WCRRI Funding Request

- Project 20-1408
- March 13, 2020
- Lower Satsop Restoration & Protection Program – Phase II, Habitat Connectivity and Reach-Scale Aquatic, Riparian and Floodplain Restoration Project

Next Section →

Appendix C-3: Restoration, Acquisition, and Combination Project Proposal

Project Number	20-1408
Project Name	Lower Satsop Restoration & Protection Program – Phase II, Habitat Connectivity and Reach-Scale Aquatic, Riparian and Floodplain Restoration Project
Sponsor	Rob Wilson, PE, County Engineer Grays Harbor County Department of Public Works 100 West Broadway, Suite 31 Montesano, WA 98563

Please respond to each question individually. Do not summarize answers collectively in essay format. The Technical Review Panel will use this information to evaluate your project. Limit the response to ten pages (single-sided), excluding supplemental questions. The sponsor may delete the italicized portion of the questions and inapplicable supplemental questions to shorten the proposal.

Submit this proposal as a PRISM attachment titled "WCRRI Project Proposal."

1. **Project brief.** The Phase II Project would supplement Phase I actions which will be constructed in 2020. Phase II design work will build upon and refine (i.e., make more precise for 2022 construction) a conceptual design developed for the larger, multi-phased Lower Satsop Restoration & Protection Program in 2019. That conceptual design was developed in close coordination with landowners, regulatory agencies and stakeholders. An adaptive management approach will be applied to the design process revising the original reach scale concepts based on the outcomes of Phase I construction. Conceptual design elements for Phase II include placing engineered wood structures in the channel and an invasive plant control and riparian planting program. These actions will: (1) improve floodplain connectivity, restore main channel, side-channel and off-channel habitats for anadromous and resident fish and wildlife; and (2) protect public and private infrastructure and agricultural lands from Lower Satsop bank erosion.

2. **Project Location.** The Lower Satsop Phase II, Reach-Scale Aquatic, Riparian and Floodplain Restoration Project (Phase II Project) is located in Grays Harbor County, WA. The project is on the Lower Satsop River mainstem. The project latitude is 46.982143 and longitude -123.482279. The Phase II Project extends from the confluence of the Lower Satsop and Chehalis Rivers upstream to the Monte Elma bridge encompassing approximately 2.3 miles of river. The Phase II Project is located in the Olympic Mountains Ecological Region, GSU 31, Lower Satsop River.

3. **Problem statement.** The critical need issues the Phase II Project aims to directly address with bearing on salmon and aquatic species are: High water temperatures; Low habitat diversity; Reduced quantity and quality of instream habitats; and Impaired water quality and floodplain connectivity. Additionally, reducing the rates of channel migration, rehabilitating the riparian vegetation, and developing an invasive species treatment program will reestablish successional riparian growth.

   Currently the Lower Satsop River system has very high rates of channel migration that disrupt the successional growth of riparian vegetation, increase colonization of invasive species and introduce fine sediment into the river. High rates of channel migration are degrading valuable floodplain habitat, reducing channel length, and concentrating stream power. These conditions are not conducive to salmon and aquatic species recovery.

   The proposed engineered wood structures placed in the channel will bring the damaging high rates of erosion and channel migration back to historic rates by sorting sediment, stabilizing gravels, building floodplains, increasing channel length, and reducing stream power. In-stream wood structures will improve aquatic habitat by scouring pools, providing cover from predation, increasing food production and locally reducing velocities to sort sediment and maintain stable gravels for spawning.

4. **Describe the limiting factors and life stages (by species) that your project expects to address.** Species present at the Phase II Project site -- as listed in Section 5.8.3 of the ASRP (page 161), as identified through the Statewide Washington Integrated Fish Distribution Dataset, and/or as identified as species, listed in Table 3-1 of the ASRP (pages 24-25) -- include: Winter-run Steelhead; Coho Salmon; Fall-run Chinook salmon; Chum salmon; Northern red-legged frog; Olympic mudminnow; Great blue heron; North American beaver; Summer-run Chinook salmon; resident Coastal Cutthroat; resident char.

   Coho salmon, Chum salmon, and Fall Chinook use the reach for spawning, juvenile Coho rear in the reach, and Winter Steelhead spawn and rear in the reach.

   The Phase II Project will restore ecosystem functions that support habitat critical to these species. These habitat features are stable gravels for spawning, cool refugia, and shallow-water margins. The project reach is a migratory route to high quality habitat upstream in the East Fork Satsop River and so the velocity refuge, food production, and

cover for species migrating upstream are additionally important habitat functions for these species.

The project will improve these habitat features using engineered log jams (ELJs) installed at a scale that positively affects the geomorphology of the reach. A table summarizing how ELJs address limiting factors by restoring ecosystem processes is included below (Table 1).

Because limiting factors change with life stages it's imperative that salmonids are able to access the habitats critical to their stage of development. Thus, **connectivity of different habitat types is a limiting factor across all of the potential salmonid indicator species limiting life stages**. The project's proposed ELJs will improve connectivity by providing refugia habitats from velocities and high temperatures, increase food productivity, scour holding pools, and increase channel length and edge habitat complexity. The project reach begins at the confluence of the Lower Satsop and Chehalis Rivers which is at the upper limit of the Lower Chehalis tidal surge plain. The project has very high restoration potential with a valuable combination of estuarine holding habitat, high quality spawning gravels, and off channel wetland habitats over a relatively short distance.

