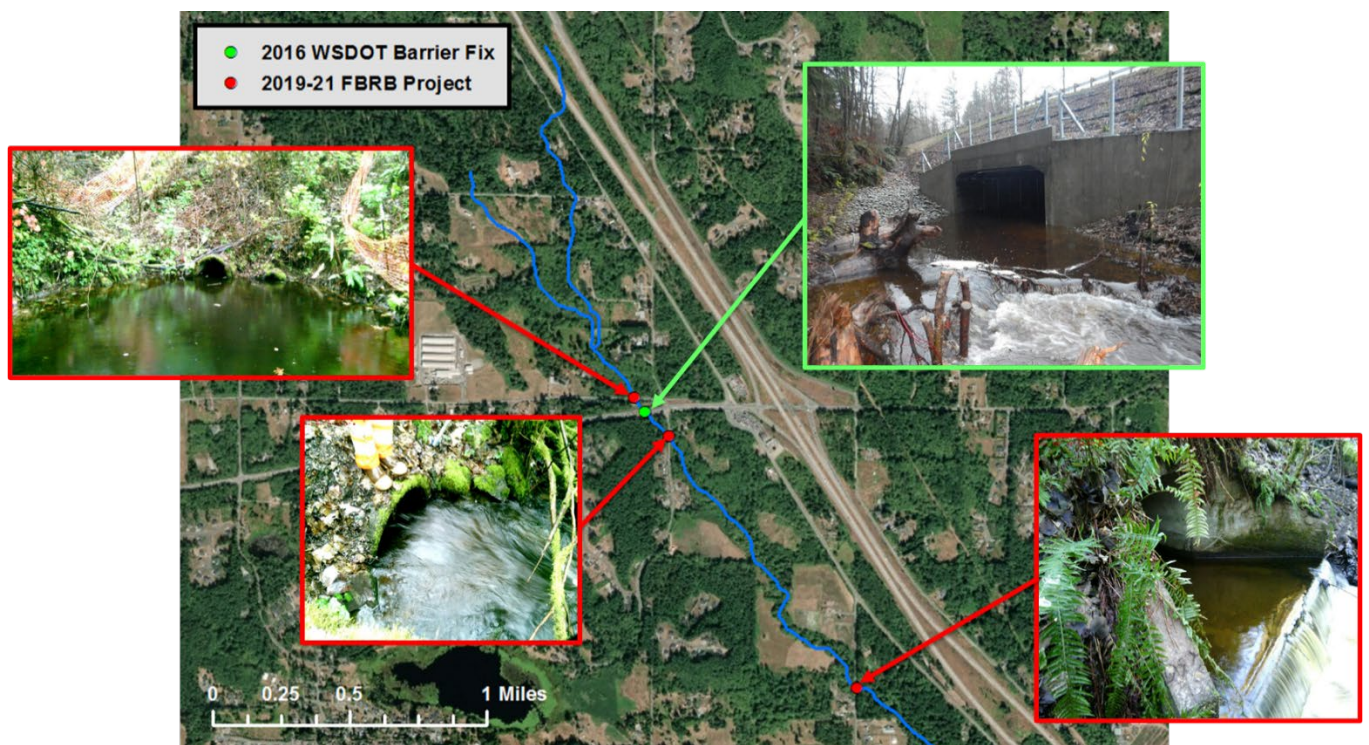


Biennial Report on the Development of a Statewide Fish Passage Barrier Removal Strategy

Washington Department of Fish and Wildlife,
Washington State Department of Transportation, and
Brian Abbott Fish Barrier Removal Board

June 30, 2021



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Executive summary

The Washington Department of Fish and Wildlife (WDFW), the Washington State Department of Transportation (WSDOT), and the Brian Abbott Fish Barrier Removal Board (FBRB) were tasked in 2020 Supplemental Capital Budget and Transportation Budget provisos to develop a comprehensive statewide strategy, focusing the efforts of all culvert correction programs into a single strategic approach to maximize the salmon and orca recovery benefits from the public investment. The comprehensive strategy is to guide the funding recommendations of the FBRB, as well as other state fish passage barrier correction programs. Existing staff have worked on the proviso, while accommodating pandemic-mandated furloughs, competing teamwork priorities due to vacancies, and the unavailability of contractors to assist. This biennial report summarizes the significant work that was done, despite such challenges.

For the purposes of this report and Washington's strategy, a fish passage barrier is a man-made structure or human caused impediment that fish cannot adequately migrate through. The most common fish passage barriers are road culverts. WDFW estimates that there are at least 18,000 - 20,000 barriers to salmon and steelhead across Washington State. A comprehensive barrier inventory is an important foundation to an effective statewide barrier removal strategy. For over 30 years, field verifications have been conducted statewide by WDFW using the barrier assessment protocols developed by WDFW. A significant portion of these inventories have been funded by partners who are committed to understanding the status of barriers they are responsible for. Inventory data are being used to look for distribution patterns of barriers in geographic regions, identify strategies, and make realistic plans for fish passage barrier removal at both the site and watershed scales. Water crossing features that were once passable can become barriers over time as conditions change or as barriers are corrected, so ongoing barrier inventories are critical to track success and promptly address new barriers in critical locations.

In Washington, many populations of salmon and steelhead are currently listed as "threatened" or "endangered" under the federal Endangered Species Act (ESA). Listed populations now include distinct genetic strains of Chinook, coho, chum, and sockeye salmon as well as steelhead, and the watersheds they use encompass a significant portion of the state. Knowing where to look for fish passage corrections that benefit ESA-listed fish is only one part of a strategy to prioritize barrier corrections. The loss of spawning and rearing habitat is the primary cause for declines in most listed populations. A successful strategy must consider that some areas and watersheds are more important for delisting than others, and fish passage barrier removal is more important for some species than others.

Southern Resident killer whales (SRKW) range from central California to Southeast Alaska and primarily eat Chinook salmon from many different runs within this area. Restoring passage to any stream that has populations of Chinook will have some benefits to SRKW recovery. However, not all barriers will have equivalent restoration benefits. Barriers low in systems, especially in estuaries, are likely to have greater benefits to Chinook populations than barriers higher up in systems or on smaller streams.

The legislative provisos recognize the importance of anadromous salmon and steelhead to maintaining populations at a level that allows for robust fisheries. The populations that constrain fisheries change over time and must be identified each year via the science and estimated return data that informs the co-management fishery negotiation processes, but there are some, such as the Stillaguamish River population of Chinook, that regularly impact negotiations. Incorporating annual population status and trend information into barrier prioritization will result in benefits of those projects to critical ESA listed stocks and to fisheries.

A successful statewide fish-barrier-removal strategy requires the skills, support and actions of multiple entities working in collaboration to gain efficiencies and to realize the greatest benefit of our state's investments. There are four primary State-sponsored programs involving fish passage barrier removal:

- Brian Abbott Fish Barrier Removal Board (FBRB),
- Family Forest Fish Passage Program (FFFPP),
- Chehalis Basin Aquatic Species Restoration Plan (ASRP), and
- The federal culvert injunction.

In addition to the four State-sponsored fish passage barrier removal programs, Washington's cities and counties have made longstanding commitments to the protection and restoration of salmon. The cost is high of replacing fish passage barriers with fish passable culverts or bridges. It is implicit in the concept of prioritization that it will help direct limited resources to achieve the greatest benefit first.

At the end of this report there are several recommendations to strengthen existing aspects of a statewide strategy, as well as enable prioritization of barrier removal at finer scales within watersheds and between stream systems. WDFW will continue developing the comprehensive statewide fish passage barrier remediation plan and will identify or seek the resources to do the work described in the recommendations.

- The state should affirm what's working among the current approaches to barrier removal and continue utilizing these practices in a statewide strategy moving forward.
- WDFW should complete work to enable statewide prioritization at the barrier and stream system scales that reflects access to the conditions fish need and for the populations that matter most to recovery.
- With statewide prioritization in hand, WDFW and state barrier removal programs should enhance the infrastructure and funding to enable more proactive promotion of these priorities.

Problem statement

The state has several distinct fish passage barrier remediation plans and programs operating simultaneously. Although fish passage barrier correction is necessary for recovery of salmon and steelhead, an additional driving factor for fish passage barrier removal investments is the federal court injunction, issued March 2013, which requires the state to significantly increase the effort for removing state-owned culverts that block habitat for salmon and steelhead by 2030. However, a sole focus on the injunction culverts alone will not deliver the desired outcomes for salmon, steelhead, orca recovery, and important fisheries statewide. The FBRB has been tasked to develop a comprehensive statewide strategy, focusing the efforts of all culvert correction programs into a single strategic approach to maximize the salmon and orca recovery benefits from the public investment. To maximize salmon and orca recovery benefit from the state investment—and build support for the level of funding needed—it is critical that these disparate strategies be merged into one comprehensive plan. A comprehensive plan will ensure that the state culvert injunction target is met by the court-imposed deadline, while also meeting identified natural resource objectives that necessitate correcting non-state-owned barriers.

Background

Salmon recovery

Our state has been committed to salmon recovery since Washington's salmon and steelhead were first listed under the Endangered Species Act in the late 1990s. This commitment was solidified with the passage of the Salmon Recovery Act of 1999 and continues to this day in the work of people throughout the state and beyond. Removing barriers in streams that prevent salmon and steelhead from reaching habitat is one of the actions that contributes to these recovery goals.

The loss of spawning and rearing habitat is the primary cause for declines in most listed populations. A successful strategy must consider that some areas and watersheds are more important for delisting than others, and fish passage barrier removal is more important for some species than others.

Federal culvert injunction

“On June 11, 2018, after decades of litigation, the U.S. Supreme Court affirmed the treaty obligation of the State of Washington to repair or replace fish-blocking culverts under State-owned roads within the United States v. Washington case area, Water Resource Inventory Areas (WRIAs) 1-23. Under the district court injunction at issue in the case, the court ordered the Washington departments of Natural Resources (DNR), Fish and Wildlife (WDFW) and State Parks to provide fish passage, by October 31, 2016, at each barrier culvert on lands owned or managed by each agency. The court ordered Washington Department of Transportation (WSDOT) to provide fish passage, by March 29, 2030, at all WSDOT culverts blocking significant habitat areas that cumulatively total 90 percent of lineal stream miles of significant salmon habitat blocked by WSDOT culverts throughout the case area. The court ordered WSDOT to repair or replace all remaining barrier culverts at the end of each culvert's useful life, or sooner as part of a highway project.

