Climate Commitment Act Project Proposals

Estuary and Salmon Restoration Program
Regional Pre-Design (Learning) Grants
2026 Applications

Project Number and Link	Grant Applicant	Project Name	Project Type	Water Resource Inventory Area	County	Grant Request	Match	Total	RCO Grants Manager
26-1196	Natural Systems Design	Beach Nourishment Effectiveness for Restoration	Planning			$235,000		$235,000	Kay Caromile
26-1233	Washington Department of Ecology	Crossing the Shoreline: Linking Beach and Subtidal	Planning			$390,000		$390,000	Kay Caromile
26-1237	W.F. Baird and Associates	Sediment Connectivity and Retention Toolbox for Delta Restoration	Planning			$295,000		$295,000	Kay Caromile
26-1238	Landau Associates	Bluff Geotechnical Data to Guide Restoration	Planning			$240,000		$240,000	Kay Caromile
26-1259	Skagit River System Cooperative	Fish Predation in Tidal Delta Habitats	Planning			$329,000		$329,000	Kay Caromile
26-1260	University of Washington	Transport Pathways through Delta Systems	Planning			$266,000		$266,000	Kay Caromile
26-1261	Washington Department of Fish and Wildlife	Juvenile Chinook Estuary Residence and Growth	Planning			$195,000		$195,000	Kay Caromile
26-1263	Blue Coast Engineering	Field Program to Verify Guidelines for Use of Large Wood	Planning			$185,000	$5,000	$190,000	Kay Caromile
26-1265	National Marine Fisheries Service	Evaluating Restoration Project Trajectories	Planning			$315,000		$315,000	Kay Caromile

WASHINGTON STATE
RECREATION AND CONSERVATION OFFICE
Salmon Recovery
Funding Board

Project Number and Link	Grant Applicant	Project Name	Project Type	Water Resource Inventory Area	County	Grant Request	Match	Total	RCO Grants Manager
26-1267	National Marine Fisheries Service	Puget Sound Habitat Hotspot	Planning			$280,000		$280,000	Kay Caromile
26-1270	Environmental Science Association	Sediment Gradation and Geometry Targets	Planning			$105,000		$105,000	Kay Caromile
26-1027	University of Washington	How Can King Tides Provide Learning Opportunities?	Planning	Duwamish-Green (9)	King	$350,000		$350,000	Kay Caromile
26-1255	Blue Coast Engineering	Restoration and Protection Embayment Strategies 2	Planning	Kitsap (15)	Kitsap	$200,000		$200,000	Kay Caromile
26-1221	Tulalip Tribes	Sitka Spruce Health in the Snohomish Estuary	Planning	Snohomish (7)	Snohomish	$327,000		$327,000	Kay Caromile
26-1264	Tulalip Tribes	Open Data and Integrated Modeling for the Snohomish	Planning	Snohomish (7)	Snohomish	$386,000		$386,000	Kay Caromile
26-1266	Washington Department of Ecology	Beach Strategies Updates for Restoration Planning	Planning	Deschutes (13)	Thurston	$158,000		$158,000	Kay Caromile
26-1049	Skagit River System Cooperative	Tidal Beaver Habitat Use and Home Range Size	Planning			$182,605		$182,605	Kay Caromile

Project Descriptions (unedited)

Project 26-1196

Natural Systems Design
Beach Nourishment Effectiveness for Restoration

Beach nourishment, the placement of sand or gravel on a beach, is an increasingly common restoration treatment in Puget Sound. This study will compile existing physical data and collect new data to assess the effectiveness of beach nourishment. The information gathered will be analyzed to augment existing design and planning frameworks (e.g., MSDG). The quantitative analysis will provide recommendations of when, where, and how beach nourishment is an appropriate tool given intended project objectives, including process-based restoration, habitat enhancement, and resilience to erosion and sea level rise. A technical advisory group will guide the study. We will synthesize existing datasets (published and gray literature, MSDG case studies, and large monitoring efforts) and collect targeted physical data at select projects implemented five or more years ago. Analyses will evaluate how nourishment influences physical processes and habitat conditions across a range of geomorphic and exposure settings. Deliverables will include quantitative analyses at sites with the highest quality baseline data, complemented by structured qualitative synthesis where data limitation preclude robust statistical inference. Lessons learned from past beach nourishment actions will be prepared. Project findings will guide the development of recommendations of when, where, and how beach nourishment is an appropriate tool. These findings can be used to inform guidance development for beach nourishment.

