Nooksack Indian Tribe

July 30, 2024

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

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

Dear Ms. Koberstein:

Thank you for the opportunity to comment on the proposed updates to the Washington Water Quality Standards for Natural Conditions Provisions in WAC Chapter 173-201A. Nooksack Indian Tribe (NIT) strongly encourages the Washington State Department of Ecology to uphold its legislative mandate to maintain the highest possible standards. As stated explicitly in Chapter 90.48 of the Revised Code of Washington (RCW):

> *"...it is the public policy of the state of Washington to maintain the **highest possible standards to insure the purity of all waters of the state** consistent with public health and public enjoyment thereof, the propagation and protection of wild life, birds, game, fish and other aquatic life, and the industrial development of the state, and to that end require the use of **all known available and reasonable methods by industries and others t**o prevent and control the pollution of the waters of the state of Washington" (Chapter 90.48.010 RCW). **[emphasis added]***

Although Ecology is not suggesting a reduction in allowances for human activities, we foresee that some dischargers may seek to lower standards under the guise of improving public processes. Washington State currently maintains rigorous standards for temperature and dissolved oxygen, and Ecology should not yield. We urge Ecology to maintain the highest possible standards and to strengthen, and never weaken, water quality standards to protect aquatic and human life.

The following are specific comments with regards to the proposed Natural Conditions Criteria ("NCC"):

Include climate change in the human allowances.
Climate change is warming Washington state waters, and warmer water holds less oxygen. Data collected by NIT and others clearly demonstrate increasing temperatures and extended periods of exceedance throughout the watershed. Climate change should be included into the human allowances. This means there is less capacity for impacts from current human activities, which will result in more stringent regulatory requirements. Ecology must integrate climate change impacts into human activity allowances, necessitating stricter regulatory measures to mitigate current impacts effectively.

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Uncertainty in modeling

Modeling by its very nature includes uncertainty. Due to various factors, including loss of traditional ecological knowledge as a direct result of colonialism, western science's understanding of historical conditions is often based on anecdotal information and inferred from data not collected for the purpose of environmental study. This can lead to a mischaracterization of historic conditions and result in an interpretation that is full of uncertainties. Without a complete understanding of historical habitat conditions, it becomes difficult to estimate historical water temperatures upon which the Natural Conditions Criteria depend. Instead, models rely on a set of assumptions, all of which impart uncertainty, and can require extensive site-specific data for extrapolation. Each change in the assumptions made to the model input affects the model outputs and thus the characterization of "natural conditions".

Temperature regimes in streams and rivers are influenced by a complex array of processes and conditions, and we are particularly concerned about the potential for natural conditions modeling to overestimate natural condition temperatures. For example, for the South Fork Nooksack River Temperature TMDL, natural temperature conditions were modeled using the 100-year system potential vegetation within 150 ft of the centerline of the South Fork Nooksack River (Scenario 5 in *South Fork Nooksack River Temperature Total Maximum Daily Load Water Quality Improvement Report and Implementation Plan,* 2020). Nooksack Tribe staff participating in TMDL development expressed concerns that this would not accurately reflect natural conditions historically present, including:

- Mature, intact riparian forests (Increased effective shade due to increased vegetation height and riparian buffer width)
- Cooler headwater and tributary input temperatures
- Historical channel planform
- Enhanced hyporheic exchange

The influence on South Fork Nooksack River maximum temperatures of these conditions was assessed individually and cumulatively through modeling of 5 additional scenarios. Model results (Table 33) indicate the cooling effect of each of these conditions, both individually and cumulatively, relative to the "natural conditions" scenario (Scenario 5). Estimated average maximum temperature in the South Fork in the cumulative "historic conditions" scenario, which incorporated the effects of each of the above conditions, was 2.9°C cooler than Scenario 5. Parameterization of these 5 additional scenarios was informed by analyses conducted by Nooksack Tribe technical staff (see *Sensitivity analysis for natural conditions*), illustrating the importance of engaging knowledgeable staff from Tribal natural resources departments in temperature modeling and water resources protection and restoration efforts. Even given the substantial effort it took to develop the historical scenario, it was still based on estimates of historic riparian tree species from GLO survey notes, a snapshot of the channel planform and width from early channel surveys, and best professional judgement to assess how changes in land use have affected tributary temperatures and the nature of bed material in the river.

