



Application for a 2015-2017 Floodplains by Design Project Grant

Submitted applications will be rated to create a ranked list in support of Ecology's FY 2015-2017 Floodplains by Design budget request.

Applications must be submitted electronically via email to Ecology by 5:00 pm, **September 8, 2014**. Send applications to:

Adam Sant at Adam.Sant@ecy.wa.gov

With the Subject line: 2015-2017 Floodplains by Design Project Grant Application

You will receive confirmation that your application has been received by close of business on September 15.

Applicants must use this form as provided. No alterations will be accepted.

Project Title

South Fork Nooksack River – Flood, Fish, Farm Conservation and Restoration Integration

Organization/Jurisdiction Name Whatcom Land Trust

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Legislative District(s) 42

County Whatcom

WRIA(s) 1

Congressional District(s) WA-01

Specific Project Location

Section multiple Township 37 & 38 N Range 5E River Mile SFNR 2 - 12

Latitude 48° 42' 53" N Longitude 122° 11' 34"W GPS coordinates N627900, E1311700

Major Watershed Project is in - South Fork Nooksack River (SFNR)

Full project (or phase proposed herein) should be completed in 3-4 years.

Project Narrative and Budget are limited to 20 pages.

Scope of Work, Schedule, Maps and Photos can be in addition to those 20 pages.

1. Short Description of Project (500 words or less)

Please describe the overall goals for this floodplain area that is the focus of your proposal. Include in the description all major components of the project or activity such as breaching a levee, constructing a new levee, restoring a specific number of acres of floodplain, wetland creation or fill, restoration planting, project design planning, public process, or any other appropriate major component. Please indicate if funding is being requested for a phase of a larger multi-year project.

Whatcom Land Trust (WLT) is working in conjunction with Nooksack Tribe and Whatcom County and other WRIA 1 watershed partners to advance a broad approach to floodplain management in the South Fork of the Nooksack River valley that is intended to reduce flood risk, advance ecological function, protect and enhance farmland productivity, and improve water quality. Through this Floodplain by Design request of \$3,216,958, WLT and partners seek to improve the coordination of public investment and advance the implementation of floodplain conservation and restoration actions necessary to recover salmon, improve water quality and maintain agricultural viability on the South Fork floodplain.

The long-term goal of this project is to realign land uses in the South Fork valley to a riparian corridor consisting of a dynamic undeveloped floodplain bordered by continuous bands of mature riparian forest, with agricultural land use protected upland of the forest and beyond the flood hazard zone. Key objectives of the South Fork Nooksack floodplain by design include:

- Create a floodplain with sufficient width to accommodate dynamic channel morphology within 100 year peak flow extent.
- Facilitate restoration of floodplain processes to create a complex network of primary channels, seasonal side channels, and wetlands that provide flood storage during peak flows and discharge water to support base flows.
- Restore a mature, complex, and diverse riparian forest throughout the South Fork valley.
- Advance in-stream habitat structures, large woody debris, both engineered and naturally recruited, that enhance salmon habitat and direct flows away from vulnerable infrastructure.
- Protect and enhance the viability of agriculture, promote agricultural land use in areas with low erosional flood risk and low potential conflict with water quality and salmon conservation.
- Locate new infrastructure outside flood hazard areas; remove or set back bank hardening structures and replace with riparian forest.

Our approach seeks to align land use and ownership patterns with natural systems in order to provide farmers with the best operable lands and water to be economically viable, while advancing restoration actions necessary to recover salmon and address water quality and quantity issues. The design will be achieved through a series of land acquisitions, land swaps, conservation easements, and projects that integrate habitat restoration with flood risk reduction. This project is envisioned as the first of three integrated phases advancing conservation, restoration, and flood risk reduction along a ten-mile stretch of South Fork floodplain between Saxon Road Bridge to Potter Road Bridge.

WLT's Flood, Fish, Farm Conservation and Restoration Integration Project elements include the following actions:

- Acquisition – Both fee simple and conservation easement acquisitions of floodplain lands that advances future restoration opportunity and maintains agricultural viability.
- Construction - Instream restoration project led by Nooksack Tribe that reduces channel constraints while placing stable log jams that will restore habitat and reconnect floodplains.
- Feasibility and Design – Develop a design that integrates flood risk reduction and fish habitat restoration in a reach of the lower South Fork, including: hydraulic modeling, alternatives analysis, and engineering design.

2. Flood hazard / risk reduction (60 points)

Describe your project and how it will reduce the magnitude or frequency of flood damages to people, structures or infrastructure. Projects will be evaluated on the significance of the flood hazard and the ability of the solution to address the hazard. Evidence of flood hazard reduction can be demonstrated via flood storage added (acre-feet), flood stage reduction [reduced BFE (base flood elevation)], conveyance increased (cubic ft/sec), sediment storage added or inputs reduced, number or value of structures and/or development rights removed from hazard area (# or areal extent), critical facilities removed from high hazard area, transportation and infrastructure facilities removed from high hazard areas, and other project-specific goals. Describe both upstream and downstream effects of your project.

Answer question 2 here:

This project is projected to reduce flood risk by:

- Reconnection of floodplain habitats in Nessel's Reach through installation of 14 ELJs and lowering of ~ 1,500 feet of levee to natural floodplain grade and breaching of levee upstream and downstream ends to reconnect relict channel, with armoring of inlet and outlet to prevent avulsion. Hydraulic modeling of the Nessel's Reach Project projects a 6% reduction in peak discharge.
- Reduce flood risk by securing 200 acres of floodplain habitats and 200 acres of farmland, removing approximately 10 development rights from the floodplain and relocating working farmland to areas with lower erosion risk.
- Advance Integrated Design work and modeling to advance removal or setback of ~2,500 feet of bank hardening with ELJs and woody revetments to increase habitat diversity, key habitat quantity and increase availability of temperature refuges.
- Advancing the protection, restoration, and reconnection of a riparian corridor along the South Fork; literature suggests that reconnecting and reforesting riparian floodplains may yield up to a 20% reduction in peak discharge (Anderson 2006).