Project 26-1233

Washington Department of Ecology
Crossing the Shoreline: Linking Beach and Subtidal

Linkages and sediment transport pathways between subaerial (upland, beach) and subaqueous habitats are not well documented, so the effects of shoreline restoration on habitat and ecosystem functions throughout the nearshore are poorly understood. Sediment transport occurs above and below the shoreline, in both cross-shore and alongshore directions, and the subtidal supports critical habitat including substrate, eelgrass, and kelp, for many aquatic species, such as culturally- and commercially important forage fish, salmonids, crab, and bivalves. We seek to understand the linkages between the subaerial and subaqueous zones, and whether they systematically relate to factors such as structures, shoreform type, bluff characteristics and erosion. Such linkages include the cross-shore gradient in subaerial and subaqeuous sediment grain size, and the correlation between nearshore turbidity, geomorphology and habitats. Dedicated surveys of the beach and subtidal zones will quantify habitat and habitat indicators (morphology, substrate, and turbidity), associated with shoreline modification and restoration. Approximately 16 sites will be selected to include segments of modified and unmodified shoreline. Synthesized findings will address habitats associated with natural processes, armoring, and shoreline restoration to help predict subtidal effects of shoreline modification and restoration, identify habitats at greater risk of degradation, and prioritize areas for restoration.

Project 26-1237

W.F. Baird and Associates
Sediment Connectivity and Retention Toolbox for Delta Restoration

Best practices for restoring sediment connectivity and retention in deltas, based on the governing physical processes over short and long term scales, promote system habitat resilience and improve outcomes for salmon at different life stages. Understanding sediment transport characteristics and pathways links marsh restoration, salmon habitat, and hydrologic connectivity. Successful restoration designs that account for sediment connectivity in the delta and implementation of sediment retention methods improve climate resilience, salmon productivity, reduce fragmentation of offshore habitats like seagrass meadows, maintain wetlands or facilitates their restoration, and reduce unnaturally high turbidity levels and land subsidence. No singular document currently serves as design guidance for understanding and accounting for sediment in delta restoration projects in Washington State. A curated set of documents and analytical techniques will form a sediment connectivity and retention toolbox for delta restoration. This will rely on the state of the science and local and Indigenous Knowledge to incorporate sediment dynamics into restoration design and include guidance for the entire project lifecycle, from planning to post construction monitoring, digital maps, and a high-level case study example to illustrate the use of the toolbox. This product will assist practitioners throughout Puget Sound, including municipalities and tribes, in implementing sustainable and resilient delta.

Project 26-1238

Landau Associates
Bluff Geotechnical Data to Guide Restoration

Understanding the processes driving bluff erosion in Puget Sound is essential for effective shoreline management and habitat restoration. Current bluff erosion models identify wave energy and geology as the primary drivers controlling erosion rates (Limber et al., 2018; Little, 2022; Grossman et al., in review); however, the lack of available data limit these models. Additionally, studies have shown that bluff toe geology can influence erosion rates (MacLennan et al. 2018; Alampay, 2022), yet these parameters are not regionally integrated into existing erosion models that will guide restoration and management decisions. This project aims to develop a geotechnical dataset of relevant bluff toe lithologies and evaluate their relationship to documented bluff recession. In partnership with U.S. Geological Survey and Washington State Department of Transportation, Landau Associates will compile existing geotechnical data and apply it to characterize bluff toe conditions across multiple sites. By integrating geotechnical data into existing USGS bluff recession models, the project will evaluate how material at the bluff toe influences erosion rates. This project, building upon past ESRP learning projects (MacLennan et al. 2018; Ecology 2018, 2026) and the Puget Sound Coastal Storm Modeling System, will strengthen the scientific basis for shoreline management and support long-term ecological resilience.

Project 26-1259

Skagit River System Cooperative
Fish Predation in Tidal Delta Habitats

While estuary restoration efforts aim to build safe areas for growth of juvenile salmon, fishes using estuaries nevertheless run a gauntlet of predators, including birds, marine mammals, and other fishes. Both juvenile salmon and their predators are natural components of estuaries and both groups can benefit from habitat restoration, but if restoration occurs without regard to design of predation-mediating habitat structure, projects could attract juvenile salmon to areas with elevated mortality risk. Our hypothesis is that restoration of habitat complexity (e.g., small blind tidal channels, tidal pools, large woody debris, and overhanging vegetation) should lead toward natural function (good for juvenile salmon, regardless of predators), but that simplified structure (e.g., simple channel network), makes these systems riskier for juvenile salmon when they are used by fish predators. This study aims to address these hypotheses in tidal deltas by 1) observing how fish predators use different habitat units of variable complexity in tidal deltas, 2) assessing relative predation risk in these habitat units by using tethered prey, 3) modeling how relative predation risk translates to absolute survival, and 4) using these data to map predation risk in restoration sites of different age, in order to track recovery time of salmon refuge functions in restoration sites. This work should therefore help determine best practices for recovering refuge habitats in tidal deltas.

