

Salmon Recovery Funding Board

PROJECT IDENTIFICATION and DESIGN REPORT EXAMPLES

REACH ASSESSMENTS TO IDENTIFY AND PRIORITIZE FUTURE HABITAT PRESERVATION AND RESTORATION PROJECTS

09-1281 Snoqualmie Fall City Reach Restoration Assessment (King County)

The goal of this grant was to identify, quantify, and prioritize high value habitat restoration projects on the Snoqualmie River between the confluence of the Raging River and Patterson Creek near Fall City, WA. As an initial starting point, nine potential restoration projects were identified that could be implemented in this reach. This reach is one of the two core Chinook spawning areas on the Snoqualmie River where the river historically had access to off-channel areas and provided greater rearing habitat. The installation of levees and revetments in this reach along with past land use practices have substantially reduced the river's ability to access these critical rearing areas. The project evaluated revetments, levees, roads, and other structures in this reach in an effort to set back or remove levees and revetments, restore natural processes, and increase productivity of salmonids, including ESA-listed Chinook salmon and steelhead trout. The assessment characterized reach conditions, identified potential projects, explored opportunities and constraints, compared and contrasted ecological benefits, and created a sequence for undertaking the projects. In addition, conceptual designs were developed for five projects and a preliminary design was developed for one project.

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10-1838 Lower Manastash Assessment and Project Development (Kittitas Co Conservation District) — NOTE: Example of multi-use assessment to address flood management and habitat in same reach

The Manastash Creek Reach Assessment identified, quantified, and prioritized salmonid habitat restoration projects in the lower 13 miles of the Manastash Creek watershed. This assessment was planned as major irrigation diversion improvements (screening and passage) and instream flow improvements have been or are in the process of being implemented in the lower 6 miles. With fish passage into the watershed nearly restored, the next logical step is instream and riparian habitat improvements. Major flood events in 2011 peaked interest levels of local landowners and agencies, thus the opportunity was presented to inventory and assess restoration projects that address habitat complexity, floodplain connectivity, riparian habitat, water quantity and water quality. This assessment will be used to guide future project development. It was completed in cooperation with the US Bureau of Reclamation so that it is compatible with the Yakima River Basin Water Enhancement Project (YRBWEP) tributary plan, opening up additional funding avenues for future projects. This project will benefit spring-run Chinook salmon and steelhead. Note that the assessment and corridor plan address both habitat restoration and flood management; SRFB funds were only applied to the habitat restoration portion of the project.

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08-1578 Tychman Slough Assessment (Sound Salmon Solutions) — NOTE: Example of relatively simple report

Sound Salmon Solutions (formerly known as the Stilly-Snohomish Fisheries Enhancement Task Force), with technical support from Snohomish County Surface Water Management, conducted an assessment and design project for Tychman Slough, a two-mile long side-channel of the Skykomish River in the braided reach near Sultan. The project assessed salmon and trout use, aquatic and riparian habitat, and hydraulic and hydrologic processes in the slough.

Land use is primarily agricultural and rural residential. Habitat conditions within and adjacent to Tychman Slough are sub-optimal for Chinook salmon and other salmonids. Assessment of current conditions was warranted in order to collect baseline data to inform development of a prioritized list of restoration project sites and actions. Landowners adjacent to the slough participated in the selection of future restoration project locations and designs. By working cooperatively with agricultural and rural-residential landowners and Snohomish County, the Task Force identified and prioritized restoration projects that serve a dual purpose of improving habitat conditions for salmonids and enhancing rural land. While acknowledging existing land use, design of restoration project options will maximize benefits to salmonid habitat.

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10-1925 Wapato Reach Assessment - (Yakama Nation) — NOTE: Actions are prioritized by preserve first, then restore connectivity, then restore process, then enhance.

The Wapato Reach Assessment project identified and prioritized salmon habitat protection and restoration needs on a 50 mile reach of the left bank of the Yakima River, from Union Gap (RM 110) downstream to Mabton Bridge (RM 60). This assessment analyzed the physical and biological attributes of the Wapato Reach of the Yakima River, identified data gaps and developed a suite of projects to protect and restore channel and floodplain processes and habitats within the reach. It also developed a set of selection criteria for prioritizing and sequencing salmon recovery actions, and developed a ranked list of potential projects.