For the first time, the federal courts interpreted the principles of United States v. Washington as an obligation to protect and restore salmon habitat, a result with potentially far reaching implications. The injunction itself, however, is relatively narrow in scope, for two reasons. First, the injunction applies only in a limited geographic area, i.e., the United States v. Washington case area. The injunction does not apply in the Columbia Basin or in the coastal areas of Southwest Washington. Second, the injunction only applies to State-owned or maintained barrier culverts. The injunction does not require correction of barrier culverts owned or maintained by local governments or other public or private entities.”¹

Nothing in this report is intended to alter the obligation set forth in the permanent injunction, including the compliance deadline, or the guidelines for compliance within that timeline that were developed during the implementation process.

Brian Abbott Fish Barrier Removal Board

Established by the legislature in 2014, the purpose of the Brian Abbott Fish Barrier Removal Board (FBRB) is to aid in the restoration of healthy and harvestable levels of salmon and steelhead statewide through the coordinated and strategic removal of barriers to fish passage (RCW 77.95.160). Board

¹ These two paragraphs are excerpted from the introduction of a white paper written by Mr. Joe Mentor, of Mentor Law Group, and dated March 13, 2019.

membership includes the WDFW (chair), the Recreation and Conservation Office in concert with the Governor's Salmon Recovery Office (RCO & GSRO), Association of Washington Cities, Washington Association of Counties, the WSDOT, the Department of Natural Resources (DNR), the Confederated Tribes of the Colville Reservation, the Yakama Nation, the Salmon Recovery Council of Regions Executive and the National Oceanic and Atmospheric Administration (NOAA).

Based on direction from the legislature in RCW 77.95.160, the FBRB developed and implemented a method for state capital grants that rewards projects that remove barriers upstream or downstream of another barrier correction and projects that sequentially remove barriers in watersheds that are recognized as critical by the state's Salmon Recovery Regions. This approach leverages the large gains made by the investments of WSDOT, the forest industry, and local governments, and also ensures fish passage removals closely align and coordinate with the salmon recovery priorities of regional and local salmon recovery organizations.

The approach described above reflects the values described by the legislature, as well as the scientific information and data at the time the FBRB was established. There is also opportunity to build on this success, incorporate the latest developments in fish passage science and professional experience, and better integrate multiple public investments in barrier removal, as described in the problem statement above.

Provisos

On March 11, 2020, lawmakers provided direction to WDFW, WSDOT, and the FBRB through provisos in the supplemental Operating Budget (ESSB 6168), the supplemental Capital Budget (ESSB 6248) and the Transportation Budget (ESHB 2322). The provisos direct the WDFW and the FBRB, working with WSDOT, to develop a comprehensive plan for fish passage barrier removal in Washington State that builds on investment in the *United States v. Washington* permanent injunction to deliver benefits to salmon and steelhead stocks that are listed as threatened or endangered under the Endangered Species Act (ESA), contribute to the protection and restoration of Southern Resident orca, and limit the harvest of anadromous fish in the Pacific Salmon Treaty or North of Cape Falcon fishery negotiations. The complete text of the Capital Budget proviso and the Transportation budget proviso are included in Appendices A and B of this report.

Biennial proviso report

In response to these budget proviso directives, WDFW, WSDOT and the FBRB have been working to develop the comprehensive statewide culvert remediation plan and satisfy the provisos. This report, co-authored by WDFW, WSDOT and the FBRB is the biennial report on the development of the new strategy.

Regrettably, the coronavirus pandemic had negative effects on strategy development. The proviso funding allotted for labor to support development of the new strategy was initially included in FY21 state budget savings, and the state hiring freeze prevented WDFW from adding staff to work solely on the proviso. Existing staff have worked on the proviso, while accommodating mandated furloughs, competing teamwork priorities due to vacancies, and unavailability of contractors to assist. This biennial report summarizes the significant work that was done, despite such challenges, and includes the principles that can form the basis of a statewide approach to barrier removal and recommendations to further refine such an approach.

Status of fish passage barriers in Washington

For the purposes of this report and Washington's strategy, a fish passage barrier is a man-made structure or human caused impediment that fish cannot adequately migrate through. The most common fish passage barriers are road culverts. Road culverts can create fish passage problems when there is an excessive water surface drop at the outlet, inlet, or within the culvert; when water velocities within the culvert exceed fish swimming capabilities; and/or when the depth of the water passing through the culvert is so shallow fish cannot propel themselves through the culvert. This report focuses primarily on barrier culverts because of their number and widespread presence across Washington.

In 2018, WDFW estimated the number of transportation-related salmon and steelhead barriers throughout Washington State. The purpose of the assessment was to update and narrow the scope of the previously estimated 40,000 fish passage barriers, which was developed over 20 years prior and included impediments to resident-only (i.e., non-anadromous) species. Through an analysis of WDFW's current fish passage inventory, and a GIS-based approach to identifying potential barriers at road and stream junctions, WDFW estimates that there are at least 18,000 - 20,000 barriers to salmon and steelhead across Washington State. Most of these barriers lie in Western Washington due to the density of both roads and streams. This estimate is assumed to be conservative due to limitations in the availability of comprehensive statewide fish distribution data.

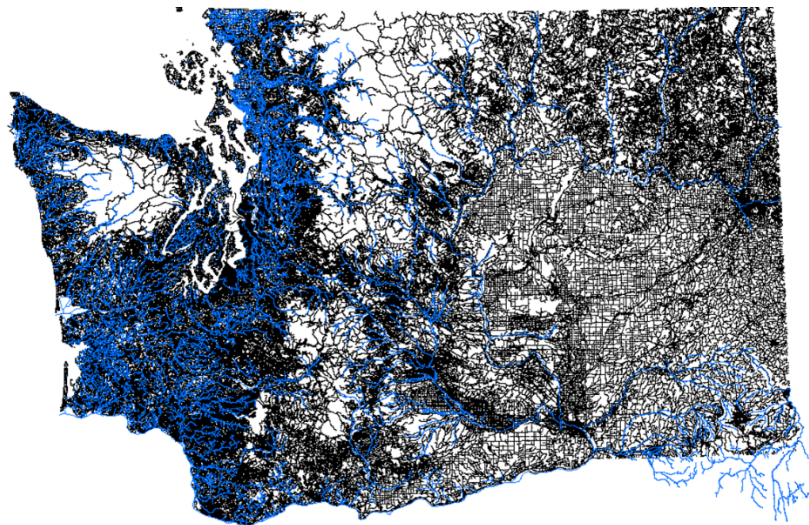


Figure 1. Intersection of roads and salmon bearing streams of Washington State

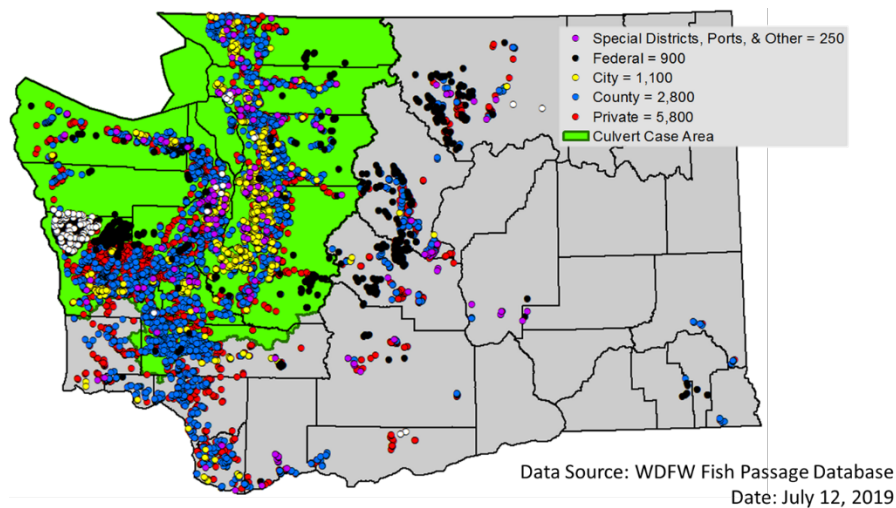


Figure 2. Known non-injunction salmon and steelhead barriers statewide

Barrier inventories

A comprehensive barrier inventory is an important foundation to an effective statewide barrier removal strategy. Because water crossing features are situated in dynamic aquatic systems, sites that were once passable can become barriers over time as conditions change. Similarly, barrier status changes over time as barriers are corrected. Thus, it is prudent to plan for systematic reassessments of fish passage features through time to track the success and benefit of investments to salmon and steelhead recovery.

WDFW develops and maintains fish passage barrier assessment procedures and best practices, which are described in the [WDFW Fish Passage Inventory, Assessment, and Prioritization Manual](#) (WDFW, 2019). The manual is a nationally used publication that provides standardized data collection procedures for the inventory and assessment of road crossing structures, dams, fishways, surface water diversions, and natural barriers, as well as guidance on project planning and coordination.

For over 30 years, field verifications have been conducted statewide by WDFW using the barrier assessment protocols detailed in the WDFW Fish Passage Inventory, Assessment, and Prioritization Manual (WDFW, 2019). A significant portion of these inventories have been funded by partners who are committed to understanding the status of barriers they are responsible for. WSDOT has funded WDFW to conduct inventories of state transportation sites since the early 1990s. Similarly, the Association of Washington Cities and Washington State Association of Counties have provided funding to WDFW to inventory local government-owned sites, primarily in the federal culvert injunction case area (WRIAs 1-23, case area). Consequently, inventory in this area is further along than the rest of the state. Based on funding for the 2021-2023 biennium, it is estimated that the cities in the case area will have a complete inventory by June 30, 2023. Estimates to complete all counties in the case area are less clear because progress over this larger area will vary greatly by funding levels.

