CLEAN, FLOWING WATERS FOR WASHINGTON

The Center for Environmental Law & Policy

May 27, 2020

SEPA Draft DEIS for Chehalis Flood Damage Reduction Project
c/o Anchor QEA
1201 Third Ave., Suite 2600
Seattle, WA 98101

RE: Comments on Chehalis River Basin Flood Damage Reduction Project Draft EIS

Filed Electronically Only

Dear Department of Ecology:

The Center for Environmental Law & Policy (CELP) appreciates this opportunity to provide comments on the Chehalis River Basin Flood Damage Reduction Project Draft Environmental Impact Statement (DEIS). The environmental review of this project is particularly important because the Chehalis is one of only four rivers in Washington with undammed flow greater than one hundred miles,[1] and with the exception of bull trout,[2] the Chehalis' salmonid stocks have not yet declined to the point of being listed under the Endangered Species Act.[3] This is a precious state of affairs.

As we all know, salmon are essential to our regional identity, to tribal lifeways, and to the livelihoods of native and non-native fishermen.[4] Building a dam would devastate these fish, already at severe risk from existing degraded habitat[5] that will be exacerbated by climate change, and harm Washington's coastal fishing economies. Building the dam would also cost hundreds of millions of dollars, not including mitigation costs, at a time when the state budget is under extraordinary pressure from the economic effects of COVID-19.[6]

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[1] TIM PALMER & ANN VILEISIS, GREAT RIVERS OF THE WEST: WASHINGTON, WESTERN RIVERS CONSERVANCY 16, http://www.westernrivers.org/downloads/files/GROW%20FINAL/WA%20GROW.pdf.
[2] DEIS at E-48 ("Coastal/Puget Sound bull trout are ESA-listed as threatened (64 Federal Register 58909). Bull trout are documented to occur in lower Chehalis River and Grays Harbor tributaries and are presumed to occur in the lower mainstem Chehalis River, which is part of the species' designated critical habitat upstream to RM 43 (near Oakville) (75 Federal Register 63898).").
[3] DEIS at E-9.
[4] *See, e.g.*, Langdon Cook, *Why Wild Salmon Remains King in the Pacific Northwest*, NAT. GEOGRAPHIC (MARCH 27, 2019), https://www.nationalgeographic.com/travel/features/searching-for-wild-pacific-northwest-salmon-from-river-to-table/#close.
[5] 2014 RECOMMENDATION REPORT, GOVERNOR'S CHEHALIS BASIN WORK GROUP (November 25, 2014).
[6] Joseph O'Sullivan, *As Coronavirus Freezes the Economy, Gov. Inslee Slashes Hundred of Millions of Dollars From Washington State Budget*, SEATTLE TIMES (April 3, 2020, 9:13PM), https://www.seattletimes.com/seattle-news/politics/as-coronavirus-freezes-the-economy-inslee-slashes-hundreds-of-millions-of-dollars-in-state-spending/; *see also* Section III, *infra.*

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In 2007, devastating flooding led to the creation of the Office of the Chehalis River and planning for strategies to reduce flood damage.[7] The residents of the Chehalis Basin need a flood strategy that reduces flood damage and flood risk for their families, homes, and livestock, but this proposal for a large dam on one fork of the Chehalis River would not provide the needed relief. Further, this proposal is for a large "expandable" dam on one fork of the Chehalis River;[8] a fatal scoping error under the State Environmental Policy Act (SEPA).

The proposed dam would partially reduce flood risk for a minority of cities in the basin—i.e., it would not solve the problem. This incomplete fix would come at an unacceptable cost to salmon, treaty fishing rights, and Endangered Species Act-protected species including Southern Resident Killer Whales. Climate change is already harming fish by increasing river temperatures and degrading ocean conditions with acidification,[9] and this dam could consign Chehalis Basin residents to being Pacific Northwesterners without salmon.

The DEIS suffers from a lack of forthrightness, a lack of detail, and an adherence to a preconceived notion that a dam would be preferable to all alternatives. Overall, the dam proposal would not meet the basin's needs. These problems are discussed below.

I. Lack of a Complete Flooding Solution

The Chehalis Basin desperately needs flood management solutions that meet local needs in the entire basin rather than simply bulking up protection for interstate commerce on I-5 and existing structures within the floodplain. The dam tries to meet this need sideways and backwards: it is aimed at protecting the people and livestock living in the basin, which is an essential goal, but it does so in a way that would create a compounding nest of new problems without solving the original one. In a late-century catastrophic flood scenario, the dam would protect less than half of *existing* structures.[10]

The proposed dam would not protect all basin communities from flood damage, and the flooding of the future would make this dam irrelevant. By late in this century, climate change modeling predicts a 25% chance of a major flood in any given year. The city of Chehalis would still get more than 10 feet of inundation during a late century catastrophic flood.[11] The failure to protect property and structures will surely lead to calls for a larger and taller dam, which the DEIS quietly considers.[12] Under SEPA, an EIS cannot falsely segment a project that is in fact one big project.

[7] Hal Bernton & Ralph Thomas, *Extensive Flooding, 3 Confirmed Deaths, Hundreds of Rescues*, SEATTLE TIMES (Dec. 5, 2007, 12:00AM), https://www.seattletimes.com/seattle-news/extensive-flooding-3-confirmed-deaths-hundreds-of-rescues/.
[8] DEIS at 7.
[9] DEIS at E-57.
[10] DEIS at S-9.
[11] DEIS at S-9. "In late-century, this type of flood has a 1 in 27 (4%) chance of occurring in any given year." S-3.
[12] DEIS at 7.

Compounding this issue is the concern that the Applicant will save the habitat mitigation for last and then run out of money, such that it never actually happens. Large dam projects routinely exceed their budgets by eye-popping magnitudes.[13] Here, spending this amount of money on a dam that would (hopefully) protect only 1,280 of 2,955 *currently existing* structures in a late century catastrophic flood scenario[14] is irresponsible by every measure: by the dam's lethal impact on salmon in violation of law and treaty obligations, by the dam's likelihood of encouraging further floodplain development that negates its purpose and harms fish habitat, and by the need for restraint in the state budget because of the economic effects of coronavirus. These problems argue against massive expenditures on a project of this magnitude that has minimal feasibility.

II. Improper Scoping & Segmentation

The DEIS raises concerns that the Department of Ecology is improperly "segmenting" environmental review of a much larger project. Under NEPA, an agency impermissibly segments environmental review when it divides "connected, cumulative, or similar" state actions into separate projects "and thereby fails to address the true scope and impact of the activities that should be under consideration."[15]

The DEIS states that the proposed dam is "expandable" because it "would be built so it could support the future construction of a larger structure . . . [that] could hold up to 130,000 acre-feet of water in the reservoir."[16] According to the DEIS, such an enlargement would "be subject to a separate environmental review and permitting process" in the future.[17] But rather than artificially disconnecting the expansion from the current project, the Department of Ecology needs to look at all reasonably foreseeable impacts now.[18]

Since the proposed dam would only incompletely[19] protect Centralia and Chehalis rather than the whole basin, it would increase the pressure for building an expanded dam later. When actions are connected—such as (1) building a dam that is specifically designed to be expandable and (2) later expanding that dam—the EIS process must encompass all such connected actions to effectively study the environmental impacts. These are not two independent actions; they are

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[13] *See, e.g.*, Atif Ansar et al., *Should We Build More Large Dams? The Actual Costs of Hydropower Megaproject Development*, 69 ENERGY POL'Y 43 (2014).
[14] DEIS at S-9
[15] *Delaware Riverkeeper Network v. F.E.R.C.*, 753 F.3d 1304, 1313 (D.C. Cir. 2014) (holding that FERC impermissibly segmented NEPA review by failing to consider the cumulative impacts of four related natural gas pipeline upgrade projects). Note that "[b] ecause NEPA is substantially similar to SEPA, [Washington courts] may look to federal case law for SEPA interpretation." *Int'l Longshore & Warehouse Union, Local 19 v. City of Seattle,* 176 Wash. App. 512, 525, 309 P.3d 654, 661 (2013).
[16] DEIS at 7.
[17] *Id.* The full language on this in the DEIS is: "The Applicant calls the proposed facility expandable because it would be built so it could support the future construction of a larger structure. The larger structure could hold up to 130,000 acre-feet of water in the reservoir. This expansion may or may not occur, and, if pursued in the future, it would be subject to a separate environmental review and permitting process."
[18] *Delaware Riverkeeper Network*, 753 F.3d at 1313.
[19] DEIS at S-9.

one extended building project. By failing to consider the actual scope of the project, the DEIS improperly segments the environmental review process.

