smaller HUA as purportedly natural conditions become less protective of aquatic species as a method intended to provide some, albeit limited, assurance that the end result will be protective of designated and existing uses. There is, however, no low level of dissolved oxygen beneath which Ecology will not allow even more deadly conditions. This does not make sense if the goal is to ensure protection. Ecology has not clearly demonstrated that its 10 percent of the NCC does provide sufficient protection at low dissolved oxygen levels or whether that should be a smaller increment. And, combined with other ambiguities and lack of protection discussed elsewhere, what protection this does provide cannot provide adequate compensation. For example, removing the Canadian and global sources from the HUA adds more risk to the species, even as Ecology is proposing to reduce risk through this graduated HUA. The graduated HUA cannot be assessed in a vacuum and Ecology does not provide the needed information.

## **V. PROPOSED RULE LANGUAGE**

### **A. Definitions.**

Ecology proposes to add a definition for local and regional sources of human-caused pollution. The purpose of this definition is to support the human use allowances, for example in proposed WAC 173-201A-200(1)(c) for freshwater temperature, where the HUA would cover only the local and regional sources while all other sources, *i.e.*, outside of Washington or the United States. This definition means that the anthropogenic contributions to the natural conditions would not, in fact, be limited. They would be unlimited. In addition to climate change, discussed in Sections IV and IV.A, *supra*, this is likely most pertinent to waters in the Salish Sea that are affected by Canadian sources of nutrients, such as nitrogen.<sup>4</sup> Excluding Canadian sources when identifying how much pollution reduction is required from U.S. sources bakes in anthropogenic pollution into what is purportedly a natural conditions criterion. This is not acceptable, as discussed in Section IV.A, *supra*.

The proposed definition for performance-based approach focuses on obtaining “predictable and repeatable outcomes” but because of the reasons explained in this comment letter, the definition does not reflect the problems with the rest of the rulemaking. Running a model with the same inputs numerous times will produce predictable and repeatable outcomes. This definition and none of the other aspects of this proposal address how Ecology will make credible estimates of the flows and temperatures entering downstream waterbodies that remove the anthropogenic

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<sup>4</sup> Note that in EPA’s Columbia River Dioxin TMDL, the agency reserved allocated a portion of the loading capacity to a known Canadian source as well as in a margin of safety to cover “other unidentified sources upstream of the U.S.-Canada border.” EPA, *Total Maximum Daily Loading (TMDL) to Limit Discharges of 2,3,7,8-TCDD (Dioxin) to the Columbia River Basin* (Feb. 25, 1991) at 4-1, 4-2.

influences of, say, upstream logging, again as discussed above. Until Ecology puts out an evaluation of how it has failed to account for such upstream conditions and then explain how it will in the future account for them, it has not made a persuasive case. Also, this definition does not address the other conditions that could mitigate unsafe but natural levels of temperature and dissolved oxygen, as discussed in Section II.B, *supra*.

## **B. Criteria Rule Language.**

Ecology proposes revisions to its WAC 173-201A-260(1) Natural conditions and other water quality criteria and applications – Natural and irreversible human conditions to read as follows:

(a) It is recognized that portions of many water bodies cannot meet the assigned aquatic life criteria due to the natural conditions of the water body. When a water body does not meet its assigned aquatic life criteria due to natural climatic or landscape attributes, the natural conditions constitute the water quality criteria.

When natural conditions constitute the aquatic life water quality criteria, criteria values may be established using site-specific criteria (see WAC 173-201A-430), use attainability analysis (see WAC 173-201A-440), or the performance-based approach (see WAC 173-201A-470).

There are numerous problems with the proposal. First, paragraph one of subsection (a) appears to stand on its own, stating that if a waterbody does not meet numeric criteria due to natural conditions, “the natural conditions constitute the water quality criteria.” This is not accurate. The natural conditions constitute the water quality criteria *only if* Ecology takes other actions. These are spelled out as criteria that “may be established” by three means.

