Chehalis Basin Strategy
Aquatic Species Restoration Plan

Science and Technical Review Team Work Products
2017-2021

For the

Office of Chehalis Basin

Washington State Department of Ecology

Olympia, Washington

September 2021, Publication 21-13-003

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Related Information

Publication 19-06-009: Chehalis Basin Strategy Aquatic Species Restoration Plan – Phase 1 Document[1]

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[1] https://apps.ecology.wa.gov/publications/SummaryPages/1906009.html
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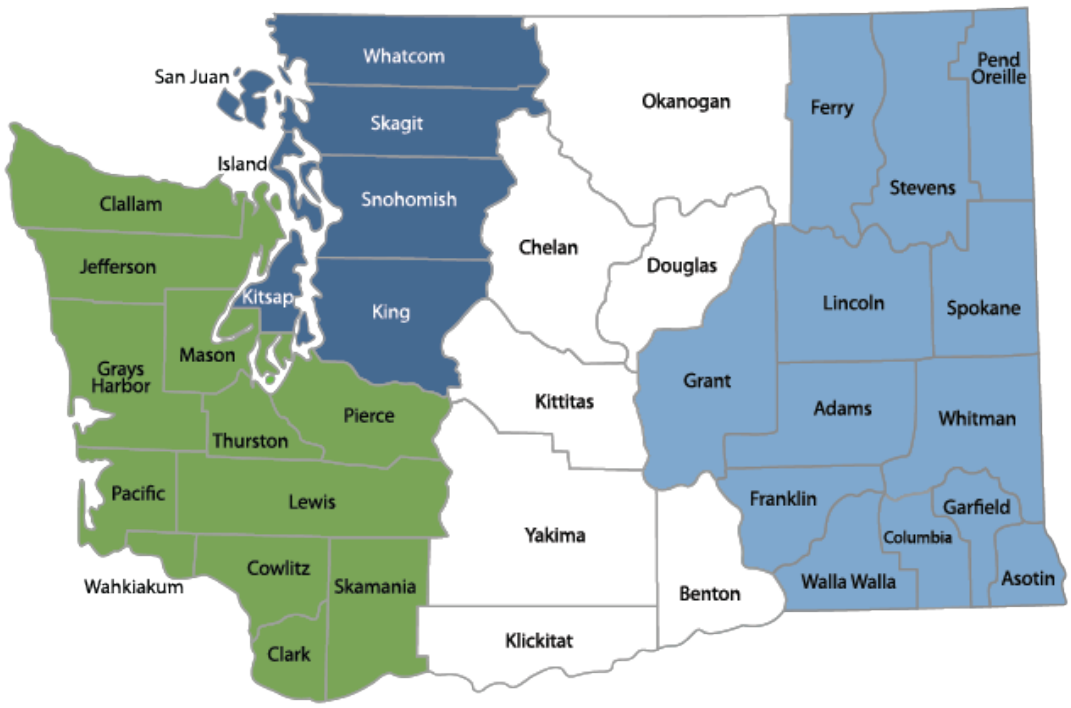
Map of Counties Served



Southwest Region 360-407-6300	Northwest Region 425-594-0000	Central Region 509-575-2490	Eastern Region 509-329-3400

Region	Counties served	Mailing Address	Phone
Southwest	Clallam, Clark, Cowlitz, Grays Harbor, Jefferson, Mason, Lewis, Pacific, Pierce, Skamania, Thurston, Wahkiakum	PO Box 47775 Olympia, WA 98504	360-407-6300
Northwest	Island, King, Kitsap, San Juan, Skagit, Snohomish, Whatcom	PO Box 330316 Shoreline, WA 98133	206-594-0000
Central	Benton, Chelan, Douglas, Kittitas, Klickitat, Okanogan, Yakima	1250 W Alder St Union Gap, WA 98903	509-575-2490
Eastern	Adams, Asotin, Columbia, Ferry, Franklin, Garfield, Grant, Lincoln, Pend Oreille, Spokane, Stevens, Walla Walla, Whitman	4601 N Monroe Spokane, WA 99205	509-329-3400
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Acknowledgements

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- Tim Abbe (Natural Systems Design)
- Tim Beechie (NOAA Fisheries)
- John Ferguson (Anchor QEA)
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History and Role of the Science and Technical Review Team

The Chehalis Basin Strategy is overseen by a seven-member[3] Board, and is tasked with "…aggressively pursu(ing) implementation of an integrated strategy and administer(ing) funding for long-term flood damage reduction and aquatic species restoration in the Chehalis river basin." Within the Strategy, the Aquatic Species Restoration Plan (ASRP) is guided by a Steering Committee with three voting members (Department of Fish and Wildlife, Quinault Indian Nation, and Confederated Tribes of the Chehalis Reservation). In 2017 the Steering Committee decided that to effectively develop the ASRP they needed advice and guidance from a dedicated group of scientific experts. The Steering Committee created a Science and Technical Review Team (SRT) to:

1. Respond to questions from the Steering Committee
2. Review ASRP content, and provide technical review comments to the Steering Committee
3. Identify critical/important scientific/technical issues that need to be addressed in the ASRP
4. Develop the monitoring and adaptive management plan

The first meeting of the SRT was August 30, 2017. Over time the subcommittee that was established to address item #4 became a separate group from the SRT, known as the Monitoring and Adaptive Management (M&AM) Team. In 2021 the Steering Committee decided to merge the SRT and M&AM teams, make some changes to participation, and refocus the group on implementation of the ASRP. The newly recombined and refocused group was named the Technical Advisory Group (TAG).