Building "a large foundation and a low dam," as the Preferred Alternative describes, would cost $60 to $100 million more than building a non-expandable dam.[20] This would be a huge and irreversible commitment of resources now to support expansion later, and suggests a high likelihood that the expanded dam would ultimately be built. Both phases of dam construction would likely contribute to the environmental and economic impacts of the project, and both should be the subject of a unified review process.[21]

The DEIS completely fails to explain why this expandable dam is required. If it is not justified, why spend millions more? But if it is justified, and the Applicant actually intends to enlarge the dam, then why are the true environmental impacts not analyzed? Falsely articulating the expansion as a separate project is a straightforward violation of SEPA and NEPA.[22] Washington courts interpret SEPA using NEPA as a guide,[23] and NEPA requires that agencies consider connected actions, "which means that they are closely related and therefore should be discussed in the same impact statement."[24] Actions are connected if they "[a]re interdependent parts of a larger action and depend on the larger action for their justification."[25] The proposed expandable dam appears to be a textbook case of this kind of connected action.

Another uncertainty about the current DEIS remains: the proposed dam would affect only one fork of the Chehalis River. The DEIS reports that studies have considered "locations on the Newaukum River,[26] the upper Chehalis River, and the South Fork Chehalis River" but that the U.S. Army Corps of Engineers rejected them because "multiple flood retention facilities or facilities at other locations would not be economically feasible, would have minimal benefit, or would cause significant impacts on transportation and the environment."[27] First, after reading the significant and unavoidable negative impacts of the dam proposal, one can only imagine the environmental impacts that led the Corps to reject other locations. Second, though locations above Pe Ell have been favored for a dam because of geology and rainfall,[28] a glance at a map shows that a number of enormous tributaries contribute to the Chehalis River before it reaches Chehalis and Centralia, creating major flood risks not addressed by the current proposal.

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[20] DEIS 1-ii, Attachment A-2: *Summary Comparison of FRO, FRFA, and FRE Alternatives*, CHEHALIS RIVER BASIN FLOOD CONTROL COMBINED DAM AND FISH PASSAGE SUPPLEMENTAL DESIGN REPORT, FRE DAM ALTERNATIVE (Sept. 2018), Table 11-1 at 41–42, https://www.chehalisbasinstrategy.com/wp-content/uploads/2018/09/FRE-Alternative-Supplemental-Report-2018-09-27-reduced.pdf (The FRE "alternative would construct a large foundation and a low dam, with the potential for future expansion if additional flood storage or flow augmentation water storage was desired.").
[21] *Delaware Riverkeeper*, 753 F.3d at 1313.
[22] *See, e.g.*, *Thomas v. Peterson*, 753 F.2d 754, 755 (9th Cir. 1985) (NEPA requires USFS to consider proposed timber sale along with the road in its DEIS. Not doing so was improper segmentation because they are connected actions. The road had no independent utility).
[23] *Int'l Longshore & Warehouse*, 309 P.3d at 654 (Washington courts look to federal case law interpreting and applying NEPA for guidance in interpreting and applying SEPA).
[24] 40 C.F.R. § 1508.25.
[25] *Id.*
[26] If climate change is going to make such formidable 100-year storms, then the smaller rivers will flood he basin anyway and the big dam makes even less sense.
[27] DEIS at 26.
[28] *Id.*

Again, building an expandable dam would cost $60 to $100 million more than a non-expandable dam, and that is still likely an underestimate on cost.[29] This is not counting the annual operating costs of the proposed dam, which are minimally estimated to be $628,000 per year.[30] This is an outrageously high number for an expansion that purportedly might not happen, and an enormous investment in a future that is totally un-analyzed in this DEIS.

III. Speculative Mitigation

In nearly every major category, the DEIS concludes that impacts will be significant and unavoidable, unless mitigation is feasible. Given that potential mitigation actions are so important to predicting the actual environmental impacts of the project, the final DEIS should go into much greater detail about possible actions and their likelihood of success. Courts have emphasized "the requirement that mitigation measures be supported by substantial evidence."[31] Some "quantified or detailed information is required" so that courts and the public can be assured that the agency took the "hard look" that NEPA requires.[32] Agencies cannot condition a permit on speculative and unproven mitigation.[33]

The DEIS admits it is impossible for the proposed dam to comply with Department of Fish and Wildlife and land use requirements of no net loss of ecological function.[34] Even without the proposed project, the baseline of climate change will cause a net loss of ecological function.[35] Climate change is emphatically not an argument for throwing up ones' hands and giving up all hope of improving ecological function; legal obligations to tribes and to the citizens of Washington state forgo that faulty conclusion.[36] Rather, the final DEIS should directly address the options for, and feasibility of, creating improvements in ecological function that are greater than the losses predicted from the project. The current DEIS, rather than explain how the adverse effects of the dam will be mitigated (and what assurances exist that the mitigation would be maintained in perpetuity), kicks the can down the road to federal agencies where more mitigation will presumably be identified.[37] This failure to identify and assure mitigation does not provide an adequate basis for evaluation of a state permit.

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[29] DEIS 1-ii, Attachment A-2: *Summary Comparison of FRO, FRFA, and FRE Alternatives*, CHEHALIS RIVER BASIN FLOOD CONTROL COMBINED DAM AND FISH PASSAGE SUPPLEMENTAL DESIGN REPORT, FRE DAM ALTERNATIVE (September 2018), Table 11-1 at 41–42, https://www.chehalisbasinstrategy.com/wp-content/uploads/2018/09/FRE-Alternative-Supplemental-Report-2018-09-27-reduced.pdf.
[30] *Id.* at 36.
[31] *Nat'l Audubon Soc. v. Hoffman*, 132 F.3d 7, 17 (2d Cir. 1997) (holding that USFS violated NEPA when deciding to extend road conduct logging by failing to adequately consider all relevant factors, and USFS's determination that preparation of environmental impact statement (EIS) was unnecessary was arbitrary and capricious).
[32] *Neighbors of Cuddy Mountain v. U.S. Forest Service*., 137 F.3d 1372, 1379 (9th Cir. 1998) (holding that USFS violated NEPA when it approved a timber sale because its description of mitigating measures it would impose to offset damage that proposed timber sale would cause to redband trout habitat was insufficient).
[33] *Id.*
[34] DEIS at S-14 (land use), 81 (fish & wildlife habitat), 97 (riparian buffers and wetlands).
[35] DEIS at S-1.
[36] *See U. S. v. Washington*, 853 F.3d 946 (9th Cir. 2017), *aff'd by an equally divided court* 138 S. Ct. 1832 (2018).
[37] DEIS at E-83.

The DEIS also fails to sufficiently describe the loss of recreational and navigational values in the river or how such losses might be avoided. Washington's Water Resources Act, enacted in 1971, declares that recreation is a "beneficial use" of water and requires that flows be protected to "preserve . . . . navigational values."[38] The DEIS' appendix covering recreation is only 38 pages and spends very little time on navigational recreation as opposed to sport fishing.[39] It is clear, however, that there would be a loss of access to whitewater and reaches of the river,[40] and mitigation is uncertain at best.[41] The DEIS acknowledges that regarding recreation mitigation, "there is uncertainty if the implementation of a plan is technically feasible or economically practicable."[42]

American Whitewater has a vision for a Chehalis River that "remains free-flowing and is accessible to the public."[43] For the recreation community, the dam would "inundate an outstanding Class III whitewater run, one of the longer stretches of continuous whitewater in the state."[44] Pe Ell could be known for its access to this 14 miles of whitewater, but dam construction would snatch this future away.

IV. Unaddressed Effects on Salmonids

The upper Chehalis, where the dam is proposed, has the best spawning and rearing habitat for salmon in the whole basin.[45] Chinook salmon, chum, salmon, coho salmon, steelhead, and coastal cutthroat are all widespread in the Chehalis River and associated off-channel and floodplain habitats.[46] Throughout all life stages, they require cool, clear water. To date, the Chehalis has continued to support fish populations, although the numbers have decreased as in other rivers and habitat restoration is essential. Climate change poses a threat to these fish, and a dam's negative impact would compound these effects.

