

Bonnie Blessing

Thank you for reading my comments on water quality criteria that include natural conditions

FROM: Bonnie Blessing Olympia WA 23 July 2024

Thank you for the opportunity to comment on the changes to the WQS and natural conditions criteria. I thank you for your patience to read this as there may be some redundancies.

TO: WA Dept of Ecology Water Quality changes.

<https://wq.ecology.wa.gov/about-us/who-we-are/news/2024-news-stories/may-10-new-approach-to-natural-conditions>

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Thank you for the opportunity to comment on the changes to the WQS and natural conditions criteria.

Dept of Ecology is considering revising Chapter 173-201A WAC. These standards include criteria to protect protection and maintenance of existing and designated uses. by setting criteria for temperature, dissolved oxygen (includes but not limited to Chapter WAC 173-201 200, 210, 260 and 310).

My understanding is that the criteria are updated periodically to be consistent with the Clean Water Act. I believe the object of the CWA is to restore and maintain the chemical physical and biological integrity of the Nation's waters with an interim goal where attainable to achieve water quality that provides for the protection and propagation of fish, shellfish, and wildlife and recreation in and on the water. States have the responsibility for reviewing and establishing and revising WQS Standards themselves include the designated uses of a waterbody and water quality criteria that protect those designated uses and an antidegradation policy.

I laud the policy of the state of Washington to insure the purity of all waters of the state consistent with public health, enjoyment and the propagation and protection of wildlife, birds game fish and other aquatic life (RCW 90.49.010). I encourage the state to develop antidegradation policy that protects uses in all water of the United states (40 CFR 131.12(a)(1)).

I have the following comments on ecology documents or various comments on other Ecology policies, natural conditions, science or observations.

1. Page 23 of Ecology Document # 24-10-15 says the state must support the most sensitive designated use of the waterbody and contain enough parameters to protect the uses of the waters.

I am concerned that there are not enough parameters to support the uses of the waters or if so they are rarely applied. In specific areas, Ecology should protect the the beneficial use wildlife habitat by 1) setting criteria for flows temperature and invasive species, 2)honor state written TMDLS that protect natural conditions in watersheds above salmon or threatened and endangered wildlife species and wildlife habitat and 3) because the point of the standards is to protect exiting uses (which include wildlife habitat), if environmental baseline (and not natural conditions) protects existing uses in site specific locations, then the environmental baseline should be protected.

Maintaining flows protects seasonally inundated areas that are essential for state endangered and federally threatened aquatic wildlife. Some of these seasonally inundated areas are not necessarily considered wetlands but do support life stages of wildlife dependent on aquatic habitats. The amount of flow or surface and groundwater present at the time of listing should be protected in the designate critical habitat. If Ecology can protect the flow, wildlife habitat in these site specific locations may be able to be protected.

Temperature

As an example, for the Oregon spotted frog, as flows diminish in summer, water levels decline and usually water temperature increase. The water level declines place Oregon spotted frogs in close proximity to bullfrogs. The water temperature increases benefit bullfrogs more than spotted frogs. Bullfrogs often thrive and reproduce more at temps above 20 C. But, at least 3 reports suggest that temperatures where OSF were found were often actually below 20 Celsius. Quotes from Watson 2000: Throughout the year frogs were located in water that averaged 19.0 cm in epth (range from 8.5 cm to 26.2 cm) with average surface temperatures of 14. 7 Celsius (range 5.6 to 19.1 C) with subsurface temp slightly slower (Watson 2000). Similarly, many spotted frogs were found in water below 20 Celsius (Figure 1.9 on page 71 of 186 of Yahnke 2015), but some temperatures taken by Morningred did exceed 20 Celsius

at the spotted frog locations. OSF also need beaver dams which may increase water temperatures (Majerova 2020). If both salmon and spotted frogs occur in a given drainage, assess whether cold water refugia could be established for salmon and allow more warmer water for spotted frogs. (I think EPA was sued for this though in Oregon)

Man-made activities that increase water temperatures include creation of wet ponds. A wet pond can increase the temperature of water. This is described in: <https://www.epa.gov/system/files/documents/2021-11/bmp-wet-ponds.pdf>. (<https://www.scielo.br/j/alb/a/cmTrcBhqZYLXZcjRG8XyRdC/?lang=en&format=pdf>).