Background & Significance of the South Fork of the Nooksack River

The South Fork of the Nooksack River has its headwaters in the Twins Sisters range on federally managed Forest Service and Wilderness lands, then it meanders through a matrix of state and private timberlands on the foothills in the upper watershed, until it opens up on the fertile floodplain of the South Fork valley downstream of the Saxon Bridge. This rich agricultural landscape is home to productive dairy farms and the rural communities of Acme and Van Zandt. The South Fork provides habitat for all Pacific salmon including ESA-listed spring Chinook salmon, winter and summer steelhead and bull trout, as well as coho, pink (odd- and even-year), chum, and riverine sockeye salmon and sea-run cutthroat. Historically, channel-spanning log jams and buried large wood would have provided natural grade control, maintaining floodplain connectivity while deflecting flow into channel banks, which would in turn recruit more large trees that would protect from further bank erosion by deflecting flow away from the eroding bank, resulting in a more stable channel planform

over time. Beginning with settlement in the 1880s, the South Fork valley floodplain was cleared and converted to agriculture. Historic logjams were removed from the channel to reduce flooding and to make it more navigable. Extensive clearing led to rapid channel incision and migration, and subsequently most of the cut banks on the South Fork were armored with rock riprap. Analysis of alluvial surfaces as part of ongoing work suggests the river has cut down about 10 feet in the last century and 4-5 feet in the last 30 years. These changes in land use, bank armoring, and removal of logjams resulted in channel-floodplain disconnection which, coupled with the ditching and draining of floodplain wetlands, has resulted in dramatic loss of river and floodplain habitat, groundwater recharge, and sediment and flood storage capacity. Riparian forest clearing has also substantially reduced riparian shading and, combined with changes in the channel, likely led to elevated temperatures. The South Fork is 303d listed for elevated temperature.

Over the past 14 years, much work has been done in the South Fork by WRIA1 Salmon Recovery partners to advance the recovery of ESA-listed chinook, steelhead, and bull trout and other salmonids. Some of the best remaining functioning floodplain habitats on the lower South Fork have been protected, and 10 instream restoration projects have been implemented. WLT owns or holds conservation easements on more than 1,100 acres of land along the South Fork. Additionally, WLT stewards conservation easements on Whatcom County's South Fork Park on the right bank between Saxon and Acme. Both Nooksack Tribe and Lummi Nation work to restore salmon habitat, and Whatcom County has worked to manage flood risk and protect agricultural lands. Meanwhile, several more reach-scale restoration projects are seeking funding to construct stable log jams to form deep pools, create temperature refuges, and reconnect floodplains. In addition, substantial public investment has been made to recover the South Fork Nooksack spring Chinook salmon through habitat restoration and the establishment and implementation of a hatchery population-rebuilding program natural-origin juvenile South Fork spring chinook. The progeny of captive broodstock have started to return to the South Fork and tributaries to spawn, and they will return in greater numbers in the next 3 to 4 years, creating additional urgency for habitat restoration. Salmon recovery efforts in the South Fork are focused on the unique South Fork Nooksack early chinook population, an imperiled population that is both a priority to the Nooksack Tribe and the Lummi Nation and essential for recovery of the Puget Sound Chinook ESU. Also unique among Puget Sound watersheds, South Fork Nooksack summer steelhead are the least hatchery-influenced summer run steelhead population in Puget Sound (90% wild, 10% hybridized with Nooksack winter steelhead); summer run steelhead have similar migration and holding needs to chinook.

The Challenge

Salmon recovery in the lower South Fork is limited by lack of landowner willingness to allow channel migration, flooding, and/or riparian restoration. FEMA no-rise requirements also constrain restoration; the entire project reach is within a mapped FEMA floodway requiring "no-rise" compliance. The South Fork valley's landowners' and to some degree the general public's, perception is that salmon recovery is at odds with flood hazard reduction and agricultural resources land preservation. Over the past century, the South Fork has been managed to control flooding and maximize rich floodplain soils for agricultural production, most often adjacent to the river corridor at the expense of salmon and the natural processes that form and sustain their habitats. Often overlooked are the benefits of floodplains to ecosystem services, such as flood and sediment storage, baseflow support, water quality maintenance, and a diversity of habitat types and complexity.

The South Fork valley offers important agricultural resource lands to the local community. Landowners are reluctant to give up space to allow natural processes to be restored, because agricultural producers need all the land they can obtain to maintain economic viability. Protection and/or acquisition to facilitate needed restoration is difficult because the land necessary is generally low value and the parcel framework overlaps

productive working farmland. Isolating and subdividing off the habitat features for conservation purchase is impractical and yields a low value that does not satisfy landowners' value expectations.

Fee simple purchase of parcels along the corridor has not been effective because land is finite and highly constrained by willingness to sell and the timing and availability of funding to support purchase. Too much high-value farmland is often purchased and pulled from production or private landowner/producer ownership. Dairy –the largest agricultural product in Whatcom County and the South Fork Valley – needs lots of land and uses lots of water. With thin operating margins, agricultural viability comes down to economies of scale. Herd size is constrained by land availability, particularly the need for sufficient acres for nutrient management, and prime soils often occur adjacent to the banks of the river channel. Given all these factors, riparian restoration and/or selling land for conservation purposes, or even enrolling in CREP is a particularly difficult sell, because dairy producers are reluctant to give up control of this finite and productive space.

The Opportunity - Protecting the valley bottom floodplain and creating space for better restoration opportunity.