Additionally, accounting for the effects of forestry practices on downstream temperatures is increasingly vital as more research emerges documenting reductions in watershed flows due to upstream timber harvest (e.g., Perry & Jones *Summer streamflow deficits from regenerating Douglas-fir forest in the Pacific Northwest, USA*, Ecohydrology 1-13 (2016); Dickerson-Lange, et al., *Modeling the effects of forest management on August Streamflow: South Fork Nooksack River Pilot Research Study* (2022)). Furthermore, agricultural impacts of historical clearing and grading of valley floors along with straightening and diking of streams has had a profound effect on the hydrological regimes of our rivers.

Shallow, aggraded systems, such as seen in the South Fork and Mainstem Nooksack River, are far from "natural". However, there is no explanation in Ecology's documentation for how legacy and current land use in the upper watershed impacts downstream temperatures. We are very concerned that failure to account for upstream and adjacent floodplain land use impacts in temperature modeling will lead to temperature regimes being characterized as natural conditions, when in fact elevated temperatures reflect degraded watershed conditions.

Consider diversity of thermal regime when establishing natural backgrounds.
Maximum temperature is only one of many factors affecting aquatic health. Other aspects of a natural thermal regime include diurnal and seasonal temperature variation, the spatial extent and persistence of thermal refugia (waters >2°C colder than ambient water), and climatic patterns (PDO, ENSO, etc.). All of these factors affect the resilience of salmonids and cold-water species to changes in temperature. For example, a natural thermal regime may exhibit temperatures near the numeric criteria, but exceedances were short-lived and habitat complexity created areas of temporary thermal refugia from cold tributaries and groundwater seepage. Therefore, the impact of a higher numeric criteria would be greater in a disturbed system compared to a "natural condition". This is not to say that identification of thermal refuges is a route to weakening existing criteria, but rather that historical conditions that allowed for healthy populations of aquatic life cannot be summarized only by maximum temperature at the reach scale. As stated in the disapproval of Oregon's Natural Conditions Criteria, "the NCC was based on a flawed assumption that historically protective water temperatures would protect salmonids now" and "the NCC attempts to restore historically higher water temperatures without restoring other conditions that previously allowed salmonids to thrive," (Northwest Environmental Advocates v. U.S. EPA, et al.).

Modeling site specific conditions costs time we don't have.
Determining natural conditions necessitates the use of modeling or statistical methods due to the absence of high-quality, site-specific, representative data from historical periods before human activities. These assessments must be customized for each water body and its specific conditions and cannot be broadly generalized. Therefore, such assessments would likely occur during site-specific regulatory decisions, such as NPDES permitting and TMDLs. Site specific rule-making, such as that in Chesapeake Bay, took over a decade to complete and did not change the requirement to reduce pollution.

Within Nooksack's historical territory of Watershed Resource Inventory Area 1 (WRIA 1), there are 233 listings on the 303(d) list for temperature or dissolved oxygen impairment (96 water bodies). Of those, there are only *five* water bodies with approved TMDLs in WRIA 1, and, for many reasons including funding and private property limitations, implementation progress has been slow. Meanwhile, salmon populations continue to decline to a small fraction of historical level, and time is running out. The salmon and the Nooksack Indian Tribe cannot wait for Ecology to complete all of the modeling up front and then set site-specific water quality standards, as some may propose in this process.

As described above, the South Fork Nooksack River Temperature TMDL includes extensive modeling work that attempts to characterize past, current, and future temperature regimes. After at least eight years of development and 252-pages of text, the most critical implementation measure identified was incredibly predictable: plant trees for riparian shade. Various restoration scenarios were included; however, "the largest effect was seen from increased vegetation height and wider buffers," (cited above). Rather than expending additional time and resources to create an alternative path to compliance with water quality criteria, Ecology should invest in the solutions that we know work, including enforcement of non-point source temperature pollution on riparian private property. Our fish are running

out of time and regulators cannot afford to be delayed or distracted by exemptions to water quality concerns we know how to fix.

Finally, the ultimate question is whether Ecology will use NCC models to determine the need for riparian buffers and associated enforcement mechanisms to bring point and non-point source polluters into compliance. Deriving these criteria and failing to implement on-the-ground solutions to achieve those criteria is a ridiculous waste of taxpayer resources. Continued failure to implement TMDL recommendations at the pace needed for salmon recovery risks losing opportunities to save critically important species in peril of extinction.

Sincerely,

DocuSigned by:
RoseMary LaClair
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RoseMary LaClair
Chairwoman, Nooksack Indian Tribe

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