Inventories of culverts owned by private landowners and other non-state/city/county culverts, however, have fallen behind. Privately-owned barriers represent a significant data gap in the database, which is largely due to obstacles to gaining landowner permissions to access private property and document barriers, as well as a lack of funding opportunities for privately-owned barriers once identified. Private barriers are captured whenever possible during habitat surveys, and some

conclusions about barrier status and habitat on private lands can be estimated or inferred using mapping data.

At the direction of the Legislature (RCW 77.95.170(5)), the barrier assessment data that results from all these inventories are collected and maintained by WDFW in a centralized database known as the Fish Passage and Diversion Screening Inventory (FPDSI) database. The FPDSI database is publicly available online at <https://geodataservices.wdfw.wa.gov/hp/fishpassage/index.html>. The Legislature also directed WDFW to create a [barrier inventory training program](#) to qualify others to perform inventories and contribute data to the database. WDFW trains hundreds of people each biennium on how to conduct barrier assessments and provides ongoing technical assistance to ensure each group is meeting their inventory goals and quality data is collected and submitted to the FPDSI database. Those data are used to look for distribution patterns of barriers in geographic regions, identify strategies, and make realistic plans for fish passage barrier removal at both the site and watershed scales.

ESA-listed species

Where ESA species occur in Washington

In Washington, many populations of salmon and steelhead are currently listed as "threatened" or "endangered" under the federal Endangered Species Act (ESA). Listed populations now include distinct genetic strains of Chinook, coho, chum, and sockeye salmon as well as steelhead and the watersheds they use encompass a significant portion of the state. There are two populations of listed sockeye in Washington: the Lake Ozette population has no known barriers to its migration pathway and the Snake River population spawns and rears in Idaho so its passage needs are addressed by considering the mainstem passage needs of Chinook. Therefore, Chinook, chum, coho, and steelhead have been the focus for in this effort. As it relates to the Proviso, the primary request is to determine how to prioritize removal of barriers that impact populations that are listed as threatened or endangered under the ESA. For the purposes of this report, the word "populations" is used in place of the word "stocks" and is meant to be equivalent in definition.

To protect salmon and steelhead species and the ecosystems upon which they depend, the ESA is administered by the National Oceanic and Atmospheric Administration (NOAA) for anadromous species. NOAA lists threatened and endangered species by species, subspecies, distinct population segments (DPS), or Evolutionarily Significant Units (ESUs). WDFW's [Salmon Conservation and Reporting Engine](#) (SCoRE) website reflects NOAA listings for individual salmonid populations and provides a tracking mechanism for the current and historic status of the individual populations. Distribution of these populations is available visually using WDFW's [SalmonScape website](#). These systems provide us with the best information available on where these ESA listed species occur in Washington. For example, NOAA identifies eight different ESUs for Chinook salmon in Washington. One of those ESUs, Lower Columbia River Chinook, is comprised of 20 distinct populations of Chinook depending on which specific watershed the Chinook utilize for spawning or what time of year the Chinook return to spawn.

ESU/DPS	Population Name (SCoRE)	Status	Listing Date
Lower Columbia River Chinook	Big White Salmon River Fall (Tule) Chinook	Threatened	03.24.1999
Lower Columbia River Chinook	Big White Salmon River Spring Chinook	Threatened	03.24.1999
Lower Columbia River Chinook	Coweeman Fall (Tule) Chinook	Threatened	03.24.1999
Lower Columbia River Chinook	Elochoman/Skamokawa Fall (Tule) Chinook	Threatened	03.24.1999
Lower Columbia River Chinook	Grays/Chinook Fall (Tule) Chinook	Threatened	03.24.1999
Lower Columbia River Chinook	Kalama Fall (Tule) Chinook	Threatened	03.24.1999
Lower Columbia River Chinook	Kalama Spring Chinook	Threatened	03.24.1999
Lower Columbia River Chinook	Lewis River Fall (Tule) Chinook	Threatened	03.24.1999
Lower Columbia River Chinook	Lewis River Late Fall (Bright) Chinook	Threatened	03.24.1999
Lower Columbia River Chinook	Lower Cowlitz Fall (Tule) Chinook	Threatened	03.24.1999
Lower Columbia River Chinook	Lower Gorge (Columbia) Fall (Tule) Chinook	Threatened	03.24.1999
Lower Columbia River Chinook	Mill/Abernathy/Germany Creeks Fall (Tule) Chinook	Threatened	03.24.1999
Lower Columbia River Chinook	North Fork Lewis River Spring Chinook	Threatened	03.24.1999
Lower Columbia River Chinook	Salmon Creek Fall (Tule) Chinook	Threatened	03.24.1999
Lower Columbia River Chinook	Tilton Spring Chinook	Threatened	03.24.1999
Lower Columbia River Chinook	Toutle Fall (Tule) Chinook	Threatened	03.24.1999
Lower Columbia River Chinook	Upper Cowlitz and Cispus Spring Chinook	Threatened	03.24.1999
Lower Columbia River Chinook	Upper Cowlitz Fall (Tule) Chinook	Threatened	03.24.1999
Lower Columbia River Chinook	Upper Gorge (Columbia) Fall (Tule) Chinook	Threatened	03.24.1999
Lower Columbia River Chinook	Washougal Fall (Tule) Chinook	Threatened	03.24.1999

Table 1. ESA-listed populations of Chinook within the Lower Columbia River Chinook ESU, one example of ESA listing status for populations in a particular area.

Table 1 shows the listed populations of Chinook within the Lower Columbia River Chinook ESU. One example of a distinct population, the North Fork Lewis River Spring Chinook, is highlighted. The SCoRE website provides a host of data on the [North Fork Lewis River Spring Chinook population](#). Figure 3 depicts the difference in scale between ESU, watershed, and population.

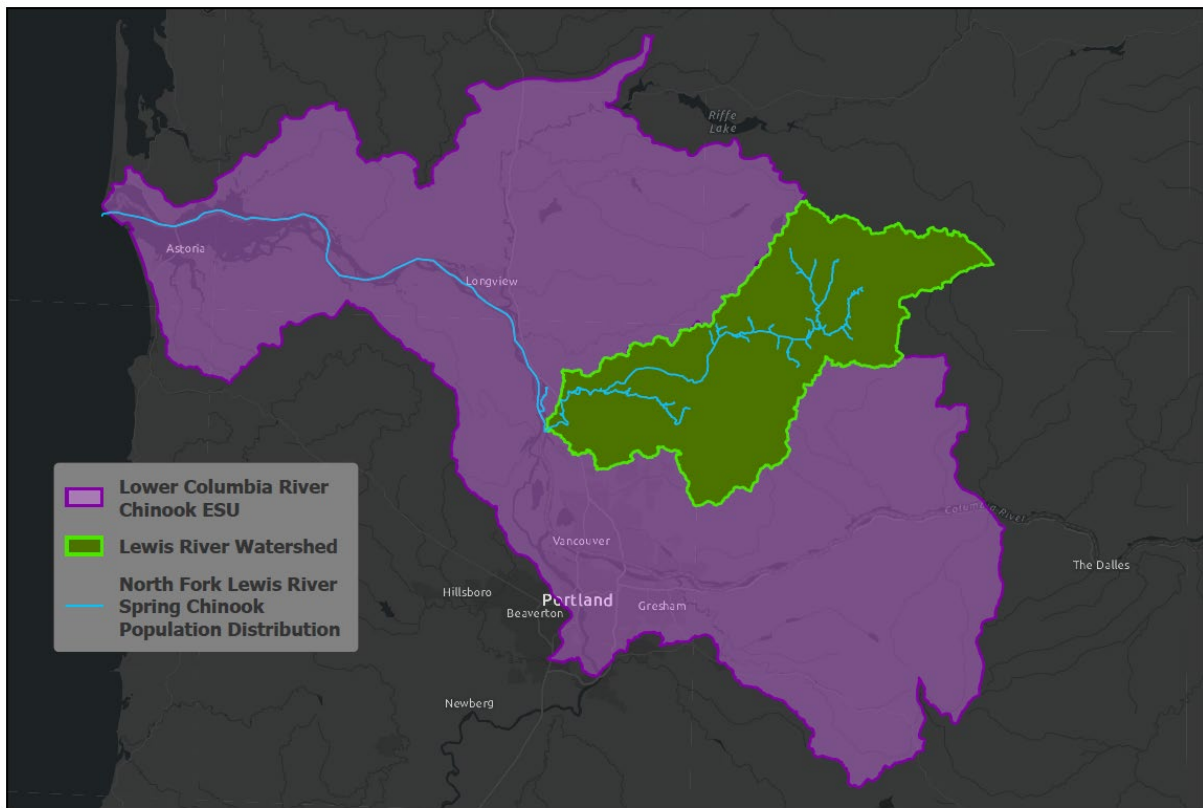
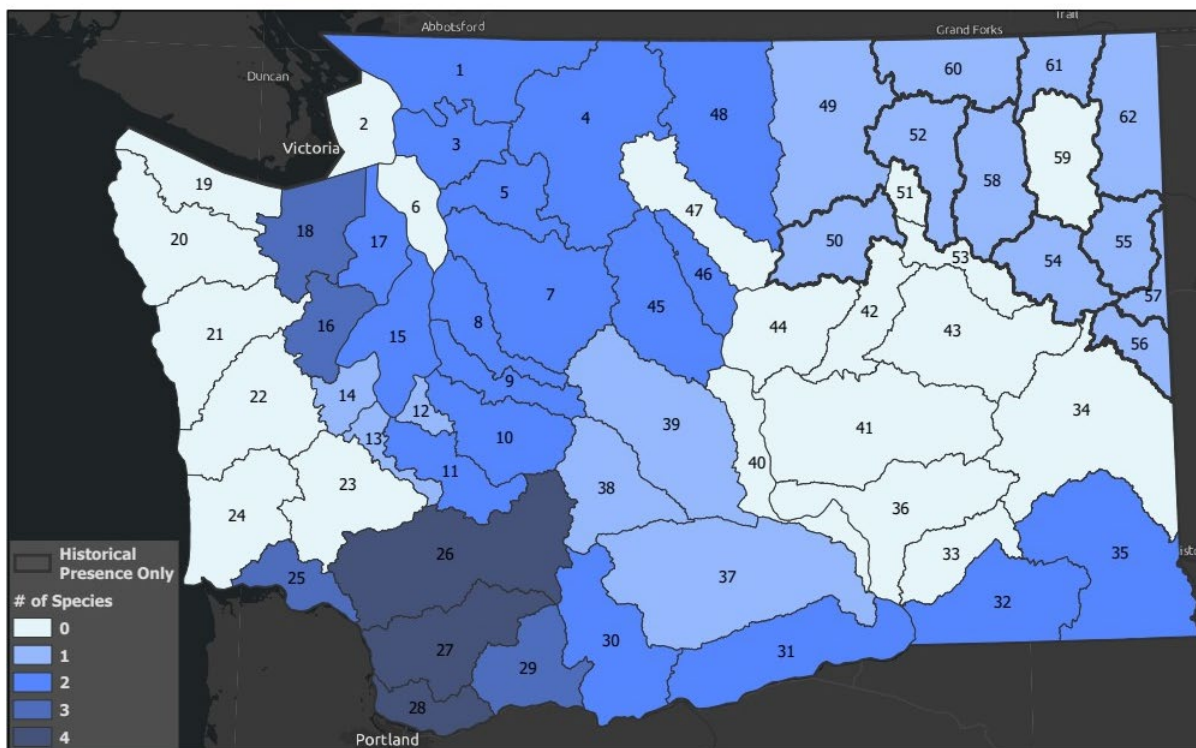


