Chehalis Basin Strategy

Aquatic Species Restoration Plan

DEPARTMENT OF ECOLOGY
State of Washington

Aquatic Species Restoration Plan Steering Committee
Near-Term (2021–2031) Implementation Report
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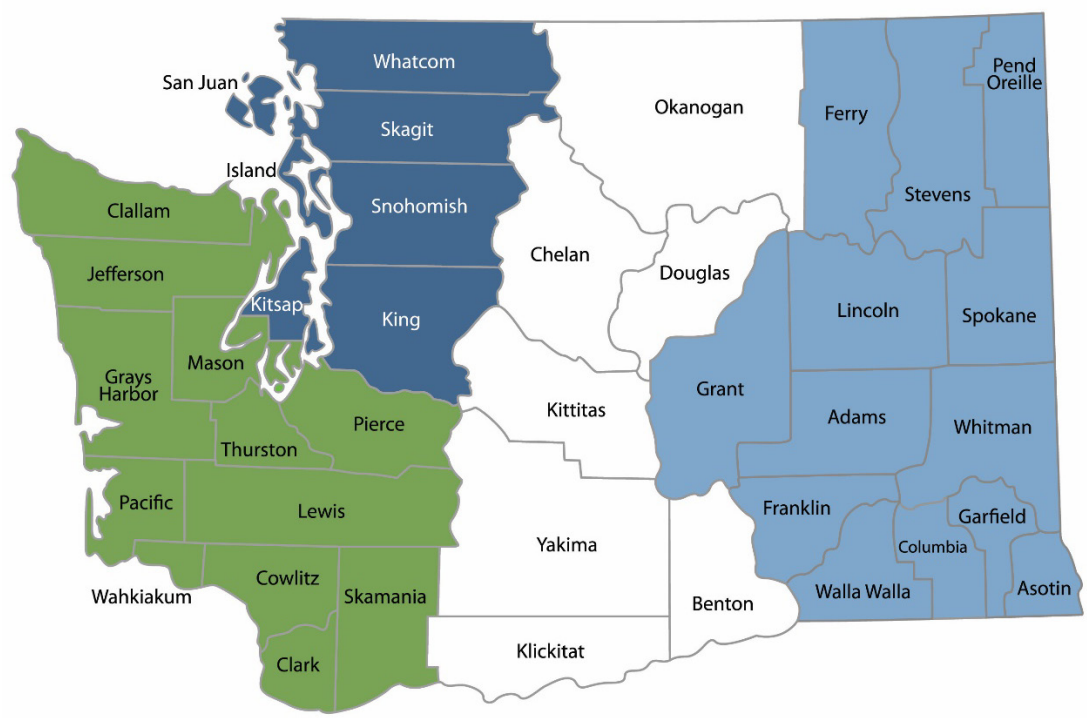

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Region	Counties served	Mailing Address	Phone
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Central	Benton, Chelan, Douglas, Kittitas, Klickitat, Okanogan, Yakima	1250 W Alder St Union Gap, WA 98903	509-575-2490
Eastern	Adams, Asotin, Columbia, Ferry, Franklin, Garfield, Grant, Lincoln, Pend Oreille, Spokane, Stevens, Walla Walla, Whitman	4601 N Monroe Spokane, WA 99205	509-329-3400
Headquarters	Across Washington	PO Box 46700 Olympia, WA 98504	360-407-6000

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The Chehalis Basin is a region rich in native wildlife, working lands, tribal and cultural significance that is economically and ecologically vital to the state and region. The basin is home to seven migratory salmon and trout species and the most diverse assemblage of amphibian species in the state. However, the ecosystem has been significantly changed and degraded from historical conditions; salmon populations are estimated at less than half their historical runs, and spring-run Chinook salmon are at just 23% of their historical population (PMFC 2019; Hiss & Knudsen 1993). Without aggressive protection and restoration actions, habitat degradation from climate change and future human development will increasingly threaten the viability of aquatic species in the Chehalis Basin. If meaningful actions are not taken, the best available science projects devastating effects—for example, the basin's spring-run Chinook salmon, an important food source for tribal communities, could be extinct by the end of the century. Coho and chum salmon and steelhead are economically and culturally important species, and the Chehalis Basin currently provides for robust commercial, tribal, ocean, and recreational fisheries, but this could be lost. Other native species such as Oregon spotted frog are limited to one last stronghold in the state that includes part of the Chehalis Basin and provide intrinsic value to the ecosystem beyond direct economic benefit to humans.

This bleak outlook demands urgent attention, but it also presents an historic opportunity to avoid Endangered Species Act (ESA)-mandated recovery measures and act on our stewardship responsibilities to ensure a brighter future for native salmon and aquatic species, along with the communities who depend on and benefit from them. The Aquatic Species Restoration Plan (ASRP), a key component of the Chehalis Basin Strategy, aims to restore and protect aquatic habitats in order to support healthy, resilient populations of native species into the future.

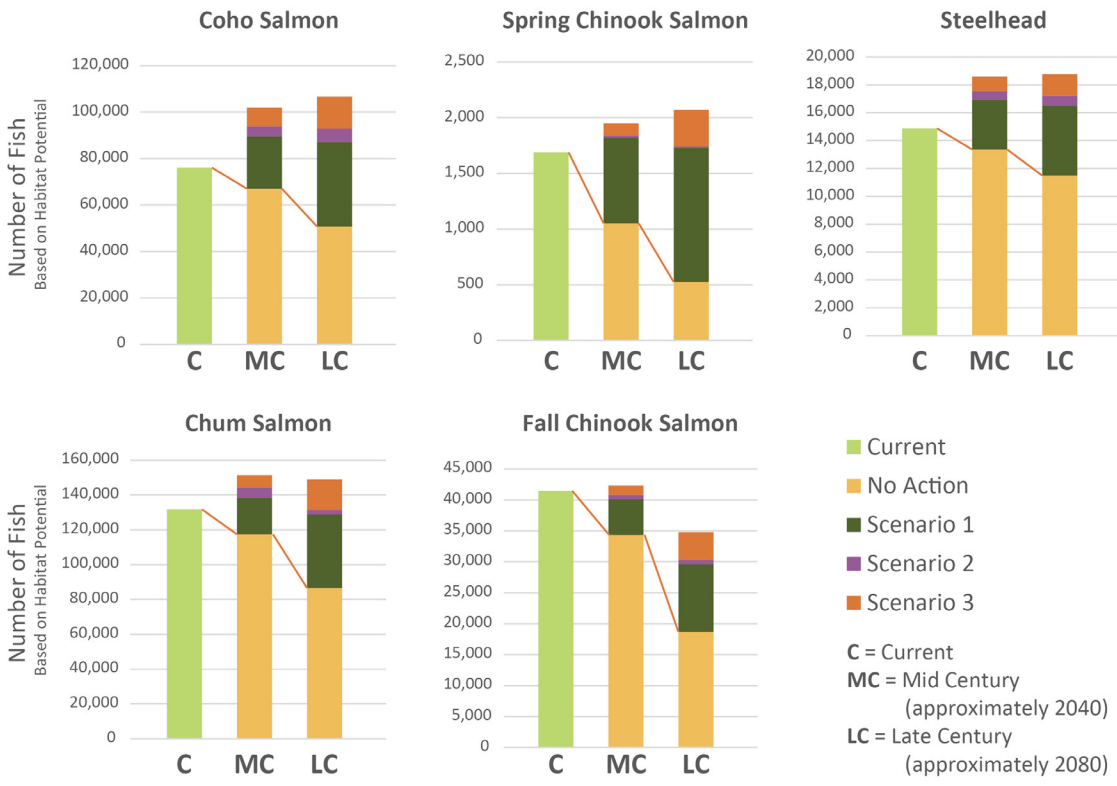
ASRP Vision Statement

The vision of the ASRP is to utilize the best available scientific information to protect and restore habitat in the Chehalis Basin in order to support healthy and harvestable salmon populations, robust and diverse populations of native aquatic and semi-aquatic species, and productive ecosystems that are resilient to climate change and human-caused stressors while honoring the social, economic, and cultural values of the region and maintaining working lands.

