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SEPA Draft EIS for the Chehalis Flood Damage Reduction Project  
c/o Anchor QEA  
1201 3rd Ave., Suite 2600  
Seattle, WA 98101

Also submitted electronically via: <https://chehalisbasinstrategy.com/eis/comment-form/>

## **RE: Comments on Draft SEPA EIS for proposed Chehalis River Basin Flood Damage Reduction Project**

Trout Unlimited (TU) is grateful for this opportunity to comment on the Chehalis River Basin Flood Damage Reduction Project Draft EIS. With over 300,000 members and supporters – including 4,000 members in the state of Washington – and over 220 staff, TU is North America’s largest non-profit organization dedicated to the protection, conservation, and restoration of cold-water fish and their watersheds. Our strength is derived from our grassroots members and volunteers working together with our staff toward the common goal of ensuring resilient fish populations for future generations. TU is dedicated to using the best available science to guide our efforts, and we have the benefit of applying the expertise of our staff fisheries scientists to support efforts requiring careful analysis, such as the one at hand.

We commend the collaborative effort to develop, fund, and implement the ambitious and much needed Chehalis Basin Strategy. TU strongly agrees that flood damage reduction actions are a critical piece of the strategy to address the impacts of flooding on the Basin’s communities. The 2007 flood devastated families and businesses in the Chehalis Basin, and we preface our comments with the acknowledgement of this incredible suffering and the need to find a solution that brings safety and peace-of-mind to the people of this watershed. We are keenly aware of the years of careful analysis of various flood damage reduction alternatives, and we commend the efforts made as part of the Chehalis Basin Strategy to find a solution that works for both people and fish.

That said, Trout Unlimited is an organization dedicated to conserving, protecting and restoring North America's coldwater fisheries and their watersheds, and our analysis of the Draft SEPA EIS (DEIS) reflects that mission. That analysis leads us to conclude that the proposed flood damage reduction actions, if implemented, would pose an unacceptable threat to salmon and steelhead sustainability in the basin.

Our comments on the proposed Chehalis River Basin Flood Damage Reduction Project are as follows:

### **Direct Impacts to Salmonid Populations**

- ***Construction of the FRE facility will result in direct losses of spawning and rearing habitat and potentially high mortality of emigrating juvenile salmon and steelhead through the dam.*** The DEIS clearly states that construction and operation of the FRE facility would have significant adverse impacts on spring-run Chinook salmon, fall-run Chinook salmon, coho salmon, and steelhead. The Project Area in the Above Crim Creek Sub-basin represents a significant proportion of the salmon and steelhead spawning in the upper Chehalis Basin. Between 2013 and 2017 WDFW spawner surveys indicated 96-100%, 72-100%, 28-67%, and 27-40% of all spring-run Chinook salmon, fall-run Chinook salmon, coho salmon, and steelhead redds, respectively, surveyed in the Upper Chehalis River Basin above Crim Creek were located in the

proposed reservoir inundation area (Ashcraft et al. 2017). The habitat in this area is critical for salmon and steelhead in the Chehalis Basin, and the construction and operation of the FRE facility will degrade the habitat quality to a point that impacts would be impossible to mitigate at the site.

Whereas the proposed FRE facility will almost certainly render the habitat within the inundation zone unsuitable for salmonids, it also will create a migration obstacle for fish that attempt to access spawning habitat further upstream and for juvenile fish seeking high quality rearing habitat. The reach of the Chehalis River and tributaries upstream from the proposed FRE facility contains some of the most productive salmon and steelhead habitats in the entire basin. For example, 15% of the steelhead produced in the basin come from the upper Chehalis River, which represents only 4% of the total habitat.

Overall, the portion of the Chehalis Basin that is above Crim Creek is especially important for the persistence of salmon and steelhead. Climate change models suggest that within the downstream reach between Crim Creek and Rainbow Falls, Spring Chinook, Coho, and steelhead could be extirpated by late century under the No Action alternative (only Fall chinook are estimated to maintain some level of productivity [DEIS Appendix E, tables E-24 and E-25]), but the reach above Crim Creek maintains productivity in late century with the No Action alternative. This reach is already critical for salmon and steelhead production and will become more important in the face of climate change, as fish seek coldwater refugia at higher elevations in the Basin.