Figure 3. Chinook distribution at the ESU (Evolutionarily Significant Unit), watershed and population scales

The data from NOAA and SCoRE can be used to demonstrate, at a finer scale, where prioritizing fish passage barrier corrections could have benefit for particular ESA-listed salmon and steelhead. A standard method in Washington of identifying similar watershed scales for comparison is by using the Water Resource Inventory Areas (WRIAs). Using the data from NOAA and SCoRE, simple visual tools can be created to show where a fish passage project may benefit multiple species. Figure 4 indicates which WRIAs have spawning ESA-listed species, and the total number of those species in each WRIA. The darker the blue, the more ESA-listed species utilize that WRIA for spawning. WRIA 27 represents the Lewis River Watershed and contains listed populations of Chinook, chum, coho, and steelhead, including the aforementioned North Fork Lewis River Spring Chinook population.



Number of species with at least 1 ESA listed stock, both current and historical, by WRIA

Four possible species: Chinook, Chum, Coho, and Steelhead

Figure 4. Number of ESA-listed salmon stocks by WRIA based on current and historic distribution including Chinook, chum, coho and steelhead with historical ESA-listed stock presence (in bold outline)

Habitat utilization

Knowing where to look for fish passage corrections that benefit ESA-listed fish is only one part of a strategy to prioritize barrier corrections. The federal agencies administering the ESA have cited loss of spawning and rearing habitat as the primary cause for declines in most listed populations. A successful strategy must consider that some areas and watersheds are more important for delisting than others, and fish passage barrier removal is more important for some species than others. For example, the thousands of fish passage barrier corrections remaining to be done statewide will be most beneficial to coho and steelhead. For Chinook and chum, the benefits from fish passage corrections, while important,

are likely to have less of an impact on restoring populations. The reasons for this are varied, and it is critical to know how the different listed species utilize aquatic habitats for spawning and rearing. Specifically, steelhead and coho prefer to spawn in upper reaches of accessible streams, whereas Chinook and chum prefer to spawn low in the watershed in larger mainstem streams. This means that coho and steelhead are likely to face many more barrier structures to reach their spawning grounds or move out of rearing areas. This is one difference of many in how different listed species utilize aquatic habitats. While all salmon species require continuous clean, cool, and oxygen-rich water, large quantities and areas of clean, rounded gravels, and complex channel habitats with lots of cover for spawning and rearing, there are variables within those general conditions that will benefit individual species. Table 2 and Figure 5 summarize how each species relevant to the Proviso utilize habitats in Washington. Table 2 lists preferences for spawning and rearing and Figure 5 shows a generic watershed to visualize those preferences on the landscape.



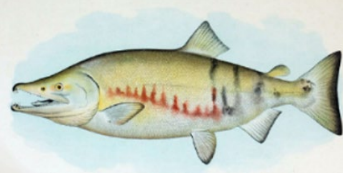

Species	Spawning Habitat	Rearing Habitat
Chinook 	<ul style="list-style-type: none"> • Mainstem spawners that need a lot of space • Large, deep, slow moving, low-gradient streams • 14 to 15 weeks of consistent, cool clean flow for optimal survival to emergence 	<ul style="list-style-type: none"> • Large, natal streams with nearby tributaries • Freshwater residence: 1 year • Estuarine habitat is critical for transition to tidal waters
Coho 	<ul style="list-style-type: none"> • Any size stream with access • Spawn in margins and side channels of mainstems and in small streams • 8 to 10 weeks of consistent, cool clean flow for optimal survival to emergence 	<ul style="list-style-type: none"> • All accessible waters • Freshwater residence: 2 years • Upper reaches of streams and off-channel habitats critical
Chum 	<ul style="list-style-type: none"> • Medium to large, slow moving, very low-gradient streams • Spawn in margins and side channels of mainstems and in small streams • 24 weeks of consistent, cool clean flow for optimal survival to emergence 	<ul style="list-style-type: none"> • Immediately move to tidal waters upon emergence • Freshwater residence: a few days • Critical need is intact nearshore and estuary habitat
Steelhead trout 	<ul style="list-style-type: none"> • Any size stream with access • Spawn in upper reaches of accessible stream habitat that has space • 5 to 8 weeks of consistent, cool clean flow for optimal survival to emergence 	<ul style="list-style-type: none"> • All accessible waters • Freshwater residence: 1 to 4 years • Diverse habitats throughout systems critical

Table 2. Habitat utilization characteristics for Chinook, chum, coho, and steelhead

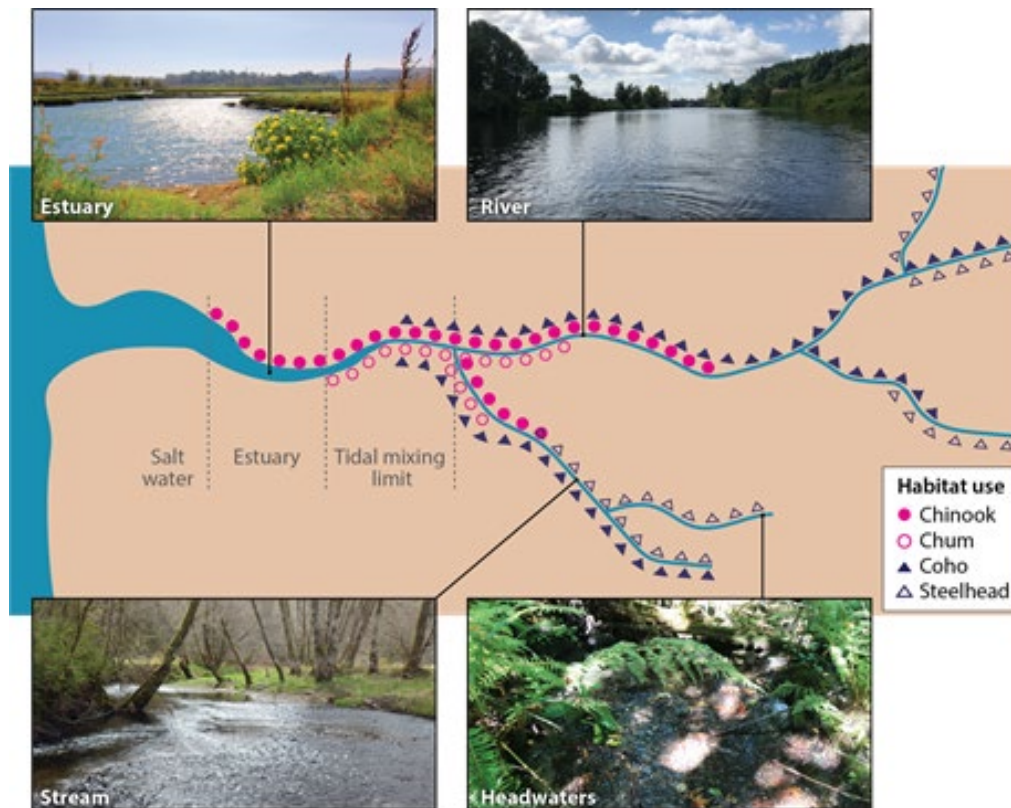


Figure 5. Habitat Utilization for Chinook, chum, coho, and steelhead in a generic watershed

Moving from the mouth of a watershed to its headwaters and removing every barrier along the way is a possible process for achieving full fish passage in Washington. The lowest barriers in any system are likely to impact all anadromous species, and removal of these barriers likely benefits all species. This process becomes even more attractive when considering multiple other benefits that come with restoring Chinook populations (as discussed in later sections); populations that would most benefit from removal of barriers low in any system. The relatively fewer remaining barriers located lower in watersheds on large streams utilized by Chinook are more typically dams and diversions that require enormous commitments of time and money to resolve. This is not a recommendation to avoid investing the time and money to solve fish passage issues at large mainstem barriers. Rather it is recognition that full fish passage for all anadromous species, a required step in species recovery and delisting, will not occur if the State of Washington only focuses its resources on one species or a few structures. A statewide strategy for fish passage must include restoring passage at the numerous culverts and other smaller barriers while simultaneously working to remove larger, more complex barrier structures.

Habitat quality, quantity, and connectivity

The NOAA website for ESA-listed salmon and steelhead describes a variety of factors that can limit the success of restoration including ocean and freshwater conditions. These factors vary greatly within and between watersheds and directly impact the habitat quality and quantity available to fish. These factors are in addition to the existing and potential connectivity (barrier-free areas) of the system. It is worth defining what is meant by habitat quality, quantity, and connectivity in relation to fish passage restoration for ESA-listed salmon and steelhead.