Second, it seems pointless for Ecology to point out that it may develop site-specific criteria or conduct a use attainability analysis because both of those actions require that Ecology submit the results to EPA for approval. The purpose of this criterion would be better kept narrowly focused on Ecology’s desire to supplant numeric criteria with purportedly natural conditions criteria.

Third, there is no reference in this provision to reflect the mantra that Ecology has sprinkled all over its rulemaking documents, namely that the resulting criteria must protect the existing and designated uses. Instead, there is imbedded the false conclusion that whatever Ecology says is natural is inherently protective and that natural conditions are limited to water quality. As the court explained in the Oregon NCC litigation, and as has been recognized by the use of narratives to mitigate the harm from 20° C migration temperatures, and that EPA explained in its regional guidance, that is simply not true.

Fourth, there is no temperature that could be established by the NCC provisions that would not be made hotter through the use of the HUA plus unlimited non-HUA warming. There is no level of dissolved oxygen that could be established by the NCC provision that would not be made

lower through the use of the HUA plus unlimited non-HUA oxygen depletion. This is simply inconsistent with the requirement that the end result must protect aquatic species.

Ecology suggests that it will cease using the NCC as a “one-way ratchet.” TSD at 28 (“In some cases, this could result in a natural conditions criterion that is more stringent than the statewide numeric criteria.”). It reiterates that EPA supports this approach. *Id.* at 41. There is not, however, any place in the proposed rules that establishes this as a requirement for using the NCC provisions. In fact, having colder temperatures is part of the need to create diversity and complexity in the aquatic environment discussed in Section II.B, *supra*.

Ecology also says that, instead of using both the hotter and colder natural temperatures, EPA “note[s] that the state can use the biologically based numeric criteria instead, but Ecology must provide a rationale as to why those criteria are protective of the most sensitive designated use.” TSD at 41. Again, this is not captured in the rule language. Moreover, there are several problems with this concept. First, Ecology has not provided any method by which it will judge whether the NCC-derived criteria are protective of the beneficial uses in the first place. Therefore, it is even more unclear how it will make a judgment that setting colder derived temperatures at numeric criteria, or lower dissolved oxygen levels, will be assessed protective or not. Second, Ecology has said nothing in its rule language or all the documents about the need to protect and restore thermal and other complexity that would have made natural temperatures supportive of aquatic species in the past. Therefore, it has no way of judging whether the NCC-derived criteria would be protective at purely hotter and colder temperatures or only hotter temperatures. Last, please explain how Ecology’s providing a rationale after-the-fact of EPA’s approval of the NCC, and ESA consultation, in any way constitutes a “performance-based approach” and in any way would ensure the outcome is protective of the species as required by the regulations.

Ecology proposes a new section, WAC 173-201A-470 Performance-based approach. Its purpose is set out in its subsection (3), namely that criteria developed using this approach need not be submitted to EPA for approval. It proposes to meet EPA’s requirements for a performance-based approach by including the following requirement:

Aquatic life water quality criteria must be derived using the procedures referenced in Ecology publication 24-10-017, “A Performance-Based Approach for Developing Site-Specific Natural Conditions Criteria for Aquatic Life in Washington,” as revised.

Proposed WAC 173-201A-470(1). This is not acceptable. First, the incorporation by reference is to a document “as revised.” This means that the water quality standard that Ecology is asking EPA to approve is referencing a document that Ecology can change at any time without EPA approval. That is, of course, entirely absurd as it defeats the purpose of this rulemaking. Second, the publication is wholly inadequate, as discussed *supra*.

Ecology also proposes the following language:

If development of aquatic life criteria using the performance-based approach cannot meet the requirements set forth in these procedures, then alternatives specified in the paragraph following WAC 173-201A-260(1)(a) may be used.

Proposed WAC 173-201A-470(4). This reference is to this language, although bizarrely it is not referenced as WAC 173-201A-260(1)(b) instead of “the paragraph following”:

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).