- ***Construction of the FRE facility will result in substantial adverse impacts on salmonid abundance, productivity, spatial structure, and diversity.*** These four metrics are used in Viable Salmonid Populations (VSP) status assessments, and they are key to evaluating population viability for three reasons. First, they are considered to be reasonable predictors of extinction risk. Second, they reflect general processes that are important to all populations of all species. Third, VSP parameters are measurable (McElhany et al, 2000). The DEIS reports that the proposed FRE facility would negatively impact all VSP parameters for salmon and steelhead.

Appendix E of the DEIS notes that spring-run Chinook salmon in the Above Crim Creek reach would experience a 97% decrease in estimated abundance under the Proposed Action (Table E-11) and an 87% decrease under the No Action Alternative (Table E-23). We believe that risking an additional 10% decrease in spring Chinook abundance as a result of the FRE facility in the Above Crim Creek modeled reach is unacceptable and will almost certainly eliminate the genetically unique spring Chinook population that utilize this reach.

Under the proposed FRE facility action alternative, productivity in the reach above Crim Creek will be significantly decreased for spring chinook, fall chinook, coho, and steelhead. DEIS Appendix E Tables E16 and E17 indicate that the productivity for all four of these species will fall below a sustainable level. For example, extirpating winter steelhead in this reach would mean extirpation of 15% of the winter steelhead in the Chehalis basin. We have significant concerns that the proposed project's impacts to salmon and steelhead productivity will result in many, if not all, of these species ultimately being petitioned for listing under the Endangered Species Act.

The Draft EIS clearly states the proposed FRE facility represents a significant impact to the genetic, physiological, morphological, and behavioral diversity of the salmon and steelhead in the Chehalis Basin. Coho salmon and steelhead found at - and upstream from - the proposed FRE facility are genetically distinct from coho salmon and steelhead in lower river areas. Additionally, Chinook salmon genetic structure (both spring-run and fall-run) within the Chehalis

Basin indicates that populations comprise upstream (South Fork and upper Chehalis River, Newaukum River, and Skookumchuck River) and downstream groups (Wynoochee, Wishkah, Satsop, Black, and Chehalis mainstem rivers; Brown et al. 2017). As such, any decline of Chinook salmon, coho salmon, or steelhead in the upper basin due to the Proposed Action would represent a significant loss of genetic diversity from Chehalis Basin populations (Appendix E, page E-145).

The proposed project will cause a decline in spatial structure for all salmonids at some level. Given the considerable impacts to habitat that the proposed action would have above Crim Creek, we don't believe there would be any way to maintain or improve productivity for salmon and steelhead in this reach if the FRE is constructed. The best outcome that could be achieved via mitigation (and one we feel is unrealistic) would require a trade-off between reduced populations within this reach and increased populations elsewhere in the Basin. This type of shift in spatial structure would have negative impacts on salmon and steelhead population viability, and is especially critical to avoid in the case of spring Chinook because they are the least abundant anadromous salmonid in the Basin; their spatial distribution in the basin already is limited; and there are possible genetic issues related to spring and fall Chinook inter-breeding.

There are two spring-run Chinook salmon populations in the Project Area, and EDT models cited in the DEIS suggest that both would be nearly eliminated by late-century due the combination of climate change and the Proposed Action. Of note, the area has supported greater abundance of spring-run Chinook salmon in the recent past under habitat conditions that have not markedly improved. Point being, the DEIS population predictions are based on recent trends, which may misrepresent the historical abundance and intrinsic potential for a larger spring chinook population in the Upper Chehalis sub-basin. Spring Chinook numbers in the Upper Chehalis sub-basin have decreased ten-fold since the 2015 and are thought to be a fraction of historic levels (Hiss and Knudsen 1993). Given the restricted current distribution of spring Chinook in the Chehalis Basin, habitat within the Project Area is important to the spatial structure and viability of this species, and we recommend that restoration efforts (e.g. ASRP) are employed to promote spring Chinook sustainability, instead of actions that will essentially eliminate them.

The DEIS states that the construction of the Proposed Project would have a moderate adverse impact on resident fish because they could continue to use habitat upstream and downstream of the construction site; however, they would still be affected by impacts on the aquatic habitat and disconnection from habitats on either side of the construction site. We believe moderate impacts on resident fish as found by the DEIS represents a conservative estimate of impacts, considering resident fish (e.g. cutthroat and rainbow trout) need unimpeded access upstream and downstream to access spawning and rearing habitats as well as temperature and high / low flow refugia.