Wetponds support bullfrogs an invasive species. Ecology should assess the type of wetpond that does not support bullfrogs. Consider a HSI model by Graves (1987)The estimated costs to control bullfrogs in order to recover a species is almost 2 billion dollars. Please do not allow creation of bullfrog ponds near special habitats

To protect wildlife habitat, a designated use, prevent introductions of invasive species in site specific locations

I encourage Ecology to to protect the most sensitive biological life and other uses of water (WAC 173-201A-260). To do so, Ecology should not permit habitat creation that benefits American Bullfrog which is a prohibited level 3 species according to WAC 220-640-050 especially in site specific locations adjoining federally listed aquatic species threatened by bullfrogs. In many states invasive species are such a problem they are considered a pollutant.

According to the 2022 book called Clean Water Act Essentials by Allison Rumsey (2022), courts have included nonnative fish as pollutants: nonnative fish introduced into a receiving water, citing U.S. Public Interest Research Group vs. Atl. Salmon of Me., 215 F. Supp. 2d 239. Another example is in San Diego area of San Mateo where a TMDL to prevent introductions of invasive organisms into wildlife habitat was developed.

Similarly, Ecology should also establish criteria for invasive species. This will help Ecology be more consistent with Chapter 77.135 RCW Invasive Species. In site specific locations, even level 3 invasive species highly degrade wildlife habitat so criteria should include presence of invasive species. Specifically, Can Ecology change the definition of ‘polluting matter’ or pollution to include invasive species that degrade wildlife habitat. Many invasive species occur in a ‘water body’ that is reservoirs, ponds, tanks that are both natural or not natural. Construction and maintenance of ‘water bodies like stormwater ponds of these water bodies are requirements of the NPDES permits issued by Ecology.

Because prevention of invasive species is in the public interest and more cost effective than trying to control invasive species after they are well established, can Ecology promote stormwater ponds that do not create habitat for invasive species. This request seems related to natural conditions. Specifically If an area has seasonally inundated water or upland dry land as a natural condition that does not currently host invasive species, avoid creating habitat for invasive species. While bullfrogs are widespread, one tool could be the habitat suitability index model developed by USGS https://pubs.usgs.gov/publication/fwsobs82_10_138 or avoiding the creation of wetponds.

I ask that Ecology calls Bullfrogs pollution. New NPDES permits should consider TMDLS that have written in ‘waste load allocations’ for invasive species. Specifically that pollution (bullfrog adults, juveniles, tadpoles eggs) do not leave the stormwater pond.

In WAC 173-201A-320, the department (Ecology?) must ensure that information is developed and used expeditiously to revise permit or program requirements. Can such information on bullfrogs be used as soon as possible.

To protect listed species from invasive species, ***first identify and map the locations of the most sensitive habitats. Use the WDFW PHS maps, the USFWS maps of Designated Critical Habitat and ask USFWS for point locations of federally listed wildlife and aquatic life. In many cases, federally listed aquatic wildlife occur near or in the same watersheds as salmon which also have existing and beneficial uses. Then promote methods to reduce bullfrog invasions.***

To protect other rare and common wildlife, consider the EPA guidance for its Construction General Stormwater Permit for ESA species (EPA 2022), maps from WDFW Priority habitats and species and Designated Critical Habitat from USFWS. To protect species impacted by stormwater site construction, adopt the EPA approach to protecting rare species when issuing permits to federal agencies (<https://www.epa.gov/npdes/construction-general-permit-threatened-and-endangered-species>).

Add watershed condition. In site specific locations to protect the most sensitive uses like ‘wildlife dependent on water’ and salmon the state may have to protect watersheds above threatened and endangered fish, aquatic species and wildlife habitat. One criteria should be watershed condition or some other term. I believe when the state issues

a permit the permit must include requirements of the TMDL (page 30 of the appendix for the Permit writes handbook). In some cases, I believe the permit writers may not have looked up the TMDLS issue by State Ecology Some TMDLS that include provisions for Low Impact Development that the state wrote mainly to protect beneficial and existing uses. Even if EPA happens to disagree with a given TMDL, the state of Washington can use more strict guidelines right because the people get to set the standards right? (RCW 90.48.010). I think specifically the state needs to vigorously defend some TMDLs to protect the Deschutes Watershed and its natural conditions especially in watersheds that still could host native runs of salmon!