Habitat quality generally means the availability of continuous clean, cool, and oxygen-rich water, large quantities and areas of clean, rounded gravels, and complex channel habitats with lots of cover for spawning and rearing.

Habitat quantity is the amount of existing or potential usable habitat that meets the general habitat quality characteristics and the more specific habitats utilized by individual species.

Habitat connectivity is not only how free of barriers to anadromous migration a system is, but also how well connected the system is to off-channel habitat, floodplains, wetlands, and other parts of aquatic systems that benefit listed species.

Many stream systems and watersheds in Washington have undergone significant anthropogenic change resulting in a host of factors that prevent habitat quality, quantity, and connectivity from existing or being restored. Where one factor has outsized influence in enabling the recovery of a species or restoration of a watershed, it is known as the “limiting factor.” In some cases, fish passage itself may be the limiting factor preventing species’ recovery and restoration. One key strategy to using limited resources will be to target areas where removal of one or a series of barriers will restore access to high quality and/or quantities of habitat. Being able to balance the immediate benefit against the overall level of effort required to restore fish passage to the entire system should be the goal.

Putting it all together

Taken together, the distribution of ESA-listed species across WRIAs and throughout a watershed illustrate the vast current and historic distribution of these species in Washington. Hence, merely layering fish species distribution and barrier location data does not result in clear priorities: more work is needed to identify the relative benefit to recovery of work with individual populations in individual streams. Fortunately, there are several efforts that begin to lay a foundation for such analysis.

As stated, the quality, quantity, and connectivity of existing functional habitat are compelling metrics to evaluate resource expenditures. In 1996, NOAA identified properly functioning watershed conditions to assess whether the conditions necessary for recovery exist in the short- and long-term. The Washington Academy of Sciences will review these 1996 properly functioning watershed metrics during the 21-23 Biennium in light of current science and climate change and will also identify data sources in Washington that align with those metrics. This will provide another scientific tool for assessing the quality of reopened habitat.

Additionally, the work of the FBRB represents one example of integrating multiple considerations to prioritize public funding for the highest priority barrier removal opportunities. Based on direction from the legislature in RCW 77.95.160, the FBRB developed and implemented a method for state capital grants that rewards projects that remove barriers upstream or downstream of another barrier correction and projects that sequentially remove barriers in watersheds that are recognized as critical by the state’s [Salmon Recovery Regions](#). Further, each barrier project is evaluated against criteria that represent measures of habitat quality, quantity and connectivity, thereby better ensuring immediate access for fish to habitat that is opened as a result of a barrier correction. This approach leverages the large gains made by the investments of WSDOT, the forest industry, and local governments, and ensures fish passage removals closely align and coordinate with the salmon recovery priorities of regional and local salmon recovery organizations. The approach described above reflects the values described by the legislature, as well as the scientific information and data at the time the FBRB was

established. Although this approach currently relies on a more standard grant model of soliciting available projects that meet these criteria, there is opportunity to build on this success, incorporate the latest developments in fish passage science and professional experience, invest in methods to proactively develop more high priority projects, and better integrate multiple public investments in barrier removal.

Southern Resident killer whales and Chinook

According to NOAA, “Southern Resident killer whales (SRKW) range from central California to Southeast Alaska and eat Chinook salmon from many different runs within this area. Southern Resident killer whales eat all year long and need access to a variety of salmon with different run timing and distribution.” NOAA Fisheries, in a partnership with WDFW, led a project that focused on streams used by Chinook stocks that were identified as priority prey sources for SRKW. This important relationship is demonstrated in the NOAA figure below from their work. The report stemming from that project titled “Southern Resident Killer Whale Priority Chinook Stocks Report” details which stream systems in Washington contain Chinook runs that are critical prey for SRKW.

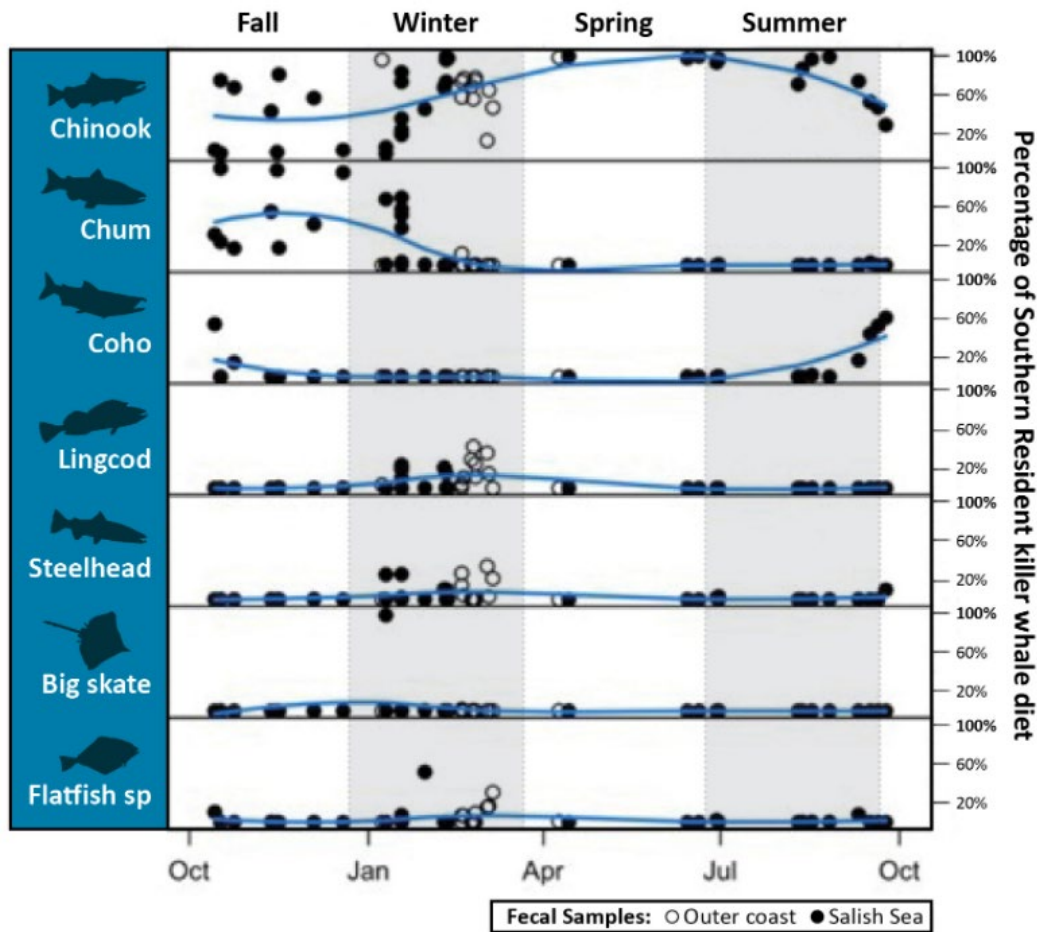


Figure 6. Southern Resident Killer Whale Prey Type by Percentage of Total Diet

To capitalize on that effort, and at the direction of the Governor’s SRKW Task Force, WDFW habitat biologists in consultation with tribal biologists, WDFW fish biologists, regional salmon recovery groups and lead entity groups, and conservation districts developed a list of known and potential passage barriers to Chinook salmon in Washington within the identified stream systems. In total, 1,931 barriers were identified and categorized into three main groups: nearshore barriers, western barriers, and eastern barriers. Methodologies for this effort are fully described in the “Fish Passage Barriers in Key Chinook Streams” report produced by WDFW. While NOAA states that “There are some Chinook salmon runs that were historically important to the Southern Resident killer whales but have been significantly reduced or extirpated and are no longer available,” the list of 1,931 fish passage barriers covers all systems with documented, presumed, potential, or historic presence of Chinook from all stocks identified by NOAA found within Washington. The list produced through this analysis is a living list, meaning it will be updated and barriers will be added to and subtracted from it as they are discovered or repaired. Additionally, WDFW created a [SRKW Chinook Barrier Analysis website](#) that identifies the location and passability of this list of barriers to Chinook passage (Figure 7).