## Impacts to Water Quality and Watershed Function

- ***Construction of the FRE facility will result in significant negative impacts to water quality in the reservoir and downstream reaches.*** Stream temperature, turbidity and dissolved oxygen are expected to exceed water quality standards as a result of the proposed project, and these issues are considered to be significant adverse impacts in the DEIS. These water quality parameter exceedances are predicted to occur for 18 days for a modeled catastrophic flood and 28 days for a modeled major flood, with impacts extending up to 20 miles downstream from the FRE facility.

The effects of turbidity/siltation and dissolved oxygen depletion on salmonid redds are well documented and predictable. Trout and salmon eggs die unless cold, oxygenated water is readily available. What is more difficult to predict is the population-level effect these impacts

might have on the sensitive salmon and steelhead populations in the Chehalis Basin. With so many existing uncertainties around how the facility would be operated (i.e. management plan), the frequency and magnitude of future floods, and the frequency and duration of inundation at the facility, it is difficult to quantify the water quality impacts. However, we believe that the modeled water quality exceedances will at the very least stress the Basin's salmon and steelhead populations and would accelerate their decline.

Water temperature already is a critical limiting factor for salmon and steelhead in the Chehalis Basin, and will become even more important in the future. Given that mitigating water temperature increases that result from climate change already is an extremely difficult proposition, we can't support a proposed action that will significantly exacerbate the problem. We strongly believe that the predicted increased water temperatures by over 5°F in the Chehalis River upstream from the FRE facility, and by 9°F in Crim Creek will be unmitigable and will have disastrous consequences for trout and salmon in these reaches.

- ***Construction of the FRE will have negative impacts on seasonal flow patterns.*** The Water Analysis also notes use of up to 150 million gallons of Chehalis River water during construction of the facility. The time of year and the rate at which water is withdrawn will largely determine the impacts this activity will have on fish and aquatic organisms. For example, water withdrawals during low flow periods will exacerbate water quality impacts described above and would have detrimental impacts on salmon, steelhead, and trout survival.
- ***Construction of the FRE will have negative impacts on natural geomorphic processes, including sediment transport and LWD transport.*** The results of the Earth Analysis presented in the DEIS describe several significant adverse effects that would severely impact salmon and steelhead. Namely, reduction in channel-forming flows and inhibited recruitment and mobilization of large woody material downstream of the facility site will interrupt important channel forming processes. It is those processes that build and maintain the habitat upon which salmon, trout, and other aquatic organisms in the Chehalis Watershed depend. We believe the DEIS does not adequately address the true impacts of disrupting natural stream processes and the ecosystem services that accompany it.

## Additional Concerns

- **Costs and Benefits**

We are concerned the balance between costs and benefits associated with the proposed action has not been adequately evaluated in the DEIS. Specifically, any informed decision regarding the proposed action requires a comprehensive analysis of the flood benefits derived from the proposed FRE structure and airport levee, weighed against the combined total costs to taxpayers, fish and wildlife populations, and ecosystem services (e.g. clean water, clean air).

The DEIS acknowledges 11 significant adverse environmental impacts (out of 17 environmental elements assessed), including those that we have previously highlighted to fish populations, aquatic habitat, and watershed function. It also acknowledges that the proposed action provides only a partial fix for the flooding problem in downstream communities. Whereas we fully acknowledge that a partial fix is better than no fix at all, especially for the areas that receive that benefit, our own interpretation of the DEIS findings is that a partial fix simply does not scale with the expected adverse impacts on fish populations and consequently on tribal treaty rights. Put more plainly, is it worth risking the future existence of salmon and steelhead in the Chehalis Basin in return for a partial solution to catastrophic flooding?

- **High Level of Uncertainty**

The inherent uncertainties in modeling both population and climate trends make it difficult to adequately quantify impacts of the proposed actions. Therefore, this high level of uncertainty exacerbates the risk of the proposed action to salmon and steelhead populations, in our view.

Predicting the recurrence interval of floods is an inexact science and continues to become more so as the climate template changes rapidly. As such, there is very little certainty in predicting the necessary frequency and duration of FRE operations. The project proponents appear to acknowledge this fact by proposing an 'expandable' structure – ostensibly to accommodate unforeseen (but expected) changes in flooding regime. If we concede that the future operation of the proposed structure is at least somewhat unknown, it stands to reason that the impacts to fish and the aquatic system will be, as well. It should also be acknowledged that the threat of FRE failure and resultant catastrophic flooding (while representing a low probability of occurrence) are very important concerns, particularly in the context of climate change where back-to-back atmospheric river events may become increasingly common.

