William Graeber

See attached comment files (5) from William Graeber

DATE2/4/2026

William Graeber Comments on Chehalis Flood Damage Reduction Project Proposal

SEPA Revised Draft EIS, Publication No. 25-06-008 November 2025

INTRODUCTION

About Myself & Why I Care:

- I am a timberlands owner, silviculturist, naturalist and avid fisher with multi-generational ties to the fisheries, timber and other natural resources benefits provided by the Chehalis River and adjacent Basins. I am a husband, father, grandfather who hopes to see the productivity of the Chehalis Basin natural resources infrastructure adequately protected and restored to sustain an abundance of benefits well into the future for my family and for the Chehalis Basin community at large.

- I am a taxpayer in Washington State and Thurston, Lewis and Grays Harbor Counties. I am deeply concerned about the RDEIS proposal's focus on protection of one relatively small commercial area from damages at the expense of the remainder of the Chehalis Basin communities still at more risk. I am also unwilling to allow the continued erosion of the flows of benefits from natural resource infrastructure that supports and otherwise sustains many of us, so that the applicant can better isolate a relatively small area and special interest group from risks of flood damages within the historic floodplain footprint.

  Putting forward the RDEIS proposal to focus on benefiting few at the expense of the broader Chehalis Basin community, without regard for Applicant's ability to otherwise avoid those damages is indefensible. The assertions that the proposal is the only available feasible and practicable alternative, without adequate reasoning and analyses being openly and transparently presented to support those assertions is even more indefensible and does not meet minimum SEPA requirements.

- I am a professional fish conservation biologist and ecologist specializing in Chinook salmon landscape ecology and recovery planning technical support. I have fifty plus years of experience that evolved into 3 decades of providing technical guidance to natural resources managers and other salmon and habitat restoration and recovery planning and implementation practitioners.

  I am a senior consulting salmon ecologist who can still navigate his way around a DEIS and separate the wheat from the chaff. With that introduction to who I am, why I care and why I feel I can contribute substantively to the further development of a successful Chehalis Basin long-term strategy; let me begin.

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GENERAL COMMENTS

- My review of the RDEIS and the historical, current and potential future context for it have led me to consider the many levels at which I have comments, concerns and issues with the RDEIS proposal and how they relate. I have determined I will primarily focus my comments on the overarching inadequacies in reasoning and analyses that will need to be addressed in any future decision making processes. More specifically, on any considerations for inclusion of the RDEIS proposal as part of a Chehalis Basin long-term strategy and the need to substantively address substantial inadequacies in reasoning and analyses to sustain defensible future decisions and subsequent action plans.

- First, the RDEIS is sufficient to demonstrate an alternate approach to flood damages reduction that will be integrated and compatible with the overall strategy including the strategies and goals of the ASRP component is critical to development of the Chehalis Basin Long-Term Strategy. It is also sufficient to demonstrate the RDEIS proposal is incompatible with ASRP goals and the overall Chehalis Basin strategy.

- The RDEIS overall findings provide a strong case for how the proposal will have significant, adverse and indefinite impacts on ecological processes and conditions, the natural resources infrastructure of the Chehalis Basin. The human communities of the Chehalis Basin who value, benefit from and rely upon the numerous natural resource yields, other values and services provided by that natural resources infrastructure will thereby incur significant adverse impacts. Those adverse impacts to the human community are inadequately addressed and will need additional scrutiny in any future decision making processes, should the RDEIS proposal be considered further in future decision making processes.