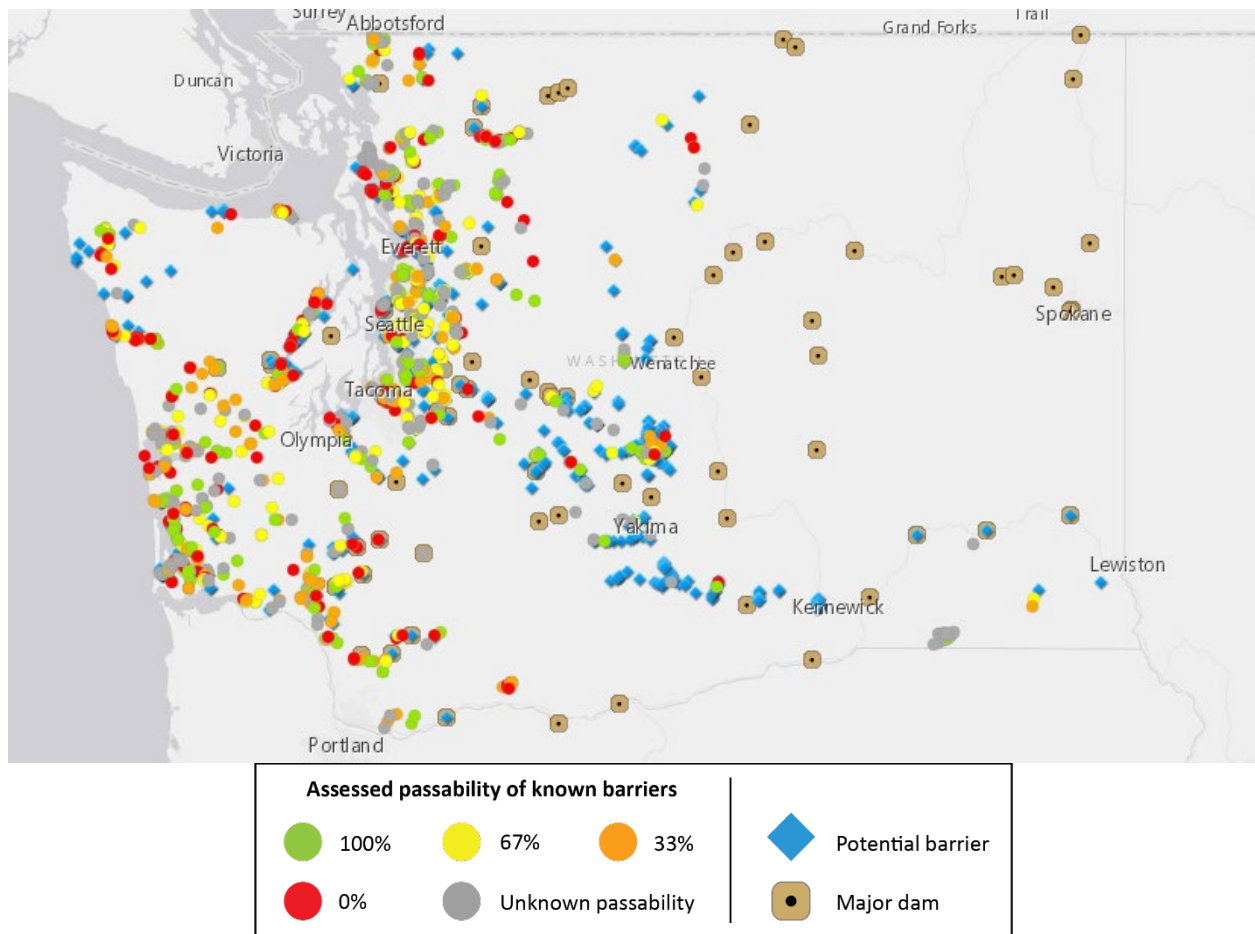


Figure 7. Washington State map with *known* and *potential* fish passage barriers to Chinook

Note: the green dot symbols denote the crossing has been assessed as 100% passable within the last 10 years.

Restoring passage to any stream that has populations of Chinook will have some benefits to their recovery. However, as noted above, not all barriers will have equivalent restoration benefits. Barriers low in systems, especially in estuaries are likely to have greater benefits to Chinook populations than barriers higher up in systems or on smaller streams. Taking a closer look at the Puget Sound area from

the [SRKW Chinook Barrier Analysis website](#) demonstrates this (Figure 8). Most known and potential barriers to Chinook are clustered in estuaries and along coastlines. Many of these structures share similar characteristics: they are in tidal waters making them difficult to assess for passability, they are on side channels, sloughs, and small systems that mainly benefit juvenile Chinook and other anadromous species' rearing, and because many occur in urban or agricultural settings they can be difficult to remove without significant additional restoration efforts and cooperation from numerous parties. Chinook utilize estuaries, and the off-channel and brackish environments they provide, during the critical life-stage where they acclimate to saltwater and grow to a size that allows for better survival during their years at sea. Structures blocking passage to estuary habitat can preclude this growth and development at that critical stage, dramatically reducing overall survival. Determining a method of prioritization at a finer scale (i.e., among stream systems within a watershed) to achieve the largest benefits, as described above, would also help restore Chinook prey for SRKW.

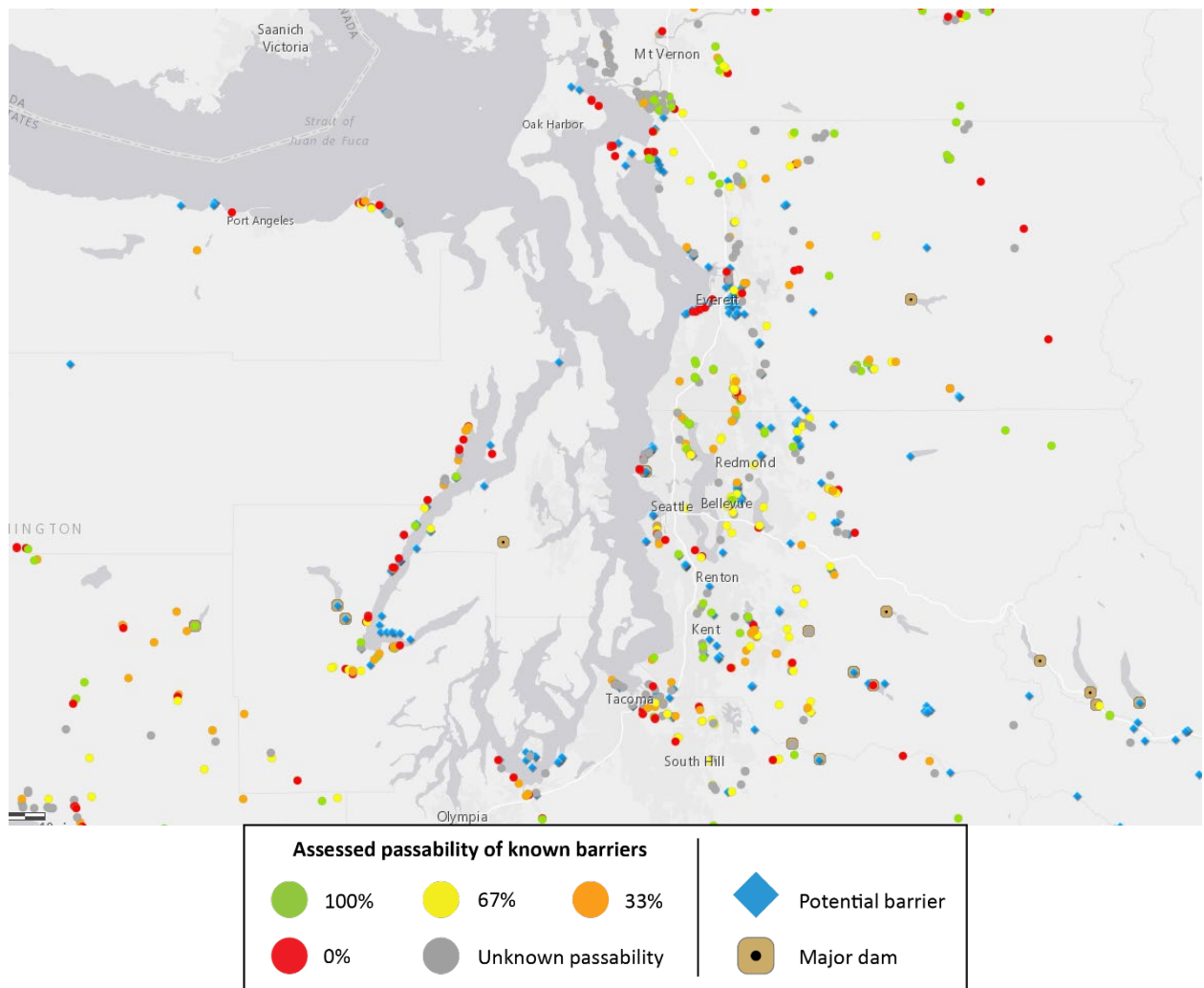


Figure 8. Puget Sound map with *known* and *potential* fish passage barriers to Chinook

Note: the green dot symbols denote the crossing was determined to be 100% passable 10 years or longer ago, with the understanding that those sites could have become barriers since their last reassessment due to changes in assessment protocols, site conditions, and deteriorating infrastructure.

Population status and trends

The legislative proviso initializing this effort recognizes the importance of maintaining anadromous salmon and steelhead populations at a level that allows for robust fisheries. The North of Falcon and Pacific Salmon Treaty processes are annual negotiations between the co-managers, WDFW and the Tribes, to evaluate population levels and set harvests for the year. By-catch (unintended catch) of fish from ESA-listed populations that are extremely low in the number of adult fish returning to spawn can limit the opportunities to fish for healthier populations because populations comingle in the ocean, Puget Sound, estuarine, and main stem environments. Considering this risk, the co-managers invest a significant amount of time and expertise each year in estimating the number of adults in the ocean based on catch records, field monitoring the number of adults that return to spawn and the number of juvenile fish that migrate out of the system, as well as sophisticated modeling to predict what population levels will be in the following year. This information represents some of the most current data about individual population status and trends, and which of the listed populations may be at greatest risk. It will be important to integrate information about the most at-risk populations into the statewide prioritization strategy to better assure we prioritize barrier removal in places where it can prevent extirpation or make the greatest gains to recovery and provide benefits to the stocks that limit harvest.

Coordination of culvert correction programs

A successful statewide fish barrier removal effort requires the skills, support, and actions of multiple entities working in collaboration to gain efficiencies and to realize the greatest benefit of our state's investments. There are four primary State-sponsored programs involving fish passage barrier removal:

- Brian Abbott Fish Barrier Removal Board (FBRB),
- Family Forest Fish Passage Program (FFFPP),
- Chehalis Basin Aquatic Species Restoration Plan (ASRP), and
- The federal culvert injunction.

The Brian Abbott Fish Barrier Removal Board's (FBRB) mission is to implement a coordinated fish barrier removal strategy that maximizes the habitat recovery value of other fish passage investments that have been made by public and private entities statewide. Created by the Legislature in 2014, the FBRB provides a sound mechanism to coordinate local, state, and private corrections statewide. WDFW staff select the barriers to be repaired based on most downstream barrier, amount of habitat opened, and with consideration of other barriers that may be repaired with other programs. The same WDFW team prioritizing culvert replacement projects for the FBRB also prioritizes barrier corrections for the Chehalis Basin and Family Forest Fish Passage Programs. Currently, the FBRB uses two barrier removal strategies: (1) a watershed pathway in which barrier removals in a particular watershed are prioritized by regional salmon recovery organizations and (2) a partnership pathway that removes barriers near other barrier corrections in order to leverage previous investments.

The Family Forest Fish Passage Program (FFFPP), created by the Legislature in 2003, is a cost-share program that provides financial and technical resources for fish passage barrier removal to families who own small forests to meet obligations under the Forests and Fish Agreement. Three state agencies, DNR, WDFW, and the Recreation and Conservation Office (RCO), work together to manage the program. A team from the three partner agencies ranks the projects in each watershed based on the presence of up/downstream barriers, the habitat opened, the number of salmon and trout species that will benefit, and the cost. After all projects are prioritized, a steering committee finalizes a list of funded projects. Those projects providing greatest benefit are funded for construction in September each year. Lower

priority projects remain in the program to be funded once they become a high priority and funding becomes available.