The report identified several properties that can be acquired, restored, and placed into State ownership as part of the Sunnyside Wildlife Area. Restoration opportunities included channel modification, placement of ballasted logs, removal of dikes and foreign material that limit floodplain function, side channel enhancement, and riparian revegetation. Some of these restoration opportunities are in key areas where property acquisition will significantly improve our ability to implement actions. All restoration actions identified through this assessment were reviewed and prioritized by a local technical advisory group. Fish expected to benefit from the project include spring, summer, and fall Chinook salmon, sockeye salmon, Coho salmon, and summer steelhead.

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CONCEPTUAL DESIGN REPORT (prepared in conjunction with project identification and prioritization)

10-1838 Lower Manastash Assessment and Project Development (Kittitas Co Conservation District)

The Manastash Creek Reach Assessment identified, quantified, and prioritized salmonid habitat restoration projects in the lower 13 miles of the Manastash Creek watershed. This assessment was planned as major irrigation diversion improvements (screening and passage) and instream flow improvements have been or are in the process of being implemented in the lower 6 miles. With fish passage into the watershed nearly restored, the next logical step is instream and riparian habitat improvements. Major flood events in 2011 peaked interest levels of local landowners and agencies, thus the opportunity was presented to inventory and assess restoration projects that address habitat complexity, floodplain connectivity, riparian habitat, water quantity and water quality. This assessment will be used to guide future project development. It was completed in cooperation with the US Bureau of Reclamation so that it is compatible with the Yakima River Basin Water Enhancement Project (YRBWEP) tributary plan, opening up additional funding avenues for future projects. This project will benefit spring-run Chinook salmon and steelhead.

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FEASIBILITY STUDIES

09-1682 NF Nooksack Wildcat Reach Feasibility and Design (Nooksack Indian Tribe)

The North Fork/Middle Fork early Chinook population is considered essential for ESU recovery, but population productivity is substantially less than that needed to sustain and recover the population. A recent assessment and restoration planning report identified limiting habitat factors and causes of habitat degradation and recommended specific restoration strategies by reach. The Wildcat reach of the North Fork Nooksack River (RM 53.3-54.8) is one of two project reaches among fourteen that scored highest in terms of restoration potential in the North Fork Nooksack River. This project will advance the development of instream projects throughout the Wildcat Reach that will restore historic channel planform, habitat diversity, and habitat functions, including stable spawning and rearing habitats for NF/MF Nooksack early Chinook salmon. Specific tasks completed include: (1) feasibility study, including refinement of limiting factors and reach-specific objectives, identification and evaluation of various alternatives, landowner outreach, and selection and staging of the preferred alternative; (2) preliminary design for the reach-scale preferred alternative, including flood risk assessment, design report, and cost estimates; and (3) final design and permits for the 1st project phase. Potential treatments range from stabilization/augmentation of existing wood accumulations to historic-scale engineered log jams, although existing wood loading in the reach is low.

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10-1866 Linden Golf Course Oxbow Setback Levee (City of Puyallup)

This project completed a feasibility study and preliminary design to breach and lower a levee along the left bank of the Puyallup River from approximately RM 9.6 to 10.5 at the confluence of the White River.

The project considered a narrow range of alternatives within the study area and final recommendations were included in the preliminary design report. Topography in the area allowed for a simpler, less-costly, easier, and nearly as effective alternative to a classic setback levee. The selected design is for breaches in the revetment to be constructed and material removed as needed to reconnect the river to over 17 acres of floodplain and allow natural channel and riparian processes to begin to create habitat in the newly opened area. A historic landfill will be removed from the site and a new side channel created in its place. In addition, the plan calls for the construction of several log structures to enhance fish habitat and direct flow and for relocation of a portion of the Riverwalk Trail. This project is intended to enhance habitat conditions for juvenile salmonids by creating off-channel habitats and increasing channel complexity. The project is expected to benefit Chinook, Chum, Pink, and Coho salmon and steelhead trout.

This particular site was identified by the Pierce County Levee Setback Evaluation done in 2008 for WRIA 10/12 (this location was identified as site number 4 of the 32 listed in the evaluation). This project ranked 19 out of the twenty proposed setback levees in the study.