> According to a 2016 report to the Quinault Indian Nation by Larry Lestelle, a Poulsbo-based fisheries biologist who has studied the Chehalis Basin for 45 years, the basin historically saw an average of 778,000 steelhead, coho and Chinook salmon swimming upstream a year. That number fell to 111,800 in 2003 and to 75,500 in 2016. Without

[38] RCW 90.54.020(1); RCW 90.54.020(3)(a).
[39] DEIS at J-17.
[40] When the dam would not be blocking the river and creating a reservoir, the river may still be partially accessible for rafting (albeit without a riparian forest) so long as Weyerhauser gives permission. However, the land within the reservoir would be owned by the Flood Control Zone District and they may deny access for liability reasons.
[41] *Id.*
[42] *Id.*
[43] Thomas O'Keefe, *New Dam Proposed for Chehalis River (WA): Take Action and Comment*, AM. WHITEWATER (April 2, 2020), https://www.americanwhitewater.org/content/Article/view/?articleid=34428
[44] Thomas O'Keefe, *New Dam Proposed for Chehalis River (WA)*, AM. WHITEWATER (Nov. 9, 2016), https://www.americanwhitewater.org/content/Article/view/?articleid=32661 (explaining that the restrictive policies of Weyerhauser have reduced the number of people who have experienced this stretch of the river).
[45] Lea Ronne, Nicholas Vanbuskirk, Curt Holt, & Mara Zimmerman, SPAWNER ABUNDANCE AND DISTRIBUTION OF SALMON AND STEELHEAD IN THE UPPER CHEHALIS RIVER, 2017-2018, WASHINGTON DEPARTMENT OF FISH & WILDLIFE (2018), https://wdfw.wa.gov/sites/default/files/publications/02034/wdfw02034.pdf ("The highest density of fall Chinook occurred between the proposed dam site (RM 108.2) and Elk Creek (RM 100.2)").
[46] DEIS at E-26.

> restoration, Lestelle estimates numbers could drop to 40,300, threatening local tribes and fisheries. Of those, spring Chinook are the most threatened: In 2016 only 1,500 returned. Without aid, that number could fall to 200.[47]

In annual surveys, nearly every reach of the upper mainstem of the Chehalis River and every accessible tributary upstream of Crim Creek are consistently occupied by juvenile salmonids.[48] Crim Creek is upstream of the proposed dam site, and would be shorn of its riparian buffer and submerged by the proposed reservoir during high flow events.[49] Chinook and steelhead in particular move up and downstream in reaches that would be affected by the proposed facility, to forage and maintain optimal body temperature.[50] Currently, salmon and steelhead spawn less than half a river mile upstream of the proposed dam site, and less than a mile and a half downstream of the site.[51]

By requiring the removal of vegetation from the temporary reservoir inundation area, the dam would have a drastic impact on water temperatures in the temporary reservoir area and directly downstream.[52] Large trees greater than 6 inches in diameter and non-flood tolerant trees would be removed in the reservoir and construction area, "affecting over 600 acres of upland, riparian, and wetland areas."[53] This means "[d]aily maximum [upstream] water temperatures would increase 0.5°C to 3°C, depending on time of year, from lack of shading, with the greatest impact in June through mid-September."[54] Downstream from the proposed dam site, the "function of the Chehalis River as a migratory corridor could be impaired by 2°C to 3°C increases in daily maximum summer water temperature."[55] The increase in temperature and the decreased dissolved oxygen content would exceed water quality standards.[56] The DEIS describes no mitigation for these dramatic effects, and it is unlikely that they could be mitigated in any meaningful way.

To prepare for the reservoir, the Applicant would remove large wood, which would have compounding and multivariant effects on salmon and other fish. Removing large wood would reduce or eliminate woody debris in the river and contributing streams.[57] Having large wood in the river and associated streams "helps slow water velocities and contributes to the development of pools that provide cooler stream temperature, decreases fine sediment transport, provides refuge for juvenile fishes from predation, and enables successful feeding."[58]

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[47] John Stang, *Will Flood Protection Set Back Salmon Restoration in the Chehalis River Basin?*, CROSSCUT (Feb. 12, 2020), https://crosscut.com/2020/02/will-flood-protections-set-back-salmon-restoration-chehalis-river-basin.
[48] DEIS at E-29.
[49] This would have disastrous effects. For example, "[i]n the summer, the temperature of the Chehalis River and streams in the temporary reservoir area would increase up to 5.4°F and up to 9°F in Crim Creek. This is mainly from the removal of trees for construction and operation of the FRE facility which would reduce shade and cover in upland and riparian zones." DEIS at 39.
[50] *Id.*
[51] DEIS at E-102 (citing Ashcroft et al. 2017).
[52] DEIS at 42.
[53] DEIS at E-102
[54] DEIS at E-103.
[55] DEIS at E-104.
[56] DEIS at 42
[57] DEIS at E-103.
[58] DEIS at E-103 (citing Wohl et al. 2015; Poff et al. 1997; Wald 2009).

Reduced wood input would create less robust river channeling, preventing pools and eddies from forming.[59] Yet pools and eddies from river channeling are places for juvenile salmon to survive away from faster currents, and places for salmon to spawn where their redds won't be swept away.[60] The DEIS acknowledges these cascading effects but stops analyzing the cascade too soon, and fails to meaningfully consider the far-reaching downstream effects of the loss of woody debris.[61]

Losing salmon does not just mean losing the identity of the region and its economic health; it also means the loss of that population's genetic makeup. The spring-run Chinook that spawn in the upper Chehalis Basin salmonids are a significant source of genetic diversity for the population.[62]

The upper basin of the Chehalis is warmer and is geographically and hydrologically distinct from other parts of the basin, and scientists have observed genetic differences between fish from different locations in the basin.[63] This corroborates the results of an earlier study and "demonstrates the importance of the upper Chehalis Basin to spring-run Chinook."[64] Scientists, concluded the DEIS in that section, have "a great deal of concern over the future of spring-run Chinook salmon in the basin."[65] These concerns cannot be ignored.

Finally, while CELP does not speak for any Indian tribe, we believe it is the obligation of Washington state to honor tribal rights reserved in treaties and executive orders. When the state fails to respect the lawful rights of tribes, it degrades resources that are used and shared by tribal and non-tribal people. The DEIS recognizes that spring and fall run Chinook salmon, coho salmon, steelhead, Pacific lamprey, and many other fish and shellfish are critical to the physical, cultural, and spiritual wellbeing of tribal nations, and that access to fish for harvest is a right reserved in tribal treaties.[66] The state must respect its government-to-government relationship with the affected tribes.[67]

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[59] *Id.*
[60] *Id.*
[61] *See e.g.*, Trevor A. Jones, Lori D. Daniels, *Dynamics of Large Woody Debris in Small Streams Disturbed by the 2001 Dogrib Fire in the Alberta Foothills*, 256 FOREST ECOLOGY AND MANAGEMENT 1751 ("For headwater streams in environments susceptible to floods and erosion we recommend that buffer zones comprised of snags to be established after fires . . . to ensure a supply of [large woody debris] into streams for years to decades after a stand-replacing fire" or other disturbance.").
[62] E-145.
[63] DEIS at E-145; E-33.
[64] DEIS at E-33.
[65] *Id.*
[66] DEIS at 70; *see also* E-83 ("Salmonid production from the Chehalis River is an important contributor to ocean fisheries and is essential for supporting in-river fisheries such as ceremonial, subsistence, commercial and noncommercial tribal harvest and recreational fisheries.").
[67] *See, e.g.*, QUINAULT INDIAN NATION COMMENTS, DRAFT ENVIRONMENTAL IMPACT STATEMENT, PROPOSED CHEHALIS RIVER BASIN FLOOD DAMAGE REDUCTION PROJECT UNDER STATE ENVIRONMENTAL POLICY ACT (May 11, 2020), https://static1.squarespace.com/static/5ea74f37fc31534cf56f0946/t/5eb9c991e85fc52b2fef48b3/1589234071989/FINAL+QIN+Chehalis+DAM+DEIS+comment+5_11_2020.pdf.

