

Snohomish Basin Salmon Recovery Technical Committee Meeting Summary

March 7, 2023, 9:00—11:00; Zoom

Attendees

Matt Pouley, Tulalip Tribes	James Lauder, Snohomish Conservation District
Mike Rustay, Snohomish County	Jim Shannon, Port/City of Everett, H&A
Norah Kates, King County	Joey Smith, NSD
Carston Curd, Snohomish County	Josh Kubo, King County
Gretchen Glaub, Snohomish County	Keith Binkley, Snohomish County PUD
Andrew McDonnell, Snohomish County PUD	Kevin Lee, WDFW
Ashley Kees, WDFW	Kirk Lakey, ARHPM WDFW
Brett Gaddis, Snohomish County	Kollin Higgins, King County
Daniel Howe, Snohomish County	Kyle Legare, Snohomish County PUD
Darcey Hughes, Snohomish County	Lindsey Desmul, WDFW
Denise Di Santo, King County	Liz Ablow, City of Seattle
Denise Krownbell, Seattle City Light	Ryan Bartelheimer, Snohomish CD
Doug Hennick, Wild Fish Conservancy	Sarah Yepez, Department of Ecology
Elissa Ostergaard, Snoqualmie Watershed Forum	Steve Winter, NSD
Gwendolyn Hannam, WDFW	Stuart Baker, Snohomish County
Hayley Tengs, Snohomish County PUD	Thomas Bulthuis, Snohomish Conservation District

Intros and Agenda Review

Co-Chairs Matt Pouley and Mike Rustay opened the meeting with introductions and Matt outlined the agenda for participants.

Regional and Basin Updates

2023 Snohomish Basin Grant Round

Lead Entity Coordinator Gretchen Glaub outlined five projects in this year's grant round with a requested total of about \$1.61M, while \$1.39M or more is likely available. Site visits are next week, and recommendations by the ranking committee will come to Technical Committee in May-June. If anyone wants to participate on the review committee, let Gretchen know. Last year's grant round has been fully funded with rollover to this year's round because some 2022 project sponsors successfully pursued federal funding.

4-Year Workplan

The 4-Year Workplan Update is in progress and in a data-gathering phase from project sponsors throughout the basin. Morgan Ruff and Carston Curd will be reaching out to sponsors to fill in gaps in the next month or so.

Legislative Session Update

All bills currently in the state legislature have had to pass major thresholds or are currently 'dead'. One topic still 'alive' is riparian grant funding. The Lead Entity and salmon recovery partners are expecting funding salmon recovery funding levels to remain consistent with prior budgets. The *Climate Commitment Act* recently auctioned off carbon emission credits, which funds accounts like the 'Natural Climate Solutions Account' in turn funding project types relevant to sponsor-led work throughout the Snohomish Basin. More information will continue to be clarified as the legislative session continues.

Snohomish Basin Salmon Recovery Forum Update

The Forum meeting this Thursday will include a 15-year status update from the Snoqualmie and South Fork Skykomish, Capital Projects update, and more information about the Legislative Session.

Snoqualmie Watershed Forum Grant Round

Norah Kates shared that the Snoqualmie Watershed Forum is convening a Monitoring Workgroup this spring to produce: (1) a prioritized list of research and monitoring questions, and (2) scored and ranked project types to inform cooperative watershed grant rounds. The team will be building off the Snoqualmie Life Cycle Model based on Josh Kubo's work to build the products.

2023 Snoqualmie Watershed Forum Grant Round

Matt shared that final submission materials are coming in for the Snoqualmie Forum Grant Round and the ranking committee will soon be moving forward. Full proposals are due March 20.

Snoqualmie Chinook Growth Study

Josh Kubo, a Stream Ecologist with King County Water & Land Resources Division presented a proposed study outline on 'Designing Habitat Restoration Projects to increase Juvenile Chinook Growth and Food Resources'. It has generally been assumed that habitat improvements have increased juvenile Chinook survival and food resources – but these projects may affect other life stages. Josh would like to evaluate how specific habitat elements and environmental conditions impact Chinook growth, survival, diet, and food resources. The outcomes of the study should evaluate the assumptions of habitat improvements, identify primary factors influencing growth, and align restoration strategies and project designs with juvenile Chinook growth, diet, and food.

The study would be conducted around the Fall City Floodplain Restoration project in April-May while freshwater growth is greatest. The study would hold juvenile Chinook in cages along the mainstem and side channels to track growth in specific habitat conditions. Enclosure cage studies over the last decade from the Sacramento Basin have informed the study design. Five Hatchery Chinook, individually marked, will be stocked in each cage to provide individualized data from dimensional measurements and stomach content analysis. Insect traps and Depth, turbidity, velocity, and conductivity measurements will be made at each cage location.