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04-1624 Fisher Slough Acquisition Feasibility (The Nature Conservancy)

This project acquired 42.27 acres of farmland within the riverine tidal wetland range of the Skagit estuary. In addition, this project assessed ecosystem functions supplied by the Fisher Slough subbasin, including hydrology and geomorphology, and provided conceptual alternatives for addressing high priority problems. The project site is adjacent to Fisher Slough, a tributary tidal slough of the Skagit River's south fork. In addition to the Skagit, Fisher Slough receives flows from three coho-bearing tributaries (Carpenter, Big Fisher and Little Fisher). The project was proposed by the landowner, a farmer who desires to provide an opportunity for habitat and farm interests to cooperate on a mutually beneficial project. These mutual benefits include additional habitat for Chinook and designs for a restoration project that, when implemented, will alleviate flooding on farmlands located upstream. The Nature Conservancy, Dike District 3 and Skagit County are the project's principal implementation partners. This is a project of the Greater Skagit Delta Initiative whose members include Skagit Watershed Council, Skagitians to Preserve Farmland, the Trust for Public Land and The Nature Conservancy. Additional partners included Skagit River System Cooperative, Skagit Conservation District and Drainage District 17.

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11-1553 Willow Creek Daylighting (City of Edmonds)

City of Edmonds completed the first phase of feasibility assessment for restoring tidal inflows and maximizing Chinook salmon rearing habitat in Edmonds Marsh through daylighting the connection between Willow Creek and Puget Sound. Edmonds Marsh is located within the City of Edmonds in the Central Puget Sound basin. The feasibility report: a) evaluated the topography and hydrology of the marsh area to determine the potential for use by juvenile Chinook; b) analyzed three options for daylighting Willow Creek; c) assessed the hydrology of a restored marsh system that identified the freshwater and saltwater hydrology signal, average water elevation, maximum and minimum water levels and hydroperiod during tidal fluctuations; d) evaluated the potential size and habitat types in a restored marsh; e) provided conceptual designs for the preferred alternative; and f) developed a conceptual plan and early cost estimate for the preferred alternative.

The evaluation of sediment accretion, erosion, and transport, and storm water inputs, and real estate negotiations will be part of the next feasibility assessment phase.

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07-1708 Stillwater Wildlife Area Floodplain Conceptual (Wild Fish Conservancy)

This grant funded the conceptual design of a project that restores natural processes to a suite of floodplain habitats in the Stillwater reach of the Snoqualmie River. The Stillwater reach of the Snoqualmie River offers an important opportunity for process restoration in a large area of publicly owned mainstem habitat. This reach is also significant because it includes the entire floodplain wetland complex associated with the junction of Harris Creek, a major anadromous tributary.

Currently, habitat forming processes in the Stillwater reach are impaired by bank hardening, a lack of large woody debris, and reduced riparian forest cover. This project developed a geomorphic reach analysis that was used to inform restoration conceptual designs. Elements of restoration design that were assessed through this analysis included: the location and extent of large wood enhancement, the amount of riprap removal required for the re-establishment of alluvial migration processes, and ideal locations for riparian forest plantings.

The restoration design derived from the geomorphic reach assessment will be implemented by the project partners, in phase 2 of the project. Project partners include the Washington Department of Fish and Wildlife, King County, the Stilly-Snohomish Fisheries Enhancement Task Force, Ducks Unlimited, and the Wild Fish Conservancy.

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PRELIMINARY DESIGNS

10-1891 QIN S.F. Salmon River Culvert Replacement Design (Quinault Indian Nation) — NOTE: Example of relatively simple report

The Quinault Indian Nation completed a preliminary design for removal of a barrier culvert on the South Fork Salmon River in Grays Harbor County. The QIN will replace the culvert with a bridge with funding through project #11-1393. The 14' corrugated metal pipe culvert is currently a partial barrier and is restricting fish passage to 5.8 miles of habitat on the South Fork of the Salmon River and other tributaries. The Salmon River is a moderate-sized tributary that flows into the Queets River and supports runs of Coho (*Oncorhynchus kisutch*) and steelhead (*O. mykiss*). Additionally, Cutthroat (*O. clarkii*) have also been recorded utilizing the South Fork of the Salmon River. This proposal was to design a bridge to replace the existing culvert that would allow fish passage to upstream habitat. The partial barrier is undersized and contains a slope of 3%, with only 33% passability.

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13-1133 Sammamish River Side Channel 2 (City of Bothell)

The City of Bothell proposes to complete preliminary and final design for the Sammamish River Side Channel restoration project, located in the city's Sammamish River Park, west of 102 Ave NE. The site includes cold water springs providing opportunities for critical cool water refuge during summer months. The future restoration will a) hydraulically reconnect a 1,080 ft relic side channel and floodplain to the Sammamish River at upper and lower ends to provide accessible off-channel rearing habitat for salmonids, with an emphasis on Chinook and Coho salmon; b) enhance 6.4 acres of reed canary grass dominated relic floodplain wetlands with extensive patches of native scrub-shrub wetland plants; c) replant about 1.5 acres of blackberry dominated riparian habitat with native floodplain trees and shrubs; d) utilize the channel cut spoils material to create < 1 acre of elevated floodplain area suitable for tree plantings, thereby enhancing the vertical riparian forest habitat structure; and e) increase opportunities for public involvement and education.