The FBRB and the FFFPP grant programs face some constraints and opportunities. Both are reactive programs which rely entirely on the willingness of grant applicants to participate in these grant programs. This is a special constraint in the context of a statewide strategy because it is dependent on when and where project proponents want to, or are able to, design a project as opposed to the highest priority locations. Additionally, the FBRB is explicitly prohibited from altering the process and prioritization methods used in the implementation of forest practices rules and the FFFPP or prohibiting or delaying any fish passage project undertaken by a state agency (e.g., WSDOT's injunction compliance). However, these two programs are also complementary in that they target relatively different portions of a watershed: FFFPP targets forest lands that are often in the mid- to upper portions of a watershed, while the FBRB funds proportionally more barriers in the mid- to lower portions of a watershed. The FBRB and FFFPP are also relatively well known among the project proponents they hope to reach, which represents an effective platform from which to build a more proactive system of directing barrier owners and project proponents to remove the highest priority barriers.

The Chehalis Aquatic Species Restoration Plan (ASRP) focuses on acting where the greatest potential exists to provide substantial gains for aquatic species, while recognizing the dynamic uncertainties of external factors such as estuary, ocean, invasive species, and climate change conditions. Unlike other regions of Washington, none of the Chehalis Basin salmon are listed under the ESA. The diversity of salmonid habitat use makes connectivity a critical issue for salmonid survival. Connectivity provides access to natal spawning grounds, the ability to move between different rearing habitats, the opportunity to escape from adverse conditions such as warming water temperatures, and the ability for populations to recolonize areas after catastrophic events. An ongoing collaborative component of the ASRP is identifying fish passage barriers that are blocking fish access to substantial areas of quality upstream habitats throughout the basin. Under the basin recovery scenarios evaluated, between 200 and 450 of these barriers would either be removed or replaced with appropriately sized culverts or bridges, or improvements to some existing fish ladders, to provide long-term fish passage for native fish at all life stages, accommodate flood flows and sediment and wood transport, and prevent barriers from reforming in the future.

WDFW manages the ASRP and works closely with tribes, RCO, and local restoration groups to prioritize the highest priority barriers to repair. The ASRP is prioritizing culverts for repair based on the amount of habitat opened. The same WDFW team prioritizing culvert replacement projects in the Chehalis Basin are also prioritizing barrier corrections for the Fish Barrier Removal Board and the Family Forest Fish Passage Program. To ensure that individual projects selected for repair under this request is not duplicative with other programs, WDFW co-develops and compares the list of proposed repairs for each program.

The federal culvert injunction applies to WDFW, DNR, State Parks, and WSDOT fish passage barriers in salmon streams in the WRIAs 1-23 case area (Western Washington and the Olympic Peninsula). WDFW, DNR, and Parks have completed their initial culvert injunction listed barriers and are now maintaining, inventorying, and monitoring culverts. WSDOT barriers are being repaired with funding through the State Transportation budget. WSDOT has until 2030 to correct barriers that correspond to 90% of the potential salmon/steelhead habitat blocked by significant fish passage barriers in the case area. WSDOT is a charter and proactive member of the FBRB and works closely with WDFW and tribal co-managers on culvert case injunction compliance. WSDOT uses the following factors to prioritize barrier corrections and is committed to keeping the board, tribes, and others aware of its project delivery plan: habitat

access; opportunity to bundle projects geographically; presence of up/downstream barriers; leverage investments by others; tribal priorities; project readiness; other transportation projects in area; and transportation impacts. WSDOT collaborates with others to produce better results for salmon, including funding state culvert corrections associated with larger habitat restoration efforts.

In addition to the four State-sponsored fish passage barrier removal programs, Washington's cities and counties have made longstanding commitments to the protection and restoration of salmon. Among other things, cities and counties have passed ordinances aimed at protecting "critical areas" from degradation, safeguarding the shoreline and its abundant natural resources, responsibly managing stormwater, and conserving open space. Cities and counties are committed to honoring tribal treaty rights and are engaged in identifying barriers to fish passage, assessing habitat, and prioritizing the removal of fish passage barriers to achieve the greatest benefits for salmon recovery.

State and federal funding for barrier removal

Much of the state's fish passage barrier removal attention has focused on inventorying, assessing, and removing road culverts because of their omnipresence throughout the state and the focus of the federal culvert injunction. The cost is high to replace fish passage barriers with fish passable culverts or bridges. WSDOT has estimated the cost of meeting their initial injunction obligation to be \$4B, with a current average cost per correction of \$5.1M. Data on project costs from the existing programs described above indicate that a typical city crossing replacement averages \$1.8M, a county replacement averages \$1.25M, and for barriers found on private property, \$185K. Few counties and cities have the tax base to afford these projects, and private citizens often do not have the means either. With 18,000 to 20,000 fish passage barriers on the landscape, demand on state funding mechanisms is high. It is implicit in the concept of prioritization that it will help direct limited resources to achieve the greatest benefit first.

There are additional techniques in use by other grant programs that could help increase participation and fund barrier removal. First, several grant programs offer reduced match levels, or reduced levels based on need. While these approaches don't increase total funding, they are an important way to increase effectiveness, since working systematically up a stream system will inevitably reveal barrier owners who don't have the means to meet even modest match requirements. It is also an important consideration of equity of the benefits of salmon recovery and healthy resources to disadvantaged communities and individuals. Second, Ecology's [Regional On-site Sewage System Loan Program](#) has successfully operated a revolving loan fund to replace on-site septic systems. More recently, the Habitat Strategic Initiative Lead for Puget Sound, led by WDFW and DNR, completed a [feasibility study](#) to apply this model to support the removal of marine shoreline bulkheads. These applications have readily apparent similarities to removal of fish passage barriers on private lands: infrastructure removal or replacement projects at smaller site scales that still represent major financial commitments for most individual private landowners.

There are also promising developments in federal funding contributions. In June of 2020, Senator Maria Cantwell requested fish passage barrier removal funding needs from WSDOT, WDFW, Washington Association of Counties, and Association of Washington Cities. The fish passage barrier metrics provided included culvert case injunction obligations and metrics on all barriers, of all ownerships, and projected correction cost estimates. Senators Cantwell, Wicker (Mississippi) and Representative Kilmer have now proposed a National Culvert Removal, Replacement, and Restoration Grant Program. The program would provide \$800M a year for five years for grants to states, local governments, and tribes to address anadromous fish passage as well as provide funding for certain freshwater impacts to marine fish and shellfish species. There may also be opportunities to explore better recognition by

federal funding programs of the importance of barrier removal as a priority, as well as improving alignment with a comprehensive state strategy to address fish passage barriers once it is complete.

A more challenging aspect of federal direction and funding is addressing blocking culverts under railroads. The Interstate Commerce Commission Termination Act (ICCTA) of 1995 gave the Surface Transportation Board exclusive jurisdiction of the railroads and preempts all state and local regulation of the railroads. In many segments of the Puget Sound, the first barrier that salmon encounter is associated with a railroad crossing of a shoreline water feature.

Summary of recommendations and next steps

Recommendations

Based on the evaluation in this report of the factors listed in the legislative provisos, there are several ways to affirm and strengthen existing aspects of Washington's approach to barrier removal. These recommendations are discussed in greater depth below this summary.

- The state should affirm what's working among the current approaches to barrier removal and continue utilizing these practices in a statewide strategy moving forward.
- WDFW should complete work to enable statewide prioritization at the barrier and stream system scales that reflects access to the conditions fish need and for the populations that can more quickly contribute the most to recovery.
- With statewide prioritization in hand, WDFW and state barrier removal programs should enhance the infrastructure and funding to enable more proactive promotion of these priorities.

The state should affirm what's working among the current approaches to barrier removal and continue utilizing these practices in a statewide strategy moving forward.

- The state should continue funding city and county inventories in the federal culvert injunction case area, WRIAs 1-23.
- WDFW should maintain the effort to train partner organizations to conduct barrier inventories and submit quality data to the [Fish Passage and Diversion Screening Inventory](#) database.
- The state should affirm the prioritization principles identified 77.95.160(2)(e) because they illustrate the principles of habitat quality, quantity, and connectivity/accessibility; the advantages of bundling adjacent projects; and address the additional public safety goal of replacing infrastructure damaged by flooding and erosion. The state should work to acknowledge the results of regions, watersheds, or jurisdictions that have completed barrier prioritization efforts using these principles and similar metrics.
- The state should affirm the value of and continue to fund existing barrier removal programs, both because they operate in complementary geographic locations and/or parts of a watershed, and two of these programs deliver on state obligations under federal law or rulings (i.e., FFFPP and federal culvert injunction). Similarly, continue to fund restoration programs that remove large barriers such as dams or install fish passage at these structures, as well as programs that address habitat quality issues that are also critical to recovery, such as poor water quality or temperature, or restoration of riparian areas, estuaries, or off channel habitat

WDFW should complete work to enable a statewide prioritization strategy at the barrier and stream system scales that reflects access to the conditions fish need and for the populations that matter most to recovery. Doing so will increase confidence that our investments will advance recovery as quickly as possible, which will also benefit the Chinook that are prey to Southern Resident killer whales and contribute to more robust harvest.

- WDFW should develop habitat quality, quantity, and connectivity metrics that can be more comprehensively applied to barriers in the [Fish Passage and Diversion Screening Inventory](#) database, thereby supporting a common framework for considering fish passage benefits statewide. The habitat quality metrics should utilize the Washington State Academy of Sciences' review of NOAA Properly Functioning Watershed Conditions criteria, and the habitat quantity/connectivity metrics should balance immediate access to habitat with a ratio of potential access to number of remaining barriers.
- WDFW and the FBRB should work with regional recovery organizations to revisit the watersheds previously identified as priorities, in light of current understanding of which populations are vital for recovery and face passage barriers, and also risks such as climate change and ongoing population growth in the state.
- Every five years, and in consultation with tribal co-managers, WDFW should develop a list of salmon populations that were most at risk during the preceding five years based on population status and trend data. WDFW should develop a method of integrating these most-at-risk populations into the statewide prioritization strategy, grant making, and project development.
- WDFW should convene an executive committee of Fish Barrier Removal Board member organizations to stay abreast of progress on a statewide prioritization strategy, and provide feedback on policy, coordination, and funding elements of such strategy.