Floodplains by Design provides WLT the perfect opportunity to leverage existing investments and action on the South Fork floodplain to advance integrated floodplain management and restoration. To advance the South Fork Floodplain by Design, we plan to reconfigure the land use/ownership pattern - acquiring lands suitable for farming and exchanging purchased lands for conservation easements on river-adjacent properties - so that better restoration and flood projects can be implemented, agricultural viability ensured, and willing private landowners are fairly compensated for their participation using acquisition of fee simple, conservation easements, lot line adjustments and 1031 like-kind-exchanges.

The acquisition element of the project will remove approximately 10 development rights from the floodplain, reducing future infrastructure in the floodplain. Moreover, it will provide for space to implement salmon recovery restoration actions in the historic migration zone plus 300 foot buffer area that include riparian restoration, ELJ construction to create deep pools with complex cover, and allow for removal or replacement of rock rip rap with woody revetments, and removal and setback of rip rap where the channel is highly constricted to allow for more conveyance and natural function. These actions will increase flood storage and conveyance. This will be discussed further in the next section as there is a strong connection between the flood risk reduction and floodplain ecosystem protection and restoration.

WLT currently has secured fee title to two match properties using private funding with the goal of advancing an integrated floodplain project. Although the project proposes the classic acquisition approaches of fee simple and conservation easement to protect floodplain habitats and create space to facilitate restoration, it will also employ a new, innovative approach. First, WLT proposes to acquire lands for sale in the floodplain. We will acquire farmlands that are near to, though not directly on the riverfront. After purchase, we will permanently protect the land's agricultural and appropriate ecological features via conservation easements. We will then offer these encumbered tracts to riverfront landowners in exchange for WLT's receipt of conservation easements or fee simple ownership of portion of their riverfront to facilitate restoration. The acquisition component of our proposed project is critical to creating the opportunity to implement future restoration and flood risk reduction projects.

Through this strategy, WLT will acquire lands in fee simple for their farmland value, protect them in perpetuity with conservation easements and then exchange the encumbered fee title for conservation easement or fee simple for riverfront farmland. This approach will provide agricultural producers with more farmland base that is protected from conversion and provide the offset and incentive to allow restoration of the riparian corridor and reduced

flooding. By acquiring fee title to approximately 200 acres of primarily floodplain farmland, WLT will have the opportunity to trade the protected farmland tracts for conservation easements over farmland with habitat protections along riverfront, channel migration zones and key floodplain wetland areas. This approach, using 1031 like-kind exchanges, allows landowners to avoid costly capital gains taxes and, even better, enhances the viability of their agricultural operation by adding land to their farming operation.

WLT's acquisition will create opportunity to establish riparian forests to help address water quality and high temperature TMDL in the South Fork. Our proposed project will facilitate future planting and maintaining of the riparian buffer underwritten by complimentary funding sources.

Flood Risk Reduction

Salmon Recovery and water quality restoration needs cannot be addressed effectively without reducing flood risk. In the South Fork the main flood impacts are erosion and avulsion. To meet salmon recovery goals and to implement restoration, floodplain connectivity and riparian function across the historic channel migration zone plus a 300 foot buffer will need to be restored. Restoring and reconnecting floodplain will attenuate peak flows and spread and store water in some areas of the floodplain and reduce peak discharge, providing flood risk reduction benefits to downstream communities. Because there is risk of erosion and loss of currently farmed agricultural land and in some areas avulsion, the combination of acquisition and flood control measures will need to be incorporated to be able to effectively implement needed restoration.

Large wood and riparian forests can play an important role in protecting against floods and bank erosion by increasing flood storage and decreasing the celerity or velocity of flood waves (Anderson 2006, Thomas and Nisbet 2006). In-stream wood adds roughness that reduce flow velocities and raise water levels which increase overbank connectivity (Brummer et al. 2006). Thus, the defining attributes of forested rivers - trees and wood - spread out a flood hydrograph, increasing the duration of flood inundation while reducing maximum flood depths, thereby providing very important ecosystem services. Flood flows through forested floodplains in a channel network can significantly lower flood stages in downstream reaches (e.g., Anderson 2006, Thomas and Nisbet 2006). Wood can also store significant quantities of sediment that would otherwise move downstream, where it could aggravate flooding. Wood structures like engineered logjams have also been successfully applied to protect banks during flood events (e.g., Abbe et al. 1997, 2003; Abbe and Brooks 2011).

By incorporating removal of riprap bank hardening and setbacks of buried bank hardening behind instream ELJ construction, we will allow for increased flood storage within the project area, thereby reducing the magnitude or frequency of flood damages to people, structures or infrastructure.

Nooksack Tribe has identified the need for a larger three phase restoration project in the Nessel Reach of the South Fork (RM 10.4-12) that will reconnect floodplain and improve instream habitat diversity. This is mainly possible due to the upstream ownership by WLT on the left bank and Whatcom County Parks on the right bank that together afford better restoration opportunities. Because of private ownership on the downstream end of Nessel's Reach, Nooksack Tribe will need to address landowner concerns to reduce flood risk in order to gain access to implement an effective restoration project in this reach.

Through an inter-local agreement, WLT will work with project partner, Nooksack Tribe, to construct Phase 3 of the Nessel Reach project, which involves lowering and breaching of the right bank levee and construction of 14 log jams to restore floodplain connectivity and increase flood storage (See Nessel's Reach Maps 3, 4 & 5) . About 1,500 feet of levee will be lowered to natural floodplain grade, and the levee will be breached at the upstream and downstream ends to reconnect a relict channel, with armoring of inlet and outlet to prevent avulsion. The project will also entail acquisition of materials for and

construction of 14 engineered log jams. Hydraulic modeling of all three phases of the Nasset's restoration project indicates that the project would result in a 6% decrease in the peak discharge at the 25-year flood (See Figure 1 below). Model results also indicate a significant increase in water surfaces and floodplain connectivity during lower-recurrence peak flows. This is consistent with research that demonstrates that the cumulative effect of reconnecting riparian floodplains can reduce flood peaks by 20% (Anderson 2006) and increase flood storage by over 70% (Thomas and Nisbet 2006).