The limiting life stages for **Winter-run Steelhead** are spawning and juvenile rearing. Limiting factors for juvenile Winter Steelhead are complex habitats that support food production, provide cover from predation, and provide temperature refugia. Limiting factors for spawning Winter Steelhead are high quality spawning gravel. The project's proposed ELJs will provide complex habitats that support rearing and spawning by increasing food productivity, providing cover, increase channel length and edge habitat complexity and sorting sediment into areas with stable gravels.

The limiting life stage for **Coho salmon** is juvenile rearing. Limiting factors for juvenile Coho are complex habitats that support food production, provide cover from predation, and provide temperature refugia. Juvenile Coho are vulnerable to warm summer temperatures as they out-migrate as yearlings. The project's proposed ELJs will provide complex habitats that increase food productivity, scour holding pools, provide cover, and increase channel length and edge habitat complexity.

The limiting life stage for **Fall-run Chinook salmon and Chum salmon** are spawning. Limiting factors for spawning Fall Chinook and Chum are cold water, stable gravels and estuarine holding habitat. The project reach begins at the confluence of the Lower Satsop and Chehalis Rivers which is at the upper limit of the Lower Chehalis tidal surge plain. The project reach provides a unique combination of estuarine holding habitat and access to potentially high-quality spawning habitat over a relatively short distance. The installation of the proposed project ELJs will further improve the habitat quality and complexity by providing stable gravels and scouring cold holding pools.

The limiting life stage for **Northern red-legged frog** are egg-laying productivity. Loss of egg-laying habitat and hydrologic modifications are the primary impacts to egg-laying productivity. Increasing backwater habitat, revising the wetland hydroperiod through improved floodplain connectivity and maintaining wetland habitats with emergent plants and adjacent riparian forest by implementing the riparian planting program are ways the proposed project will benefit habitat critical to these species.

The limiting life stage for **Olympic mudminnow** is rearing. Mudminnows are threatened by habitat degradation and exotic species and are completely dependent on healthy wetlands for survival. Increasing backwater habitat, revising the wetland hydroperiod through improved floodplain connectivity and maintaining wetland habitats with emergent plants and adjacent riparian forest by implementing the riparian planting program are ways that the proposed project will benefit habitat critical to these species.

The limiting life stage for **Great blue heron** is nesting and is negatively impacted by human disturbance, predation, and habitat decline. Nesting habitats are made in mature riparian vegetation with alders being a preferred species. The riparian planting and invasive treatment program will improve nesting habitat for this species by restoring successional riparian plant ecology.

The limiting life stage for **North American beaver** are young to dispersal age and are closely related to vegetation and stream variables. Availability of food resources is commonly limiting as beavers often deplete resource over time within a usable forging distance of impoundments. Distribution of habitats on the landscape with riparian plant species for foraging and side channels and backwaters for developing impoundments are critical habitat for these species. The project's proposed ELJs will improve floodplain connectivity and side channel development while the riparian planting and invasive treatment program will improve availability of food sources across the reach.

In addition to addressing the limiting life stages mentioned above and identified in Section 5.8.4 of the ASRP (page 165) the Phase II Project's **invasive species management and riparian planting program** will rehabilitate plant communities that contribute to the geomorphic stability of the reach and support healthy ecosystem function by restoring the floodplain large-wood cycle (2011 Collins et. al.).

Table 1 lists limiting factors for the project reach, design elements, how proposed actions restore impaired ecosystem processes, and the species and life stage that will benefit from these actions.

Table 1 – Limiting factors, design elements, restored ecosystem processes, & species life stage to benefit.

Limiting Factor	Design Element	Physical Processes by which Design Elements will Restore Ecosystem Process and Function	Life Stage and Species to Benefit
Water Temperature	• In channel ELJs	ELJs scour deep pools, provide cover, and increase surface to groundwater interactions which push surface water into the stream bed reducing temperature in the water column. Riparian plantings will provide shade which can	• Fall Chinook spawning • Chum spawning

	• Riparian planting program	maintain cool water temperatures. They also support the floodplain large wood cycle where mature species eventually fall into streams providing cover, habitat and the other myriad of benefits associated with wood.	• Winter Steelhead rearing • Coho rearing
Low habitat diversity (lack of side channels, large wood, and floodplain connectivity)	• In channel ELJs	ELJs provide cover, scour holding pools, and locally increase water surface elevations. As the river planform evolves in response to the sediment they sort and collect channel length increases and stream gradient decreases, which along with increased water surface elevations improves floodplain connectivity. When side channels develop naturally it is in locations where hydraulic conditions will maintain them.	• Winter Steelhead rearing • Coho rearing • Northern red-legged frog • Olympic mudminnow
Reduced quantity and quality of instream habitat	• In channel ELJs • Riparian planting program	ELJs increase benthic macroinvertebrate productivity, provide cover and reduce water temperature by increasing surface water interactions with groundwater. They also sort sediment and maintain stable gravels for spawning by locally reducing the velocity of the water around them. Finally, ELJs improve floodplain connectivity by raising water surface elevations increasing frequency of side channel utilization. The riparian planting program will improve edge habitat by providing cover along shallow margins in floodplain wetlands and backwater habitats.	• Winter Steelhead rearing • Coho rearing • North American beaver young •Great blue heron nesting
Channel length and width	• In channel ELJs	ELJs increase channel length by splitting flow and locally raising water surface elevation increasing floodplain inundation and side channel utilization. Their primary hydraulic influence is local, creating velocity and shear stress gradients which result in pool habitat and adjacent sediment sorting. However, once enough structures are installed to change sediment dynamics in a reach, they can have a reach-scale geomorphic effect. This geomorphic effect is a result of natural processes at work in the system which over time settle into a self-regulating low maintenance equilibrium.	• Winter Steelhead rearing • Coho rearing • Northern red-legged frog • Olympic mudminnow • North American beaver young
Fine sediment loading	• In channel ELJs • Riparian planting program	ELJs will reduce fine sediment loading by reducing the rate of erosion of agricultural lands. Structures will be placed to aggrade alluvium in areas where erosion is a problem creating a buffer of aggraded alluvium and gravel between the highly erodible soils and the river. The banks will be planted with native riparian species which will provide soil cohesion and trap solids present in runoff before they enter the river.	• Fall Chinook spawning • Chum spawning
Predation	• In channel ELJs • Riparian planting program	ELJs provide cover, increase food production of benthic macroinvertebrates, and scour holding pools. The project will also increase complex edge habitat by increasing channel length, improving floodplain connectivity and connecting floodplain wetland and backwater habitats to the main channel with greater frequency. The riparian planting program will reduce predation by providing cover along shallow margins in floodplain wetlands, backwater habitats, and along the main channel.	• Winter Steelhead rearing • Coho rearing • North American beaver young • Great blue heron nesting • Northern red-legged frog • Olympic mudminnow