The *Phase 1 Aquatic Species Restoration Plan* (2019 ASRP; ASRP SC 2019), published in 2019, presents a detailed, science-based roadmap for restoring habitat and protecting intact ecosystems for aquatic species along the rivers and streams in the Chehalis Basin. The 2019 ASRP portrays a comprehensive suite of actions necessary to achieve the program's vision based on coordinated scientific data collection and analysis unprecedented anywhere in Washington. This 2019 ASRP serves as the foundation for the refinements and advancements of recommended actions completed since 2019. This Implementation Report describes

work performed since the 2019 ASRP. It lays out both specific, on-the-ground actions to improve habitat for aquatic species and actions to improve the effectiveness and efficiency of the ASRP. This document summarizes work completed since 2019 to ensure that actions implemented are effective, efficient, and take steps toward fulfilling the vision of the ASRP. This work, if fully implemented now, is projected to support substantial increases in salmon populations, reversing current trends that have only declined year after year and are projected to continue if significant action is not taken. See Figure 1 for modeled projections for salmonid populations from current to mid- and late century for no action and restoration scenarios from the 2019 ASRP.

Figure 1
Expected Outcomes for Salmon



Note:
Reproduced from the 2019 ASRP. Refinements to the plan in this document aim to improve projected outcomes for all local species to improve upon the projected performance shown here.

The ASRP would be an unprecedented investment in conserving the native aquatic species in Washington State. There are many challenges to successfully implementing such a plan, including steady funding support, engaging and partnering with private landowners across the basin, and building the

capacity of the communities and organizations within the Chehalis Basin to take on the large-scale actions and long-term stewardship required.

To tackle these challenges, a policy-focused Steering Committee composed of representatives from the Quinault Indian Nation, the Confederated Tribes of the Chehalis Reservation, the Washington Department of Fish and Wildlife, the Washington Department of Natural Resources, the Washington Department of Ecology's Office of Chehalis Basin, and the Chehalis Basin Lead Entity for salmon recovery oversees program development and implementation. The Steering Committee has worked together with farmers, foresters, conservationists, other state agencies, local governments, and local landowners to seize the opportunities, find solutions to the challenges, and inform development and implementation of the ASRP. The Steering Committee is supported by technical committees composed of restoration experts from around the region. The ASRP honors existing community values, builds on previous actions to protect and restore basin habitat and ecological processes, and complements investments the state and others have already made in aquatic species habitat restoration and protection.

Success of the Chehalis Basin Strategy as a whole depends on advancing both flood damage reduction and aquatic species benefit goals. This report provides the Chehalis Basin Board with information useful for developing and funding the integrated long-term strategy and recommendations for how best to maintain the momentum that has developed over the last 2 years. By following these recommendations, the Chehalis Basin Board will be able to demonstrate quantified measures of success to the Washington State Legislature, including significant progress on the miles and acres of aquatic habitat restored and protected and species benefits in the Chehalis Basin in the 2021–2023 biennium.

Summary of Near-Term Implementation

From its inception through November 2021, the ASRP has completed 57 project packages, and an additional 21 projects are in progress. Completed and in-progress projects have improved or protected habitat in key locations for the most at-risk species, including spring- and fall-run Chinook salmon and Oregon spotted frog.

Results: By the Numbers

57 project packages completed

- **87** river miles of habitat made accessible for salmon and steelhead migration

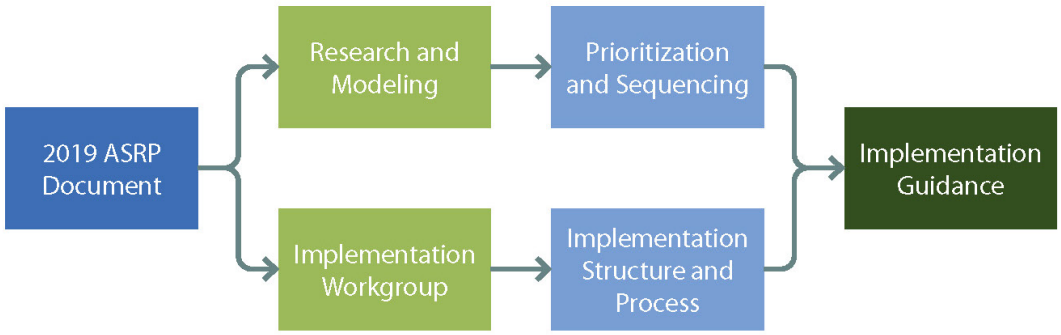
21 projects in progress

- **970** acres of floodplain habitat protected or restored
- **16** miles of instream habitat protected or restored
- **10** river miles of habitat made accessible for salmon and steelhead migration

Since 2019, the Steering Committee has refined ASRP priorities to increase the effectiveness of on-the-ground actions (Figure 2). The Steering Committee has also organized the implementation process, creating a collaborative project pipeline with local and regional partners to speed up implementation. These refinements increase confidence in the projected gains in the viability of salmon and other aquatic species, while they also have increased the potential scale and cost of the largest scenario developed in the ASRP

(Scenario 3) from 450 to 555 miles of restoration and protection at a cost ranging from $600 million to $1.3 billion over the approximately 30 years of the program.

Figure 2
ASRP Implementation Plan



For the first time in this region, scientific experts have developed a detailed Prioritization and Sequencing Plan to guide implementation actions and drive smart investments for the 30-year implementation timeline. Informative summary maps and tables have been developed to guide potential project sponsors with information on high-priority actions for the near-term (Years 1–10), mid-term (Years 11–20) and long-term (Years 21–30) implementation periods. Actions with rapid benefits for at-risk species and actions that require long lead times, like riparian plantings, dominate the near-term priorities. As implementation moves into the mid- and long-term periods, actions like fish passage barrier corrections will cover a broader geographic area and shift toward improving the productivity and connectivity of core habitat for the range of native aquatic species.

The Steering Committee developed an Implementation Plan to provide the structure and process to support funding and execution of habitat restoration at a large scale. The Steering Committee is shifting away from the traditional grant-based approach in favor of a "project pipeline" approach more suited to rapid, large-scale project implementation. Projects enter the pipeline through endorsement by Regional Implementation Teams made up of project sponsors and local and technical experts working together to identify priority opportunities. A dedicated Technical Review Team verifies the technical basis for each proposed project, and the Steering Committee periodically recommends projects to the Office of Chehalis Basin/Chehalis Basin Board for approval. This collaborative approach will increase project throughput through the pipeline process and also ensure projects are aligned with the goals of the ASRP early in their development, driving implementation efficiency. Efficient implementation will allow benefits for aquatic species to accrue sooner and will result in smart investments in the local community. A Monitoring and Adaptive Management Plan has been developed to accompany project implementation with periodic self-assessments to keep the ASRP on track.

The continued success of the ASRP relies on successful partnerships with different programs operating within the Chehalis Basin. This involves creating awareness, establishing connections, and communicating opportunities around engagement and funding. The ASRP funding program was developed with many partner programs in mind and with the understanding that each program has different requirements, such as matching fund requirements for habitat restoration projects. The ASRP will continue to coordinate with a variety of programs to provide mutual benefits.

As the ASRP adopts the accelerated pace of restoration and new implementation structure, the Steering Committee recommends the Chehalis Basin Board consider committing to steadily increasing funding for project implementation. The overall program budget is broken into various categories, including project implementation, implementation support, staff support, and monitoring. The Steering Committee recommends increasing the project implementation portion of the ASRP budget from $20 million in 2021–2023 to $30 million in 2023–2025 and to $40 million in 2025–2027, along with supplementing other aspects of the program budget as necessary to support increased implementation. Five- and 10-year evaluation cycles will inform both the Chehalis Basin Board and the Steering Committee as to whether the ASRP is meeting its goals to protect and restore habitats and natural processes and increase aquatic species viability and populations. These steady and predictable increases in funding will help the Chehalis Basin Strategy work with partners to aggressively restore aquatic species habitat in the Chehalis Basin for the next 10 to 30 years.

The recommended investment of approximately $1 billion in the Chehalis Basin for aquatic species is well within the scale of funds spent on other fish and wildlife programs. It also has a better chance of success, as salmonid species in the basin are not yet ESA listed and the scale of human development in the Chehalis Basin is far less than in many other watersheds in Washington. This is a historic opportunity to get it right and restore a resilient ecosystem in the Chehalis Basin.