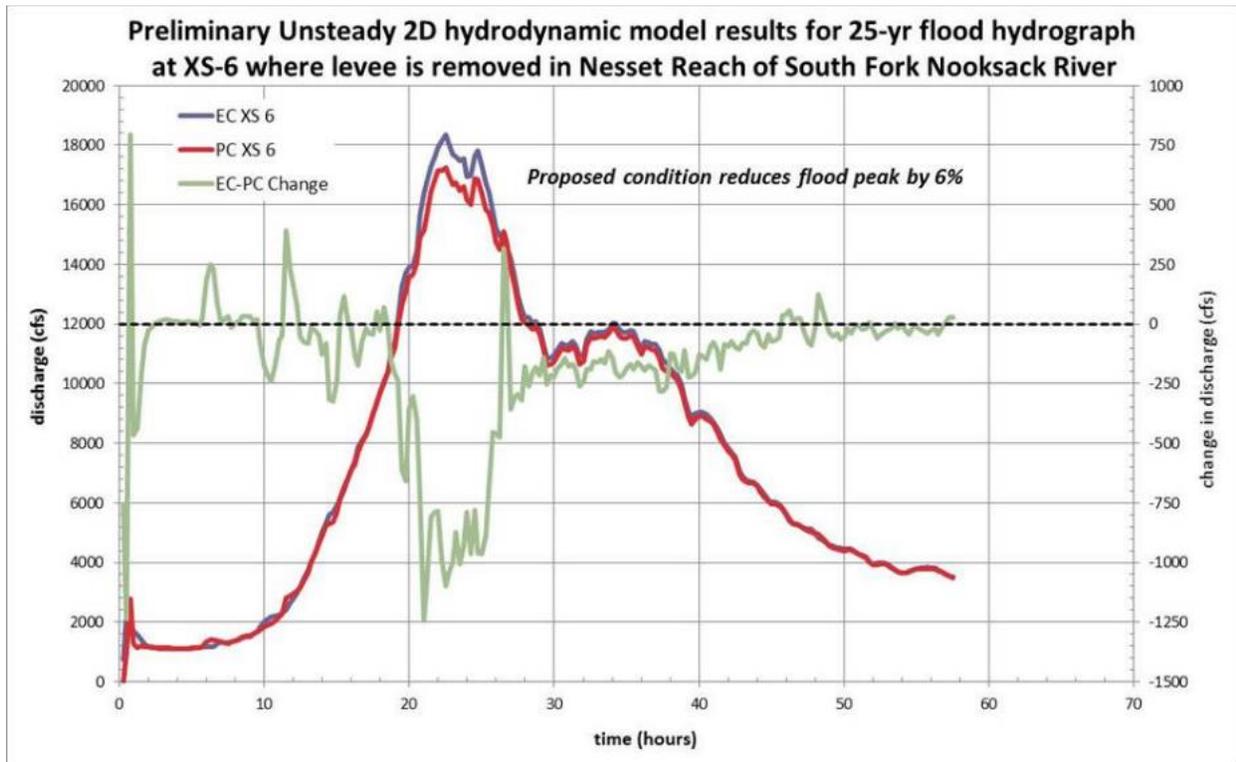


Figure 1. Preliminary modeling result for 25-yr flood for Nasset's Reach Full Restoration (Natural Systems Design 2014).

Describe both upstream and downstream effects of your project.

When salmon recovery and water quality restoration needs are addressed by implementing actions that increase habitat diversity, restoring riparian areas and addressing channel incision, flood risk can also be decreased by lowering peak discharge and increasing floodplain storage. The conceptual model for the South Fork Nooksack Floodplain by Design is to protect and restore a riparian river corridor primarily focused on the historic migration zone plus 300 foot buffer, and then also to conserve and maximize the long-term viability of the adjacent farmland within the valley bottom. These actions paired together will advance the effort to recover sustainable harvestable runs of salmon, reduce flood risk within these reaches and downstream communities, improve the timing and availability of water for people and natural systems, and advance and promote agricultural viability.

3. Floodplain ecosystem protection or restoration element (60 points)

Describe the ecological benefit of the project, its significance, and the ability of the solution to address the overall need in the project area or watershed. Examples include, but are not limited to, reconnecting floodplains, salmon recovery actions, habitat restoration, Channel Migration Zone protections, etc. Evidence of ecosystem benefits include floodplain (including estuary) habitat type (e.g., wetland, side

channel, forest) and area restored (# acres), floodplain area protected from bank armoring (# of acres), floodplain area protected from development or other land use change (# acres), hardened bank removal or levee/riprap removal (linear feet), levee setbacks constructed (linear feet, # acres), new side channels or reconnection of old side channels (linear feet or storage volume), salmon species benefitted (# of listed, non-listed species). Secondary evidence includes culvert replaced to restore fish passage or increase conveyance, logjam and or wood structures installed, riparian area planted, and other project-specific goals.