Project 26-1260

University of Washington
Transport Pathways through Delta Systems

A team of researchers from the University of Washington proposes to investigate how sea-level rise will affect river delta hydrodynamics and sediment transport to inform restoration project planning. Using a suite of idealized models capturing the range of river deltas in Puget Sound, we will probe how changes to sea level will affect freshwater transport and other estuarine processes, and the relative strength of longitudinal and lateral transport processes that deliver sediment throughout the delta. These models will also be used to characterize the effect that fringing marshes and side embayments exert on freshwater distribution and transport processes. The long term success of restoration interventions such as marsh building and dike removal depend on adequate sediment delivery, regimes for which may shift with sea-level rise and which are therefore important to understand. Model results will be used to create a typology of transport regimes as well as a set of thresholds to help restoration practitioners understand potential tipping points associated with the changing climate.

Project 26-1261

Washington Department of Fish and Wildlife
Juvenile Chinook Estuary Residence and Growth

Estuary restoration is a cornerstone of Puget Sound Chinook Salmon recovery, with substantial investments aimed at improving juvenile survival by increasing habitat capacity and ecological function. Despite advances in our understanding of estuarine habitat use, significant knowledge gaps remain regarding residence time and growth.

Filling these gaps is vital in the Whidbey Basin, where multiple Chinook populations with contrasting abundances and juvenile life-history strategies frequently use non-natal deltas to rear and grow. We propose to quantify growth and residence time of juvenile Chinook across multiple time periods in Whidbey Basin's three estuaries: the Skagit, Stillaguamish, and Snohomish River deltas. Our approach uses genetic stock identification alongside otolith microstructure and microchemistry analyses to estimate estuary growth rates, residence duration, entry timing, and natal origin within and among these populations. By comparing contemporary data with archival otolith samples collected prior to large-scale restoration, we will assess how growth and residence patterns vary as estuarine capacity has changed. This project will provide restoration sponsors and recovery planners with empirical, basin-scale data on how juvenile Chinook salmon use estuarine habitats within an interconnected and evolving restoration landscape. This supports more informed capital restoration design, prioritization, and performance evaluation across the Whidbey Basin.

Project 26-1263

Blue Coast Engineering
Field Program to Verify Guidelines for Use of Large Wood

This learning grant will build on a previous learning project (Prism Project #20-1922), which developed preliminary design considerations for use of large wood (LW) in shoreline restoration projects. This second phase of work for this project includes an extensive field program to validate and expand upon preliminary design considerations developed during the initial learning project. Significant data gaps that will be filled with this project include: field monitoring of relevant ecological factors, seasonal variability of extents and quantity of LW, improved measurements of quantity of LW, and seasonal variability in beach planform at project sites. Verified and updated design considerations can be used improve design of shoreline restoration and soft shoreline projects in Puget Sound through the informed use and placement of LW to maximize ecological function of the restored shoreline site. In addition, a pilot study to develop a data layer of LW density for the Beach Strategies will be expanded to cover all Puget Sound shoreline areas. Information collected as part of the field program at project sites will also be developed into a GIS format compatible with Beach Strategies and overlaid with the LW density data layer. The LW site information data layers will be scalable to other locations in Puget Sound and can provide a framework for LW monitoring at both natural and restored sites moving forward.

Project 26-1265

National Marine Fisheries Service
Evaluating Restoration Project Trajectories

Restoration to support salmon recovery is predicated upon the idea that restored sites will provide similar function to degraded sites and reverse the long trend of habitat loss. It is well documented that restoring sites develop and evolve over time, along a trajectory, whereby habitat function trends toward a natural, or reference, condition. However, the trajectory among, and within (i.e., specific habitat functions), restoration sites can vary substantially making it difficult to predict the success of a particular site or its timeline toward recovery. We propose to evaluate variability in functional trajectories for a suite of habitat functions across a set of estuary restoration projects within Puget

Sound. Our analysis will specifically evaluate how rates of change for specific habitat attributes or functions (e.g., elevation, channel morphology, vegetation, fish, etc.) vary across projects and may relate to particular site or basin characteristics including project design, landscape position, and historical land use. The results of our work could inform future project design and prioritization as well as identify opportunities for adaptive management throughout the region.