1 INTRODUCTION

The Chehalis Basin is the second largest basin in the State of Washington, and its fish and aquatic resources are of regional, national, and international significance to tribal, commercial, and sport fishing interests. The 2,700-square-mile Chehalis Basin has more than 3,400 miles of identified perennial streams and is one of the only remaining river basins in Washington where no salmon species are listed as threatened or endangered. The basin encompasses the Chehalis River, Grays Harbor Estuary, and all their tributaries, which includes a large expanse of floodplain habitats with lower levels of development than many other basins in the Pacific Northwest. The fish and aquatic resources of the Chehalis Basin are of regional, national, and international significance to tribal, commercial, and sport fishing interests.

The Chehalis Basin faces increasing threats to its ecosystems and its natural resource heritage for both tribal and non-tribal people of the basin. For more than 100 years, human activities have degraded the health of the Chehalis Basin's rivers, streams, and aquatic species without a comprehensive response. Climate change and future human population growth will increasingly threaten the viability of natural resources in the Chehalis Basin. The basin is one of the only remaining river basins in Washington where no salmon species are listed as threatened or endangered. However, estimates indicate that existing salmon populations are less than half of their historic run sizes, with spring-run Chinook salmon currently just 23% of historic run sizes in the Chehalis Basin (PFMC 2019; Hiss and Knudsen 1993). If meaningful actions are not taken, the best available science projects devastating effects—for example, the basin's spring-run Chinook salmon, an important food source for tribal communities as well as for orca whales, could be extinct by the end of the century. Without aggressive protection and restoration actions, climate change and future human development will increasingly threaten the viability of aquatic species in the Chehalis Basin. A large-scale and sustained level of commitment and action is required to restore ecosystem resiliency of the basin's habitats.

The Aquatic Species Restoration Plan (ASRP) is a major component of the Chehalis Basin Strategy, a collaborative, science-based process that was created to address the dual challenges of extreme flood damages and degraded aquatic species habitat while avoiding or minimizing adverse environmental, social, cultural, agricultural, and economic impacts. The ASRP is intended to be a program of integrated actions focused on aquatic species habitat restoration over both the short and long term. The ASRP presents a historic opportunity to prevent the more significant degradation and Endangered Species Act (ESA) listings that have occurred in other basins and ensure a brighter future for native salmon, other aquatic species, and the local communities who depend on and benefit from them.

This document summarizes the current status of the ASRP and describes the progress toward fulfilling the vision of the ASRP since its publication in 2019.

1.1 ASRP Background

The Chehalis Basin Strategy's *Phase 1 Aquatic Species Restoration Plan* (2019 ASRP; ASRP SC 2019) provides a detailed, science-based, and strategic roadmap for restoring aquatic species habitat and protecting ecosystems along the rivers and streams in the Chehalis Basin. The necessary actions have been comprehensively analyzed through coordinated scientific analysis at a level that is unprecedented anywhere in Washington. At the same time the ASRP honors the social, economic, and cultural values of the Chehalis Basin's residents and provides an ambitious but realistic timeline for implementation. Regional tribes have been key leaders in the ASRP's creation, and farmers, foresters, conservationists, the State of Washington, and local landowners have been important stakeholders in the plan's creation. The plan recognizes private property rights, and restoration will only occur where there is willing participation by landowners. By following the roadmap laid out in the ASRP, the basin's aquatic species and habitats can be restored and protected now to help ensure a resilient, flourishing basin into the future.

In the 2019 ASRP, the foundation for strategic planning and initial actions includes the following:

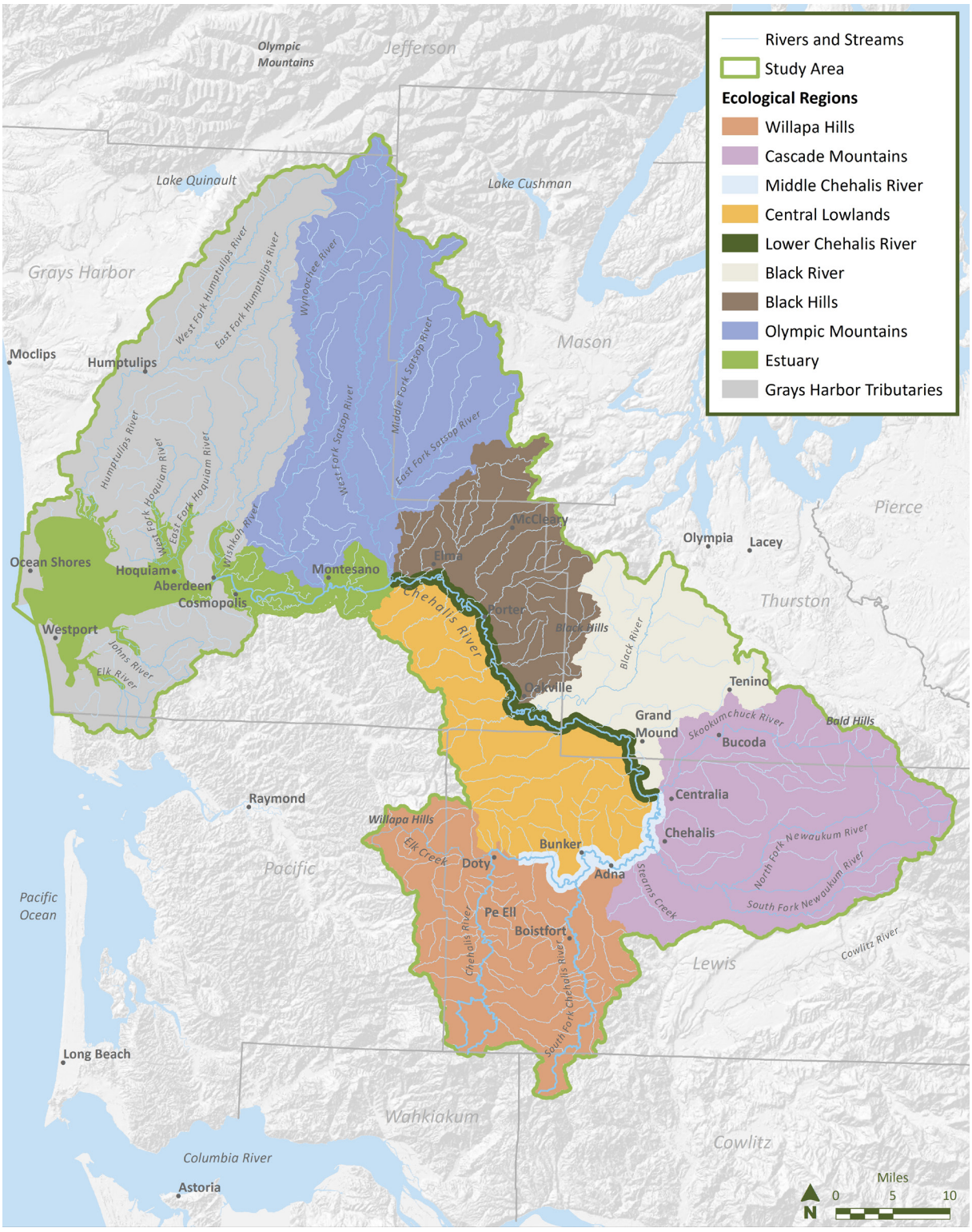
- Descriptions of past, present, and potential future conditions with and without ASRP actions
- Identification of priority indicator species to guide habitat protection and restoration strategies
- Delineation of ecological regions as the geographic planning framework for the Chehalis Basin (ecological regions have distinct characteristics that guide actions for targeted species and habitats) (Figure 3)
- Presentation of the ASRP approach with desired outcomes, guiding goals, strategies, and potential actions based in a clear scientific rationale

ASRP Goals

The following goals were developed to guide the ASRP strategies, actions, and restoration scenarios:

- Protect and restore natural habitat-forming processes within the Chehalis Basin watershed context.
- Increase the quality and quantity of habitats for aquatic species in priority areas within the Chehalis Basin.
- Protect and restore aquatic species viability within and across the Chehalis Basin considering viable species population parameters.
- Increase watershed resiliency to climate change by protecting and improving natural water quantity and timing characteristics and water quality characteristics.
- Build recognition of and support for ASRP actions and the ways the ASRP supports resilient human communities.