Answer question 3 here:

Please see background and problem statement laid out in Section 2 above. This project is expected to protect and restore floodplain ecosystem function by:

- Restoring mainstem and floodplain habitats for rearing and holding salmonids, specifically:
 - Placing 14 stable log jams expected to form at least 5 new primary pools and 5 new secondary pools with complex instream cover, in a 0.7-mile reach devoid of complex habitat and cover.
 - Reconnecting ~1,000 feet of side channel by breaching a levee at the upstream and downstream ends; side channel is expected to provide low-velocity rearing and flood refuge habitat.
 - Creating 1 new temperature refuge (pool with temperatures at least 2°C cooler than ambient river temperatures) for holding and rearing salmonids in the mainstem South Fork.
 - Based on hydraulic modeling, the broader Nessel Reach restoration project (which also includes placement of 31 ELJs in addition to the 14 ELJs proposed herein) is expected to increase weighted usable area for chinook incubation, fry, juvenile, and adult holding life stages by 12%, 5%, 11%, and 11%, respectively.
- Reconnecting floodplain habitats in Nessel's Reach through installation of 14 ELJs to raise water surface elevation, coupled with lowering of ~ 1,500 feet of levee to natural floodplain grade. The overall Nessel Reach restoration project (45 total ELJs) will reconnect an estimated 7.3 acres of floodplain and 4,200 feet of floodplain channel.
- Advancing salmon recovery by:
 - Securing 200 acres of floodplain to permanently protect it and increase opportunity for restoration,
 - Implementing a habitat restoration project that would restore habitat conditions and habitat-forming processes in a 0.7-mile reach of the South Fork important for chinook holding and rearing. Increasing restoration opportunity would ultimately lead to improvement of riparian functions (wood recruitment, shading, bank stability, nutrients and organic matter) on up to 200 acres of floodplain and restoration of up to 2 miles of mainstem and floodplain habitats.
- Advancing integrated design work and modeling to advance removal or setback of ~ 2,500 feet of bank hardening with ELJs and woody revetments to increase habitat diversity, key habitat quantity and increase availability of temperature refuges.
- Improving water quality by protecting and restoring riparian and wetland forests to address South Fork temperature TMDL. Implementation of habitat restoration component will also help form temperature refuges for salmon.

With prior conservation and public acquisitions upstream of Acme, there is the opportunity to further the implementation and better coordinate the public investment of several phases of fish and flood projects (see attached maps). In 2008, Whatcom County completed an in-stream project in the Acme reach just upstream from the Acme SR9 Bridge. Whatcom County is also the right bank owner in the Acme Hutchinson Reach and is the primary right bank owner in the Nessel's Reach. WLT owns the majority of the left bank in Nessel's reach and Hutchinson Reach. In 2014 – 2015, Nooksack Tribe is planning to implement the third phase of in-stream restoration of the Hutchinson Reach (RM 9.6-10.4), and is designing and seeking funding for a three-phase project up-stream in the Nessel's Reach (RM 10.3-12). With Floodplains by Design funding, we would be able to integrate these considerable tribal, public agency and private sector resources to achieve effective flood control and salmon recovery.

The Nooksack Tribe has identified the need for \$3,160,000 in salmon recovery funding to implement future projects in the Hutchinson Phase 2a (8 log jams) and Nessel Phase 1 through 3 reaches (45 log jams) of the South Fork of the Nooksack River. This proposed project would fund Phase 3 (downstream portion of the 3-phase restoration project). Phase 3 will to implement construction of 14 engineered log jams and a flood control set-back project led by Nooksack Tribe in a high priority reach of the South Fork. The Nessel's Reach Project restoration goals include: reduce reach-level constraints to habitat formation (removal of bank hardening), reconnect existing habitat, and implement interim actions to achieve immediate habitat targets. The specific restoration objectives include: increase habitat diversity (quantity of complex wood cover in low-flow channel, habitat unit diversity), increase key habitat quantity (number and depth of pools in low-flow channel - particularly primary pools greater than one meter residual depth), reconnect disconnected floodplain and floodplain tributaries, and increase availability of temperature refuges.

Salmon Recovery and water quality restoration needs cannot be addressed effectively without reducing flood risk. Conversely, past traditional flood risk reduction actions, primarily bank armoring and levee construction, have increased flood risk downstream, simplified critical salmon habitat, disrupted habitat-forming processes, and contributed to the decline of salmon. In the South Fork, the main flood risk concern is erosion and avulsion. Effective restoration and flood risk reduction will require acquiring and restoring the historic migration zone plus a 300 foot buffer.

Riparian vegetation has been shown to significantly affect flood peak timing and magnitude with up to a 20% reduction in flood peaks (Anderson 2006). While instream restoration in the short term is necessary to increase habitat diversity, riparian restoration will be critical to addressing long term habitat-forming processes. Restoring and reconnecting floodplain will further attenuate peak flow, reduce velocity, and spread and store water in some areas of the floodplain and reduce peak discharge, and provide flood risk reduction benefits to downstream communities. Because there is risk of local erosion and loss of currently farmed agricultural land and in some areas avulsion, the combination of acquisition and flood control measures will be pursued to effectively implement needed restoration.

The Nooksack Tribe's restoration project in Nessel's Reach will reconnect floodplain and improve instream habitat diversity. This is mainly possible due to the upstream ownership by WLT on the left bank and Whatcom County Parks on the right bank affording better restoration opportunities. By incorporating removal of riprap bank hardening and setbacks of buried bank

hardening behind instream ELJ construction, we will facilitate increased floodplain storage within the project area, thereby reducing the magnitude or frequency of flood damages to people, structures or infrastructure downstream.

Nooksack Tribe will construct Phase 3 of the Nasset Reach project, which involves lowering and breaching of the right bank levee and material acquisition and construction of 14 log jams to restore floodplain connectivity and increase flood storage. Right bank levee modification involves lowering of ~1,500 feet natural floodplain grade, and breaching of levee at upstream and downstream ends to reconnect relict channel (with armoring of inlet and outlet to prevent avulsion (See Nasset'. Hydraulic modeling of all phases of the Nasset's restoration project indicates a 6% decrease in the peak discharge when the model was run at the 25-year flood (See Figure 1). This is consistent with research that demonstrates that the cumulative effect of reconnecting riparian floodplains can reduce flood peaks by 20% (Anderson 2006).