Another use is aesthetics, beneficial use. In Washington State, aesthetics is recognized as a use (WAC 173-201A-200(4) that should not be degraded WAC 173-201A-260. Can Dept of Ecology add or modify aesthetic criteria to the natural conditions. Protecting the aesthetic value protects some wildlife species dependent on aquatic habitats. Specifically the aesthetic value of wildlife habitat. While some may view swamps as undesirable (Tribot 2018), perennial meadows have aesthetic value (Southon 2017). Yet, aesthetics has received little attention. However views of wildlife habitat are very appealing. Some people actually claim they get sick if they see degraded wildlife habitat. Protecting views protects wildlife habitat, salmon habitat and may be in the public interest. I ask Ecology to consider that protecting the aesthetics of upstream areas often protects downstream water body criteria (WAC 173-201A-260). Views of forests and meadows that also support wildlife habitat. Consider the ACOE method of assessing views at <https://blmwyomingvisual.anl.gov/docs/vrap.pdf>. Views preferred by many people include savannah like grasslands with clusters of trees that may support prospect refuge views preferred by people and animals and protect 'negative space' (discussed pages 75 to 78 in 'Joyful' by Lee 2018).

Protecting aesthetic values may also serendipitously protect recreation and wildlife or cooler water. For instance, protecting aesthetics by protecting wildlife habitat, meadows, trees and shrubs upstream cools water downstream. This in turn (cooler water) reducing harmful algae growth and toxin production from algae. Toxins released from cyanobacteria accumulate in livers of turtles and waterfowl (Chen et al 2009). And microcystin may even cause estrogenic effects to frogs (Liu et al 2024). So, even if natural conditions are such that the water temp is approaching 20 Celsius (either naturally or not naturally), its best to keep water temperatures below 20 C if possible to maintain recreation uses, drinking water (Stanton 2023) and wildlife habitat. I believe there is literature that says cyanobacteria blooms or releases toxins at 20 Celsius. (Wallis 2018).

2) General Comments on page 11 of publication 24-10-015.

The Ecology executive summary (page 11) says Ecology reviewed the previous EPA, FWS and natural conditions. (<https://www.epa.gov/sites/default/files/2017-10/documents/wawqs-letter-02112008.pdf>). This is so very old and doesn't include species recently listed. To inform your analysis please update your list of ESA species in your Technical Support Document (24-10-15 on Page 18 to 19). Oregon spotted frogs are another federally listed that occur below both MS4 outfalls, in agricultural landscapes and in natural areas. This process of identifying natural conditions seems like it could overlap the process described by publication 24-10-027. (The Stormwater management action planning guidance for phase 1 and 2).

3) Comments on when beneficial uses seem to be protected even when the area doesn't meet criteria. The extremely challenging issue for Ecology and EPA is that some threatened wildlife species may occur in conditions that actually do not meet water quality standards.

https://www.fws.gov/sites/default/files/documents/OSF_Final%20Listing_Threats%20Synthesis.pdf. As an example both Beaver Creek (Listing ID 41118) and Salmon Creek (Listing id 73993) are listed as not meeting temperature and dissolved oxygen criteria. The Black River is listed in places as not meeting dissolved oxygen criteria for criteria. Nor does Salmon Creek. Yet these areas host Oregon spotted frogs and their designated critical habitat. The listing of the frog states that when water quality criteria do not meet standards that those water quality criteria are a threat to spotted frogs.

79FR51675 at (<https://www.federalregister.gov/d/2014-20059/page-516785>)

This describes how grazing may be a tool to sustain Oregon spotted frogs but that this may lower water quality. 79FR51683 to 79FR51684 describes how water quality plans have been developed for much of the range of the Oregon spotted frog in Washington because so many do not meet water quality standards including for temperature and dissolved oxygen. The normal measures to 'improve water quality for these species include planting trees and excluding cattle which would not be conducive to the maintenance of conditions necessary for Oregon spotted frog egg-laying habitat.