- I have found the RDEIS to be inadequate to support the proposal, and its multiple tiered assertions that the offered alternative, is the only feasible and practicable solution to flood damage prevention available at this time to meet the applicant's purpose and objectives. I conclude from review of the RDEIS that the FRE is mitigation for the ongoing future impacts of the Airport Levee Change project. The RDEIS has not demonstrated that all feasible and practicable alternatives, that would avoid the catastrophic adverse impacts of the FRE were adequately developed and analyzed in a context that would be useful and meaningful to develop defensible future decision processes. It provides no evidence or analyses to demonstrate the proposal is more feasible and practicable than the full range of potential alternatives Further, the included draft mitigation plan for the FRE did not analyze whether those mitigation measures would be effective, feasible or practicable. The RDEIS, therefore, provides no commitment to a specific defined mitigate plan or any certainty that effective, feasible or practicable mitigation will be included in the proposal were it to move forward. Based upon the above inadequacies, it does not meet minimum SEPA requirements. See above comments on the need to substantively address substantial inadequacies in reasoning and analyses to sustain defensible future decisions and subsequent action plans.

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SPECIFIC COMMENTS

- A. I am going to forego providing many of the specific comments I have developed on the main body, discipline reports and associated technical support documents I have summarized and provided them in the General comments above. I will provide a few specific comments here where I feel they provide important details support my general comments.

- I feel providing a long list of detailed comments will detract from the importance of my comments regarding the overarching inadequacies of reasoning and analyses embodied in the RDEIS proposal. My general assessment of the RDEIS response to comments is; it focuses on the technical level aspects of the FRE and ignores the comments on higher level, or overarching issues regarding the need to address other alternatives.

- I will first note here that in my review of the DEIS, the available public comments to it and the RDEIS responses (or lack of substantive responses as appropriate); I have concluded the majority of those DEIS comments remain largely unaddressed, still stand and need to be responded to in any future associated actions arising from the RDEIS. The future decision making processes will need to be responsive to both the DEIS and RDEIS comments to be minimally defensible under SEPA, but also more broadly, to be morally and legally defensible and sustainable.

- The RDEIS does not address ecological processes and functions of salmon as a marine nutrients vector supporting the plant animal and thereby human communities. An important concept on the true scope of adverse impacts to salmon: First salmon are a central biological component and process affecting habitat conditions and ecological processes. The functional health of the habitat conditions and ecological processes, from the river reach to subbasin to Chehalis basin wide scales is being driven by the delivery of marine nutrients via the salmon runs. Those ecosystems are natural resources infrastructure of the entire basin that supports flows of the goods and services we value. Therefore adverse impacts to salmon at various population levels is a degradation of those ecosystems processes and functions that support habitat conditions and the entire plant, animal communities – the natural resources infrastructure that supports. See comments elsewhere on the need to substantively address substantial inadequacies in reasoning and analyses to sustain defensible future decisions and subsequent action plans.

- D. See attached files for additional specific comments.

Specific Comment on Apdx E:

Table E-1. Summary of Significant Adverse Impacts to Fish Species and Habitats from the Proposed Action

Specific Comment: Separate ALC and FRE impacts and mitigation analyses to better inform any subsequent decision making processes

The proposal consists of two separate projects. The Airport Levee Changes to better protect a small target area of commercial value and the FRE Facility that is being proposed as mitigation for the Airport Levee Changes.

For adequate review and for your stated use, " informing subsequent decision making processes", it is essential to see the Significant Adverse Impacts for each of the two separately throughout the document. The RDEIS document has done an inadequate job of demonstrating that the adverse impacts of the Airport Levee Changes cannot otherwise be mitigated, thereby totally avoiding the impacts of the FRE and all the additional cascade of Significant Adverse Impacts from all of the mitigation actions required. Should the Airport Levee Changes be further pursued in subsequent decision making processes (including another Revised DEIS process) it will need to do a much more adequate analysis of all mitigation steps and options for a proposed alternative and equally substantive alternative(s) to arrive at a sustainable decision.

This comment applies as well, to discussions of all other significant adverse environmental impacts on the natural resource conditions and ecological processes and functions and thereby the natural resource and human communities. See also comments elsewhere and on the Salmonscape processes and functions and on salmon as a marine nutrients vector, to add context to our comments here.

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SPECIFIC COMMENTS

Specific Comments relating to the inadequacies of the RDEIS reasoning and analyses to address ecological processes and functions of the full floodplain footprint in supporting water quality and quantity attributes that will in turn support salmon and other fish & wildlife resources and other ecological services people value.