Simulations of South Fork chinook extinction risk indicate that decreasing the river's peak flows by this 6% would reduce the extinction risk by 30.0% and increase mean spawner abundance by 12% over the next 50 years. Decreasing the river's peak flows by 20% would reduce the extinction risk of South Fork Chinook by 86.0% and increase mean spawner abundance by 324% over the next 50 years. (McLaughlin, 2014). It is clear reducing flood peaks by reconnecting riparian floodplains will profoundly benefit both salmon and people.

The conceptual model - South Fork Floodplain by Design - is to protect and restore a riparian river corridor primarily focused on the historic migration zone plus 300 foot buffer, and then also to conserve and maximize the long-term viability of the adjacent farmland within the valley bottom. These actions paired together will advance the effort to recover sustainable harvestable runs of salmon, reduce flood risk within these reaches and downstream communities, improve the timing and availability of water for people and natural systems, and advance promote agricultural viability.

4. Is your project in a Puget Sound Partnership Priority Floodplain? (5 points)

(Deschutes, Dungeness, Duwamish/Green, Elwha, Hood Canal, Lake Washington, Lower Skagit, Nisqually, Nooksack, Puyallup, Sauk, Skokomish, Skykomish, Snohomish, Snoqualmie, Stillaguamish, Upper Skagit)

Answer question 4 here: Yes - Nooksack No

5. Other benefits (40 points)

Describe how your project maintains or improves agricultural viability, water quality, public open space/recreation access, economic development, or other important local benefits or values, and does not conflict with other objectives of this program. Projects receive points based on the importance of the result produced, the ability of the solution to address the overall stakeholder need and the long-term improvement.

- a. Agricultural viability (evidence of agricultural benefits include reductions in flooding (acres), protection from development (acres), improvement of drainage infrastructure (acres), or other capital or non-capital benefits to agricultural productivity).
- b. Water quality improvement [e.g., through stormwater infrastructure upgrades, treatment of a TMDL or 303(d) issue, reduction in sediment, restoration of wetlands or riparian areas, implementation of related best management practices, etc.].
- c. Public access and recreation (e.g., through land acquisition, the development of trails or other recreational infrastructure, etc.)
- d. Other floodplain values or services of local importance.

Answer question 5 here:

Water Quality Improvements

The South Fork of the Nooksack is 303(d)-listed for temperature, and a temperature TMDL is in development. Reforestation of cleared riparian areas to improve stream shading is the highest priority action to address high temperatures, although restoration of channel complexity and floodplain reconnection are important to restore the hyporheic exchange, groundwater recharge, and temperature refugia that also maintained the natural temperature regime. The project will improve water quality in the South Fork of the Nooksack by shifting agricultural operations away from the river, restoring riparian forest buffers, improving hyporheic exchange, and protecting forested wetlands in the riparian corridor. These measures will reduce nutrient contamination in the river, restore shade to the river and its tributaries, and enhance summer base flows with sources of cool clean water. Results will help maintain water temperature in compliance with 303(d) and pending TMDL limits. This proposed project will also facilitate future planting and maintaining of the riparian buffer underwritten by complimentary funding sources.

Agricultural Viability

Recognizing that the South Fork of the Nooksack River valley bottom floodplain is dominated by agriculture, and the protection of agriculture is an important value to the citizens of Whatcom County, this project integrates farmland protection and agricultural viability into our objectives. Because the ownership and land use patterns do not align well with natural systems, and riverfront that is currently actively-farmed will be needed to advance necessary salmon recovery and water quality restoration actions, the Floodplains by Design approach seeks to modify the land use and ownership pattern to provide farmers with the best operable lands and water to be economically viable while advancing the necessary restoration actions. This phase of the project will work to protect at least 200 acres of farmland from conversion, fragmentation, and erosion loss, and remove approximately 10 residential development rights from the agricultural floodplain.

Public Access and Recreation

While project does not specifically include development of public access and infrastructure, Whatcom County Parks owns the South Fork Park located on the right bank upstream of Acme. The project is compatible with and is intended to enhance the long-term public benefits of these conserved parklands. The design element of the project will likely advance ecological improvements to these lands that would increase its aesthetic and educational values (see attached maps and letter of support from Whatcom County Parks).

6. Cost-effectiveness (20 points)

- a. Project will be judged on whether the budget is appropriate to the project scope, and designed for project success.
- b. Describe how the project will be continued or maintained after the grant has been completed.
- c. If project cannot be fully funded, explain how the project could be scaled downward.

Answer question 6 here:

Acquisition Element

Acquisition cost estimates are based on several recent acquisitions and several tracts have appraisals completed or underway. WLT staff have experience effectively completing complex real estate transactions, and have appropriate cost estimates for land value, incidentals, and personnel costs to deliver transactions. Over the past 30 years WLT has completed over 150 real estate acquisitions and is responsible for stewardship of more than 10,000 acres in Whatcom County.

The initial acquisitions are expected to come together quickly in the first year of the grant period. WLT expects the next phase for negotiating and completing exchanges to occur over years 3 & 4 of the grant proposal. In terms of sequencing the project, acquisition is the first and most critical task, in order to create more opportunity to implement the best alternative approaches to restoration projects that improve habitat and reduce flood risk. If the acquisition budget were scaled, fewer acres could be acquired. Reducing the alternate acquisition would reduce the scope by \$325,000. The other acquisitions are more developed and the opportunity would likely be lost if not funded during this round. If the project were to be scaled by removing the design phase, we would need to defer future construction projects for 3-4 years, or until funded by a future FBD round.