Channel Instability (bed scour and sediment transport)	• In channel ELJs • Riparian planting program	The project proposes a design with a reach-scale effect on the sediment dynamics of the system. The ELJs will stabilize eroding banks, sort sediment into areas with stable gravels and reduce the high rate of channel migration to the historic rate. Riparian plantings will control erosion at the river's edge and help filter and keep water clean.	• Fall Chinook spawning • Chum spawning
Low flows	• In channel ELJs	ELJs provide pools, and increase surface groundwater interactions which help reduce the temperature of the water column. Additionally, they locally raise water surface elevations increasing floodplain inundation and side channel utilization which support healthy riparian vegetation.	• Winter Steelhead rearing • Coho rearing • North American beaver young •Great blue heron nesting

5. Community resilience, through the **creation and maintenance of local jobs**, is key to the mission of the WCRRI Grant Program. It is understood that these job counts will be estimates. However, applicants should be diligent and prudent with their estimates. Describe and/or show how, including dollar values, you determined your answers. Please note if the hires are likely to come from the local community.

   a. **How many jobs, shown in 12-month full-time equivalents (FTEs), are projected to be created by the project?**

   Jobs were estimated by using the project cost estimate and schedule. A summary of 12-month FTE job creation is shown in **Table 2**. The wages earned column is inclusive of the job quantity as is the Total FTE's column. The total 12-month-FTE's that would be generated during project construction are 1.3. The total 12-month-FTE's that would be generated in the design, permitting and administration of the project are 1.2. The project would create a total of 2.5 12-month FTE's for design and construction.

   There are many existing jobs which will be positively affected by this project which are harder to quantify and include material manufacturing and sales, timber harvesting, regulatory agency review and oversight, fisheries, and agriculture.

Table 2. 12-Month FTE's estimated for the Lower Satsop

Job Description	Job Quantity	Duration (Weeks)	Total Wages Earned	Talent Source	Total FTE's
Construction: Heavy Equipment Operators	2	10	$44,000	Grays Harbor County	0.4
Construction: Laborer	3	10	$42,000	Grays Harbor County	0.6

Construction: Superintendent	1	14	$33,600	Grays Harbor County	0.3
Assessments, Permitting, Engineering, and Administration	4	20	$384,000	Whatcom, King, Grays Harbor, and Thurston Counties	1.2

b. **How many jobs, shown in 12-month FTEs, are projected to be maintained by the project?**

After project implementation remaining tasks will include riparian planting and invasive species removal. Pulling numbers from the cost estimate we have:

- Invasive species removal as a 100-hour effort with 5 laborers twice a year resulting in 0.5 12-month-FTE's.
- Material planting assumes that a laborer can install 250 plants/day we estimated planting 130 acres resulting in 2,962 hours of planting labor. Assuming a 12-month FTE is 2,080 hours this would create 1.5 12-month-FTE's.

The total 12-month-FTE's maintained by the project would be 2.

6. **Please list the community benefits (ex. access, flood protection, recreational opportunities, etc.) that will result from the project.** Phase I of the Lower Satsop Restoration & Protection Program will:

- Reduce immediate erosion pressures on the heavily travelled Keys Road and Monte Elma Road Bridge and forestall the need for future costly and less habitat-friendly emergency repairs.
- Reduce immediate erosion pressure on the Satsop Business Park's primary potable water supply.
- Stop further loss of irreplaceable, high-value cropping farmland necessary to maintain a vital local agricultural economy.
- Restore habitat and floodplain features and functions lost as a result of past river management practices to benefit fish, habitat and commercial and recreational interests (fishing, guiding, birding, etc.).
- Sufficiently address immediate and imminent threats in order to provide local authorities and community members with demonstrable flood relief.
- Preserve existing local and state revenue generation from local agricultural sales and activities (crops, inputs, harvest, etc.), commercial and recreational fishing (gear,

licenses, fees, etc.), tourism (fishing, bird watching, bicycling, etc.), Satsop Business Park (call center, vehicle storage, cannabis-cultivation, compressed natural gas, truck-driving school, forestry program, emergency training, etc.), and more.

a. **Explain how the community benefits listed above will be achieved as part of the project.** Putting the Lower Satsop River back into balance with engineered log jams, revetment removal, improved floodplain connectivity, invasive species control, and extensive riparian planting will ensure continuation of the economically vital Satsop Business Park, regionally significant agricultural community, and restoration and correction of fish habitat and riverine functions long threatened by past river management decisions.

b. **Describe any outreach and education aspects of the project.** Lower Satsop Restoration & Protection Program is highly visible (i.e., to Legislators, Chehalis Basin Board, newspapers, landowners, etc.). As such it provides a unique opportunity to showcase environmentally and fish-friendly habitat and floodplain restoration. In addition, because of the Lower Satsop's visibility, proximity and accessibility, the ability to continue with organized stakeholder tours, impromptu stakeholder tours, and shared aerial (drone) imagery is assumed. This will continue to aid the advancement of lay person understanding of the beneficial effects of ELJs for fish, flood and restoration (versus the limited effects for riprap, sheet pile, etc.).