Project 26-1267

National Marine Fisheries Service
Puget Sound Habitat Hotspot

Historically, restoration efforts in the Puget Sound nearshore have been small and opportunistic, with limited understanding of their benefits for salmon. More recent efforts have focused on strategic and science-based approaches that include landscape and process-based considerations. A key science question for nearshore habitat restoration remains to what extent different salmon populations use restored nearshore habitats spread out across Puget Sound. This proposal will combine fish presence data with existing habitat layers in order to identify potential restoration hot spots across Puget Sound. In 2025, we developed a diffusion-based model for PS Chinook Salmon using capture data of juveniles marked at origin, and expanded to capture variable outmigration sizes and hatchery releases. When individual sources are accumulated across Puget Sound, this "heatmap" can predict how likely nearshore areas are to be used by all Puget Sound Chinook populations. However, to be more accurate, this model needs better incorporation of local habitat elements such as submerged aquatic vegetation and non-natal watersheds. In this proposal, we will address these gaps by incorporating additional layers to address multiple habitat aspects related to fish use. These products can then be used to identify important areas of focus for restoration efforts. at both a localized and region wide scale.

Project 26-1270

Environmental Science Association
Sediment Gradation and Geometry Targets

Title: Sediment Gradation and Geometry Targets for Mixed Sand–Gravel Beach Restoration in Puget Sound. Mixed sand-gravel beaches are high-value nearshore features in Puget Sound that support forage fish spawning, juvenile salmon rearing and migration, and shoreline resilience to erosion and sea-level rise. Despite their importance, beach restoration projects are often designed with limited transferable guidance on appropriate sediment gradation or beach geometry. This project will conduct a comparative analysis of mixed sand-gravel reference beaches across Puget Sound with documented nearshore fish value. Grain-size distributions derived from sieve analyses will be paired with consistent measurements of beach geometry to identify sediment-geometry relationships that can inform future restoration, nourishment, and marsh-protection projects.

Project 26-1027

University of Washington
How Can King Tides Provide Learning Opportunities?

Our team at the University of Washington (UW) and Washington Sea Grant (WSG) propose a collaborative learning project focused on king tides in Puget Sound. King tides are extremely high tides that occur when astronomical events amplify the normal gravitational pull between the Earth and the moon, typically occurring in winter months (November ??? January). Documentation of king tides are prevalent in the popular press, providing ample opportunity for scientific learning and community engagement that could guide future efforts. Our team will use a combination of traditional scientific field data, community science and engagement through the MyCoast app, and expert knowledge from planning and restoration practitioners to inform how king tides may affect restoration design and concerns for future capital restoration projects. Our proposal will deliver applications to the ESRP Beach Strategies project, accounting for how the strong physical forces of king tides may govern ecological functions and stability. Moreover, king tides simulate future sea level rise (SLR) scenarios, and we can further learn how these episodic events may guide planning for long-term resilience.

Project 26-1255

Blue Coast Engineering
Restoration and Protection Embayment Strategies 2

The project objective is to develop a decision support tool for identifying priority embayments for restoration and protection in the Puget Sound region by evaluating current conditions, assessing future vulnerabilities, and prioritizing protection and restoration actions. The proposed project will build on the work completed during RCO Project 22-1767, Phase 1 Embayment Strategies. Phase 1 work involved inventory of existing data, identifying data gaps, developing a conceptual model ,and developing a GIS framework for an embayment strategies tool in collaboration with a group of regional experts and user groups to be completed by November 30, 2026. The proposed work for phase 2 is to fill data gaps, refine the GIS workflows and outputs to create a draft decision support tool, continue to invite and facilitate regional and local review of the tool, and prepare the tool for hosting by WDFW as a companion to Beach Strategies. The river is used by, Chinook, which are listed as threatened with extinction under the federal Endangered Species Act.