Construction Element

The construction element is ready to be implemented by project partner Nooksack Tribe in the next two years. Because the construction element is leveraging other salmon recovery funds, scaling this task is not recommended. Nooksack Tribe is also concurrently pursuing funding for this element of the project through a PSAR Large Capital Request to implement all three phases of Nessel's Reach. If funded by PSAR Large Capital, this project element could be reduced in scope to implement only flood risk reduction elements, moved to another South Fork Project in the Black Slough Reach, or removed from the Scope of the Project to reduce funding need. Nooksack Tribe still strongly supports the acquisition and design elements of the project in the event that the construction element of the proposal is removed.

Design Element

WLT has conferred with project partners to develop an appropriate scope for the Design element of the project. WLT will contract with qualified consultants and convene stakeholders and partners to advance a comprehensive design for an integrated project. In the past, there has been more local conflict as salmon and flood interests did not work together and conservation was perceived as removing too much farmland out of production. With the Floodplains by Design approach, WLT is excited to advance a cooperative project that will offer a better way forward to advance needed salmon recovery and water quality restoration, reducing flood risk and recognizing the importance of agriculture and working to creatively enhance farmers' viability. WLT seeks to forward a design for a construction project request for the 2017-19 biennium, which ultimately will most likely be advanced by a tribal or county partner.

7. Long-term cost avoidance: (30 points)

- a. Describe how your project minimizes or eliminates future costs for maintenance, operation, or emergency response. **(15 points)**

Answer 7.a. here:

This project will reduce costs over the long-term by moving working farmland out of the historic migration zone, removing development rights from the floodplain, and designing and implementing setback/removal of flood protection infrastructure. Restoring riparian areas will ultimately both restore habitat-forming processes (wood recruitment, stream shading) and reduce bank instability that leads to loss of productive farmland. By working to conserve the historic migration zone, limiting future floodplain development, and restoring natural process to the extent possible, watershed partners will minimize the future costs of maintenance and operation. Creating a protected corridor along the river that allows for modest movement of the river where natural processes can recruit large woody debris. Because of past riparian and floodplain clearing has been disrupted, with will take time to recover the process. Re-establishing riparian forest in an important first step, because it will take 50 years or more before the wood size will be appropriate for function. ELJ construction will provide near term benefits while the riparian corridor is restored.

- b. Describe how your project accounts for expected future changes to hydrology, sediment regimes, or water supply resulting from other floodplain management efforts, land use changes, extreme weather events, or other causes. **(15 points)**

Answer 7.b. here:

This project will provide substantial mitigation for the most important climate change impacts forecasted for the South Fork Nooksack valley. In this region, climate change is expected to alter the timing and availability of water. In particular, peak flows are expected to increase in magnitude and frequency, while summer base flows are expected to decrease in magnitude and increase in temperature. These changes will render flood risk reduction, salmon restoration, and agricultural viability more difficult to achieve. The project will mitigate forecasted impacts of climate change in the following ways.

Flood hazard. Warmer winter temperatures are expected to shift much precipitation in the upper basin from snow to rain (Mantua et al. 2010). This shift will increase flood magnitude and frequency. Our design will mitigate these impacts by increasing water storage in undeveloped riparian habitats, by protecting side-channel habitats to buffer salmon and other biota from peak flows, and by removing vulnerable infrastructure and land uses from flood-prone areas in the South Fork valley. Low flow reduction. Shrinking snowpack and warmer spring and summer temperatures are expected to depress summer low flows. This impact may be exacerbated by groundwater extraction, particularly in lands close to the river where extraction interferes with hyporheic flows. Our design will mitigate these impacts by reconnecting water sources in the floodplain and adjacent riparian forest with the main channel, by restoring channel complexity to promote hyporheic exchange, , and by shifting groundwater extraction to sites more distant from the river.

Water supply. WRIA1 basins, including basins associated with the South Fork, are fully or partially closed to new water allocations, despite increasing water demands that often exceed available water supply already. Climate change impacts compound this issue by reducing base flows when supply is lowest and demands are greatest. This project will mitigate the shortfall somewhat in both the South Fork and the mainstem Nooksack by increasing summer low flows.

Water temperature and quality. Declining summer flows and increasing air temperatures are likely to exacerbate problems, rising water temperatures, decreasing dissolved Oxygen, and other water quality issues. Our design will mitigate these impacts by maintaining higher base flows, restoring

riparian forest to shade the South Fork and tributary streams, and by restoring forest buffers that filter nutrients and sediment in runoff.

Salmon restoration. Climate change impacts on salmon populations in the region are expected to be severe (Mantua et al. 2010; McLaughlin 2014). Populations that are vulnerable already, such as South Fork Chinook and steelhead, lack resiliency to withstand substantial climate impacts. Our proposal will help forestall or prevent climate change-induced salmonid extinctions by mitigating climate impacts, including increasing peak flows, reduced minimum flows, and rising water temperatures.

Agricultural viability. The project will buffer South Fork agriculture from many climate change impacts by shifting operations to land less vulnerable to flooding, less dependent on expensive flood protection infrastructure, and less constrained by more strict regulations likely to be imposed by further salmon declines.

With this and other projects, WRIA1 watershed partners are working to incorporate the best available science on climate change into our conservation and restoration strategies. We are interested particularly in collaborating with NOAA, the UW Climate Impacts Group, and other partners to evaluate and quantify climate change impacts that could affect design and implementation of this project.