Desired study outcomes will inform the value of restoration strategies and designs, verify the assumptions on these benefits on habitat improvements, and identify which habitats or habitat attributes or environmental conditions promote juvenile Chinook growth and food resources.

- Will restored habitats provide the intended benefits to growth and food resources?
- What's the comparative value of different strategies?
- Are conditions providing optimal growth and food are fully supported by our current project designs?

Q&A

- What are the planned enclosure measurements? They seem small.
 - Same dimensions in Sacramento, like a hot dog: 2'x2'x6', composed of an extruded plastic mesh aligned with fish size in April-May to be as big as possible. The enclosures won't allow fish to move between habitat types but will better inform life in specific habitats.

- Hatchery fish are larger than naturally occurring fish in the river – how will growth rates be compared?
 - The mesh size would have to change dramatically if fish were selected early from hatchery. Josh hasn't decided on the approach for targeting specific sizing of fish from hatchery. The study will track individual growth rather than bulk population – PIT tags will be important.
- How many fish can go in each enclosure?
 - Habitat densities to limit competition will be relatively low; five Chinook per enclosure.
- Was there a difference between larger and smaller enclosure sizes in the Sacramento study?
 - Empirical research showed a stronger effect from habitat than enclosure size, with low population densities.
- Which habitat types are being selected?
 - Enclosures will be placed in two mainstem habitats (Bar & Unarmored Bank), and in two off-channel habitats (Backwater & Side Channel). Food resources will be evaluated across a broader list of habitats.
- Smaller hatchery fish are being used in the study. Could there be genetic reasons why hatchery fish are smaller than average?
 - It's an understood caveat; hatchery fish need to be used in the study, but the information will still be valuable.
- How long will the study last?
 - The study period will run observations every other day from late April through May over a six-week time frame to minimize flooding impacts and maximize the change in size among growing Chinook juveniles.
- Given known diurnal patterns with Chinook – will the study match the same kind of substrate in each habitat type to consider the 'hiding' component?
 - The study isn't trying to match different substrate types but will have a broad distribution. The study will try to capture primary habitat types to tell part of the story.
- Is the sub-yearling residence time known? The Sultan River side channel projects benefitted yearling Chinook based on smolt trap data.
 - We have a pretty good understanding of where they're at in terms of habitat types and how long certain life histories are in those habitats. It is hoped the study will fill the data gap about how certain habitat types affect survival. If certain projects bring back underrepresented life histories, the study can shed light on the value of certain habitat.
- Will the study account for human access?
 - Signage and frequent visits are built into the study design, but it's a good impact to know and understand.
- Are you considering pulling the surrogate group early from the hatchery to control growth size?
 - It's a good idea – feed them less to restrict quick growth. The study will still need them to be a certain size for PIT tagging.

Shinglebolt Slough Project

Brett Gaddis from Snohomish County Surface Water Management introduced Steve Winter and Joey Smith from Natural Systems Design to share hydraulic modeling for side channel restoration at the Shinglebolt Slough project near Sultan and development of alternative designs for construction in 2025.

Site Conditions

The project sits at the clear geomorphic boundary between two reaches of the Skykomish River, possibly because of a bridge and tributary influences from the Wallace River. Existing side channels include Shinglebolt, Skykomish, and South Sloughs, with increasing flow for southerly connections. A series of levees including the 'Groeneveld Levee' and a plug levee are located on the left (south) mainstem bank, just upstream of the bridge across the Skykomish River (311th Avenue SE). Property to the east of the project, at the east entrance to Skykomish Slough, is not currently owned by Snohomish County and influences modeling.

Project Location



Low flow at Shinglebolt Slough is due to sand infill and blockage – Much of the project design revolves around whether enough water can enter the Slough to maintain an active channel without stressing bridges or inducing avulsion. The project must not make flooding worse to the north (Sultan). In some alternatives, there is a potential benefit to reduced flooding in Sultan due to removal of flow from the mainstem Skykomish River and distribution into slough side channels. Excavations will be necessary.

Flooding & Hazards

In typical migration flows, there's not a lot of connection to the side channels, which generally activate during 1- to 2-year flow events. The county has identified the whole area as a channel migration hazard zone, with an avulsion hazard area through Shinglebolt Slough.

Conceptual Alternatives

The hydraulic modeling team has developed three conceptual alternatives for project design and restoration of side channels at the site. In general, modeling shows that the largest offsets happen when the Groeneveld levee is removed.