a. Lethal Effects of Dam Construction

For a period of three to five years, construction of the dam would create myriad new ways for Chehalis Basin fish to die.[68] This would be catastrophic, because the loss of four or five year-classes in a row could end salmon runs. Besides the temperature increases due to vegetation removal (which would begin during construction and continue to harm salmonids during operation),[69] fish would also be harmed by elevated turbidity due to earthwork in the river channel, sound pressure waves from rock blasting (which cannot be measured, only observed),[70] vibrations from roller-compacting concrete, and decreased or eliminated fish passage due to the large unlighted tunnel into which they are unlikely to venture.[71] Survival rates for trap-and-transport systems project a mere 32–65% survival among different species.[72]

During construction, migrating fish would move up the river with the assistance of a temporary trap and transport facility, and down the river with a "temporary flow diversion tunnel."[73] This is the tunnel that would provide downstream fish passage during construction.[74] During trap and transport, adult salmonids would be prioritized.[75] Overall, the expected survival rate for fish during construction is exceptionally poor. Only 45% of adult steelhead travelling upstream and 49% travelling downstream are expected to survive,[76] with similar estimates for other trout.[77] For spring and fall run Chinook salmon, 0% of juveniles travelling upstream would survive during construction.[78]

It bears repeating that these numbers refer to survival, not just to fish passage.[79] Likewise, survival rates are in the low 60s for fall run Chinook adults travelling upstream during construction.[80] The DEIS recognizes this by calling the adverse impacts "significant and unavoidable," especially because mitigation is uncertain. All of this violates federal protection for endangered bull trout,[81] and treaty protected fish passage for salmon and other fish.[82]

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[68] "If permitted, the Applicant expects FRE facility construction would occur between 2025 and 2030 and would last approximately 5 years (Martin 2019b)." DEIS at E-99. "Construction of the FRE facility is expected to require three separate in-water work periods lasting from July 1 through September 30 each year." *Id.*
[69] DEIS at E-103.
[70] DEIS at E-63.
[71] DEIS at E-100.
[72] DEIS at E-106.
[73] DEIS at E-100. Temporary trap and transport would become operational during Year 2 of construction, and fish would travel upriver in the main channel until then. *Id.*
[74] Another problem: "The Applicant's project description does not include plans to light the diversion tunnel for fish passage. However, fish move throughout the diel period, and juvenile steelhead in the upper Chehalis River show a clear pattern of upstream movement near dawn and downstream movement during early evening (J. Winkowski and Zimmerman 2017)." DEIS at E-80. This is why the DEIS assumes upstream migration through the tunnel will not occur.
[75] DEIS at E-80.
[76] DEIS App. E, Table E-9.
[77] DEIS at E-148.
[78] DEIS App. E, Table E-9.
[79] *Id.*
[80] *Id.*
[81] 64 Federal Register 58909.
[82] U. S. v. Washington, 853 F.3d 946 (9th Cir. 2017), *aff'd by an equally divided court* 138 S. Ct. 1832 (2018).

According to the DEIS, measuring sonic impacts during construction to evaluate compliance with state and federal fish protection mandates "may not be possible."[83] Someone, an unspecified observer of some kind, would have to monitor fish behavior to observe the "effects of sound created by construction as a permit condition of the Hydraulic Project Approval" or HPA.[84] An HPA "ensures that construction is done in a manner that protects fish and their aquatic habitats."[85] Standard HPA's have a five-year statutory limit, beyond which a mitigation agreement is required in addition to an mitigation plan.[86] Pursuant to S.B. 1579 passed by the legislature in 2019, the HPA process is currently undergoing a rulemaking change to implement "recommendations of the Southern Resident Killer Whale Task Force related to increasing Chinook salmon populations." In the context of the Chehalis dam proposal, the irony is rich. In practice, it is unclear whether an HPA for this project would include a provision for modifying operations if the observer sees a problem. The EIS should address this question.

b. Fish Passage During Operation is Speculative

The proposed fish passage is inadequately described, especially the temporary passage proposal during construction, and its effectiveness is uncertain. We do not know exactly how the fish will get to the other side of the dam, and we do not have data on whether it will do what the Applicant says it will do. Mitigation is already uncertain, and the DEIS acknowledges as much.

During normal flows, fish would migrate up and down through five outlets at the base of the dam, each 310 feet long and unlit.[87] During flood conditions when the outlets are closed, fish passage would consist of "[a] trap-and-transport facility that captures fish and transports by truck around the dam above the reservoir."[88] This means that to ensure minimal fish survival during dam operations, funding and staff would have to be ensured in perpetuity during the life of the dam.

The DEIS measures fish passage performance with a "combination of passage efficiency and survival."[89] During operation, fish would move up and downstream with a "specialized fish collection, handle, transfer, and release (CHTR) system."[90] During dam operation, the National Marine Fisheries Service requires fish passage to be provided for the "middle 90% of the streamflow of record when migrating fish are normally present at a site,"[91] and Washington state law "requires provision for passage of all fish and fish life stages believed to be present in the system."[92]

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[83] DEIS at E-63.
[84] *Id.*
[85] HYDRAULIC PROJECT APPROVAL (HPA), WASHINGTON DEPARTMENT OF FISH AND WILDLIFE, https://wdfw.wa.gov/licenses/environmental/hpa.
[86] RCW 77.55.021(9)(b); MITIGATION FOR BETTER HYDRAULIC PROJECT APPROVAL (HPA) PROJECTS, WASHINGTON DEPARTMENT OF FISH AND WILDLIFE, https://wdfw.wa.gov/sites/default/files/2019-02/mitigation_for_better_projects.pdf.
[87] DEIS at 20.
[88] DEIS at 8.
[89] DEIS at E-76
[90] *Id.*
[91] DEIS at E-76 (citing NMFS 2011).
[92] DEIS at E-76 (citing RCW 77.57.030).

Under the dam scenario, the proposed fish passage would often fail to actually provide fish passage.[93] This is straightforwardly established in Table E-9 of the DEIS Fish Appendix. Further, the numbers for fish survival during dam operation all include the assumption that fish would migrate up through the "310-foot-long, unlit tunnels in the base" of the proposed dam during normal flow[94] This means the abysmal numbers discussed here would likely be lower.

For spring run Chinook salmon, discussed further below with respect to Southern Resident Killer Whales, zero percent of juveniles travelling downstream would survive during flood retention.[95] The same numbers are true for fall run Chinook salmon: zero percent of juveniles travelling downstream would survive during flood retention.[96] This is not to mention survival rates as low as 50% for juveniles travelling upstream during flood retention, and the 64% survival rate projected for fall and spring Chinook juveniles travelling upstream during business as usual with the dam in. This is abysmal, especially when these species are already under stress from climate change and ocean acidification, and would be under further stress from stagnant water and higher temperatures from destroyed riparian buffer zones.

The zero percent survival rates are the same for coho salmon, steelhead, coastal cutthroat, pacific lamprey, and western brook lamprey: no juveniles of any of those species would survive going upstream during construction, and no juveniles would survive going downstream during flood retention.[97] Even when the dam would not be retaining floodwater, survival rates range from 96% at the most[98] down to 64% at the least.[99]

Even these pessimistic projections of how the proposed fish passage system would operate are highly speculative. The DEIS acknowledges that "[t]he exact details of how fish passage would transition from open outlet conduits to closed conduits and operation of the CHTR facility have not been identified by the Applicant."[100] This means the all-important mitigation for fish impacts is speculative, and the DEIS cannot functionally perform an effective analysis. This question must be answered before a decision is made, as the law requires fish passage for any dam constructed.

Similarly, the DEIS disclaims that the analysis of fish passage, especially for lamprey, is speculative: "[p]ending more information being provided by the Applicant regarding the low velocity CHTR entrance; the proposed design is a prototype, the design has not been developed beyond the 30% level, nor has the prototype been installed or evaluated."[101] This kind of speculation is no foundation on which to base a decision for such a massively impactful project.

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[93] DEIS App. E, Table E-9.
[94] DEIS at E-81 ("The impact assessment included the following assumptions during non-flood conditions: Fish would enter and pass through the 310-foot-long, unlit tunnels in the base of the FRE facility.").
[95] *Id.*
[96] *Id.*
[97] DIES App. E, Table E-9.
[98] For steelhead and both species of lamprey. *Id.*
[99] For juvenile coho salmon and coastal cutthroat. *Id.*
[100] DEIS at E-82.
[101] DEIS at E-79.