Figure 3
Chehalis Basin Ecological Regions



In general, the 2019 ASRP demonstrated the urgent need for action and provided initial direction, while pointing to the need for additional development of processes and institutional capacity to support the unprecedented scale of actions being planned.

The 2019 ASRP also presented initial options to the Chehalis Basin Board, tribes, state agencies, and local communities for what the ASRP can achieve given different scales and focus of the implementation. Three scenarios were considered that build upon each other, as follows:

- **Scenario 1:** Protect and enhance core habitats for all aquatic species. Restoration was proposed to occur on approximately 222 miles of rivers. Scenario 1 was projected to maintain species populations at or above current levels through mid-century even with climate change but may not keep pace with climate change by late century.
- **Scenario 2:** Protect and enhance core habitats and restore key opportunities. Restoration was proposed to occur on approximately 316 miles of rivers. Scenario 2 had modest additional benefits above Scenario 1, primarily benefitting coho salmon and steelhead in smaller sub-basins, but may not keep pace with climate change by late century.
- **Scenario 3:** Protect and enhance core habitats, restore key opportunities, and expand spatial distribution. Restoration was proposed on approximately 450 miles of rivers. Scenario 3 was projected to provide substantial improvements to most species populations at both mid- and late century, although fall-run Chinook salmon may still decline by late century.

Modeled outcomes for salmon and steelhead showed that while near-term gains for most species are predicted, climate change would reduce gains in abundance for all species later in the century (especially fall-run Chinook salmon) for all three scenarios, further highlighting the magnitude and urgency of the needed restoration and protection.

ASRP Approach

The ASRP approach is structured around five strategy categories:

- Habitat and Process Protection
- Habitat and Process Restoration
- Community Planning
- Community Involvement
- Institutional Capacity

1.2 Purpose of This Near-Term Implementation Report

Since 2019, the ASRP Steering Committee and staff have worked to refine recommendations and plan for implementation of the full ASRP. Work included the following: 1) refining the Scenario 3 to improve its effectiveness and certainty of success; 2) sequencing restoration and protection recommendations to prioritize the most at-risk species and promote resilience of habitats across the basin; and 3) creating a strategic plan for implementation of the ASRP resulting in an updated approach and structure for facilitating rapid, large-scale project implementation.

This document summarizes work completed since 2019 to ensure that actions implemented are effective, efficient, and take steps toward fulfilling the vision of the ASRP. Information captured in this document will also help serve the Chehalis Basin Board in fulfilling its legislative mandate to develop a detailed set of actions to reduce flood damage and improve aquatic species habitat with new scientific information, an implementation schedule, and quantified measures for evaluating success. The ASRP will monitor, analyze, and report project progress and outcomes at pre-set intervals in order to communicate the cumulative impact of actions as well as adaptively manage actions as conditions change over time. The Steering Committee has committed to documenting ASRP advancements to support the established Chehalis Basin Board-level program reviews as part of the ASRP monitoring and adaptive management (M&AM) structure. Through structured reviews, the Chehalis Basin Board will receive key information on metrics such as miles and acres of habitats restored and protected, the number of landowners engaged and participating, and status and trend numbers on aquatic species populations that will support decisions on future biennium budget allocations for the ASRP. The Steering Committee now provides this milestone report, which describes formal modifications to the ASRP since the 2019 ASRP was released and outlines the path forward for ASRP implementation in the near term.

Chehalis Basin Strategy Mandate

The Chehalis Basin Strategy has a mandate set in Washington State regulation to *"include a detailed set of actions to reduce flood damage and improve aquatic species habitat. The strategy must be amended by the Chehalis board as necessary to include new scientific information and needed changes to the actions to achieve the overall purpose of the strategy. The strategy must include an implementation schedule and quantified measures for evaluating the success of implementation"* (RCW 43.21A.732).

Tracking the ASRP Goals

Progress toward the ASRP goals will be tracked using metrics such as the following provided examples and reported to the Chehalis Basin Board on a regular schedule:

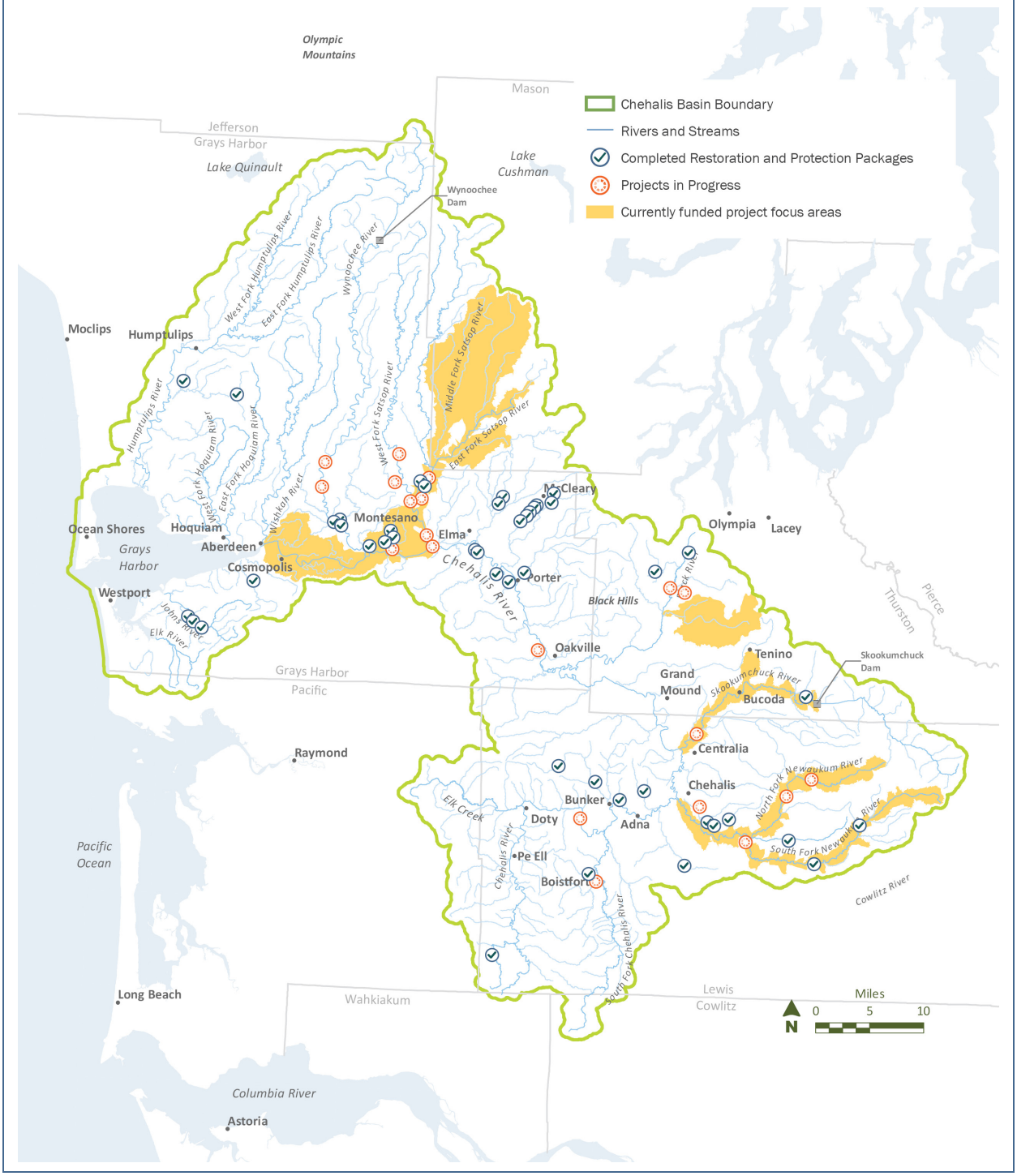
- Protect and restore natural habitat-forming processes within the Chehalis Basin watershed context—for example, as acres of floodplain habitat reconnected to the rivers.
- Increase the quality and quantity of habitats for aquatic species in priority areas within the Chehalis Basin—for example, as miles of riparian and stream habitat restored.
- Protect and restore aquatic species viability within and across the Chehalis Basin considering viable species population parameters—for example, as numbers of juvenile salmon produced and adults returning.
- Increase watershed resiliency to climate change by protecting and improving natural water quantity and timing characteristics and water quality characteristics—for example, as reduction in summer water temperatures.
- Build recognition of and support for ASRP actions and the ways the ASRP supports resilient human communities—for example, as number of landowners participating in ASRP projects.