A key project in the 2002 Sammamish River Corridor Action Plan, this proposal responds directly to the 2005 WRIA 8 Chinook Recovery Plan identified need to increase off-channel rearing habitat for salmonids throughout the river basin. The preferred design was selected by stakeholders to the *Sammamish Side Channel Restoration Feasibility Study* (11-1517) completed in 2013 (Preferred Alt 3 with a partial of Alt 1B west of 102nd Ave NE for riparian enhancement).

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DOWNLOAD [SUMMARY OF COMMENTS FROM THE SEPTEMBER 2014 COMMUNITY MEETING](#)

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09-1636 Lilliwaup Creek Reach Assessment and Design (Long Live the Kings)

The Lilliwaup Creek Restoration Assessment and Preliminary Design report took the first steps toward restoring and protecting the anadromous reach. The condition of Lilliwaup Creek's habitat continues to limit the spawning and rearing success of ESA-listed summer chum and other native species. Stream flow, tidal influence, estuarine connectivity, and spawning range are impaired by gravel aggradation in the 0.7 mile anadromous reach. Lack of riparian vegetation contributes to channel instability, reduces contribution of large woody debris, and reduces the amount of shade to cool the water and provide cover to returning adults and out-migrating smolts. Unmaintained culverts prevent access to side streams and pools. Upstream of the anadromous reach, slide scars are revegetating slowly.

The *Preliminary Project Design* section of the report contained the following elements:

1. **Upland slope and sediment source stabilization:** stabilizing Winter Creek (a seasonally active sub-basin of Lilliwaup Creek); stabilizing and revegetating the flume slide scar, the road fill culvert failure in Beardsley Creek, and the logging landing slide scar in Beardsley Creek.
2. **Off channel restoration:** deepening the existing ponds to the south of the hatchery and connecting them to the eastern channel of Lilliwaup Creek at a point several hundred feet downstream of the east west channel fork; and constructing a small bridge to allow fish passage below an existing private road.

3. Creek channel restoration: removing sediment from the main channel, eastern and western forks to restore pre-2005 bed elevations and gradients which will restore tidal inundation, tidal prism, and reduce groundwater level in riparian soils; establishing channel dimensions necessary to maintain sediment transport, channel integrity, bank stability, and restore late summer surface flows in Lilliwaup Creek, and year round connectivity to the newly restored off channel habitat sites.

4. Upland enhancement: placing the majority of the sediment taken from the creek channel and placing it along the banks to be accessed and mobilized gradually; and placing the rich organic material generated by restoring the off channel habitat on top of the coarse sediment to improve fertility of upland soils and facilitate more diverse and abundant native vegetation and conifer growth.

5. Riparian vegetation and large woody debris enhancement: placing large woody debris suitable to bring abundance and volume up to target levels; and planting diverse native riparian vegetation which will include a mix of conifers and deciduous trees, shrubs, and groundcover to jumpstart the current state of succession.

Comments on the report were solicited and incorporated as the project transitioned to the next phase (“Lilliwaup Creek 100% Design Completion”, PRISM #11-1316). Comments regarding the report are contained in Appendix K of the *Lilliwaup Creek Watershed Assessment and Preliminary Design Report*, and the comments are addressed in the report’s *Executive Summary* section.

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09-1468 Skagit Bay Nearshore Restoration Design (Whidbey Camano Land Trust) — NOTE: Example of sponsor-written overview report that pulls the results of separate consultant reports together

Whidbey Camano Land Trust completed preliminary designs in preparation for permit applications for restoring habitat-forming landscape processes at the Dugualla Heights (Shorecrest Lagoon) pocket estuary site along Dugualla Bay on North Whidbey Island. The feasibility study completed site analysis on ecological processes and conditions and gathered stakeholder input for the Dugualla Bay Preserve (Ducken) site and then identified additional information that is needed before preliminary designs drawings can be completed on this site. The geographic location and proposed actions at the sites represent the highest priorities under WRIA 6’s salmon recovery strategy. The sponsor permanently protected both sites for ecological restoration using funding from SRFB Grant Nos. 07-1591, 07-1592, and 09-1482. Implementation of the project design at the Dugualla Heights Lagoon site will restore tidal exchange, fish passage and native nearshore plant communities, creating roughly 12 acres of intertidal habitat. The restoration is expected to increase juvenile Chinook salmon rearing capacity in the Skagit Bay/Whidbey Basin by about 26,000 additional smolts, which represents about 17 percent of the target recovery capacity for pocket estuaries identified in the *Skagit Chinook Recovery Plan*. The project included an extensive stakeholder consultation component to inform the restoration designs and support the social policy objectives of WRIA 6’s salmon recovery strategy.