Four years ago, the Center for Environmental Law & Policy raised these same concerns in comments on the Draft Programmatic DEIS for the Chehalis Basin. We were concerned about the adequacy of fish passage, and the lack of detail in the proposed mitigation measures. We wrote: "Any fish passage method ultimately selected should operate through permanent features of the dam (i.e., fish ladders rather than trap and haul facilities), so that continued human intervention is not needed to provide for fish survival."

Today, the applicant and the state continue to rely on human intervention rather than structural adaptations for ensure fish passage past the proposed dam. Among other things, this requires adequate continued funding, which recent experience shows us is never assured. It bears repeating that this assumes fish passage would actually be built and operational on schedule, which experience shows is a bold ask.[102]

V. Unaddressed Effects on Other Fish

If the dam were to be built, other fish would fall prey to all the same stressors discussed above with salmon. Many of these species are protected by the state Endangered Species Act, which sets out requirements for landowners to comply with conservation plans.[103]

Lamprey are insufficiently analyzed in the DEIS. Indeed they could not be, because their population structure in the Chehalis River is not known.[104] One study suggested that river lamprey are likely present in major coastal rivers such as the Chehalis.[105] This is the case despite the Western river lamprey being included "as a state of Washington Species of Greatest Conservation Need and Candidate for the state of Washington Priority Habitats and Species list."[106] Likewise, "Pacific lamprey is included as a Species of Greatest Conservation Need in the Washington State Wildlife Action Plan and is a Species of Tribal Importance."[107] Lamprey are a traditionally important food in the Pacific Northwest, and the DEIS contains insufficient information on the dam's potential impact on them.

The DEIS states that "[i]mpacts to chum salmon, bull trout, eulachon, green sturgeon, and white sturgeon are not analyzed in detail since these species tend to occur downstream of areas that would experience significant impacts to hydraulics, water quality and substrate continuity."[108] Even despite their concentration downstream, this lack of attention to chum salmon is concerning for the second-most abundant anadromous salmonid present in the basin.[109]

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[102] "A 2014 study of 245 dams in 65 countries, however, shows an average cost overrun of 96% for dam building." *FAQ*, CHEHALIS RIVER ALLIANCE, https://www.chehalisriveralliance.org/faq (citing Atif Ansar et al., *Should We Build More Large Dams? The Actual Costs of Hydropower Megaproject Development*, 69 ENERGY POL'Y 43 (2014)). The cited study examined hydropower rather than flood control dams, which unlike the proposed dam at issue have some prayer of providing a return on investment.
[103] Chapter 220-610 WAC.
[104] DEIS at E-43.
[105] DEIS at E-44 (citing Wydoski and Whitney 2003).
[106] DEIS at E-44.
[107] DEIS at E-43.
[108] DEIS at E-105.
[109] DEIS at E-45.

Impacts to rainbow trout, cutthroat trout, and mountain whitefish are even more shrouded in mystery. They are widely distributed throughout the basin, but their abundance is not well-characterized in the area above the proposed dam, where the reservoir would be.[110] In the Chehalis River, "[l]ittle is known" about juvenile mountain whitefish spatial distribution.[111] This means that the Environmental Impact Statement is unable to evaluate the environmental impacts on these species.

Freshwater sculpins, minnows, and suckers are also documented in the proposed inundation area.[112] The Olympic mudminnow is a state listed sensitive species.[113] It is unique to the coastal lowlands of western Washington, occurring "nowhere else in the world," and the majority of the population is in the Chehalis Basin.[114] These facts have enormous implications for what a dam would mean for this species.

The Olympic mudminnow is heavily dependent on temporarily flooded wetland habitats and sensitive to changes in hydrology. It requires "a muddy bottom, little or no water flow, and abundant aquatic vegetation."[115] Wetland loss in western Washington has been the primary cause of their decline.[116] Even before this DEIS, negative impacts were difficult to measure and prevent because shallow mudminnow habitats are often mis-mapped and mis-identified, and information is not always transmitted between managing agencies.[117] In 2009, Glasgow and Hallock (2009) stated: "Many mudminnow habitats are mis-mapped or misclassified as 'non-fish bearing' waters on the Washington State Department of Natural Resources regulatory water type maps, which can substantially reduce mudminnow habitat protection."[118]

Given that a comprehensive survey of streams and wetlands of the upper Chehalis has not been completed, it is likely that mudminnow habitat is still mis-mapped and mis-classified. The DEIS should have better information on habitat used by such a sensitive species, especially in light of the proposed dam's hydrologic impacts, and the extent of wetland habitat the dam would eradicate. NEPA and SEPA, as information forcing laws, require agencies to do the research to answer questions like these.[119]

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[110] DEIS at E-45.
[111] DEIS at E-46 (citing J. Winkowski et al. 2018).
[112] DEIS at E-46; E-47.
[113] "A species native to the state of Washington that is vulnerable or declining and is likely to become endangered or threatened in a significant portion of its range within the state without cooperative management or removal of threats. The 8 state Sensitive species are designated in Washington Administrative Code 232-12-011." THREATENED AND ENDANGERED WILDLIFE IN WASHINGTON: 2012 ANNUAL REPORT at 7, https://wdfw.wa.gov/sites/default/files/publications/01542/wdfw01542.pdf.
[114] DEIS at E-48.
[115] THREATENED AND ENDANGERED WILDLIFE IN WASHINGTON: 2012 ANNUAL REPORT AT 157, https://wdfw.wa.gov/sites/default/files/publications/01542/wdfw01542.pdf.
[116] *Id.* at 158.
[117] *Id.* at 158.
[118] *Id.* at 158 (citing Glasgow and Hallock 2009).
[119] *See Sierra Club v. United States*, 23 F. Supp. 2d 1132 (N.D. Cal. 1998) (circumstances changed after a flood, and NPS needed to revisit and reexamine an EIS for a Yosemite lodge).

Coastal and Puget Sound bull trout are listed as threatened under the Endangered Species Act.[120] Bull trout are documented in the "lower Chehalis River and Grays Harbor tributaries and are presumed to occur in the lower mainstem Chehalis River, which is part of the species' designated critical habitat upstream to RM 43 (near Oakville)."[121] This is well below the dam, but the temperature effects of the dam are likely to negatively affect the endangered bull trout downstream.[122]

Likewise, the southern distinct population segment (DPS) of eulachon smelt is listed as threatened under the Endangered Species Act.[123] The Chehalis Basin is not included in their designated critical habitat; low numbers were found in Grays Harbor, but recent surveys suggest that eulachon exist higher in the Chehalis Basin.[124] For policy makers to make an informed decision, this information should be included in the DEIS.

The southern distinct population segment of the green sturgeon is also listed as threatened under the Endangered Species Act.[125] Their nearest critical habitat to the Chehalis Basin is Willapa Bay and Grays Harbor, and the lower Columbia River from the mouth to rkm 74.[126] Green sturgeon are known to be in the Chehalis River, where some suitable spawning habitat exists, while the distribution of white sturgeon is unknown.[127] Grays Harbor has a recreational and commercial fishery for sturgeon, and the DEIS should examine this economic impact.[128]

Overall, each of these descriptions of the population dynamics of certain fish species in the Chehalis River is honest about the abject lack of data, both upstream where the dam is proposed and downstream where the dam's impacts on hydrology and water temperature extend. This betrays a fundamental weakness of the DEIS. Additionally, the Chehalis River is also subject to increasing colonization by non-native fish.[129] Invasive bass, especially, are known to thrive in warmer and slower moving water.[130] In other words, creating a reservoir at certain times of year will exacerbate disadvantages of native fish. Building the dam would increase the bass population and its predation on juvenile salmonids, thereby decreasing the salmon population. This is yet another way the dam is detrimental to not only economically and culturally critical salmon and steelhead populations, but also to many other native fishes of the Chehalis ecosystem.