2 ACCOMPLISHMENTS TO DATE

Between 2015 and 2021, the ASRP has funded and completed 57 restoration and protection project packages, resulting in 87 miles of improved habitat access and more than 700 part-time jobs supported. In addition, 21 projects are in progress as of the writing of this report, including 970 floodplain acres being restored to provide habitat connectivity and stream shading, 16 miles of instream habitats being restored to provide quality habitat for native species, and 10 miles of improved habitat access. As of spring 2021, $48.1 million has been invested in the ASRP.

The focus of upcoming projects will be to complete up to 9 miles of habitat restoration in currently funded focus areas (shown in yellow on Figure 4).

Figure 4
ASRP Strategy-Funded Accomplishments 2015 to Spring 2021



3 SCENARIO REFINEMENTS

3.1 Refinements to the ASRP

At the request of the Steering Committee, the Science and Review Team undertook an evaluation in 2020 to refine Scenario 3 of the 2019 ASRP to improve aquatic species viability within and across the Chehalis Basin, a primary goal of the ASRP. This included a more detailed evaluation of the Ecosystem Diagnosis and Treatment (EDT) salmonid habitat model and the National Oceanic and Atmospheric Administration (NOAA) salmonid life-cycle model results, a review of information on the Grays Harbor Estuary, recent salmon and steelhead data collection and trends throughout the basin, and a detailed review of amphibian data collection and modeling in the basin. As a result of this evaluation, the following key refinements are recommended to achieve improved species outcomes, particularly for spring- and fall-run Chinook salmon:

- The Grays Harbor Estuary has been included within the scope of the ASRP, and all tidal reaches of tributaries to Grays Harbor (including the mainstem Chehalis River) are included within the renamed Estuary Ecological Region (Figure 3). The supporting rationale is that all anadromous salmonid species, particularly Chinook salmon, as well as other focal native fish and wildlife species, use estuary habitats. Protecting and enhancing estuary habitats will improve the quantity and quality of this priority habitat and the viability of multiple species.
- Recommended potential restoration actions have been expanded to include beaver ponds, a key habitat feature for aquatic species and climate resiliency by which water quantity, water storage and release, and water quality can be improved.
- The geospatial units (GSUs) included in the ASRP have been refined to remove one GSU and add 12 GSUs that showed the best potential to improve species performance. Additionally, the proposed intensity of protection/restoration actions are increased in nine GSUs in the upper basin to increase climate resiliency and potential benefits for spring- and fall-run Chinook salmon and were decreased in three GSUs that showed lower potential benefits. The importance of actions such as riparian restoration, placement of large wood, reconnection of floodplains, removal of fish barriers, and beaver ponds are emphasized or de-emphasized for specific GSUs based on the limiting factors that most affect species performance to improve the effectiveness of restoration projects.
- Several headwater areas of small streams are recommended for restoration and protection in the Willapa Hills, Black Hills, and Olympic Mountains ecological regions (Figures 3 and 4) to benefit sensitive amphibian species such as coastal tailed frog and marsh habitats in the Black River Ecological Region for the ESA-listed Oregon spotted frog.

- Experimental actions are encouraged that could increase survival and genetic viability of spring-run Chinook salmon, including potential installation beaver dam analogs to encourage separation of spring- and fall-run Chinook salmon spawning, creating thermal refugia such as deep pools that are critical for climate resiliency, promoting hyporheic exchange through gravel sediment wedges, and experimenting with the size and frequency of potential "node" restoration along the mainstem Chehalis River.
- Protection actions are recommended to be emphasized in some portions of the basin to specifically protect key habitats that are critical for climate resiliency, including glacial outwash deposits that are important contributors to groundwater recharge and cold-water inputs to streams, springs, and other cold-water input areas; headwater areas that are important cold-water retention areas; tidal surge plain habitats; and a transition zone to accommodate sea level rise. In addition, areas of unique amphibian assemblages, such as wet prairie habitats and headwater lakes, are recommended to be prioritized for protection.

Large-Scale Restoration Concept Refinement

The "node" concept would restore highly productive floodplain wetland and off-channel patches spaced along the mainstem Chehalis River to provide refuge and feeding spots for adult and juvenile fish migrating through the river.

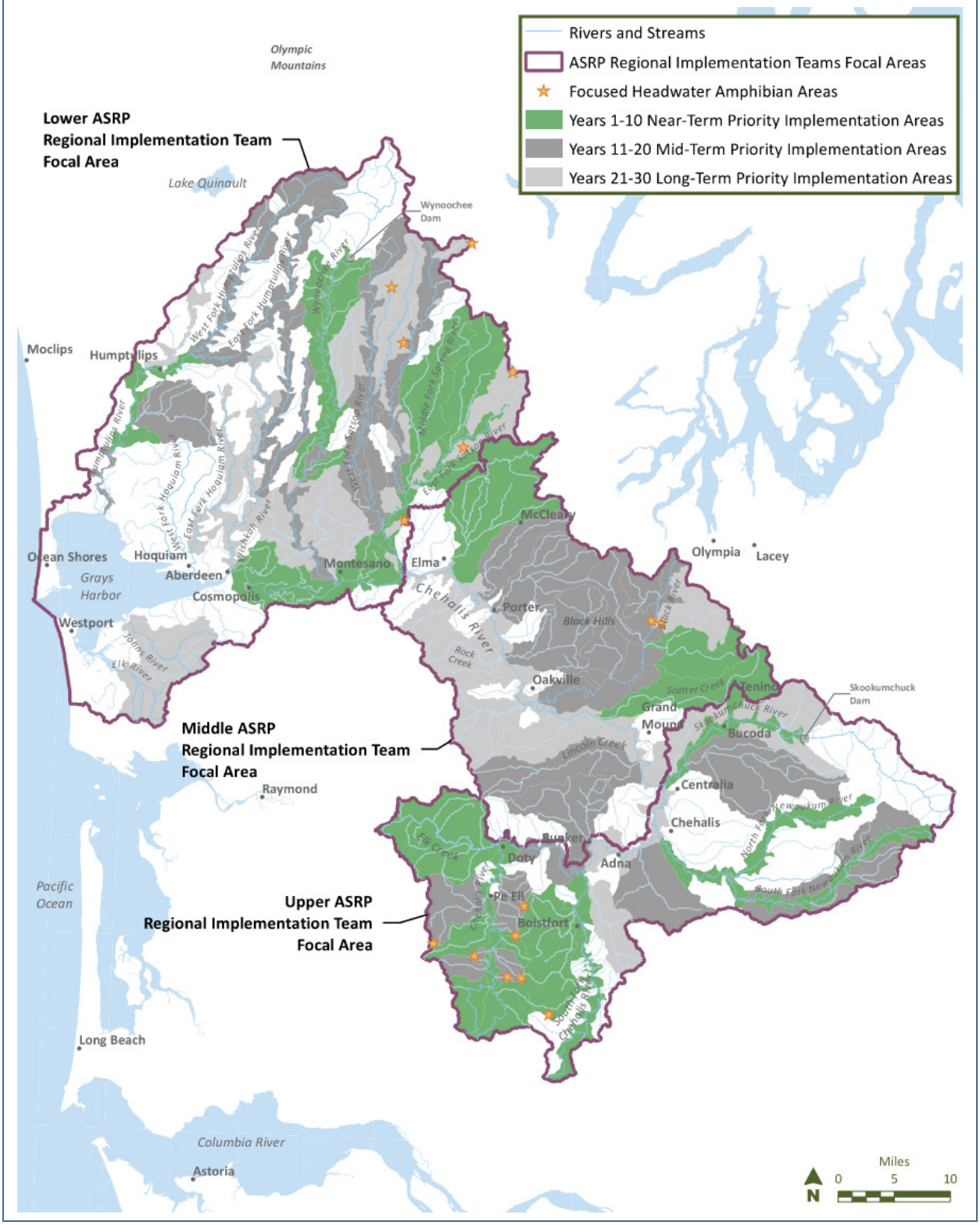
These refinements mean that implementing the ASRP would increase the potential scale and cost of Scenario 3 to 555 miles of restoration and protection at a cost ranging from $600 million to $1.3 billion over the approximately 30 years of the program. The ASRP should be adaptively managed to ensure efforts are focused in the most effective areas and actions that are improving species habitats and performance. The proposed refinements are expected to improve the predicted outcomes of the 2019 ASRP Scenario 3, particularly for the most at-risk species (including spring- and fall-run Chinook salmon, Oregon spotted frog, and other amphibians).