Specific Comment:

Primary Fish Habitat Types of the Chehalis River Page 12

The following comments focus on the definition of Emergent Floodplain Wetlands as a primary fish habitat as used here in the RDEIS analysis. The weight of scientific evidence supports a much more extensive value to floodplains areas, beyond that defined in the RDEIS analyses, as ephemeral but significant habitats that support Chinook population viability, either as habitats that are directly occupiable as sheltering, and rearing areas with increased prey base production or as areas that have limited occupancy value but still can provide significant increases to prey base production benefiting juveniles in adjacent habitats. The definition and subsequent exclusion of the majority of the floodplain is contrary to the weight of scientific evidence that documents how several species of fish and juvenile Chinook salmon in particular move through riverine and estuarine ecosystems, expressing a diversity of life types and trajectories that support populations (eg, Beamer et al, numerous dates 2003 2020; Sommer et al., 2001; Reimer, 1971). That support can be measured as expressions of the viability status of populations in terms of their VSP parameters and at various geographic and ESU scales. The VSP parameters provided are the parameters that the EDT and LCM use to assess the performance of salmon population units to the habitats they experience over their life cycles. The artificially constrained definition of juvenile Chinook habitat and resulting omission of what is believed to be a significant habitat from any further consideration calls the analysis, discussions and conclusions into question as to another source of uncertainty effecting modeling results and interpretations.

Literature describing juvenile Chinook utilization of the Yolo Bypass, the primary (remaining) floodplain of the lower Sacramento River, indicates that agricultural fields are a major portion of the habitat that provides prey base and or other rearing and migration functions for juvenile Sacramento Chinook. (eg., Sommer et al. 2001). They further discuss the importance of inundated agricultural fields and other floodplain areas beyond the seasonally wetted channel systems as a major source of invertebrate drift within floodplains and note production in floodplains may provide very substantial contributions to the

entire system. Further discussion notes that contribution to be greater than production in lower mainstem itself and tends to be greater in wet years with a longer hydroperiod of inundation for a larger greater area of the floodplain. The discussion also describes ecological processes relating to increases in the detrital food web supporting the increased production; cite Bayley (1991), Bayley (1995), Jassby (2000), and Junk (1989) refer the reader particularly to Junk for further information on the flood pulse flow concept in river-floodplain systems that helped inform and structure their reasoning and analysis.

Literature describing juvenile Chinook colonization and utilization of remote pocket estuary habitats, well removed from any candidate natal stream, indicates chinook fry migrants have until recently underappreciated capabilities to move long distance across thin layers of freshwater to access and colonize suitable rearing habitats (eg Beamer et al., numerous dates Skagit System Cooperative) Based upon these studies I full expect chinook fry and larger juvenile migrants will occupy most inundated floodplain areas over just a few inches in depth.

The above gap in recognition of the broader floodplain habitats and ecological processes supporting juvenile salmon survival and production adds significantly to the uncertainty of the RDEIS EDT- LCM results and subsequent interpretations. The analysis' incomplete definition of the extent of the floodplain landscape (beyond their defined floodplain wetlands aquatic habitat boundaries) that will be accessible to and utilized by juvenile salmon during the range of temporarily flooded flows above what they term as ordinary high winter flows leaves a gap in the RDEIS EDT- LCM model integration of the landscape (habitat) effects on life history trajectories. It also does not address the role of the full floodplain landscape (beyond their defined floodplain wetlands aquatic habitat boundaries) in providing substantial increased production of macroinvertebrate prey base for juvenile salmon during inundation events. This is likely an even more significant error in accounting for important foodweb function supporting salmon life history trajectories across the landscape. See comments on Appendix E above at Pages i-ii, relating to the need to fill this gap and reduce uncertainties as part of any potential subsequent decision making processes.

Specific Comment: Please see figure Figure E-2b.

The text states "Figure E-2b. Examples of Winter Floodplain Off-Channel and Wetland Habitats Within the Study Area"

"Areas in orange are modeled to become inundated after typical high flows in winter; these may be used by aquatic species for periods of days to weeks, especially if connected to the mainstem Chehalis River or tributaries."