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[120] 64 Federal Register 58909. Under the ESA, 'threatened species' "means any species which is likely to become an endangered species within the foreseeable future throughout all or a significant portion of its range." ESA § 3(20).
[121] DEIS at E-48 (citing 75 Federal Register 63898).
[122] *See* DEIS at E-iv.
[123] 75 Federal Register 13012.
[124] DEIS at E-48.
[125] 71 Federal Register 17757.
[126] *Green Sturgeon*, NOAA FISHERIES, https://www.fisheries.noaa.gov/species/green-sturgeon#conservation-management.
[127] DEIS at E-49.
[128] *Id.*
[129] *Id.*
[130] DEIS at E-50

VI. Shellfish & Macroinvertebrates

While knowledge of non-salmonid fish in the Chehalis River is incomplete, knowledge of shellfish and macroinvertebrates is even more limited. The DEIS says it all: "The effects of the proposed actions on freshwater shellfish and aquatic macroinvertebrates are evaluated qualitatively because of a lack of documentation of their distribution in the primary study area, particularly in the areas that will be most affected in the temporary reservoir inundation area and the reaches immediately downstream of the proposed FRE site."[131]

Freshwater mussels have a significant role in filtering and cleaning water.[132] For the persistence of their populations, longstanding mussel sites must be allowed to persist. In 2018, WDFW recognized that their surveys "likely covered only a fraction of the mussel distribution in the Chehalis Basin, and species composition was not determined."[133]

Likewise, the DEIS recognizes that aquatic macroinvertebrates "play a crucial role in the decomposition of organic materials and are a critical link in the flow of energy through the food web, from primary producers to vertebrate predators."[134] In places like the Chehalis River where macroinvertebrate populations are suffering, chronic human impacts like climate change, pollutants, temperature increases, and loss of riparian vegetation all preclude recovery.[135] "Dams that have modified the natural flow regime of streams and rivers remove the structuring influence of floods on invertebrate communities, in some cases leading to dramatic, often deleterious, shifts in community composition."[136] "This is one reason," the DEIS acknowledges openly, "a number of ecologists advocate for the return or maintenance of natural flood regimes to regulated rivers."[137]

VII. Southern Resident Killer Whales

The proposed dam would have a negative and unstudied effect on endangered Southern Resident Killer Whales. They rely on Chinook salmon as they journey up and down Washington's coast, and a dramatic reduction in Chehalis Chinook would not help the whales in their desperate fight for survival. The Southern Resident distinct population segment of killer whales is protected by the Marine Mammal Protection Act, and was federally listed as endangered under the Endangered Species Act in 2005 and updated in 2014.[138] Their designated critical habitat

[131] DEIS at E-82.
[132] DEIS at E-50.
[133] DEIS at E-51.
[134] DEIS at E-52.
[135] DEIS at E-54 (citing Hershey and Lamberti 1998).
[136] DEIS at E-54 (citing Poff et al. 1997).
[137] DEIS at E-54.
[138] 70 Federal Register 69903; 79 Federal Register 20802.

generally covers Puget Sound, the Salish Sea, and the Strait of Juan de Fuca,[139] but in the winter and spring they range the open coast from Monterey Bay, California up to southeast Alaska.[140]

Many Washingtonians do not realize just how endangered this population is. As of November 2019 the population stands at only 73 individuals, down from 98 in 1995.[141] According to the Marine Mammal Commission, an independent federal agency, "[t]he prospects for recovery appear bleak, as since 2015 there has been just one birth that have produced a calf who survived to juvenile age."[142] The top threats to the southern resident killer whales are prey availability, pollution and contaminants, vessels, and noise.[143]

Washington's governor, however, understands the gravity of the whales' situation and has taken action to try and remedy their prospects. In 2018, Governor Inslee signed an executive order directing state agencies to take certain immediate actions and established a task force to study the issue with tribes, Canadian agencies, and other partners.[144] The order recognized that the "health of Southern Residents and Chinook salmon are tightly linked."[145] Studies have shown that "reduced Chinook salmon runs undermine the potential for the Southern Resident population to successfully reproduce and recover," and both salmon and whales are already under stress from warming oceans and ocean acidification.[146]

The importance of Chinook salmon to Southern Resident Killer Whales cannot be overstated. Chinook salmon make up about 80% of their diet.[147] In the most recent task force report from 2019, Goal #1 for whale recovery is "[i]ncrease Chinook abundance."[148] Three orcas died in 2019, "a tragic reminder that the Southern Residents are struggling from a lack of Chinook salmon" compounded by other stressors.[149] Looking forward, the task force recognized the need to "[s]ustain the priority focus on increasing Chinook salmon abundance."[150] And the focus needs to be on increasing Chinook abundance *everywhere* – Southern Residents make their home in Washington's Salish Sea for much of the year, but they seek Chinook "along the West Coast from Northern California to Southeast Alaska."[151] In all regions, the state's focus is on making Chinook

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[139] 71 FR 69054 - ENDANGERED AND THREATENED SPECIES; DESIGNATION OF CRITICAL HABITAT FOR SOUTHERN RESIDENT KILLER WHALE, https://www.govinfo.gov/app/details/FR-2006-11-29/06-9453 ("Three specific areas are designated, (1) the Summer Core Area in Haro Strait and waters around the San Juan Islands; (2) Puget Sound; and (3) the Strait of Juan de Fuca, which comprise approximately 2,560 square miles (6,630 sq km) of marine habitat.").
[140] SOUTHERN RESIDENT KILLER WHALE, MARINE MAMMAL COMMISSION, https://www.mmc.gov/priority-topics/species-of-concern/southern-resident-killer-whale/.
[141] FINAL REPORT AND RECOMMENDATIONS, SOUTHERN RESIDENT ORCA TASK FORCE 4 (November 2019), https://www.governor.wa.gov/sites/default/files/OrcaTaskForce_FinalReportandRecommendations_11.07.19.pdf.
[142] SOUTHERN RESIDENT KILLER WHALE, MARINE MAMMAL COMMISSION, https://www.mmc.gov/priority-topics/species-of-concern/southern-resident-killer-whale/.
[143] *Id.*
[144] EXECUTIVE ORDER 18-02, SOUTHERN RESIDENT KILLER WHALE RECOVERY AND TASK FORCE (March 14, 2018), https://www.governor.wa.gov/sites/default/files/exe_order/eo_18-02_1.pdf.
[145] *Id.*
[146] *Id.*
[147] FINAL REPORT AND RECOMMENDATIONS, SOUTHERN RESIDENT ORCA TASK FORCE 19 (November 2019), https://www.governor.wa.gov/sites/default/files/OrcaTaskForce_FinalReportandRecommendations_11.07.19.pdf.
[148] *Id.*
[149] *Id.* at 4.
[150] *Id.* at 8.
[151] *Id.* at 19.

populations "abundant, diverse, and accessible."[152] And yet, several observers of the effects of climate change on the Chehalis Basin have posited that "Chinook are the most vulnerable to the increasing temperatures because they spend the most time waiting in upstream areas to spawn."[153]

Advanced study of marine biology is unnecessary to appreciate the existential threat to this delicate food web presented by the proposed dam. The Southern Resident Killer Whales are already at risk of death by a thousand cuts, and this dam would have a disproportionately negative impact on the health of Chinook and Southern Resident Killer Whales. The Chinook produced in the Chehalis River contribute to the Grays Harbor population, and in turn would be part of the salmon available to Southern Resident Killer Whales along the coast.[154]

The DEIS acknowledges that reduction in spring-run Chinook would have at least a "moderate" impact on Southern Resident Killer Whales, but the DEIS also admits that the "degree to which a decline in the specific subpopulation of fish originating from the upper Chehalis River would affect the Southern Resident killer whale is unknown, and the magnitude of construction-related impacts on killer whales is highly uncertain."[155] This is an inappropriate and unacceptable way to do business. Just as with all the other endangered species connected to the Chehalis Basin, the proposed dam would negatively affect theses species' chances of recovery.

VIII. Failure to Address Climate Risk

The fish, wildlife, and people of the Chehalis Basin are already experiencing negative effects from climate change. The dam would exacerbate these effects, which is yet another reason that the state should reject the dam proposal and pursue local flood resilience instead.