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10-1895 Boston Harbor Road Culvert Design report (South Puget Sound Salmon Enhancement Group) —

NOTE: Example of simple report

This project completed a preliminary design for a 140-foot long, 3-foot diameter culvert under Boston Harbor Road near Olympia in Thurston County. Located on an unnamed tributary to Gull Harbor, this culvert is currently impassable due to the combination of being undersized, slope, tailwater submergence and inlet drop. The South Puget Sound Salmon Enhancement Group managed all aspects of this project in cooperation with the Thurston County Roads Department and the Capitol Land Trust. Boston Harbor Road is the primary access road for all residents and visitors to Boston Harbor in Thurston County, WA. The tributary flowing under the road at this location is connected to a vast complex of upland freshwater wetlands upstream of this site. This culvert and Boston Harbor Road are located in the transition zone between freshwater riparian forest and the tidally influenced northern slough of Gull Harbor Estuary. This project offers passage opportunities not only to migrating South Sound Salmonids but also has the capacity to create a safe corridor for a variety of aquatic and terrestrial species including large mammals. This project is a small, albeit critical component to the Budd to Henderson Conservation Initiative which will create a wildlife corridor connecting Gull Harbor and Woodard Bay by preserving the upland wetland complex and associated watersheds in perpetuity. Once constructed, this project will benefit chum and coho salmon and steelhead trout.

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FINAL DESIGNS

11-1564 Cle Elum River Ph 2-Instream Habitat Design (Kittitas Conservation Trust)

The Kittitas Conservation Trust produced the full range of preliminary and final engineering drawings, exhibits, construction notes and cost estimate for 8 large engineered log jams and 30 instream snag placements that are scheduled for construction in the lower Cle Elum River during autumn 2014. The engineering and project design process was informed by extensive scientific studies, field work, LIDAR data, flow modeling and analyses pertinent to developing effective and durable instream structures. Design process elements included:

- > Site reconnaissance and extensive topographical surveys of the project reach
- > Hydraulic modeling coupled with geomorphic assessments and analyses
- > Stakeholder presentations and regulatory agencies' review and comment
- > Project management, administration, and document production.

The 8 engineered log jams (ELJ) and 30 instream snag placements are scheduled for construction in the reach of the mainstem Cle Elum River located between 1.0 and 2.0 miles downstream from the Lake Cle Elum Dam. Helicopter assisted construction techniques will be used to minimize impacts to the adjacent floodplain habitat. The primary purpose of the ELJ's is to restore instream habitat complexity for Spring Chinook, Coho, Sockeye, Steelhead and bull trout spawning and rearing.

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DOWNLOAD [REPORT APPENDIX 1 \(PAGE1-14\)](#): GEOMORPHOLOGY AND RESTORATION
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07-1833 Fisher Slough Tidal Restoration Final Design

The Nature Conservancy developed final designs and permits for all three phases of a 60-acre estuary restoration project located in the Skagit delta near Conway, Washington. Fish that will benefit from implementation of the design include Chinook, coho and chum salmon and bulltrout. The design included levee setbacks, installation of self-regulating tidegates and the removal of antiquated culverts and fish passage barriers. A feasibility study identifying a preferred restoration plan was completed in February 2007, a result of SRFB grant #04-1624P. As part of the final design, alternatives were evaluated against criteria for fish passage, habitat, flooding and drainage, and the alternative that maximized the benefits for all the criteria was selected for final design. In addition, permit applications were submitted in preparation for construction. The engineering design predicted approximately 57 acres of freshwater tidal habitat will be restored, providing enough habitat to support the production of more than 16,000 Chinook smolts, improve water quality and improve fish access to the 22 square mile Carpenter Creek watershed. In addition, the restoration provides important flood protection benefits for residents and farmland in the watershed.