The first thing that strikes us is the very artificial and compromised structure of the focus areas in the panel on the right side of the map showing the reach of the river from mile 65 to 80 as compared to the structure of the highlighted areas in the other two panels. This graphic presentation is in agreement with the narrative that described the reach as having an incised and degraded riverine channel system that is isolated from the floodplain, and the Floodplain Off-Channel and Wetland Habitats presented in the graphic.

The next thing I want to note is that, were one to overlay the current 100 year floodplain delineation on the three panels displayed in the figure, the highlighted areas would be a minor proportion of the 100 year floodplain area. That would very graphically illustrate how dramatic an effect, excluding that area from further consideration could have on modelling results and interpretation.

The majority the floodplain was excluded contrary to the weight of scientific evidence documenting those areas has of high existing and potential value as salmon habitat even though they may be wetted only a small proportion of the season when juvenile salmon may be able to access those areas but more importantly benefit from substantial increases to available prey production. See our comments above on language at page 12 discussing the value of the full floodplain in providing habitat and ecological function supporting juvenile chinook rearing and outmigration (as well as other juvenile salmon and other fish and wildlife species). See comments elsewhere in my letter relating to the need to address the inadequacies as part of any potential subsequent decision making processes.

Specific Comment:

2.2.1.2 Middle and Lower Mainstem Chehalis River Page 23

It is unclear what habitat is being referred in the text: “The fish community found in this habitat reflects the physical conditions of the mainstem river.” The rest of the text seems to focus on floodplain off channel habitats.

General Comment: There is much discussion in the section about impairment factors that may be limiting factors for salmon and other fish. There is very little translation of that into any specifics describing the existing performance of the fish and populations experiencing the conditions. The almost dismissive and extremely general statements of salmon use (for example) are very uninformative. Text such as “when adequately connected to the mainstem or with long hydroperiods, serve as refuge and high-quality rearing habitat for other species like juvenile coho salmon, particularly during winter. The mainstem is used by juvenile salmonids for rearing during all stages of development and as a migration corridor for adult salmon accessing spawning habitat in the upper reaches or tributaries” dismiss any discussion here on the effects of those impairments (as limiting factors) on the expressions of productivity, abundance diversity and spatial VSP parameters for both adult salmon and juvenile salmon and especially juvenile life history trajectories.

There are no specific descriptions for the effects of the impairment on the viability parameters for the habitats by life stage occupancy inputs and output to all the modelling (EDT, LCM, PHABSIM check and list all) as defined by all preferred habitat and subsequent analytical steps. Although the analysis was done in section 3, it but is not presented here. Without that link, the RDEIS is inadequate to provide the basis for substantive review and does not meet SEPA requirements.

There is no mention of juvenile Chinook in the statement: “when adequately connected to the mainstem or with long hydroperiods, serve as refuge and high-quality rearing habitat for other species like juvenile coho salmon, particularly during winter.” The various life history types of juvenile Chinook and their

various life history trajectories are well known to make extensive use of all connected systems of mainstem, off-channel floodplain wetlands and broader floodplain habitats available to them.

Extensive use of these habitats as connected ecosystems that enable expression of their life history diversity at Chinook population and ESU levels indicates these habitats and their connectivity are essential to the survival and viability of Chinook populations. It requires more description to help adequately inform the reviewer of the adequacy (or not) of the analytical process and reasoning that formed the basis for the RDEIS conclusions about the reported population trajectories. See comments elsewhere in my letter relating to the need to address the inadequacies as part of any potential subsequent decision making processes.