For salmon in the Chehalis River, all observers agree that the prognosis is only worsening. One article reported that "[a]ccording to the state Department of Fish and Wildlife and other Chehalis observers, climate change is a major culprit in the salmon's decline. In an early January presentation in Centralia, state experts noted that only 25% of the Chehalis River Basin retains optimal temperatures for coho salmon. That is expected to decrease to 6% by 2040 and to 2% by 2080."[156] To repeat: already, only 25% of the basin retains optimal temperature, and it is dropping precipitously.[157] This is a lethal state of affairs. All of this is without the proposed dam and the associated removal of 600 acres of vegetation,[158] which would dramatically increase the temperature of the Chehalis River both upstream and downstream of the proposed dam site.[159]

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[152] *Id.*
[153] John Stang, *Will Flood Protection Set Back Salmon Restoration in the Chehalis River Basin?*, CROSSCUT (Feb. 12, 2020), https://crosscut.com/2020/02/will-flood-protections-set-back-salmon-restoration-chehalis-river-basin.
[154] DEIS at E-55.
[155] DEIS at L-24.
[156] John Stang, *Will Flood Protection Set Back Salmon Restoration in the Chehalis River Basin?*, CROSSCUT (Feb. 12, 2020), https://crosscut.com/2020/02/will-flood-protections-set-back-salmon-restoration-chehalis-river-basin.
[157] *Id.*
[158] Large trees (greater than 6 inch diameter) and non-flood tolerant trees would be removed in the reservoir and construction area – "affecting over 600 acres of upland, riparian, and wetland areas" DEIS at E-102.
[159] *Id.*

Even without a dam, the news is bad for current and projected water temperature.[160] Increases in air temperature and lower summer flows are projected to increase summer stream water temperatures under climate change scenarios.[161] That increase in stream water temperatures will "reduce the quality and quantity of freshwater habitat, especially for salmonid species that become stressed from high water temperatures."[162] Such temperature increases will negatively impact freshwater productivity.[163]

For salmon and other fish, higher summer water temperatures "could increase susceptibility to disease, parasites, and predators."[164] Future climate change scenarios, extensively researched, demonstrate that invasion and expansion of nonnative species will increase.[165] These habitat changes will give non-native fish a competitive advantage, and some will become predators of native species.[166]

In sum, higher water temperatures are coming, and they kill salmon independently and by fostering ecological conditions that lead to premature salmon deaths. Proposals for flood management in the Chehalis Basin should aggressively mitigate these harmful outcomes rather than exacerbating them.

Further, the "full implications of ocean acidification on salmon are not known at this time."[167] Acidification should properly be considered as part of anticipated climate change effects, because it would most likely compound the negative effects of higher stream temperatures to bring survival rates even lower. Lower ocean survival makes it even more critical that salmon are protected during their time in fresh water.

IX. The Local Action Alternative Was Inadequately Studied

a. DEIS Local Action Alternative

Flooding in the Chehalis Basin is a devastating problem. Most recently, the flood in 2007 sparked the conversation that has led to this DEIS, but the causes are older than 2007, and multifaceted. W. Jay Gordon, a local leader and dairy farmer, explained to the New York Times that the causation of the floods and the tension around solutions for them is "not just logging. It's not just farming. It's not just development, and it's not just environmentalists."[168] Making the Chehalis Basin more flood resilient requires solutions as complex as the causes of the flooding.

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[160] DEIS at E-57.
[161] *Id.* (citing Isaak et al. 2017, McConnaha 2018).
[162] *Id.* (citing Mantua et al. 2010).
[163] *Id.* (DNR 2018, Ohlberger et al. 2018, J. Winkowski and Zimmerman 2019).
[164] *Id.*
[165] DEIS at E-58 (citing Lawrence et al. 2012, Lawrence et al. 2014, Rubenson and Olden 2019).
[166] DEIS at E-58.
[167] DEIS at E-59.
[168] William Yardley, *Anger and Blame After Deadly Flood in Northwest*, NEW YORK TIMES (Jan. 3, 2008), https://www.nytimes.com/2008/01/03/us/03flood.html (quoting W. Jay Gordon).

A one-size-fits-all dam is tempting in its seeming simplicity, but for all the reasons herein stated is a mirage of a solution. It would not effectively protect residents and livestock in the Chehalis Basin, and it would have devastating consequences for legally protected local fishing economies. The Local Action alternative is the only one that could result in compliance with treaty rights and the Endangered Species Act.[169]

The Local Action alternative is also clearly the most cost-effective, despite an anemic attention to that type of analysis for this alternative. A point in history when our state's budget may take decades to recover from the impact of coronavirus is not the time to engage in a dam construction project that is so likely to lead to cost overruns in the millions of dollars.[170]

Development in the floodplain is one contributing cause of the severity of Chehalis floods. In 2007, the Seattle Times talked to a University of Washington scientist about how development can contribute to increased flooding impacts:

> While individual filling projects might not appear to have an impact, the cumulative effect of repeated development in a floodplain can mean big trouble, the experts argue. It's like putting bricks in a bathtub. One brick displaces a little water. But a lot of bricks can force the tub to overflow. 'The more stuff you put in a flood plain, the higher the water the will rise,' said David Montgomery, a scientist at the University of Washington who has studied the history of rivers in Western Washington.[171]

The Center for Environmental Law & Policy expressed concern about this four years ago, in comments on the Draft Programmatic DEIS for the Chehalis Basin. Then, we commented that "building a dam would almost certainly promote development of the floodplains downstream – just as it has on the Green and Puyallup Rivers." This would promote a backwards type of flood insurance from the true risks inherent in the landscape. More development in the basin would also stress the existing system of water rights. The Chehalis Basin is over-appropriated, and creating a situation that fosters development would threaten the instream flow rule with more permit-exempt wells. Instead, building outside of the floodplain avoids the risk of flood damage, and requires no maintenance.

Flooding is not bad in itself; the negative human impacts are. Floods recharge groundwater and are essential to the overall ecology of the Chehalis Basin.[172] Since floods provide ecological benefits, the goal should be to reduce exposure to flood damage (e.g. by raising and relocating buildings), not to reduce flooding itself. The focus should be on eliminating the human cost of floods, rather than the floods themselves.

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[169] The ESA consultation process with NOAA for an incidental take permit under ESA § 7 would likely reveal even more problems.

[170] Atif Ansar et al., *Should We Build More Large Dams? The Actual Costs of Hydropower Megaproject Development*, 69 ENERGY POL'Y 43 (2014). (studying hydropower dams and concluding in general that cost "[e]stimates are systematically and severely biased below actual values," and "[p]rojects that take longer have greater cost overruns; bigger projects take longer.").

[171] Lynda V. Mapes, *Did Development, Logging Set The State for Disaster?*, SEATTLE TIMES (Dec. 9, 2007), https://www.seattletimes.com/seattle-news/did-development-logging-set-the-stage-for-disaster/.

[172] DEIS at E-129; E-130.

Currently, the "Local Actions Alternative considers a variety of local-scale actions that approximate the Applicant's objective through improving floodplain function, land use management actions, buying out at-risk properties or structures, floodproofing buildings, channel migration protection, improving early flood warning systems, and increasing water storage from Pe Ell to Centralia through floodplain storage improvement."[173]

This is a good start, but the DEIS should contain a more thorough analysis of possibilities for improving floodplain function in order to facilitate an unbiased comparison of the FRE dam and Local Action alternatives. In summary, the proposed dam would not solve the problem, nor would a future, expanded dam. Local actions for flood resilience would be a much more effective way to reach a solution that aids farmers and homeowners in the Chehalis Basin, and deserves further study.[174]

b. Economic Advantage of Wetland Conservation & Restoration

A comparative approach throws the short-sightedness of this dam proposal into greater relief. For example, experience in California's Sacramento Valley demonstrates that "alternative flood control systems can be designed without eliminating floodplain function and processes."[175] Their Yolo Bypass was "engineered to allow Sacramento Valley floodwaters to inundate a broad floodplain" of agricultural lands and seasonal and permanent wetlands.[176] The 24,000 hectare floodplain can convey "up to 80% of the flow of the Sacramento River basin during high water events."[177] Finding a comparable solution for the Chehalis Basin would require adapting floodplain solutions to its unique needs, but the Sacramento study demonstrates that this approach can succeed.

Similarly, a study of the Smith Creek Basin in Saskatchewan, Canada demonstrated that "wetland retention is an economically viable solution to limit the financial, social and environmental damages of flooding."[178] Draining wetlands increases downstream flood damage to local infrastructure and agriculture.[179] Conversely, retaining existing wetlands in that basin provides a social return on investment ratio of 7.7.[180] General flood management services provided by all types of wetlands give a social return on investment ratio of 3.17.[181] Wetlands and other ecological systems for building flood resilience make good economic sense.