7. **Provide a narrative as to why the project is a good fit for the WCRRI Grant Program**.

The Phase II project will address the WCCRI objectives of addressing the regions highest priority ecological protection and restoration needs while stimulating economic growth and creating jobs. The Phase II project will do this by:

- Implementing a process-based reach scale restoration design with critical habitat for amphibians, salmonids, mammals, and avian species, This will improve habitat connectivity for these species with other restoration sites in the Lower Satsop watershed resulting in a positive effect greater than restoring the site alone.
- Reducing erosion of agricultural lands which coastal community members have relied upon for generations to support their livelihood. Letters of support for the project have been written by The Washington State Dairy Federation, The Grays Harbor Voluntary Stewardship Program, and the Grays Harbor/Pacific County Farm Bureau.
- Protecting floodplain infrastructure (Keys Road) which provides access to the many jobs at Satsop Business Park.

8. **Project goals and objectives.**

a. **What are the project's goals?** The project goals are to create a reach-scale Phase II design from the Monte Elma bridge to the confluence of the Chehalis

River that builds upon Phase I actions scheduled for construction in 2020. The Phase II design will (1) improve floodplain connectivity to spread flood flows throughout the floodplain and restore main channel, side-channel and off-channel habitats for anadromous and resident fish, and wildlife; and (2) protect public and private infrastructure and agricultural lands from bank erosion.

b. **What are the project's objectives?**

- Develop reach-scale Phase II designs and engineering that incorporate floodplain connectivity, invasive species management, riparian plantings, and address flood and erosion hazard/risk to landowners in the project area.
- Ensuring habitat connectivity between ASRP reaches in the Satsop River watershed.
- Develop designs and engineering that utilize bioengineering techniques and process-based restoration tools.
- Conduct outreach to reach landowners and recreational community during the design process to ensure their goals are met.
- Develop designs and engineering that provide for expedited permitting (e.g., Nationwide Permits, Programmatic Permits, etc.) to support construction beginning summer2021.

c. **What are the assumptions and constraints that could impact whether you achieve your objectives?** The Phase I project has requested $900,000 in supplemental state capital budget funding through the 2020 legislative session. If these funds are not granted, the Phase I project would be short on funds needed for construction in 2020. The Phase I project could be scaled back so that some portion of the project is able to be constructed in 2020 using the available $1.2 MM the county has already raised. This would affect the Phase II Project by decreasing the total number of ELJs the project would be able to install by the end of 2021, reducing the reach-scale effect of the design. If this were to happen further phasing splits would be proposed to ensure the overall Lower Satsop Restoration & Protection Program was able to achieve the objectives over a greater time frame.

9. **Project details.** Please answer the questions below and all pertinent supplemental questions at the end of the application form.

a. **Provide a narrative description of the proposed project.** The Phase II Project is a restoration project that would supplement Phase I actions which will be constructed in 2020. The design work would build upon a conceptual design which was developed for the reach in 2019. An adaptive management approach would be applied to the design process revising the original reach-scale concepts based on the outcomes of Phase I construction. Conceptual Phase II Project design elements

include placing engineered wood structures in the channel to split flow and locally raise water surface elevations and near banks to aggrade sediment and build up floodplains in areas where migration rates are greater than the historic rate of erosion. The invasive plant control and riparian planting program will be proposed in areas where enhancement of existing resources is needed. Rehabilitation of historic riparian zones would be negotiated with participating landowners and used to reduce bank erosion in conjunction with in-stream ELJ elements. These actions will improve floodplain connectivity, restore main channel, side-channel and off-channel habitats for anadromous and resident fish, and wildlife as well as protect public and private infrastructure and agricultural lands from bank erosion.

b. **Provide a scope of work and detailed list of project deliverables**

Table 3 – Project scope task list, deliverables, responsible party and schedule.

Task	Responsible Party	Duration	Deliverables
Conceptual Design Report and Drawings	Engineering Consultant	July 2020 – September 2020	• Design drawings, cost Estimate, BOD Report
Preliminary Design Report and Drawings	Engineering Consultant	October 2020 – December 2020	• Design drawings, cost Estimate, BOD Report
Permit Applications and Authorization	Engineering Consultant	September 2020 – December 2020	• JARPA • Cultural Resources Report • Wetland/Critical Areas Report • Biological Assessment
Final Design	Engineering Consultant	January 2021-May 2021	• Final Plans, Cost Estimate, and Specifications
Construction	Contractor TBD	July 2021-October 2021	• Implementation

Table 4 – Permit Plan and Typical Permits Triggered by Work below OHWM or within wetlands.