This is nonsensical. Ecology is saying if the performance-based approach isn't going to work, revert to the existing “alternative estimates,” which plus a HUA will constitute “an alternative criteria.” Is there a more clear-cut example of how Ecology is attempting to package its business-as-usual NCC as a performance-based NCC while actually not changing anything? No, this language is not acceptable for the reasons given by the court in the Oregon NCC litigation and EPA's disapproval of Oregon's NCC.

**VI. ALL THE ATTENTION TO THE NCC BEGS THE QUESTION: WILL ECOLOGY USE ITS NCC MODELS TO DETERMINE WHAT NONPOINT SOURCES NEED TO DO TO MEET ALLOCATIONS AND CRITERIA?**

Frankly, all of Ecology's attention to the NCC is utterly irrelevant to meeting its mission to protect and restore aquatic health to Washington's waters. Ecology already invests significant resources into the development of TMDLs, when it bothers to issue them, the vast majority of which are based on the now-disapproved NCC provisions. Ecology has never used its TMDL models to determine the needed riparian buffers, let alone taken any enforcement action against nonpoint sources based on the TMDL outputs. Yet it asserts that for EPA-approved TMDLs it should “[c]ontinue implementation measures.” Implementation Plan at 14. No amount of pages in those TMDLs is a guarantee of any actual on-the-ground and in-the-water implementation of the findings made in them. Deriving superseding purportedly natural conditions criteria and not using them to restore water quality to anywhere remotely resembling natural conditions is an absurd use of agency and taxpayer resources. Moreover, by failing to take the necessary enforcement actions against point and nonpoint pollution sources, Ecology wastes the opportunity to save species that are on the brink of extinction, along with those that are extirpated in Washington waters, along with those that surely will join such lists of species in the future.



## VII. ECOLOGY SHOULD IMPROVE THE FORMATTING OF ITS DOCUMENTS

Ecology uses a very basic outline form in its various documents, but it hides the ball and creates ambiguity by not making the outline form clear. The form, such as it is, can be seen in the Table of Contents, without any indicators of outline level, *i.e.*, a combination of Roman and Arabic numerals, capital and lower case letters. The lack of anything other than two levels in the Table of Contents renders the document to have less than ideal clarity for the reader. For example, on page 48 of the Proposed Updates, there is a heading entitled “A Performance-based Approach for Developing Site-Specific Natural Conditions Criteria for Aquatic Life in Washington.” Below are various sections, such as “General provision updates” (medium blue), “2021 Disapproval of previously approved natural conditions,” “EPA 1997 memorandum and 2015 framework guidance.” But these are not subsections. Another example is on page 50 pertaining to “Human use allowances” (medium blue), which is followed by various sections including “Temperature” with the only indications that the subsections that follow that are, in fact, subsections, indicated by a change in font. On page 64, the heading “Lake criteria” is just free floating after pages about temperature. We could go on with examples. The point is that if Ecology used an outline format—used by nearly every other regulatory agency—every reader would have more clarity and less ambiguity as they are reading, and in consulting the document later.

## CONCLUSION

To quote William Shakespeare, this set of documents intended to explain and support Ecology’s rulemaking for new Natural Conditions Criteria is best described by the character Macbeth as “full of sound and fury, Signifying nothing”:

Tomorrow, and tomorrow, and tomorrow,  
Creeps in this petty pace from day to day,  
To the last syllable of recorded time;  
And all our yesterdays have lighted fools  
The way to dusty death. Out, out, brief candle!  
Life’s but a walking shadow, a poor player,  
That struts and frets his hour upon the stage,  
And then is heard no more. It is a tale  
Told by an idiot, full of sound and fury,  
Signifying nothing.<sup>5</sup>

Sincerely,



Nina Bell  
Executive Director

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<sup>5</sup> William Shakespeare, *The Tragedie of Macbeth* (circa 1606).