Specific Comment: The discussion should then include descriptions of the various impairments to these habitats and apply them to a limiting factors analysis that would inform the reviewer of how the limiting factors will be used to inform the analysis reasoning in general and as inputs the EDT and LCM models that will in turn interpret and integrate those effects across the landscape and life history trajectories. This is essential to provide projections of population performance for baseline conditions and various scenarios. The lack of this discussion leaves the reviewer with no opportunity to provide substantive review comments on the validity the reasoning and analytical process steps. It leaves any interested party who does not have the expertise and resources needed to understand the difference between two poor alternatives. Basically, the reviewer either trusts it was done correctly or express suspicions as to the adequacy of the analysis and outputs. This leads to the fact the RDEIS does not meet SEPA and corrective actions need to be taken to proceed. See comments on Appendix E above at Pages i-ii, relating to the need to address the inadequacies as part of any potential subsequent decision making processes.
General Comment: Finally, the description represents substantially flawed omission of facts and therefore reasoning provided to the reviewer for consideration:

The description of section (2.2.1.2) is another example of where the RDEIS fails to present adequate documentation of reasoning and analytical process steps supporting their results and conclusions. For example the text states: “The mainstem is used by juvenile salmonids for rearing during all stages of development and as a migration corridor for adult salmon accessing spawning habitat in the upper reaches or tributaries.” The section omits the fact that a substantial subpopulation or population level unit of the Chehalis basin fall Chinook spawn in the subject mainstem reaches. Juvenile Chinook use of the entire floodplain habitat system via various life history trajectories as I described above was omitted. Egg incubation, fry development and emergence also were omitted. All the life history stages that occur in these reaches move across and use the entire floodplain habitat system, via various life history trajectories. The above topics of when and where the life stages occur and of how they move across the habitat landscape deserve more discussion to be adequately informative. See comments elsewhere in my letter relating to the need to address the inadequacies as part of any potential subsequent decision making processes.

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Specific Comments

Specific Comment: Appendix E. Fish Species and Habitats Discipline Report

2.2.2.4 Aquatic Macroinvertebrates page 58

The text states; “Off-channel and floodplain wetlands often function as areas where macroinvertebrates accumulate and find refuge from extreme flows (Negishi et al. 2002). Floodplain production of invertebrates can be orders of magnitude greater than that produced in the river channel (Gladden and Smock 1990) and result in enhanced growth and survival of salmonids using the floodplain habitat (Sommer et al. 2001).”

It is not clear if this was carried forward into the modelling. The first sentence indicates a significant constraint for analysis of floodplain habitat. It is unlikely that Sommer et al. 2001 and supporting literature suggests constraining the concepts to what I consider an artificial habitat definition used in the RDEIS (ie.,” Off-channel and floodplain wetlands”) vs a more general inundated floodplain habitats. To include all floodplain habitats would be more appropriate given the absence of information to prove the juvenile salmon do not access and use and otherwise benefit from the entire wetted floodplain area during inundation events. See comments elsewhere on our reasoning and literature references supporting the hypothesis that juvenile salmon will actively explore, colonize and use all suitably wetted floodplain areas, even those wetted for short durations, a far greater proportion of the floodplains than that delineated in the RDEIS analysis. If the RDEIS proposal goes forward (see comments elsewhere as to meeting SEPA and decision defensibility requirements going forward), it must address this large gap in modelling. It will need to address the remaining gaps to model broader floodplain conditions processes and functions and the remaining limitations and uncertainties that imposes on the analytical teams capabilities to forecast outcomes. See comments elsewhere , relating to the need to address the habitats and ecological functions across the entire floodplain and reduce associated uncertainties, as part of any potential subsequent decision making processes.

Specific Comment: The final sentence of the section acknowledges that ecologists have supported an effort to mimic natural flow regimes to rehabilitate the effect of flow modifications on ecological processes supporting indigenous (or desired) macroinvertebrate communities. The remainder of the

discussion focuses on the adverse effects of flooding on the macroinvertebrate communities within the channel system and ignores the positive effects of those same events within the floodplain community. The floodplain production documented tends to be multiples of that found within just the perennial riverine channel system itself. This would appear to more than off-set the loss of main channels macro invertebrate prey base for effected fish species according to Sommers (2001) and others (some cited in the text). As documented in Sommers (2001), the resulting prey densities within floodplain habitats of juvenile Chinook salmon results in far better growth for those fish than their cohorts in the river mainstem habitats.