3.2 Prioritization and Sequencing

Following the scenario refinement work, the Science and Review Team further developed details for prioritization and sequencing to build upon the initial framework developed in the 2019 ASRP that had identified immediate, medium, and long-term priorities for implementation. This more detailed prioritization and sequencing identifies both priority locations and actions within the near-, mid-, and long-term time periods, reported in the ASRP Science and Technical Review Team's Prioritization and Sequencing Plan (ASRP SRT 2021) and summarized for the implementation community in the *ASRP Project Science Guidance* (ASRP SC 2021).

Figure 5 shows how GSUs have been grouped into prioritized implementation areas.

Figure 5
Chehalis Basin Priority Implementation Areas and Regional Implementation Team Focus Areas



The near-term priorities (Years 1–10) are focused on locations and actions that will provide rapid habitat benefit to aquatic species currently most at-risk within the basin, particularly spring-run Chinook salmon, Oregon spotted frog, and coastal tailed frog. A total of 33 GSUs are prioritized, with actions recommended for 235 stream miles of habitat in seven ecological regions (Figures 3 and 4). This includes spring-run Chinook salmon habitat in the Cascade Mountains and Willapa Hills ecological regions, coastal tailed frog habitat in the Willapa Hills Ecological Region, and protection and restoration of wetland habitats for Oregon spotted frog in the Black River Ecological Region. The habitats of these three species were selected for focus, but it is important to recognize that their habitats are co-occupied by many additional native aquatic species that will also benefit from these early restoration actions.

Additionally, restoration in the Olympic Mountains Ecological Region is targeted to protect unique habitats and restore high-priority core habitats for multiple species. Long-lead-time actions should be initiated such as restoring riparian buffers and planting trees to transition the Chehalis River further upstream from the tidal surge plain (this habitat is projected to be lost due to sea level rise in the future).

In the mid-term period (Years 11–20), the focus continues on long-lead-time actions and also on protecting and restoring productive core habitats that support multiple species. The spatial distribution of the priorities broadens away from a focus on the upper basin to include many ecological regions. Habitat restoration actions in the Grays Harbor Estuary are initiated and restoring access to quality habitat through fish passage barrier corrections is emphasized. A total of 28 GSUs are prioritized, recommending actions on 198 stream miles of habitat in nine ecological regions. Numerous actions are recommended to address the effects of future climate change and human population growth in the region. Experimental actions and targeted learning may continue in the mid-term period depending on results of monitoring actions taken in the near-term period.

In the long-term period (Years 21–30), priorities are expanded across the basin. Actions should be directed at restoring productive core habitats throughout the Chehalis Basin that support multiple species and restoring connectivity among aquatic habitats through fish passage barrier corrections. A total of 24 GSUs are prioritized, recommending actions on 121 stream miles of habitat with an emphasis on seven ecological regions. This includes restoring a chain of quality habitats in the Lower and Middle Chehalis River ecological regions. This concept utilizes in-channel structures such as engineered logjams to improve habitat conditions in the mainstem channel and promote connectivity between mainstem channel, floodplain, and off-channel habitats to benefit native amphibian, resident fish, and anadromous fish species. Numerous actions are recommended that address the effects of future climate change and human population growth in the region.

The overall intent of the Prioritization and Sequencing Plan is to front-load more effort in the early years of the ASRP to specifically focus on rapidly improving conditions for the most at-risk species while also building in resilience to climate change and future human development for the range of aquatic habitats and species.

4 IMPLEMENTATION PLAN

4.1 Implementation Approach

One of the goals of the ASRP is to build recognition of and support for ASRP actions and the ways the ASRP supports resilient human communities. To achieve restoration and protection on this unprecedented scale, new approaches to community planning and community involvement are needed. In addition, the existing human capacity of project sponsors and restoration practitioners needs to grow with a commitment of sustained funding to ensure implementation is followed by management or stewardship of projects and protected lands into the future.

Since 2019, the Steering Committee collaboratively established a structure for how high-priority projects will be developed and funded to achieve the goals of the ASRP. A high-level overview in Figure 6 shows four key elements of the ASRP implementation process that will coordinate and guide work across the basin, organized within a local structure that will promote community-level engagement.

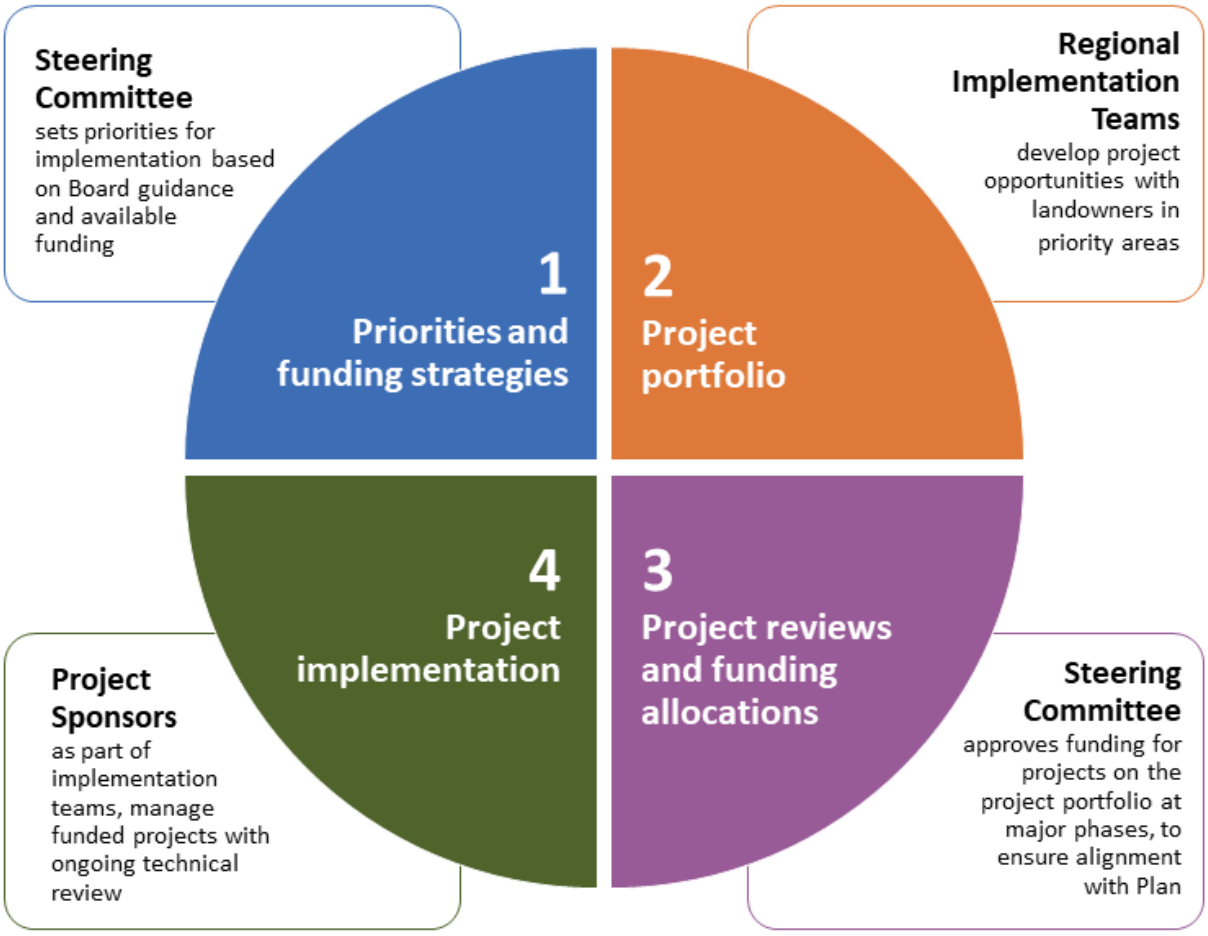
Scaling ASRP Actions

Scaling ASRP actions within a community-based program involves the following:

- **Community planning** to align ASRP goals and community plans in the Chehalis Basin
- **Community involvement** to engage landowners and Chehalis Basin communities to incorporate input and support for implementation.
- **Institutional capacity** of existing organizations and individuals would be built-up for restoration, protection, and planning processes.