Clean Water Act Section 404 permit from the Corps for work below OHWM or in wetlands			
Section 7 Consultation under the Endangered Species Act	Magnuson-Stevens Fishery Conservation and Management Act consultation for Pacific Coast Salmon Essential Fish Habitat	Section 106 consultation under the National Historical Preservation Act	Clean Water Act Section 401 water quality certification and Coastal Zone Management Program Consistency from Ecology
State Environmental Policy Act (SEPA) determination by Gray Harbor County			
Washington Department of Natural Resources (WDNR) Aquatic Use Authorization	Shoreline Substantial Development Permit Issued by Grays Harbor County for permitted use in Rural Development Use Zone		Hydraulic Project Approval (HPA) from WDFW
Local Certifications and Permits (issued by Grays Harbor County)			
Flood Hazard Certification issued by Grays Harbor County	"No-Rise/No-Impact" Certification to be submitted by County to FEMA	Clearing and Grading Permit Critical Areas review	
Construction Permits (not comprehensive)			
National Pollution Discharge Elimination System (NPDES) Construction Stormwater General Permit issued by			

Ecology (required prior to construction If >1acre earthwork/clearing)

c. **Explain how the sponsor determined cost estimates.** The cost estimate was developed using costs for nearby projects of similar scope and scale (e.g., Upper Quinault, East Fork Satsop EAR). This project is cost effective because site access and topography will allow for lower cost to mobilize equipment and lower cost for site isolation as several structures could be constructed from the bank of the river. Synergies with the WDFW 2020 Floodplain and Habitat Restoration Project (funded through the Washington Coast Restoration and Resiliency Initiative in 2019) may make the project further cost effective by using installed erosion and sediment control measures, site access, and combining material procurement. Matching funds have been leveraged from the following fund sources; Rural County Economic Development .09 Funds; Grays Harbor County Road Fund; and Local Community Contributions.

Table 5 - Budget information from Excel, tab "Total All Sheets"

		OVERALL PROJECT	GRANT REQUEST	MATCH
		Cost	**Amount**	**Amount**
Sheet #3 Restoration				
Construction Costs		$1,416,829	$1,416,829	$ 0
AA&E		$372,553	$372,553	$ 0
	STotal	$ 1,789,382	$ 1,789,382	$ 0
	GTOTAL	**$ 1,789,382**	**$ 1,789,382**	**$ 0**

d. **Describe the design or acquisition alternatives considered to achieve the project's objectives.** Several design alternatives have been considered over the last five years. These alternatives have been evaluated using cost, constructability, ecologic benefits, and stakeholder and permitting agency support. Alternatives have included no-action, removal of bank hardening, bar-scalping, grading side channels, relocating floodplain infrastructure, land acquisition, restoration actions including the use of ELJs and riparian planting, and improving floodplain and wetland connectivity. The process of evaluating the alternatives has brought stakeholders and regulatory agencies together on a shared path that prioritizes the use of ecologically sensitive methods at a reach-scale. This approach will leverage natural processes to stabilize the system and provide ecologic benefits for aquatic and terrestrial species habitat.

e. **How have lessons learned from completed projects or monitoring studies informed this project?** Activities and experience on the analogous Upper Quinault system have greatly informed and influenced this project, e.g., type, number and placement of ELJ structures.

f. **Describe the long-term stewardship and maintenance obligations for the project or acquired land.** Plans for long term stewardship of the project reach include implementing the invasive species management plan and monitoring riparian

planting efforts to ensure design survival rates are achieved. The Lower Satsop Advisory Group will continue to meet to evaluate if project outcomes and implementation have achieved stated goals and objectives for the project. An adaptive management approach will be used to respond appropriately as needed.

10. **Explain why it is important to do this project now instead of later.** Implementation of Phase II now is critically important for the following reasons:

    - Phase I will be implemented (constructed) Summer/Fall 2020 and will stabilize the system. Phase II, implemented/constructed Summer/Fall 2022, will begin the process of preserving and maturing the investment made in Phase I. The Lower Satsop Restoration & Protection Program has been developed as a multi-year investment program. As such, each incremental investment builds on the previous investment. Phase II builds on Phase I, Phase III builds on Phase II, etc. This adaptive management, incremental investment approach will be the best and most efficient means to stabilizing, restoring and enhancing the floodplain and habitat in the Lower Satsop for all species.

    - Investing now in Phase II is a "low-hanging fruit" way to ensure investments already made in the upper reaches through the Early-Action Reach Restoration effort (as part of ASRP) are successful. Currently, the Lower Satsop, because of its high velocities, high erosion and low habitat value cannot function as the corridor to the upper reaches that it could. Investing now in Phase II to create a fish-friendly corridor to the upper reaches of the Satsop system will make Early Action reach restoration investments meaningful (productive).

    - Investing now based on current models and current data collection preserves and utilizes that investment. By waiting, the river and system may further change thus nullifying earlier modelling and data collection 9as they'd need to be redone).

11. **If the project is a part of a larger project or strategy, describe the goal of the overall strategy, explain individual sequencing steps, and which of these steps is included in this application for funding.** This project, Phase II, is an integral part of the larger community and stakeholder driven Lower Satsop Restoration & Protection program. Phase I to stabilize the system for flood and to ready for Phase II (Habitat) will be implemented Summer/Fall 2020. See more here https://www.ezview.wa.gov/site/alias__1492/37609/lower_satsop_restoration_and_protection_program.aspx.

12. **Describe the sponsors experience managing this type of project.** Grays Harbor County has participated in several projects funded by RCO and others that improved aquatic habitat for fish species by removing barriers, installing in channel structures and overseeing project management and implementation. Natural Systems Design is an engineering consultant with a diverse team of scientists and engineers that has overseen

the design, planning, permitting, and construction oversight of several reach-scale restoration projects on rivers in the Olympic peninsula that have used project elements described in this application.