Modeling population trends carries with it much of the same uncertainty as modeling weather events. This uncertainty is illustrated by the discrepancies between model results within the DEIS. For example, exhibit 5.3-2 shows the percentage of change in salmon and steelhead abundance during construction based on the integrated modeling for the two sub-basins. The DEIS notes that the EDT modeling showed changes in abundance similar to the integrated model, however Appendix E Table E10 suggest otherwise. Compared to the Integrated model, the EDT model indicated much greater impact on abundance for all salmon species. In Table E-10 the Integrated model indicates a 54% decrease in abundance for spring chinook Above Crim Creek, whereas the EDT model indicates an 84% decrease in abundance.

Furthermore, this characterization in the DEIS of trends in salmonid abundance through time relied primarily on integrated model results, which estimate salmonid habitat impacts within only two reaches of the mainstem Chehalis – just above and just below the FRE facility. In our opinion, the integrated model does not adequately address the possible impacts to salmonids and habitats outside of the modeled areas.

The many assumptions and uncertainties associated with DEIS modeling significantly increase the potential risk to salmonid populations already in steady decline. For example, there is significant uncertainty related to the effectiveness and impacts from trap and haul facility; impacts from the FRE facility's inability to pass all fish species or life stages; and lethal and sub-lethal impacts resulting from trap and haul (e.g. lower productivity due to elevated cortisol hormone levels in fish).

Also, there is significant uncertainty associated with the proposed project's impacts on juvenile salmon and steelhead. The DEIS analysis focuses almost exclusively on impacts to adult fish. However substantial monitoring efforts have documented the regular migration of juvenile salmon above the dam site, and the construction and operation of the FRE facility will certainly have significant impacts to juvenile salmon, steelhead, and trout.

## **Summary and Closing Remarks**

As mentioned in our introduction, we are extremely sensitive to the need to identify an approach to flood damage reduction in the Chehalis Basin that protects the lives and livelihoods of its residents, while sustaining the critical fish populations that rely on this watershed. Taking no action is unacceptable in our view. However, Trout Unlimited feels the proposed FRE project poses an unacceptable risk to fish populations in the Chehalis River basin.

The DEIS makes it very clear to us that the proposed action seeks to address the problem of flooding (albeit partially) at a very significant cost to fish populations. As such, it seems inconsistent with the objectives of the Chehalis Basin Strategy, which is to fix both problems in tandem. Certainly, we would not set out to restore fish populations by implementing a series of habitat actions that significantly exacerbate flood risk in downstream communities. Congruently, we cannot support a proposed flood reduction alternative that poses a significant threat to the sustainability of salmon and steelhead populations. Simply put, If the goal is to fix what is broken with both flood and fish resiliency in the Chehalis Basin, we shouldn't begin that effort by breaking one of those things even more.

For these reasons, and those we describe elsewhere in these comments, Trout Unlimited cannot support the proposed action, which very clearly would have significant negative impacts to salmon and steelhead in the basin. While acknowledging the years of hard work and expertise that have gone into developing the current proposal, we strongly urge the Chehalis Basin Board to reconsider and re-analyze (to the extent possible) local flood damage reduction actions and/or other combined approaches that do not have the inherent unavoidable negative impacts to fish populations associated with the proposed FRE facility.

To meet the Chehalis Basin Strategy objectives in the near-term, we strongly support prioritizing projects that provide dual benefits of flood damage reduction and habitat restoration (i.e., local flood damage reduction actions and ASRP implementation). It is unfortunate the restorative floodplain alternative (as modeled) did not achieve the desired flood damage reduction benefit, but we recommend that alternative be re-analyzed in combination with other potential actions to the extent practical. And, while we fully acknowledge that property acquisition is a politically sensitive approach to the problem, and will not be possible in many instances, we do believe that moving people out of harm's way (where feasible with willing landowners) is at least part of the solution to meeting the flood damage reduction objectives over the long-term in an economically sustainable way.

We greatly appreciate your consideration of these comments, and we are happy to answer any questions you may have about our concerns.

Sincerely,



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