Top/middle photo credit: Kirsten Harma
Bottom photo credit: Kasia Pierzga

Figure 6
ASRP Implementation Structure Overview



4.1.1 Implementation Structure and Process

A key element of the implementation structure is the delineation of implementation regions to better organize funding and localized resources across the breadth and diversity of the Chehalis Basin. Regional Implementation Teams will be organized in partnership with local conservation districts to include willing project sponsors, community members, and other interested parties to coordinate and collaborate on ASRP project implementation. Focal areas for Regional Implementation Teams are shown in Figure 5. As a team, project sponsors will identify project development areas of interest that align with the priority areas and funding guidance set by the Steering Committee. Participation on these teams will foster collaborative and efficient project planning and landowner outreach within a single region.

The ASRP Implementation Structure Overview for 2021–2023 (Implementation Overview) developed in September 2021 provides the necessary details about the framework and process through which projects will be developed and funded to achieve ASRP goals. A primary emphasis of work since 2019 was to make these details accessible to the Chehalis Basin community, in parallel with targeted outreach, to allow project sponsors to align their proposed restoration and protection work with the ASRP priorities and to facilitate successful project implementation through the ASRP.

Key Elements to the ASRP Implementation Structure

- **Regional Implementation Teams** of project sponsors, community members, and other interested parties coordinate and collaborate on ASRP project implementation under the leadership of local conservation districts.
- **The ASRP Project Portfolio,** a publicly available list of projects that are aligned with ASRP goals, is vetted for technical merit and has funding reserved to support project completion.
- **The project pipeline process** is a method for bringing a project from initiation through completion that allocates funding and identifies checkpoints for each phase of project development, design and review cycles, implementation, and closeout.

Briefly, the Implementation Overview describes the detailed stepwise project pipeline process for projects to become included in the ASRP Project Portfolio, a publicly available list of projects that have been developed through collaborative processes across the basin that have funding reserved to support project completion. The Implementation Overview also describes the roles and responsibilities of the various organizations that oversee the development and implementation of the ASRP, technical review of projects, and funding allocations. Finally, the Implementation Overview explains funding eligibility, contracting, and the ASRP project funding strategy.

4.1.2 Implementation Guidance

A library of resources on implementation guidance was developed that is specifically directed toward project implementers to facilitate their engagement and success in the 2021–2023 biennium. Materials are now available that describe the implementation process in detail and provide a uniform approach for establishing sponsor eligibility, project inclusion, and project development. Guiding materials on the following topics have been made publicly available on the Chehalis Basin Strategy website (https://chehalisbasinstrategy.com/asrp/implementing-projects/):

- Scientific guidance, priority locations and actions, and restoration examples
- Funding guidance
- Project sponsor eligibility
- Regional Implementation Teams
- The ASRP Project Portfolio, implementation structure, and project review criteria

- Template forms for project proposals, site assessments, landowner acknowledgements, and permitting

In addition, an M&AM Plan has now been fully developed that clearly lays out the need for strategic monitoring of ASRP efforts, including monitoring of project effectiveness based on biological outcomes, status and trends monitoring for the overall basin, and testing of scientific hypotheses that underpin the ASRP (ASRP SC and MAMT 2021).

4.2 Alignment with Other Programs and Efforts

The ASRP is a key element of the Chehalis Basin Strategy, an effort to reduce flood damage and restore aquatic species in the Chehalis Basin. Given the Chehalis Basin Strategy's integrated approach, many of the actions proposed to restore habitat will also help reduce erosion and other damages. In addition to the ASRP, the Chehalis Basin Strategy is funding an environmental analysis of a proposed flood reduction dam, a Local Actions Non-Dam (LAND) alternative analysis, a Community Flood Assistance and Resilience (CFAR) program, and a series of smaller projects and initiatives for inclusion in the long-term strategy. As each of these initiatives progresses, the Office of Chehalis Basin will be working closely with tribes, government agencies, community members, and the Chehalis Basin Board to ensure that each element aligns with the overarching goals of the Chehalis Basin Strategy.

The continued success of the ASRP relies on developing and implementing successful partnerships with different programs operating within the Chehalis Basin. This involves creating awareness, establishing connections that are complementary with other work, and communicating opportunities around engagement and funding. To facilitate this effort, the Regional Implementation Teams will work with project sponsors, partners, and landowners to identify small and large project opportunities, connect sponsors with project opportunities, and continually implement restoration actions.

The Chehalis Basin Lead Entity, along with other restoration practitioners, has been a valued partner in helping to develop the ASRP into a program with mutual benefits for project funding and implementation. Applying lessons learned from other restoration funding programs, ASRP funding will occur on a rolling or continuous basis, which allows project sponsors matching funding through other programs to capitalize on efficiencies and enhance coordination of projects between funding sources.

ASRP funding cycles were developed with many partner programs in mind and with the understanding that each program has different requirements, such as matching fund requirements for habitat restoration projects. ASRP will continue to coordinate with a variety of programs to mutually benefit projects. Several complementary programs are currently operating within the basin and include, but are not limited to, the following:

- Salmon Recovery Funding Board
- Brian Abbott Fish Barrier Removal Board
- Family Forest Fish Passage Program

- Washington Wildlife and Recreation Program
- Washington Coast Restoration and Resiliency Initiative
- Chehalis Basin Partnership Streamflow Restoration Plan
- Washington Department of Natural Resources and Washington Department of Transportation Fish Barrier Correction Programs
- Freshwater Mussel Research Partnership

The following is a summary of a few of these programs and their connection to the ASRP:

- **Salmon Recovery Funding Board:** The Chehalis Basin Lead Entity leads the process for salmon recovery funding in the basin to implement restoration and protection projects to create healthy salmon habitat. The ASRP focuses on restoring aquatic species habitat across the same landscape that the Chehalis Basin Lead Entity operates within and is complementary to the Salmon Recovery Funding Board in many ways. Restoring and protecting salmon habitat also usually promotes improvements for other aquatic species, such as amphibians.

- **Brian Abbott Fish Barrier Removal Board:** This program provides funding to identify and remove impediments to salmon and steelhead migration. Restoring habitat for aquatic species, such as salmon and steelhead, is a focus of the ASRP, with removal of impediments to migration as a mutual goal. The ASRP can help to provide required matching funds for projects that address priority species and locations.

- **Family Forest Fish Passage Program:** This program assists private forestland owners in removing culverts and other fish barriers. In the coming biennium, the ASRP will be expanding efforts to work with forest landowners to explore restoration opportunities on private lands. The ASRP is well positioned to provide matching funds to bolster a project that benefits aquatic species and their habitats in priority locations.

- **Washington Wildlife and Recreation Program:** This program provides matching funds to create new parks, protect wildlife habitat, and preserve working lands. The majority of land in the basin is privately held and supports agriculture and forestry. The ASRP recognizes the benefits of partnering with farmers and foresters to preserve working lands while also restoring and protecting aquatic and riparian habitat. This program aligns well with the ASRP, which seeks to protect habitat and promote long-term restoration of natural processes.

- **Washington Coast Restoration and Resiliency Initiative:** This program funds projects that address priority ecological protection and restoration needs while stimulating economic growth and creating jobs in coastal communities. The ASRP includes Grays Harbor and tidal habitats and acknowledges the importance of healthy coastal, estuary, and freshwater habitats and their connection to one another. The ASRP can supplement programs such as the Washington Coast Restoration and Resiliency Initiative where restoration and protection actions align to support robust ecological and human communities.

- **Chehalis Basin Partnership Streamflow Restoration Plan:** This plan focuses on offsetting future streamflow impacts through water rights acquisitions, promoting conservation, and habitat projects in areas where projected development may impact shallow groundwater resources, which are greatest in the Black River, Scatter Creek, Skookumchuck River, and Newaukum River sub-basins. The ASRP near-term priority areas align with the Chehalis Basin Partnership Streamflow Restoration Plan's focus areas, which generates opportunities for leveraging funds to restore habitat for species like spring-run Chinook salmon by addressing impacts to the basin's water resources.