79FR51690 states that where OSF overlap with documented poor water quality, USFWS considers poor water

quality and contaminants to be a threat to the Oregon spotted frog.

4) Comments on 24-10-017

This document helped me understand the difference between the CWA and the state criteria. Its interesting that 'states may adopt water criteria different from EPAs as long as the state criteria are based on sound scientific rationale, contain sufficient parameter to protect the designated uses and support the most sensitive designated use of a waterbody. According to page 28 of EPAs Water criteria, EPA supports the use of biological criteria to refine aquatic life designated uses. (EPA 823-23-001). That is why page 12 of Publication 23-10-005 is confusing. "In many situations, anadromous species would not be appropriate for determining impairment of a designated use because of the difficulty in linking the organisms condition to the condition of the water body it was collected in. However, we do acknowledge that there are situations where this connection can be documented. We have removed the requirement for biological information or data based on resident species in this section of the policy (Section 1G)."

This removal does not make any sense because the beneficial uses are wildlife and aquatic life.

5) In other states (See San Diego 2023), rare wildlife and aquatic species are included as designated uses that need water quality criteria standards. Locally, in the upper Chehalis river, Oregon spotted frogs should be called a designated use to maintain genetic grouping and recover the species (page 34 of https://ecos.fws.gov/docs/recovery_plan/Draft_OregonSpottedFrog_RIS.pdf). The TMDL for San Mateo Creek Aquatic Invasive offers template or example of how ESA listed species could be protected under Ecology's guidance. As an example, I suggest that Upper Chehalis could be placed on the CWA 303d list of impaired water bodies, with rare and endangered species as the impaired use. The impairment of Upper Chehalis is from release and introduction of invasive species, warming that enhances the spread of bullfrogs, and unsuitable hydroperiod. This proposal would be more consistent with 40 CFR 131.11(a)(i) where states adopt narrative criteria to protect designated uses. A scientifically defensible technical method could be developed to implement the narrative criteria. To maintain hydrological conditions a) encourage Low Impact development, especially in watersheds with rare aquatic species. In Western Washington LID methods also improves aesthetics, recreational use and wildlife habitat. An example locally is the Ken Lake ordinance for LID (Thurston 2022). b) maintain water flows into designated critical habitat whether or not the water is delivered

6) Comments on Publication 24-10-022. ECONOMIC. I am concerned that more analysis should be done of the economic impacts that will occur in a few small areas with DCH due to protection of existing and designated uses. Its just going to happen. Small businesses that could be affected include realtors, residential developers small farms The Washington Regulatory Fairness Act (Chapter 19.85 RCW) requires Ecology to evaluate the relative impact of proposed rules that impose costs on businesses in an industry. There seems to be a discrepancy between the 2020 'Small Business Economic Impact Analysis of 2020' and the Preliminary Regulatory Analysis of May 2024 (publication 24-10-022). The current construction stormwater permit says that the cost of the general permit does have disproportionate impact on small businesses (page 2 of the May 2020 Publication 20-10-022 or Small Business Economic Impact Analysis for the Construction Stormwater General Permit, the NPDES and SWDGP). However the 2024 analysis says that the proposed rule will result in cost-savings for dischargers as compared to analysis (page 52 of the 2024 Preliminary Regulatory Analysis). On the last paragraph of page 10 of publication 24-10-022 it says that Ecology is exempt from assessing the relative costs of the proposed rules on businesses in an industry. However, (my comment) to maintain and protect existing and designated uses there may be costs imposed. Specifically, use of land may be impaired if one cannot develop certain places because Ecology may ask for a TMDL to be honored. To be fair to all, I think Ecology is not exempt from performing additional analysis under the Regulatory Fairness Act because I think that small businesses actually can be affected. Especially if all existing and beneficial uses need to be protected which is in the WAC 173-201A.

However according to RCW 19.85.061 an agency is not required to comply with this chapter when adopting a rule solely for the purpose of conformity or compliance or both with federal statute or regulations. So if Ecology is only rewriting this for the purpose of compliance with the clean water act, then Ecology may not be required to comply with this chapter.