13. **List all landowner names.** Project landowners are Greg and Terry Willis, Stephen Willis, Ed Comfort, Barbara Chapman, Daryl Blumberg, Debbie and Richard Scott, the Port of Grays Harbor, Washington Department of Fish and Wildlife, and Grays Harbor County.

14. **List project partners and their role and contribution to the project.** Project partners include WDFW, Grays Harbor Conservation District, the Port of Grays Harbor, the Chehalis River Basin Flood Authority, Natural Systems Design, and private landowners in the reach. WDFW has collaborated with the county by using remaining funds from a restoration project on property within the reach to remove a section of rock revetment that has been identified by landowners as exacerbating erosion of agricultural lands. The county worked to help develop figures for permit revision so that construction crews on site in 2019 could complete the rock toe removal. Grays Harbor County Conservation District has engaged landowners and helped bring stakeholders together for outreach as well as coordinating access for topographic surveys, bathymetric surveys, and site tours. The Port of Grays Harbor has participated in Advisory Group meetings, hosted stakeholder meetings at their Satsop Business Park offices, and granted access to their property for surveys and data collection pertinent to design efforts. The Chehalis River Basin Flood Authority has coordinated meetings with state legislators, resource agencies and stakeholders to unify a disparate group and facilitate the vision and framework development for the program. Natural Systems Design is the county's engineering consultant for the project and has supported the design process and outreach to stakeholders, resource agencies, and state legislation. The Scott's and Willis's have granted access to their properties for data collection and topographic survey to help develop the Phase I design and reach-scale conceptual design.

15. **Stakeholder outreach**. The project is supported by landowners, stakeholders, resource agencies, and permitting agencies. A successful advisory group was formed in 2017 and includes the Department of Ecology, the Quinault Indian Nation, USACE, DNR, WDFW, Grays Harbor County, Chehalis River Basin Flood Authority, Grays Harbor County, the Port of Grays Harbor, Grays Harbor Conservation District, and WSDOT. The advisory group typically meets quarterly to discuss stakeholder needs, reach issues, and design progress. Advisory group meetings have established the framework for the Lower Satsop Restoration & Protection Program https://www.ezview.wa.gov/site/alias__1492/37609/lower_satsop_restoration_and_protection_program.aspx) as well have served as an opportunity to strategically evaluate community and agency priorities and turn them into actionable plans and next steps. Key documents include the Lower Satsop River Investment Plan, The Lower Satsop Planning, Visioning, and Priority Setting Scope of Work, and the Satsop River Floodplain Restoration Report and Addendum.

The project has support from landowners in the reach, permitting agencies (WDFW, USACE, ECY, DNR) and the Quinault Indian Nation. Matching funds have been secured and permitting agencies have been engaged and consulted in Advisory Group meetings as the design has evolved. Permits have not been issued for Phase I project construction yet. The permitting timeline is a concern but it is still likely that the project will be issued permits in time for Phase I 2020 construction to be completed.

Supplemental Questions

Restoration Project Supplemental Questions

Answer the following supplemental questions:

A. **Will the sponsor complete, or already has completed, a preliminary design, final design, and design report (per RCO's Manual 18: Salmon Recovery Grants Appendix D) before construction?** This grant application includes funds and a schedule to develop a conceptual, preliminary, and final design including reporting and construction documents prior to construction. These designs and reports will include the riparian planting plan as well as the invasive treatment plan.

B. **Will a licensed professional engineer design the project?** The project manager overseeing the design will be a license professional engineer. The design firm retained to complete the design has several staff with PE licenses as well as professional geologists, professional wetland scientists, landscape architects and ecologists that will all participate in the design resulting in a multidisciplinary restoration design.

C. **If this project includes measures to stabilize an eroding stream bank, explain why bank stabilization there is necessary to accomplish habitat recovery.** The rate of soil erosion in the reach is currently much higher than the historic erosion rate. The unnaturally high rate of erosion is contributing to many processes which are reducing habitat quantity and quality. These are inputs of fine sediment to the system, loss of mature riparian vegetation, increase in stream power and reduction in channel length. Phase I of the Lower Satsop Project primarily focuses on stabilizing banks and protecting floodplain infrastructure using ecologically sensitive methods consistent with restoration projects in the watershed. The principal materials used will be wood, and use of rock, cable, and chain have been minimized by relying on pile supported structures. Phase II plans to build on this at a reach scale by installing structures aimed at changing the sediment dynamics of the reach and accelerating successional riparian plan growth.

D. **Describe the steps the sponsor will take to minimize the introduction and spread of invasive species during construction and restoration.** All wood materials brought on site will be steam disinfected to prevent the spread of invasive species. Equipment will be mobilized to the site after being cleaned and will not be tracked through invasive species or used to remove or treat invasive species. Equipment will remain on site until

construction is complete with no on's and off's allowed during project implementation. All invasive species treatment will be completed using hand tools.