1. The 'Full Kitchen Sink' – an attempt to maximize flow through Shinglebolt Slough. Two side channel connections upstream from the bridge would rely on land outside Snohomish County ownership and require excavation through the Groeneveld Levee and throughout Shinglebolt Slough. The concept includes scour protection along 311th Avenue SE and riparian enhancement, with 10 acres retained for agriculture.

This alternative model shows good engagement in 1-year flow with deeper flow depths and uptick in velocity for 2- to 5-year flood events, moving floodwater from the mainstem and Skykomish Slough into new side channels. In 100-year events, a slight decrease in flood stage on the mainstem Skykomish was modeled.

2. The 'Middle Option' – assumes upstream connections on lands not owned by the county will not be possible but retains side channel connections by notching the Groeneveld Levee and excavating fewer channels in the county-owned land along the west side of 311th Avenue SE.

In this alternative, flow in Shinglebolt Slough gets spotty in 1-year flood events, which may restrict channel development. Modeling shows smaller but still representative capture of flow from the mainstem and Skykomish Slough onto the new Shinglebolt side channel. Distributary channels closest to the mainstem bridge show the strongest flow and velocity in 2- to 5-year flood events. In 100-year events, a very slight decrease in flood stage on the mainstem was modeled.

3. The 'West Side Only' option (the basis of 2009 modelling) – would restore a riparian zone on the east side of 311th Avenue SE, but only excavate new side channel habitat on west side of 311th. The modeling showed no flow during 1-year flow events, but shallow inundation and backflows on the east side of 311th, especially in 2- to 5-year flood events.

Public Process

The first community meeting is March 8th, 2023, with final design happening in 2024 and construction projected into 2025.

Q&A

- Explain the dense parcel pattern on downstream side of Shinglebolt Slough
 - Snohomish County has acquired all but 3 parcels since the 80's. Varying mitigation requirements and consolidation of ownership is currently happening. The County is continuing to acquire parcels and work with owners on resiliency. There are Parks interests to balance, too.
- There is lots of interest in the 'Full Kitchen Sink'. When the Skykomish River is high, backwater on the lower Sultan can occur up to a mile in extreme conditions. How far upstream Sultan River can changes be extrapolated?
 - Understanding backwater effect will be important, and future modeling will need to develop a long profile. The current model was run when both river systems were 'high'. Condition changes in the lower Sultan are on the order of a quarter of a foot, but trending in a positive condition. Permutations of Skykomish and Sultan peak flow interaction are complicated.
 - Watershed Science's basin calibration and validation run events were used instead of a theoretical event, ranging from 2- to 100-year flood events. Specific conditions that impacted Sultan can be analyzed.
- The 'Full Kitchen Sink' option looks best for fish; was there any fish benefit in the other two options?
 - If nothing is opened east of 311th, conditions can still evolve over time. There's still an encouraging amount of flow in the first side channel downstream of the 311th bridge. There's still some fish benefit in a hybrid approach between Options 1 and 2 to reduce the differential water level on the Groeneveld Levee.
 - The eastern property is hesitant to get involved; the river is also migrating into the east end of the project site. Aging infrastructure and deficient abutments increase the prioritization of work at the County.

- Will modeling show inundation at lower flows; what are the impacts for the alternatives given expected effects of climate change?
 - A stepped hydrograph was modeled for a variety of flows, including low flows. Existing features are not currently engaged during low flow events. Excavating down is a tradeoff with stream power in less frequent events that maintain channels in low flow events.
 - The river is trained in the area – the project isn't preventing potential avulsion into South Slough. Geomorphic objectives vs habitat objectives: the easier it is for flow on the downstream end of the slough at peaks, the more potential for backwater habitat.
- What's the risk of avulsion of the mainstem into South Slough?
- What's the construction funding coming from? Bipartisan Infrastructure Law for an even bigger project?
 - Engineers typically restrict the funding outlook to what's known. Integrated floodplain management discussions are starting to open up conversations about future resilience and salmon recovery. Phase III of Floodplains by Design grant funding is looking good; getting estimates for concepts and additional design for preferred alternatives will fill out more information. The project being listed on the basin's recovery plan has helped discussion with county engineers about habitat improvement assumptions.

Round Table Updates

- Matt Pouley – planning conversations for Technical Committee topics is happening. Reach out if you have something to bring to the committee.

<i>Follow Up Items:</i>

- | |
|--|
| <ol style="list-style-type: none">1. Next meeting will occur on: April 4th, 2023. |
|--|