7) CONSISTENT WITH FEDERAL STANDARDS. Under the CWA and 40 CFR 131.11 states must adopt water quality criteria that protect designated uses. (possibly on table 602?) The State Dept of Ecology is designated by EPA as the states Water Pollution Control Agency for all purposes of the federal clean water act and authorized to participate fully in programs of CWA (RCW 90.48.260). According to the federal clean water act, the state must then develop and adopt an antidegradation policy that protects existing uses in all water of the United states (40 CER 131.12(a)(1). And, it is the policy of the state of Washington to insure the purity of all waters of the state consistent with public health, enjoyment and the propagation and protection of wildlife, birds game fish and other aquatic life (RCW 90.49.010). And, the state 'has a policy of working with the federal government' while 'still ensuring that the future standards of water quality within the state are determined by the people of Washington' (RCW 90.48.010). Dept of Ecology has jurisdiction to prevent the pollution of waters and underground waters of the state (RCW 90.48.030). To that end, it is unlawful for any person to drain or discharge or cause to be allowed to seep or otherwise thrown or run into waters of the state any organic or inorganic matter that shall tend to cause pollution (RCW 90.48.080). In Washington WAC 173-201A-200 protects uses like miscellaneous freshwater uses that include wildlife habitat and aesthetics (WAC 173-201A-200). To protect all miscellaneous uses, criteria include criteria for toxic, deleterious materials and aesthetic values (WAC 173-201A-260). According to the WAPA 34.05.328, an agency must before adopting a rule, state the goals and objectives of that statutes, do a cost-benefit analysis, determine if statute differs from federal standards and whether that rule or statute is justified by a statute that allows the agency to differ from federal standards.

On page 11 of 24-10-022 it says that the WAPA requires Ecology to determine after considering alternative versions that the rule being adopted is the least burdensome alternatives for those required to comply etc.

However the WAPA also says something like (RCW 34.05.328(1)(f)) that the rule adopted shall not require those to whom it applies to take an action that violates requirements of another federal or state law.

My comment is this then: it can be burdensome to adopt a rule that requires others to get a different permit because otherwise they'd violate a different law. Can Ecology then ensure that the stormwater rules don't require those to whom it applies to do anything that violates requirements of the endangered species act. Those requirements would likely include avoiding harm to a federal listed wildlife or fish species.

8) Please consider that when issuing NPDES permits, that while the permit is not the permit that authorizes the activities after construction, there may be instances where the general permit does not adequately assure that water quality WILL or even can be protected. In those cases Ecology must consider the narrative criteria of WAC 173-201A-260 when it determines permit limits and conditions. Ecology must consider AKART.

9) Since wildlife habitat is a beneficial use and the general permit rarely protects wildlife habitat, Ecology could adopt the federal NPDES Construction General Permit for Threatened and Endangered Species. On this page

<https://www.epa.gov/npdes/construction-general-permit-threatened-and-endangered-species> the EPA protocols for assessing in evaluating potential effects is described. I realize that According to the 'Frequent Questions on EPA's construction General Permit,' States are *not required to use* the requirements in EPA's General Construction Permit (which includes the above appendix and assessment of ESA species) but States must comply with the objectives of the Clean Water Act which is to maintain the biological integrity of the Nations waters.

10) Is there a larger role for the Army Corps of Engineers? Please explain this: Under Section 304a of CWA EPA advises states on water quality standards. And in some cases, the US Army Corps of Engineers assesses for compliance with the Endangered Species Act. But we all know that there are timing restrictions and sometimes the USACE must approve sometimes without a full review. In some cases it appears there is a lapse in communication. Can Ecology fill that gap? For instance, residential development may need a Nationwide Permit if any listed species or designated critical habitat might be affected or is in the vicinity of the activity. I believe sometimes this nationwide permit process just does not happen. But then Ecology issues their STATE construction general stormwater permit. But according to some websites, no activity is authorized under any NWP which may affect a listed species or designated critical habitats unless ESA section 7 addressing the consequence of the proposed activity on listed species or critical habitat has been completed.

11) INCONSISTENCIES BETWEEN WQ CRITERIA AND BIOLOGICAL INDICATORS.