WCRRI Funding Request

- Project 20-1408
- March 13, 2020
- Lower Satsop Restoration & Protection Program – Phase II, Habitat Connectivity and Reach-Scale Aquatic, Riparian and Floodplain Restoration Project

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Lower Satsop Restoration & Protection – Phase II, PRISM ID 20-1408

WCRRI Funding Request

March 13, 20202

Lower Satsop Advisory Group

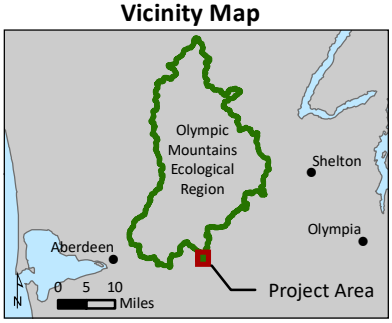
Project Area Map

Lambert conformal conic projection, NAD 1983 State Plane Coordinate System (WA South Zone). Aerial Imagery Source: 2019 drone flight by Natural Systems Design and 2017 USDA NAIP

Legend

- Roads
- Bridges
- WDFW Floodplain and Habitat Restoration Project, 2019-2020

Vicinity Map



March 13, 2020

WCRRI Funding Request

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- March 13, 2020
- Lower Satsop Restoration & Protection Program – Phase II, Habitat Connectivity and Reach-Scale Aquatic, Riparian and Floodplain Restoration Project

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WCRRI Funding Request

March 13, 20202

NOTES:

1. WORK ASSOCIATED WITH THE KEYS ROAD FLOOD PROTECTION PROJECT IS SHOWN IN GRAY. A CONCEPTUAL LAYOUT FOR THE LOWER SATSOP RESTORATION & PROTECTION PROGRAM – PHASE II, ARE SHOWN IN COLOR.
2. PLANTING AREAS SHOWN ARE ABOVE THE OHWM AND WOULD NEED TO BE ASSESSED FOR ECOLOGICAL CHARACTERISTICS SO THAT PLANT PALETTES COULD BE DEVELOPED.
3. INVASIVE SPECIES REMOVAL AREAS NEED TO BE IDENTIFIED AND MAPPED DURING A SITE RECONNAISSANCE VISIT.

WDFW FLOODPLAIN RESTORATION PROJECT

WEST DIKE

POND A

SOUTH DIKE

POND B

EXISTING SPOIL PILE

POND C

EAST DIKE

200' 100' 0 200' 400'

N

0 Ø 1

IF THIS BAR DOES NOT MEASURE 1" THEN DRAWING IS NOT PLOTTED TO ORIGINAL SCALE.

GRAYS HARBOR COUNTY 1854

Natural Systems Design

NAME OR INITIALS AND DATE	
DESIGNED	RLE, MS
CHECKED	RLE
DRAWN	MS, GM
CHECKED	RLE

GEOGRAPHIC INFORMATION	
LATITUDE	47°03'49"N
LONGITUDE	123°29'29"W
TN/SC/RG	T18W/S12/R7W
DATE	2/14/2019

LOWER SATSOP RESTORATION AND PROTECTION, PHASE II

PRISM ID 20–1408
SHEET 2

2

SHEET 2 OF 2

(20)

Mar 12, 2020

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WDFW FLOODPLAIN RESTORATION PROJECT

WEST DIKE

POND A

SOUTH DIKE

POND B

EXISTING SPOIL PILE

POND C

EAST DIKE

2

200' 100' 0 200' 400'

N

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Mar 12, 2020

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GRAYS HARBOR COUNTY 1854

Natural Systems Design

NAME OR INITIALS AND DATE		GEOGRAPHIC INFORMATION	
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CHECKED	RLE	DATE	2/14/2019

LOWER SATSOP RESTORATION AND PROTECTION, PHASE II

PRISM ID 20–1408
SHEET 2

2

SHEET 2 OF 2

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Project Name: Lower Satsop Restoration & Protection Program – Phase I
WCRRI #: PRISM ID 20-1408
Sponsor: Grays Harbor County

RESTORATION

See Manual 5 for additional information regarding allowable costs.

				OVERALL PROJECT	GRANT REQUEST	MATCH			
				Budget must account for all costs to complete the project	*Enter only the amount of the grant request*	*The Grant Request and Match should equal the total project cost and Budget Check cell should be 0. Sponsors must account for all sources and types of match need to complete the project.*			
Construction				Amount	Grant Amount	Match in PRISM	Funding not reported in PRISM	Source (Grant, Cash, Materials, Labor, Volunteers, etc)	Match Type (federal, state, local)
Category	**Task Description**	Qty	Rate						
Mobilization	contractor mobilization and demobilization	1.00	$ 102,475.00	$ 102,475	$ 102,475	$ -	$ -		
Demolition and site prep	access, staging, erosion, and pollution control measures	1.00	$ 48,391.00	$ 48,391	$ 48,391	$ -	$ -		
Construction	isolation, dewatering, pile driving, excavation, building ELJs, placing alluvium	1.00	$ 349,236.00	$ 349,236	$ 349,236	$ -	$ -		
Materials	timber, ballast, chain, cable, racking, slash, and plants plus sales tax (assumes 31 ELJs and 131 acres of planting)	1.00	$ 712,334.52	$ 712,335	$ 712,335	$ -	$ -		
Construction supervision	construction monitoring, reporting, and supervision	1.00	$ 30,950.00	$ 30,950	$ 30,950	$ -	$ -		
Construction labor	Invasive species removal - 10 day effort twice a year with 5 laborers (assumes 10 acres treated)	1.00	$ 38,500.00	$ 38,500	$ 38,500	$ -	$ -		
Construction labor	supervision of and plant delivery, staging, installation, and irrigation	1.00	$ 134,942.00	$ 134,942	$ 134,942	$ -	$ -		
			$ -	$ -	$ -	$ -	$ -		
			$ -	$ -	$ -	$ -	$ -		
			$ -	$ -	$ -	$ -	$ -		
			$ -	$ -	$ -	$ -	$ -		
			$ -	$ -	$ -	$ -	$ -		
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			$ -	$ -	$ -	$ -	$ -		
			$ -	$ -	$ -	$ -	$ -		
			$ -	$ -	$ -	$ -	$ -		
			$ -	$ -	$ -	$ -	$ -		
			STotal	**$ 1,416,829**	**$ 1,416,829**	**$ -**	**$ -**		