This document compiles the formal memoranda and guidance documents created by the SRT and M&AM groups from their respective inceptions through the creation of the TAG. These work products were used to inform the creation of the ASRP Phase 1 Document, the ASRP Monitoring and Adaptive Management Plan, and will be used in the ASRP Implementation Supplement, planned for completion in early 2022.

[3] Seven voting members, two of whom are appointed by the Governor, one each from the Quinault Indian Nation and the Confederated Tribes of the Chehalis Reservation, and three from the Chehalis Basin Flood Authority (RCW 43.21A.731). There are also five ex-officio non-voting members representing five State agencies: Ecology, Natural Resources, Fish and Wildlife, Conservation Commission, and Transportation.

Appendix A: Technical Memorandum 1: Spawning Distribution of Chehalis Spring-Run Chinook Salmon and Application to Modeling

This document describes the state of the SRT's knowledge about the spawning distribution of spring Chinook salmon in the Chehalis Basin and its application in modeling and planning for the (ASRP) process.

Spring Chinook was and is the least abundant population of Salmon in the Chehalis Basin, and is a culturally significant species for both the Quinault Indian Nation (QIN) and the Confederated Tribes of the Chehalis Reservation (Chehalis Tribe). The SRT identified various uncertainties associated with knowledge about the status and spawning distribution of these fish in the basin. Four key uncertainties were discussed:

- River entry timing
- Abundance trends that differ from other Washington Coast spring-run salmon
- Spawning overlap with fall-run salmon
- Shifting spawning time

The report concludes with a recommendation for additional data collection (specifically genetic analysis from UC-Davis), and cautions that uncertainty in differentiating between spring- and fall-run Chinook have artificially inflated estimates of the extent of spring-run Chinook habitat.

Note that while this memorandum was completed in 2019, the bulk of the memorandum was written in 2017, prior to the follow-up Technical Memorandum 2, which was completed in 2017[4].

[4] Cynthia Carlstad, personal correspondence.

Appendix B: Technical Memorandum 2: Final ASRP Phase 1 Analytical Structure and EDT Results

This memorandum describes the evaluation of the effect of habitat change in the Chehalis Basin on five salmonid species that could occur as a result of climate change and actions developed in Phase 1 of the Aquatic Species Restoration Plan (ASRP).

The ASRP uses the output of an Ecosystem Diagnosis and Treatment (EDT) model to project the current and future state of salmon in the basin. For this memorandum the Basin EDT model was run for multiple restoration scenarios, with multiple climate change scenarios. The results are salmon species abundance values tor each of the nine model runs, representing the range of possible future conditions in 2040 and 2080.

Appendix C: Spring-run Chinook Salmon Early Actions

As the precarious and declining state of Spring-run Chinook became clear, the Steering Committee and SRT became interested in actions that could be quickly implemented to reduce fall- and spring-run interbreeding and generally improve the near-term outlook for the population. The memorandum outlines 5 potential actions:

1. Install Beaver Dam Analogs
2. Synthesize Environment Information During Adult Holding
3. Evaluate Sediment Wedge Effectiveness
4. Implement Proof-Of-Concept Restoration
5. Implement High-Priority Riparian Plantings

This work product was written by John Ferguson, and was not vetted as a full SRT work product, but it did influence the thinking of both the SRT and the Steering Committee, and so is appropriate to include here.

Appendix D: Informational Reference Guide: Ecosystem Diagnosis Treatment and Life Cycle Model

The SRT used both EDT and NOAA's Life Cycle Model (LCM) to provide assessments of how changes in stream environments have affected salmon, and how potential restoration actions could affect salmon in the future. Both EDT and LCM are complex models that integrate fisheries science with on-the-ground data, and their results require expertise to interpret. This memorandum describes the fundamentals of the science on which the models are based, the basics of how they operate, some key information about how to interpret their results, and a short description of potentially important factors that the models do not address. It also compares the two and describes their relative strengths and weaknesses.

Appendix E: Prioritization and Sequencing Memo

After the development of the ASRP Phase 1 document, the SRT developed a Prioritization and Sequencing plan for the Steering Committee to aid the program's shift from scenario development to implementation, and to incorporate new data and research developed since the Phase 1 document was published. This Memorandum is one of three companion documents, which also include an interactive spreadsheet (distributed electronically along with this publication), and a Worksheet describing how to use the spreadsheet.

The Prioritization and Sequencing divides actions into near-, mid-, and long-term implementation periods. Near-term actions target the most at-risk populations: spring-run Chinook salmon, Oregon Spotted Frog, and coastal tailed frog. They also seek to establish restorations that will take a long time to provide benefit, such as riparian vegetation. Mid-term actions broaden the geographic area of focus, and continue studies and data collection in the basin. The long-term actions take place in the broadest geographic area, and focuses more on restoration in larger rivers than the first two periods.

Appendix F: Explanation for the SRT Prioritization and Sequencing Workbook

The Workbook is an Excel spreadsheet that translates the guiding principles of the ASRP into a schedule of specific actions across the Basin. The Explanation describes how the Workbook functions.

Appendix G: Aquatic Species Restoration Plan Monitoring and Adaptive Management Plan

Published in August 2021, the Monitoring and Adaptive Management Plan is the final work product of the M&AM Team. It divides all present and future studies into three categories:

- Status and Trends, which evaluates changes in watershed conditions and abundance and distribution of target aquatic species over time;
- Project Effectiveness, which examines the effectiveness of restoration activities and determines how well they improved habitat conditions at the project scale; and
- Hypothesis Testing, which conducts targeted studies to fill critical gaps in knowledge to inform restoration planning and to test the scientific assumptions used to create the ASRP.

The M&AM Plan also creates a structure of two "feedback loops", one annual and one every five years, to keep the Steering Committee and the Chehalis Basin Board informed of the progress of the ASRP over time.