It is very challenging to set criteria for the environmental baseline, or, the natural and, alas, unnatural conditions that still support wildlife habitat, aquatic life and even aesthetics. Especially challenging when water quality that may have temperature, dO or fecal coliform problems still supports biological life. In the EPA guidance from 2015, EPA

describes that there maybe inconsistencies between water quality and biological assessment results. For example, assessment of certain water quality criteria (e.g. pH) for any given water body may suggest impairment while other applicable indicators (biological assessment) suggest some uses are being met. So then a state may adopt Site Specific Conditions (SSC) to protect sites specific water quality criteria. When a state does this, the criteria must protect the use. (page 7 of 28 of <https://www.epa.gov/sites/default/files/2015-02/documents/natural-conditions-framework-2015.pdf>). In WA state uses include miscellaneous uses of wildlife habitat and aesthetics, as measured by pollutants and esthetics. The selection criteria are described on page 9 of this document. To determine whether low water quality is 'natural' one must assess whether a) upstream areas are surrounded by undisturbed vegetation and natural buffers, b) whether current land use do not indicate anthropogenic land use, c) whether there is significant groundwater withdrawal in the area, d) whether point source discharges are upstream, e) whether the area has high biological integrity based on state or region wide data. Can you ensure these items are in the Dept of Ecology protocol? If Ecology added item a or item e that would further protect wildlife habitat. Add presence of salmon, peat bogs and oregon spotted frogs to biological measures.

In the EPA protocol, the following are used to indicate whether the low water quality is natural. Could you clarify the comparison between EPA and DOE?

EPA	DOE
upstream and instream areas are surrounded by undisturbed vegetation	
historic and current do not indicate anthropogenic impacts	
there is insignificant groundwater withdrawal	
evidence of hydrological modification is minimal upstream	
groundwater recharge to surface water is not impacted by anthropogenic	
influence of nonpoint source runoff from ag, lawns, golf course impervious surfaces from human activities is absent immediately upstream	
biological measures indicate whether the water body has high quality biological integrity	

12) In the State DOE protocol, the following are used to indicate whether the low water quality is 'natural' or not: (Table 602 of WAC 173-201A-602 says all miscellaneous uses are designated uses in the WAC 173-201A-430 SCC. WAC 173-201A-440 is it attainable? 40 CFR 131.11, 2023 WQ stanards)

Can natural conditions include beneficial uses of aesthetics and wildlife habitat? My interest in natural conditions started due to esthetics. I became very interested in natural conditions while driving past the beautiful rolling hills and farms in wet meadows in Thurston County. The natural conditions here differed from north Seattle. The eye candy here included meadows, (sometimes with cows) bordered by forest and farmhouses. The only sound breaking the silence was bugling elk and flying geese and occasional logging trucks. And, we could breathe without choking on fumes. These natural conditions were nice. I worried about 'unnatural conditions'. Specifically livestock *in a wetland itself* which clearly would have increased nutrients and fecal coliform. But then I was told that this was a special site. That careful managed grazing in the wet meadows created openings in the 'unnatural' canarygrass and somehow helped maintain frog habitat. So in some cases, human agricultural activity supported rare species in an 'ecosystem'.

13) Here is an example of natural and unnatural conditions that may influence wildlife habitat. At another place (formerly called Adams Garden), special species occurred in a marsh and associated ponds. And three man-made features seemed to influence habitat suitability for the rare frog. The natural condition (according to early General Land office surveys), was 'uninhabitable swamp' This 'natural condition' was likely a stream with beaver dams in a flat area with beaver dams and occasional migration of water across the flat valley. Humans try to find a way to 'reclaim the swamp'. Farmers dredged a ditch in a north to south direction. Farm ponds were excavated, perhaps for waterfowl. An unimproved gravel road was built x the marsh. Somehow Oregon spotted frogs a priority species were able to occupy this combination of manmade and natural features. As the old road and ditch aged and became