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[173] DEIS at v.
[174] *See infra*, Section X.
[175] Ted Sommer et al., *California's Yolo Bypass: Evidence That Flood Control Can Be Compatible with Fisheries, Wetlands, Wildlife, and Agriculture*, 26 FISHERIES 6 (2011).
[176] *Id.*
[177] *Id.*
[178] John K. Pattison-Williams et al., *Wetlands, Flood Control and Ecosystem Services in the Smith Creek Drainage Basin: A Case Study in Saskatchewan, Canada*, 147 ECOLOGICAL ECONOMICS 36 (2018).
[179] *Id.*
[180] *Id.*
[181] *Id.*

Finally, a study of the Mississippi Basin demonstrated how building flood control infrastructure can backfire.[182] Despite a "massive effort" throughout the 20th century to build levees in the upper Mississippi Basin, mean annual flood damage "increased 140% during that time."[183] Given their study, the scientists suggested that it was:

> [T]ime to develop a comprehensive flood management strategy that includes using wetlands to intercept and hold precipitation where it falls and store flood waters where they occur. History testifies to the truth of this premise: it was the rampant drainage of wetlands in the nineteenth century that gave rise to many of today's water resources management problems.[184]

Restoring and maintaining wetlands is a powerful tool. In general, less harmful and simpler solutions abound. For example, a substantial portion of projected future flood damage could be reduced simply by increasing freeboard height, or elevation of structures.[185] Likewise, the "2017 Programmatic EIS stated that 75% of the residential structures and 25% of the commercial, industrial, and other non-residential structures in the Chehalis River floodplain could be protected through elevation, other floodproofing measures, and buy-outs."[186] These ecologically compatible solutions are far superior to reducing floodplain resilience by removing wetlands,[187] which would impact multiple species in addition to reducing the flood capacity of the basin.

The Wild Salmon Center has suggested more effective long-term solutions for flooding that would also protect the river's salmon runs, which include restoring natural floodplain function.[188]

> Restoring natural floodplain function to the Upper Chehalis means investing in habitat restoration, culvert removal, and de-channelization where the river has been artificially narrowed. We also need to be smart about development within the floodplain: discouraging more infill and hard surfaces, encouraging voluntary buy-outs, conservation easements, and sensible ways to move people and structures out of harm's way.[189]

The dam would be a massive step in the wrong direction for building flood resilience. The DEIS found that building the dam would result in "the loss of ecological function across up to 847 acres of upland, wetland, and riparian vegetation communities from reoccurring inundation events that will result in sediment deposition, channel widening, channel migration, and future colonization by invasive vegetation."[190] Wetlands are the kidneys of the landscape. Losing them

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[182] Donald L. Hey & Nancy S. Philippi, *Flood Reduction Through Wetland Restoration: The Upper Mississippi River Basin as a Case History*, 3 RESTORATION ECOLOGY 4 (1995).
[183] *Id.*
[184] *Id.*
[185] DEIS at 120.
[186] DEIS at 121.
[187] DEIS at E-24.
[188] CHEHALIS RIVER, WILD SALMON CENTER, https://www.wildsalmoncenter.org/campaigns/chehalis-river/.
[189] *Id.*
[190] DEIS at E-122.

means losing their massive ecosystem services and filtration abilities, which means losing ecological resilience at a moment in human history when we need it more than ever.

c. Design for Resilience

Dams are a static solution to a dynamic problem. Rivers are alive in more ways than one. They move, change in size, and more. This is normal and necessary.[191] For decades,[192] engineers and landscape designers have been studying how to design with rivers.[193] Similarly, hazard planners work with governments, including the United States, to develop landscape-based solutions to environmental risks.[194]

According to landscape architects Watson & Adams, the "first step in resilient design for inland flooding is to identify and map areas of any existing natural features . . . that provide ecosystem services in absorbing rainfall."[195] The next step is to develop "a plan that protects or restores these features."[196] In performing both of these steps, the authors urge special attention to flow pathways of water, wetlands and the conversion of surface water to groundwater, native vegetation, geology and soils underlying water movement, and connectivity for native plants and wildlife.[197] In general, landscapes will be less flood-prone if they have less impervious land cover like asphalt. Porous pavement with infiltration beds can enable car travel and parking without contributing to water buildup during high flow events.[198]

During extreme rainfall events, the "capacity of any system, natural or man-made, to hold water will eventually be exceeded, and water will move downstream."[199] In a natural system, the rate the water moves downstream is "buffered by wetlands, riparian buffers, and floodplains."[200] These do two things: capture the volume of water, and slow the velocity at which it flows.[201]

When these assets are considered holistically, emergency planning becomes more resilient.[202] One University of Washington professor led a study to strengthen the Federal Emergency Management Agency (FEMA)'s process in Washington for hazard mitigation and recovery planning. Normally, hazard planning begins and ends with analyzing a hazard scenario and its effect on the built environment.[203] But when stakeholders begin by identifying built, natural, and

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[191] Dorothy Mulkern, landscape architect/urban planner, personal communication (May 7, 2020).
[192] Well, really for centuries.
[193] *See, e.g.*, DONALD WATSON & MICHELE C. ADAMS, DESIGN FOR FLOODING: ARCHITECTURE, LANDSCAPE, AND URBAN DESIGN FOR RESILIENCE TO FLOODING AND CLIMATE CHANGE (2011).
[194] *See, e.g.*, Robert C. Freitag, Daniel B. Abramson, Manish Chalana, & Maximilian Dixon, *Whole Community Resilience: An Asset-Based Approach to Enhancing Adaptive Capacity before a Disruption*, 80 J. AM. PLANNING ASS'N, 324–35 (2014).
[195] DONALD WATSON & MICHELE C. ADAMS, DESIGN FOR FLOODING: ARCHITECTURE, LANDSCAPE, AND URBAN DESIGN FOR RESILIENCE TO FLOODING AND CLIMATE CHANGE 103 (2011).
[196] *Id.*
[197] *Id.*
[198] *Id.*
[199] *Id.* at 119.
[200] *Id.*
[201] *Id.*
[202] Freitag at 324.
[203] *Id.*

social assets that contribute to human wellbeing before introducing the hazard scenario, a more realistic picture emerges. In the study, stakeholders also identified assets that could help them adapt to a new normal—neighborhood level social connections were a top priority.[204] This kind of planning identifies assets for resilience as well as assets that could aid in future adaptation following an emergency.[205]

In sum, these are precisely the kind of adaptations that should have been studied as part of the Local Action alternative. Resilient landscape design focuses on solutions that can be long-lasting, in contrast to the proposed dam with, for example, fish passage that would require funding and staff for interventional trap and haul in perpetuity. For policymakers to make a robustly informed decision on the Applicant's dam proposal, these alternatives must be better explored.

X. Concluding Summary

The proposed dam in the Chehalis Basin would not effectively manage floods: in a late-century catastrophic flood scenario, the dam would protect less than half of existing structures. In return, the dam would be a disaster for salmon, trout, and other fish already stressed by climate change, as well as creatures that rely on those fish like endangered Southern Resident Killer Whales. The mitigation proposed for these negative impacts is largely speculative. Plus, the DEIS violates SEPA and NEPA by falsely segmenting the environmental analysis for an "expandable" dam. Building any dam would make no practical, environmental, or economic sense, and would violate Washington's legal obligations under treaties with Indian nations, which have the status of federal law, and the Endangered Species Act. Instead, the state should foster wetland restoration and other resilient designs to make the floodplain safer for people.

The DEIS discusses how climate change will threaten all fish populations in the basin; now is the time to safeguard these emblems of our regional identity. The 2007 flood was devastating for communities in the Chehalis basin, from young families losing their houses to ranchers losing ruinous numbers of cattle. These costs must be addressed at the local level, supported by state and federal governments, with practical improvements to floodplain function.

Please do not hesitate to contact CELP if you have questions about the above or would like any clarifications. Thank you again for accepting these comments.

Best Regards,

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[204] *Id.*
[205] *Id.*

The following organizations sign on in support of these comments:

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