Outreach				Amount	Grant Amount	Match in PRISM	Funding not reported in PRISM	Source (Grant, Cash, Materials, Labor, Volunteers, etc)	Match Type (federal, state, local)
Category	**Task Description**	**Qty**	**Rate**						
Choose Category			$ -	$ -	$ -	$ -	$ -		
			$ -	$ -	$ -	$ -	$ -		
			$ -	$ -	$ -	$ -	$ -		
			$ -	$ -	$ -	$ -	$ -		
			$ -	$ -	$ -	$ -	$ -		
			$ -	$ -	$ -	$ -	$ -		
			Stotal	**$ -**	**$ -**	**$ -**	**$ -**		

Administrative, Architechtural & Engineering				Amount	Grant Amount	Match in PRISM	Funding not reported in PRISM	Source (Grant, Cash, Materials, Labor, Volunteers, etc)	Match Type (federal, state, local)
Category	**Task Description**	**Qty**	**Rate**						
Conceptual design	Update reach scale concept design for agency and stakeholder review	1.00	$ 22,415.00	$ 22,415.00	$ 22,415	$ -	$ -		
Preliminary design	Preliminary design document, construction cost estimate, and BOD report	1.00	$ 22,900.00	$ 22,900.00	$ 22,900	$ -	$ -		
Assessments (geologic, hydraulic, etc.	Hydraulic modeling of proposed design conditions	1.00	$ 50,750.00	$ 50,750.00	$ 50,750	$ -	$ -		
Other	JARPA preparation assumes NWP 27 pathway	1.00	$ 40,552.00	$ 40,552.00	$ 40,552	$ -	$ -		
Other	Cultural Resources survey (assumes level of effort similar to EF Satsop ASRP cultural resources survey)	1.00	$ 81,000.00	$ 81,000.00	$ 81,000	$ -	$ -		
Invasive plant management plan	Reach assessment of invasive species and treatment plan development	1.00	$ 20,235.00	$ 20,235.00	$ 20,235	$ -	$ -		
Riparian planting program	Reach assessment of riparian plant ecologies and planting plan development	1.00	$ 15,176.25	$ 15,176.25	$ 15,176				
Final design	Final design production and bid package development (plans, specificaitons, cost estimate, and design report)	1.00	$ 25,445.00	$ 25,445.00	$ 25,445	$ -	$ -		
Administrative	Meetings, project management, travel, and administration	1.00	$ 41,962.00	$ 41,962.00	$ 41,962	$ -	$ -		
RCO administrative cost	Portion of funding absorbed by RCO to administer funds	1.00	$ 0.03	$ 52,117.91	$ 52,118	$ -	$ -		
Sales Tax	Sales tax not charged on A,A&E services	-		$ -	$ -	$ -	$ -		
			Stotal	**$ 372,553.16**	**$ 372,553.16**	**$ -**	**$ -**		

Indirect Costs

	Description	Approved Rate	Total Project Base						
	Indirect	0.000%	$ -	$ -	$ -	$ -	$ -		
	Indirect	0.000%	$ -	$ -	$ -	$ -	$ -		
			STotal	$ -	$ -	$ -	$ -		

AA&E Budget Check	
A&E maximum allowed in PRISM	*$ 425,048.56*
A&E validation	*$ 52,495.39*

GTOTAL	**$ 1,789,382**	**$ 1,789,382**	**$ -**	**$ -**	
	PRISM Project Total		**$ 1,789,382**		
	RCO Percentage		Match Percentage		
	100.00%		0.00%		

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Secured and *Pending* Implementation/Construction Funding: 2020 and 2021 ($4,014,406)

GHC Phase I, Keys Road Corridor Protection
GHC Phase II, Habitat Connectivity and Reach-Scale Aquatic, Riparian and Floodplain Restoration Project (ASRP or WCRRI)

	2019	2020 (March through December)	2021 or 2022 (July through August)
Grays Harbor County	n/a	$1,325,024 (GHC Phase I Secured) $ 900,000 (GHC Phase I Supplemental State Capitol Budget Secured) $ 372,553 (GHC Phase II ASRP or WCRRI *Pending*) **$2,597,577 total**	$1,416,829 (GHC Phase II ASRP or WCRRI *Pending*) **$1,416,829 total**
Notes	n/a	a. See funding breakdown chart below. b. Secured funding ($2.2M) can serve as **match** for $1.7M Phase II ASRP or WCRRI funding request. c. ASRP or WCRRI work will include invasive species treatment, design, engineering, permitting.	d. See funding breakdown chart below. e. Secured funding ($2.2M) can serve as **match** for $1.7M Phase II ASRP or WCRRI funding request. f. ASRP or WCRRI work will include ELJ construction, implementation. g. Fish window (8/01 – 8/31) will require project completion in 2021 or 2022 (ASRP or WCRRI).
WA Dep't of Fish and Wildlife	**$1,030,000** (WDFW Phase I Completed)	**$1,429,000** (WDFW Phase II Secured)	n/a
Notes	1. Construction completed. 2. 200' of WDFW rock toe revetment removed, 20' x 85' floodplain access channel created.	3. Construction to be completed Summer 2020. 4. Remaining WDFW Revetment to be removed in its entirety pending completion of Phase I. 5. Stockpiled WDFW rock will be re-purposed providing financial benefit to GHC and WDFW.