poorly maintained, they both seemed ok for the frog. One site feature, The farm pond however hosts abundant bullfrogs. In one year at least 40 bullfrog eggs were found in the ~17000 square foot farm pond. This was reduced substantially by controlling bullfrog egg masses tadpoles and adults over 10 years. Prevention of bullfrogs is recommended as a recovery action (https://ecos.fws.gov/docs/recovery_plan/Draft_OregonSpottedFrog_RIS.pdf). Because Ecology still approves of wetponds near spotted frog habitats, this is not consistent with the federal recovery plan. To meet federal ESA objectives could the state impose greater restrictions on private property owner near spotted frog designated critical habitat? If Ecology does impose greater restrictions this benefits the state and federally listed wildlife habitat. Protecting aquatic frog habitat also protects groundwater. Protecting aquatic frog habitat also mean protecting salmon.

14) I noticed some changes between CR-101 and the later CR-102. The difference is a bit unclear but I think CR102 emphasized numeric criteria for dO and Temp and the natural conditions assessment. But then the natural conditions assessment performance manual only says dO, Temp will be assessed. I don't know if this is related but: There may be a problem here because Tier 2 analysis seems very odd. So many projects are being approved and the applicant states their project that degrades water is in the overriding public interest. Then they get this general permit for it. I am unclear on exact what the OPI is. I assume its an economic and social interest of having more housing. But if this additional housing permanently retards the reocvery of adjoining endangered species is the permit issuance and/or project really in the public interest?

15) In a thesis I did, it showed that *some marshes that host Oregon spotted frogs are shrubby with small openings in the canopy*. This was based on looking at a limited number of spotted frog marshes. These shrubby areas are sometimes characteristic of the 'natural conditions' that were found in the early GLO surveys as well. But usually now a combinatin of natural conditions and some level of anthropogentic agricultural land use may still be the 'environmental baseline'.

16) Low dissolved oxygen seem to occur in many places where non-salmonid fish and nonfish aquatic species occur. The EPA natural conditions framework (page 12) states that low dO may be natural in areas with a low channel gradient and high decomposition of wetland vegetation. One very special status state species, the Olympic mudminnow often occur where dO is low. (See: Kuehne and Olden 2016 entitled Environmental drivers of occupancy and detection of Olympic mudminnow). Perhaps this is because other fish cannot tolerate the conditions the Olympic mudminnow tolerates. Several water bodies that host Oregon spotted frogs have low dissolved oxygen (How's my Waterway EPA website). It seems unclear exactly causes the low dO. It is interesting that Olympic mudminnow also occur in many of these waters impaired by low dissolved oxygen. These include Black River, Salmon Creek, Blooms ditch, Dempsey Creek, Beaver Creek. Some bullfrog ponds at lower Salmon Creek have remarkably low dissolved oxygen. I can send that data later. I suspect the low dO stems from low dO groundwater, accumulation of organics that breakdown as well as very low gradient.

17) *Invasive plants may lower dissolved oxygen:*

Invasive plants often occur in the gravel bars on the margins of rivers and streams. Canarygrass itself, often considered an invasive, results in lower dissolved oxygen in the root zones. The dO near the roots of canarygrass was 0.26 mg/liter and near the native juncus was 0.97 mg/liter. Canarygrass has invaded the shorelines of many rivers that also host salmon. See citation in bibliography

18) I thought the state should develop an antidegradation policy due to 40 CFR 131.12. I believe there is more to protecting designated uses than just temperature and dissolved oxygen.

19) I want to comment on WAC 173-201A-260 discusses WAC 173-201A-430 or site specific criteria. WAC-201-430 says that site specific criteria must be consistent with federal regulation on designated and protecting uses (40 CFR 131.10 and 131.11). The site specific criteria must show that it will protect the existing and attainable uses of the water body (WAC 173-201A-430).
40 CFR 131.10 and 40 CR 131.11

20) In WAC 173-201A-240, criteria discussed for toxic sustenances, aquatic life protection and human health protection. Protect western washington lakes from release of toxics from blue-green algae and from aluminum sulfate

21) Consider aesthetics more fully or set real criteria. There is little discussion of aesthetics of natural conditions of wildlife habitats in and near surface waters. Changes to natural conditions affect both wildlife habitat, aquatic habitat and the design of stormwater management systems. Yes aesthetics is sometimes a natural condition and sometimes environmental baseline condition and changed by human activities. We all say we like wildlife habitat but we appreciate the views and the smells and the sounds. We don't like to see or hear deleterious materials like invasive species in wildlife habitat. As an example, One goal of habitat management for Oregon spotted frogs is to maintain meadow like conditions to maintain breeding habitat. Another goal of habitat management is to ameliorate the hydrological fluctuations that impair breeding success. One way to do that is to retain forest in head waters above their designated critical habitats. People also prefer to see forests rather than impervious surfaces above their farmlands that host endangered wildlife.