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10-1859 Middle Boise Creek Restoration (King County) — NOTE: Example of simple report

King County designed, permitted, and constructed a habitat restoration project on Boise Creek in a predominantly agricultural area. Historic stream and floodplain drainage activities have included extensive stream channelization, channel dredging, and placement of drain tiles to expand agricultural areas. This has resulted in channel entrenchment, gravel embedment, sidecast spoil terraces, and the removal of riparian vegetation and instream wood. King County is completing a feasibility analysis and conceptual design for future restoration projects to be implemented along Boise Creek from River Mile 1 to 3. King County completed: a) a permit-ready design; b) construction of a streambank restoration pilot project; and c) riparian restoration. Acquisition of property was paid for by King County outside of this grant. King County will monitor the project and maintain the project for at least five years following construction. The goal of this project is to restore fish habitat (in particular, slow water margin habitat) and improve water quality in a degraded reach of Boise Creek. Specific objectives are to: a) place wood in the riparian zone, including the stream and b) revegetate the riparian zone with native trees and shrubs. This project significantly benefitted Chinook and steelhead, and in particular White River spring Chinook, which spawn and rear in Boise Creek. They are the only spring population in south Puget Sound and are genetically the most distinctive stock in south and central Puget Sound. Approximately one mile of livestock exclusion fencing was installed.

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13-1177 Brown Island Historic Feeder Bluff Restoration (Friends of the San Juans)

Along the southeast shore of Brown Island near Friday Harbor, is a small drift cell with a historic feeder bluff that is currently armored across multiple private properties. The wave energy is limited making it an excellent site for full bulkhead removal. Restoration of the feeder bluff will uncover potential forage fish spawning habitat, and restore coastal processes such as upper intertidal and back shore sediment, sediment source, littoral drift, and detritus potential and recruitment. Removal of the rock will also allow for expansion of marine riparian vegetation onto the lower bank face and increase the connectivity of the vegetation into the littoral/nearshore system. This will enhance insect and organic material delivery into the nearshore benefiting outmigrating juvenile salmon. The project site is very typical of developed shorelines in San Juan County (SJC): the parcel sizes are relatively small; there are multiple private landowners; and the beach has outdated, unnecessary rocks placed on upper beach habitat that limit sediment supply to the drift cell system. Restoration will contribute to efforts to reduce demand for armoring along Puget Sound shorelines by providing a demonstration site where two private landowners are willing to remove their bulkheads, restore their beach and place permanent protections.

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10-1027 Duncan Creek Dam Design (Lower Columbia River Fisheries Enhancement Group)

This project created the Duncan Dam retro-fit final designs to restore unobstructed access to WDFW's Duncan Creek chum salmon spawning channels and increase anadromous salmonid access to over 1.93 miles of Tier 1 & 2 spawning and rearing habitat in upper Duncan creek. As a collaborative effort, this project utilized stakeholder input via US Army Corp of Engineers (USACE), Skamania Landing Owners Association (SLOA), and Washington Department of Fish and Wildlife (WDFW) to produce final designs to retrofit Duncan Dam fish passage facilities to increase passage for ESA listed coho, Chinook, steelhead and chum salmon populations. Since 2001, Duncan Dam fish passability is only 5 - 20%, during the peak spawning migration periods in the fall/winter months.

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13-1398 Rattlesnake Creek SR 129 Culvert Replacement (Asotin County Conservation District)

The Asotin County Conservation District (ACCD) will replace the SR 129 Rattlesnake Creek 3.5 x 45' corrugated pipe culvert at milepost 5.78 with a 25' x 70' three-sided bottomless culvert to restore upstream fish passage in this reach and improve habitat conditions within the watershed. The design of the new culvert will meet Washington Department of Fish & Wildlife (WDFW) Stream Habitat Restoration Guidelines. The Washington State Department of Transportations (WSDOT) statewide prioritization of the project is not high enough to fund design and construction in the foreseeable future. However, ACCD, WSDOT, and WDFW have collaborated on a conceptual design and a shovel-ready project. A partnership with Snake River Salmon Recovery Board will secure a funding package for final construction.

Repair of this high flow velocity and low flow barrier will restore access to 8.97 miles of habitat beginning 1.39 miles upstream from the confluence with the Grande Ronde River, including 2.13 acres of spawning and 4.63 acres of rearing habitat. In addition, there are two upstream barriers that received Family Forest Fish Passage Program funding and are planned for construction in 2013. This perennial stream has many springs and seeps with adequate temperatures (46-55° F in late summer), moderately good cover, diverse habitats, and spawning gravels, and many juvenile salmonids have been observed during habitat surveys and site visits. Targeted species include steelhead, resident trout, and bull trout.

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