In any OSB and Chehalis Basin Strategy efforts moving forward, I request more complete and balanced descriptions (and incorporation of that in modeling) of the effect of flood flows on the macroinvertebrate communities in ways meaningful to how those processes affect salmon and other fish species' survival and population performance. See comments elsewhere , relating to the need to address the habitats and ecological functions across the entire floodplain and reduce associated uncertainties, as part of any potential subsequent decision making processes.

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SPECIFIC COMMENTS

Specific Comments Regarding a MMDP Analogy: The Applicant and Authors assert the FRE facility is a unique project design and operations project. That assertion is false.

- The project has a very similar analog in the MMDP in the Puyallup Basin.
- Errors of omission are failures to present adequate information relative to potential futures outcomes forecasts presented by the RDEIS.

My review of the Proposed FRE Project including our assessment of the impacts presented and an additional weight of evidence comparative assessment to other dam projects has led me to the conclusion that Proposed FRE is not just inconsistent with the goals of the Chehalis Basin Strategy and ASRP, it is totally incompatible. The resulting destruction of the Upper Chehalis Basin ecosystem and species, including the likely long-term extinctions of salmon populations that are keystone salmon species driving the productivity and function of the entire subbasin ecosystem will be catastrophic. The ecosystem including the associated plant and animal species and communities that are providing substantial flow of goods and services to the human communities and economic sectors that are reliant that ecosystem and its function will be devastated. We see the un-avoided impacts of the FRE as precluding the ability of the BCS and AQRRP, to effect any meaningful progress toward the stated goals, and especially as those overall goals relate to maintaining and improving ecological function levels of the upper Chehalis subbasin and adjoining subbasins.

My review of the Proposed FRE Project and a search of readily available public records and associated literature indicate The Mud Mountain dam project is a close analog to the FRE. Our brief comparison of the two and the Mud Mountain dam project history including the associated full build out into the Puyallup/ White River floodplain, the history for the Puyallup Basin at large and for the history of White River spring Chinook and Puyallup fall Chinook populations as part of the Puget Sound ESA listing and resulting Puget Sound Salmon Recovery Planning and implementation effort are all informative as to the potential alternative futures for the Chehalis Basin Strategy including the ARRS should the FRE be built or not.

The factual history of the MMD Case History comparison to the FRE provides a weight of evidence case strongly indicating construction and operation of the FRE will commit the Chehalis Basin Community to an un-avoided path of Upper Basin salmon populations, to at least a high risk of extinction in the near to intermediate future, and to possible actual extinctions. And the above is indicated even with the high scales of human intervention that have been implemented to date in the Puyallup Basin. The comparison also indicates a growing risk of extinction for the populations over the long-term. In addition, the above

impacts to (including losses of) the Upper Basin salmon populations indicates a future where substantially more resources will be necessary through the remaining ESU and all it limiting factors (4Hs) to sustain Population and ESU viability above thresholds for potential listing petitions, a threshold far below the stated CBS and included AQRRS goals.

Subsequent decision making processes will need to be responsive both RDEIS and DEIS comments. Should the RDEIS proposal for either the Airport Levee Change (ALC) or FRE project (or derivatives) move forward in any future decision processes, the gap in analyses of Flood damage reduction Alternative(s) comparisons to the RDEIS proposal will need to be filled.

As part of that analysis process I recommend the development of a thorough comparative analysis of the MMDP analog to the FRE be conducted to help fill the major gap left by the RDEIS and still needed for the Chehalis Basin Strategy to develop and sustain defensible future decision processes. Our suggested preliminary scope for such a study would entail a detailed comparison of the FRE to the Mud Mountain Dam project. The comparative study elements would include analyses of the history Mud Mountain Dam project and the associated full build out into the Puyallup/ White River floodplain, the history for the Puyallup Basin at large and for the history of White River spring Chinook and Puyallup fall Chinook populations and the history on salmon recovery progress and status to date under the Puget Sound Salmon Recovery plan framework.