With statewide prioritization in hand, WDFW and state barrier removal programs should enhance the infrastructure and funding to enable more proactive promotion of these priorities.

- **Inventories:** WDFW should develop and seek funding for an ongoing state inventory program that targets priorities and includes strategic partnerships to improve private landowner willingness to participate in field inventories.
 - In developing such an inventory program, assess options including taking a routine and methodical approach to completing inventories statewide, conducting targeted inventories based on priority stocks, focusing WDFW effort on priority stream systems and recruit and train partner organizations for remaining areas, or a combination of those techniques.
 - WDFW should establish a best practice for the length of time after which one should re-inventory stream systems.
- **Coordination of programs:** WDFW should seek funding to provide the outreach and technical assistance necessary to proactively direct barrier owners and project proponents to remove the highest priority barriers. Once the statewide prioritization strategy is complete, state barrier removal programs should:

- Identify how to incorporate a preference for the highest priority barrier removal projects into their program.
 - See through to completion projects that have received public funding for design to realize the existing public investment, while shifting support for new projects that are aligned the statewide prioritization strategy.
 - Maintain some flexibility to support significant opportunity created by willing landowners and/or other public policy needs, such as the need to protect public health and safety or leverage investments by others.
 - Continue to value opportunities to bundle multiple projects together to reduce design and construction costs, improve project and program delivery time, utilize agency staff more efficiently, and deliver completed projects faster.
- **State and federal funding:** It is implicit in the concept of prioritization that it will help direct limited resources to achieve the greatest benefit first, however there are additional techniques to promote new sources of funding that can align with barrier removal priorities and improve participation in funded programs. The state should:
 - Include fish passage barrier removal as a state priority in discussions of new sources of conservation funding.
 - Continue collaboration with federal delegation and federal partners to maximize existing funding and pass the National Culvert Removal, Replacement, and Restoration Grant Program.
 - Evaluate the feasibility of creating a revolving loan fund with low- and no-interest loans for private landowners to replace their fish passage barriers.
 - Enhance the effectiveness and equity of grant programs by considering need-based reductions to match requirements and reducing other barriers to participation for private landowners.

Next steps

WDFW will continue developing the statewide barrier prioritization strategy. Where necessary, WDFW will identify or seek the resources to do the work described in the recommendations above. WDFW will continue the commitment to do this work in collaboration with the FBRB, WSDOT, tribal co-managers, and regional recovery organizations. WDFW will also continue to work in collaboration with the FBRB, WSDOT, and other state agencies who manage fish barrier removal programs to provide additional recommendations as to statutory or policy changes and budget needs for the FBRB and state capital budget programs.

References

Washington Department of Fish and Wildlife. 2019. Fish Passage Inventory, Assessment, and Prioritization Manual. Olympia, Washington

Appendix A

2020 Supplemental Operating Budget (ESSB 6168) Proviso

Section 307. (Page 342, Line 12)

(34) \$142,000 of the general fund—state appropriation for fiscal year 2021 is provided solely for work addressing fish passage barriers, including data analysis and mapping to identify streams and barriers that have the greatest potential benefit to listed salmon populations, southern resident orca whales, and fisheries. In conducting this work, the department must consult with tribes and coordinate with the department of transportation's fish barrier work plans.

2020 Supplemental Capital Budget (ESSB 6248) Proviso

In the 2020 supplemental Capital Budget (ESSB 6248) lawmakers provided additional guidance on fish passage barrier correction to not only WDFW but also to the Washington State Department of Transportation (WSDOT) and to the Brian Abbott Fish Barrier Removal Board (FBRB) that states:

Section 3062. (Page 93, Line 3)

(1) Nothing in this section alters the obligation set forth in the permanent injunction, including the compliance deadline, entered on March 29, 2013, in *United States v. Washington*, sub-proceeding 01-1 (Culverts), or the guidelines for compliance within the specified timeline with the permanent injunction as developed by the state agencies during the implementation process.

(2) Nothing in this section creates an obligation on the part of the state to provide funding for corrections for nonstate-owned culverts. Nothing in this section precludes the state from providing funding for corrections for nonstate-owned culverts.

(3) In order to provide recommendations, the Brian Abbott fish barrier removal board must develop a comprehensive statewide culvert remediation plan that works in conjunction with the state approach and that fully satisfies the requirements of the *United States v. Washington* permanent injunction and makes both local and state funding recommendations for additional nonstate barrier corrections across state culvert correction programs that maximize the fisheries habitat gain and other benefits to prey available for southern resident killer whale and salmon recovery.

(4) The comprehensive statewide culvert remediation plan must be consistent with the principles and requirements of the *United States v. Washington* permanent injunction and RCW 77.95.180 and must achieve coordinated investment strategy goals of permanent injunction compliance and the following additional resource benefits. The Brian Abbott fish barrier removal board chair, representing the board and the appropriate department of fish and wildlife executive management, shall consult with tribes to develop a watershed approach. Provided it is consistent with the *United States v. Washington* permanent injunction, prioritization of barrier corrections must be developed on a watershed basis and must maximize the following resource priorities:

- (a) Stocks that are listed as threatened or endangered under the federal endangered species act.
- (b) Stocks that contribute to protection and recovery of southern resident orca whales.

(c) Critical stocks of anadromous fish that limit or prevent harvest of anadromous fish, as identified in the Pacific salmon treaty; and

(d) Weak stocks of anadromous fish that limit or prevent harvest of anadromous fish, as determined in North of Cape Falcon process.

(5) The comprehensive statewide culvert remediation plan must include recommendations on methods and procedures for state agencies and local governments to complete and maintain accurate barrier inventories. This plan must also allow for efficient bundling of projects to minimize disruption to the public due to construction as well as adjustments in response to obstacles and opportunities encountered during delivery.

(6) The Brian Abbott fish barrier removal board must also:

(a) Provide to the office of financial management and the fiscal committees of the legislature its recommendation as to statutory or policy changes, or budget needs for the board or state capital budget programs, for better implementation and coordination among the state's culvert correction programs by January 15, 2021; and

(b) Develop a plan to seek and maximize the chances of success of significant federal investment in the comprehensive statewide culvert remediation plan.

(7) It is the intent of the legislature that, in developing future budgets, state agencies administering state culvert correction programs will recommend, to the maximum extent possible, funding in their culvert correction programs for correction of barriers that are part of the comprehensive statewide culvert remediation plan developed by the Brian Abbott fish barrier removal board under this section.

(8) By November 1, 2020, and March 1, 2021, the Brian Abbott fish barrier removal board and the department of transportation must provide updates on the development of the statewide culvert remediation plan to the office of financial management and the legislative fiscal committees. The first update must include a project timeline and plan to ensure that all agencies with culvert correction programs are involved in the creation of the comprehensive plan.

(9) Prior to presenting the comprehensive statewide culvert remediation plan, the Brian Abbott fish barrier removal board must present the status of the plan to the annual Washington state and Western Washington treaty tribes fish passage barrier repair progress and coordination meeting. The board must submit the comprehensive statewide culvert remediation plan and the process by which it will be adaptively managed over time to the governor and the legislative fiscal committees by January 15, 2021.

2020 Supplemental Transportation Budget (ESHB 2322) Proviso

Section 305. Page 83, Line 10

(25)(a) The Washington state department of transportation is directed to pursue compliance with the U.S. v. Washington permanent injunction by delivering culvert corrections within the injunction area guided by the principle of providing the greatest fisheries habitat gain at the earliest time and considering the following factors: Opportunity to bundle projects, tribal priorities, ability to leverage investments by others, presence of other barriers, project readiness, culvert condition, other transportation projects in the area, and transportation impacts.

(b) The department and Brian Abbott fish barrier removal board, while providing the opportunity for stakeholders, tribes, and government agencies to give input on a statewide culvert remediation plan, must provide updates on the development of the statewide culvert remediation plan to the capital budget, ways and means, and transportation committees of the legislature by November 1, 2020, and March 15, 2021. The first update must include a project timeline and plan to ensure that all state agencies with culvert correction programs are involved in the creation of the comprehensive plan.

Appendix B: Statewide Chinook barrier inventory results and methods

WDFW habitat biologists developed a list of known and potential passage barriers to Chinook salmon in Washington State. The project focused on streams used by Chinook stocks that were identified as priority prey sources for SRKW through NOAA's 2018 "Southern Resident Killer Whale Priority Chinook Stocks Report." Approximately 1,900 barriers were identified by WDFW biologists and a multitude of stakeholder groups (e.g. Tribes, Lead Entities, Conservation Districts, Regional Fisheries Enhancement Groups). The barriers were categorized 5-Year Review for Southern Resident Killer Whales June 18, 2021 Page 3 into three groups: nearshore barriers, western barriers, and eastern barriers. The dividing line between western and eastern barriers was the White Salmon River. The list covers all streams with documented, presumed, potential, or historic presence of Chinook from stocks identified in the NOAA report. The final project package included a web map and project summary report. Next steps include continuing to review and process stakeholder feedback and completing quarterly updates to the web map and barrier list as new Chinook sites are submitted to the Fish Passage and Diversion Screening Inventory database. The list is not currently prioritized for barrier removals.

[SRKW Chinook Barrier Analysis \(arcgis.com\)](#)

Appendix C: Status of salmon recovery and watersheds

For current information on the state of Salmon Recovery in Washington State, progress made to date and the challenges which lie before us, please see the [State of Salmon in Watersheds Executive Summary 2020](#) produced by the Governor's Salmon recovery Office.

Please also see the [2020 State of Our Watersheds: A Report by the Treaty Tribes in Western Washington](#).