Project 26-1221

Tulalip Tribes
Sitka Spruce Health in the Snohomish Estuary

Sitka spruce are one of the few coniferous trees in the Puget Sound that can survive in estuaries. They provide shade and essential cold water refugia for fish species during the hot summer months, most notably juvenile Chinook salmon. Remnant Sitka spruce stands in the Snohomish Estuary appear to be declining in tree health. The timing of this decline conspicuously coincides with hydrodynamic changes to the system resulting from restoration efforts. At the same time, Sitka spruce plantings on the berms in the Qwuloolt site are thriving. Little is known about physiological adaptions of Sitka spruce living in the intertidal zone. This project aims to quantify Sitka spruce health at the stand

level, the individual level, and the physiological level. In combining these three different study resolutions, the Tulalip Tribes aim to develop a comprehensive understanding of factors impacting Sitka spruce health in the intertidal zone. This understanding will be used to influence hydrodynamic assessments for new restoration efforts to reduce stressors to existing Sitka spruce stands as well as provide a set of guidelines for establishing Sitka spruce stands and provide a lift to the diversity and quality of intertidal ecosystems in Puget Sound.

Project 26-1264

Tulalip Tribes
Open Data and Integrated Modeling for the Snohomish

Large-scale estuary restoration has reconnected over 1,500 hectares of tidal habitat in Puget Sound, yet the cumulative effects of multiple projects on hydrodynamics, temperature, and salmon habitat quality remain poorly understood. In the Snohomish River estuary, recent restoration has altered tidal prism and salinity regimes, while intertidal vegetation is critical for moderating water temperature, is slow to establish and sensitive to salinity and subsidence. This project will advance restoration planning by integrating long-term continuous water sensor (CWS) monitoring, vegetation dynamics, and mechanistic modeling to quantify compounding thermal effects of restored and unrestored intertidal areas. We will modernize the Snohomish CWS network through telemetered sensors, automated QA/QC, and open-access data infrastructure to enable near real-time decision support. Using extended BACI analyses, drone-derived vegetation mapping, and coupled hydrodynamic heat flux modeling, we will evaluate cumulative restoration effects across three major projects and forecast thermal recovery trajectories. Project outputs will provide actionable tools, real-time data access, and transferable monitoring frameworks to support adaptive, system-scale estuary restoration planning in Puget Sound.

Project 26-1266

Washington Department of Ecology
Beach Strategies Updates for Restoration Planning

In Puget Sound, restoration sponsors rely on regional datasets to prioritize restoration and situate planning within the context of drift cell conditions. Previous work produced standalone shoreline armor mapping datasets, representing a moment in time and making it challenging to track change or incorporate expert knowledge. The lack of continuity limits reproducibility, reducing confidence in results. We will develop and pilot a framework for performing continuous updates to Beach Strategies Phase 2 metrics. Ecology is mandated through state legislature to map modification of all Puget Sound marine shorelines and update the data every two years. We will integrate Ecology's continuously updated dataset with the framework from Beach Strategies Phase 2 to produce updated Beach Strategies quantitative metrics and outline methods for continuous updates into the future. Using shoreline modification, shoretype, and drift cell mapping and the metrics developed for the Beach Strategies Phase 2 report as a test case, we will assess the metric inputs, refine metric equations, and develop a repeatable approach. Resulting data will be hosted in both Ecology's Coastal Atlas Map and in a web application designed to facilitate community engagement. This project will also generate a qualitative management recommendation dataset based on existing

Beach Strategies equations, and will provide that data in a geodatabase to WDFW to host on their existing Beach Strategies data viewer. The river is used by, Chinook, which are listed as threatened with extinction under the federal Endangered Species Act.

Project 26-1049

Skagit River System Cooperative
Tidal Beaver Habitat Use and Home Range Size

Beaver dams in tidal habitats quadruple low-tide pool habitat; these low-tide pools have triple the density of juvenile Chinook salmon as do other low-tide channel habitats. The pools act as low-tide refugia that allow small fish greater residence time in small tidal channels rather than being flushed into large river channels (Hood 2012, Beaver in tidal marshes: Dam effects on low-tide channel pools and fish use of estuarine habitat. Wetlands 32:401-410). Since these findings, there has been increasing interest in incorporating beaver into tidal marsh habitat restoration to maximize rearing habitat function for salmon. But, basic tidal beaver natural history, such as how much tidal habitat they need, how far they move on a daily basis, what kinds of habitat they frequent is needed to design for beaver in tidal habitat restoration projects, and to answer fundamental questions such as how many acres of restored habitat are required to support one beaver colony? Are some restoration project too small to support a new colony of beavers? To this end, we will trap and tag at least 12 beaver with 9-m resolution GPS tags to follow their movements and determine habitat use and territory size in the Skagit and Snohomish deltas. This will be coupled with thermal drone imagery to assess the abundance and distribution of untagged beaver. Work will be done by a graduate student with the guidance and logistical support of SRSC and Tulalip biologists. SRSC will be the project lead.