Figure 1. Wildlife habitat near Trout Lake Washington.



Figure 2. ESA habitat South of Olympia



Figure 3. Viewing platform of ESA listed habitat.



Figure 4. ESA listed wetland Habitat south of Olympia

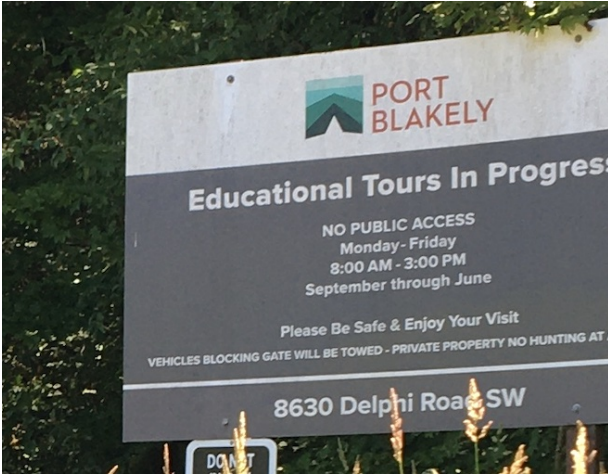


Figure 2. Viewing of wildlife area. Education center that includes views of ESA listed wetland habitat.



Figure 3. View of ESA listed species habitat from Port Blakely location



Figure 4, View of ESA habitat south of Olympia. Watershed natural



Figure. These views are of homes but some find them not aesthetic.



Figure 5. This was not aesthetic to downstreamers. Compare with view in Figure 4.



C. J. Earle

Figure 5. forests and shrublands in watersheds protect water bodies downstream that support wildlife habitat. People find the forests aesthetic.

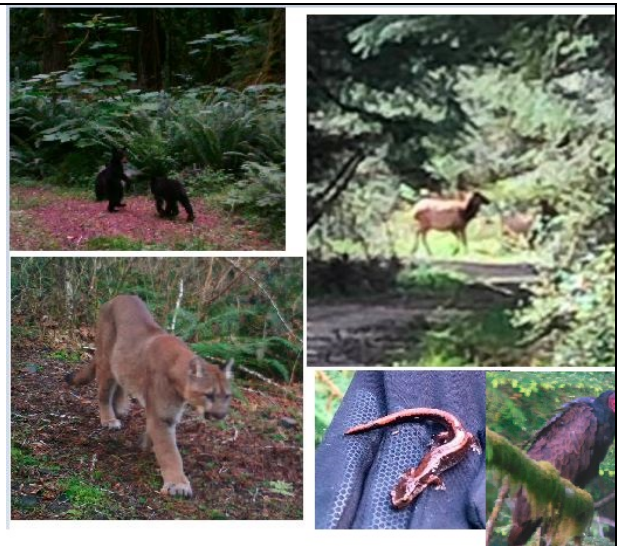


Figure 6. Legacy forest that protects aesthetics of wildlife habitat protect aquatic wildlife.



Figure 8. Not aesthetic due to road. Roads built in marshes lower habitat suitability for wildlife and also are not aesthetic because people see the water on roadway. Perhaps avoid building a road x these places?



Figure 9. Not aesthetic. Severe solastalgia for the neighbors downstream.

Miscellaneous citations referenced in my comments:

- BMPS for wetponds.<https://www.epa.gov/system/files/documents/2021-11/bmp-wet-ponds.pdf>
- EPA 2023. Water quality standards handbook Chapter 3: Water quality criteria.
- Majerova M. et al. 2020. Beaver dam influences on streamflow hydraulic properties and thermal regimes. Science of the Total environment.
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