Communication and coordination between programs will continue to take place through several means including the Regional Implementation Teams, ASRP symposia, regional conference and workshop participation, Chehalis Basin Habitat Working Group and Chehalis Basin Partnership meetings, and other opportunities as they arise. These venues provide frequent opportunities to share progress and relevant information for restoration scientists and practitioners, raise awareness around funding opportunities and time frames, connect potential project sponsors to project opportunities, and ultimately enhance collaboration and leverage funding to make the most out of available restoration funding.

As the ASRP project implementation process moves forward, the Steering Committee will continue to coordinate with local groups and partner agencies to ensure the successful implementation and adaptive management of the program.

5 COST ESTIMATE REFINEMENTS

5.1 Cost Estimates by Scenario

The Scenario 3 refinement described in Section 4.1 would improve the effectiveness of actions to address limiting factors to restore natural processes and improve species viability, include the estuary as a key habitat, and protect areas critical for climate resiliency such as cold water refugia and tidal flood plains. The inclusion of additional priority locations and restoration actions to the originally defined Scenario 3 in the 2019 ASRP would increase the overall potential capital restoration costs of ASRP implementation, if adopted (Table 1). Restoration implementation costs have been updated for the refined Scenario 3 and are also identified for the near-, mid-, and long-term increments of implementation (Table 2).

Table 1
Range of Costs for Restoration Scenarios

Restoration Scenario	Miles of Channel Restored	Riparian and Floodplain Acres Restored	Cost Range (Millions)		
			Low	Average	High
Scenario 1	222	9,000	$290	$440	$600
Scenario 2	316	10,250	$370	$550	$750
Scenario 3	450	15,300	$550	$810	$1,100
Refined Scenario 3	554	16,700	$590	$910	$1,300

Note:
Costs use 2021 dollars and do not account for price escalation over time as the plan may change over 30 years. The cost ranges from low to high reflect material pricing and land acquisition costs under current conditions for a range of sites with varying existing access and development constraints; the cost ranges do not reflect differing intensities of restoration.

Table 2
Range of Costs for Implementation Periods for Refined Scenario 3

Implementation Time Period	Miles of Channel Restored	Riparian and Floodplain Acres Restored	Cost Range Per Increment (Millions)		
			Low	Average	High
Near-Term	236	6,600	$200	$340	$500
Mid-Term	198	5,600	$220	$320	$460
Long-Term	120	4,500	$170	$250	$340

A scenario has not been selected by the Chehalis Basin Board at this time, but rather, the Steering Committee has proposed a budget for the first 3 biennia (first 6 years) of the near-term implementation period that would advance the near-term priorities as rapidly as feasible while recognizing that M&AM will be required to determine if the subsequent priorities for implementation will remain as currently proposed or adjust based on results. A slow ramp-up over the first 6 years as shown in Table 3 would only achieve approximately one-quarter of the prioritized restoration mileage proposed for the near-term implementation period (10 years), so effort would need to accelerate in subsequent years to provide more certainty that the ASRP could achieve the desired outcomes.

Table 3
Proposed Project Implementation Budget for First 6 Years of Near-Term Implementation

Biennium	Miles of Channel Restored	Riparian and Floodplain Acres Restored	Proposed Budget (Millions)
2019–2021	3	120	N/A
2021–2023	9	400	$20[a]
2023–2025	15	600	$30
2025–2027	25	1,000	$40

Note:
a. Funding actually allocated in 2021–2023 biennium.

5.2 How Does the ASRP Compare to Other Regional Restoration Programs?

The ASRP is a bold plan to rapidly protect and restore aquatic species habitats throughout the Chehalis Basin. To bolster confidence that such a large-scale program can achieve results, we have considered the progress of other regional programs. Other restoration programs in the Pacific Northwest directed at salmonids and other native species include the Salmon Recovery Funding Board and the multiple entities funding Columbia Basin fish and wildlife mitigation and recovery.

The Salmon Recovery Funding Board has invested over $1 billion for Washington State since its inception in 1999, with approximately 57% of this total provided by the State of Washington, 40% provided by federal partners, and 3% provided by local sponsor matching dollars. The ASRP is recommending over $1 billion in funding for the Chehalis Basin alone. The Salmon Recovery Funding Board and partners recommended $4.7 billion by 2020 as the necessary level of funding in the salmon recovery plans developed in the early 2000s to make demonstrable improvements in salmonid populations and habitats to support eventual recovery of listed salmonid species (State of Washington 2020). With less than one-fourth of the recommended funding for salmon recovery, the majority of listed salmonid species stocks in Washington are either still in decline or not making improvements, whereas a few stocks have improved (e.g., Hood Canal summer-run chum salmon).

The Columbia Basin Fish and Wildlife Program has spent roughly $8 to $12 million per year since 1991 to address impacts from the Columbia Basin dams on restoration, protection, fish passage, hatcheries, monitoring and management (NW Council 2021). This is the largest watershed in Washington and includes portions of six other states and one Canadian province. While the cumulative funding has resulted in measurable improvements in native fish survival, particularly through the system of dams, as well as improved habitat conditions, it has not resulted in recovery of listed species. The Bonneville Power Administration has invested approximately $1 billion in fish and wildlife mitigation and restoration studies and projects since 2007. Additional significant investments have also been made by the federal agencies and public utilities that own and operate the dams on the system to address fish and wildlife mitigation needs.

In short, an investment of approximately $1 billion in the Chehalis Basin for aquatic species is well within the scale of funds spent on other fish and wildlife programs and has a better chance of success, as salmonid species are not yet ESA listed and the scale of human development in the Chehalis Basin is far less than in many other watersheds in Washington where recovery of salmonids and other native fish and wildlife species has been extremely difficult.

6 CHEHALIS BASIN STRATEGY INTEGRATION

The Chehalis Basin Board has set mid-2023 as the desired time frame for delivery of several flood damage reduction-related analyses to inform the suite of potential actions to advance the Chehalis Basin Strategy. These include the non-dam flood damage reduction framework, state and federal final Environmental Impact Statements for the proposed Pe Ell Dam, and an analysis of options for the Skookumchuck Dam. These products will support decision-making by the Chehalis Basin Board to develop and implement a detailed set of actions for the combined long-term strategy in the 2023–2025 biennium that will be critical to the long-term certainty and funding for the ASRP.

By mid-2023, the ASRP will also have a Project Portfolio of detailed restoration and protection projects, both pending and completed to fit into the combined long-term strategy. The Regional Implementation Teams and Technical Review Team will create a robust pipeline of projects in high-priority areas, from initial planning through construction. The M&AM program will enable high-priority scientific studies to be completed and create feedback and review cycles for the Steering Committee and the Chehalis Basin Board at annual, 5-year, and 10-year intervals. Annual reviews will primarily keep the Chehalis Basin Board apprised of project implementation progress. The 5- and 10-year review cycles will be more comprehensive evaluations of whether the ASRP is meeting its goals. They will also provide an opportunity to evaluate the overall vision for the program, which will help to ensure the Chehalis Basin Board and the Steering Committee continue to share goals for the ASRP and its role in accomplishing Chehalis Basin Strategy objectives.

To fully capitalize on these completed and upcoming ASRP advancements, the Steering Committee recommends the Chehalis Basin Board adopt the ramp-up funding recommendation laid out in Section 5.1 of this report by the mid-2023 Chehalis Basin Strategy check-in. A key challenge the ASRP faces at present is local partner concern about the certainty of long-term funding, which makes those partners hesitant to build their own capacity (such as new staff) in the program. A commitment by the Chehalis Basin Board to funding both flood damage reduction and aquatic species restoration, especially an increase in funding that matches the anticipated increase in ASRP capacity, would alleviate those concerns and drive participation of project sponsors and landowners with the Chehalis Basin Strategy as a whole.

In the next 2 years, the ASRP will build on lessons learned to date and further refine the program to be capable of delivering tens of millions of dollars of aquatic habitat restoration and protection projects every biennium. This aggressive pursuit of aquatic species restoration is the best science-based, locally informed path to healthy and resilient aquatic species habitats and populations in the Chehalis Basin.

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Chehalis Basin Strategy

Aquatic Species Restoration Plan

Near-Term (2021–2031) Implementation Report

Office of Chehalis Basin
Department of Ecology
State of Washington

The Chehalis Tribe

Washington Department of Fish and Wildlife

Department of Ecology
State of Washington

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