8. Demonstration of need and support (30 points)

- a. Describe how your project is consistent with the intent of existing floodplain management or habitat recovery plans or is specifically identified through existing plans or work programs. (Elements of the project may have been developed through more than one planning process. Please identify the planning process used for each major element if they are not from a common plan.) **(15 points)**

Answer question 8.a. here:

The *WRIA 1 Salmonid Recovery Plan* (WRIA 1 SRB 2005) specifically identifies habitat degradation as the leading cause of decline for WRIA1 salmonid populations. Restoration actions seek to address primary limiting factors of low habitat diversity, lack of key habitat, and high temperatures. The *Plan* also identifies the need to integrate salmon recovery needs into floodplain management. Detailed reach assessments and restoration planning have been completed for the lower South Fork (Lummi Natural Resources 2002; Nooksack Tribe 2006). Major objectives identified in these restoration plans include: improving instream habitat quality and diversity, restoring floodplain connectivity, restoring riparian function, and restoring wetland functions for temperature and baseflow. SRFB Restoration Strategy matrix from Nessel proposal “– Designed primarily to benefit chinook, this project will implement the following actions identified as highest priority (Tier 1) for chinook “Log jams to form deep complex pools: cool-water inflow areas,” “Log jams to form deep complex pools: other areas” and “setback or remove riprap embankments.” Project design also includes the following Tier 2 actions: “replace riprap with wood bank structures,” “reconnect and restore side channels and restore historic channel pattern,” “lower artificial levees to native bank/floodplain elevations.” Tier 2 actions involving riparian restoration will be implemented through other funding sources. Finally, this project has been identified as a “Habitat Action – Chinook Priority” in the *2014-2016 WRIA 1 Salmon Recovery 3-Year Project Plan* (WRIA 1 SRB, 2014).”

In 2010, the WRIA1 Salmon Recovery Board commissioned a study to evaluate the cumulative effects of planned restoration to flood risk in the lower South Fork using geomorphic assessment and hydraulic modeling. The study, conducted by Herrera Environmental Consultants identified opportunities and constraints for restoration, including failing levee and avulsion risk on the right bank in the lower Nessel’s Reach, which the Nooksack Tribe project will address, and the need to set back levees and to increase conveyance, which the integrated design project element will further explore and advance options.

With prior conservation acquisitions and public county park ownership upstream of Acme, there is the opportunity to further the implementation and better coordinate the public investment of several phases of salmon and flood projects (see attached maps). In 2008, Whatcom County completed an in-stream project in the Acme reach just upstream of the Acme SR9 Bridge. Whatcom County is also the right bank owner in the Acme Hutchinson reach and is the primary right bank owner in the Nessel’s reach. WLT owns the majority of the left bank in Nessel’s reach and Hutchinson reach. In 2014 – 2015, Nooksack Tribe is planning to implement the third

phase of in-stream restoration of the Hutchinson Reach (RM 9.6-10.4), and is designing and seeking funding for a three-phase project upstream in the Nessel's reach (RM 10.3-12). With Floodplains by Design funding, WLT would be able to integrate these considerable tribal, public agency and private sector resources to achieve effective flood control and salmon recovery.

The Nooksack Tribe has identified the need for \$3,160,000 in salmon recovery funding to implement future projects in the Hutchinson Phase 2a (8 log jams) and Nessel Phase 1 through 3 reaches (55 log jams) of the South Fork of the Nooksack River. This reach of the river was targeted for restoration coming from recommendations in the WRIA1 Salmon Recovery Plan 2005. This proposed project would fund Phase 3 (downstream portion of restoration is Phase 1 of 3 for a total project build out). Our proposed project will also advance a large scale high priority instream construction of 50 engineered log jams and a flood control set-back and rock removal project by Nooksack Tribe in a reach of the South Fork. Our proposed project will also design and construct flood control set-back and rock removal. The project is consistent with advancing the goals of the *WRIA1 Salmonid Recovery Plan*, South Fork Nooksack River Restoration Plans. Whatcom County River and Flood Control Zone Districts Comprehensive Flood Management Plan 1999 does not extend upstream on the Nooksack River past Deming into the forks.

The WRIA 1 Characterization conducted by Ecology (2011) classify the project area is within the landscape group mountainous. Within the WRIA1 mountainous landscape group, the project areas sub basins overall importance of water flow is rated highest for protection. The Black Slough sub basin portion of the valley is rated highest importance for restoration for water flow. The entire project area is rated highest importance for surface storage and highest restoration for surface storage. The entire project area is rated highest importance for discharge. The project area also includes highest importance for both restoration and protection of discharge.

- b. Describe which flood control authorities, Tribal Nations, local governments, lead entities, key stakeholders or decision-makers representing floodplain interests located within the river reach or affected by the project have provided letters of support explicitly endorsing the project and its outcomes for their interests. **(15 points)**

Answer question 8.b. here:

Please see letters of support attached from the following entities: Nooksack Indian Tribe, Whatcom County River and Flood, and Whatcom County Parks. WLT has collaborated with the WRIA 1 Salmon Staff Team, but the WRIA1 Lead Entity does not provide letters of support for any projects.

9. Readiness to proceed and complete the proposed phase of the project (25 points)

Describe how your project is ready to proceed with the scope of work, and your capacity to complete the project successfully and maintain it over time, including your project schedule and deliverables. Describe your experience with similar projects. If your project is acquisition only, describe how you will complete floodplain restoration subsequent to the acquisition.

Answer question 9 here:

Acquisition Project Element

Whatcom Land Trust (WLT) is a non-profit conservation organization based in Bellingham working in Whatcom County and the Nooksack Watershed. WLT was founded in 1984 and has completed more than 150 conservation transactions from simple donations to complex facilitation and land exchanges that have protected more than 20,000 acres across Whatcom County. In the South Fork Nooksack River WLT has protected more than 1,500 acres through 21 transactions, and WLT has worked and continues to advance projects with multiple partners including both Nooksack Tribe and Lummi Nation, Nooksack Salmon Enhancement Association, Whatcom Conservation District, Whatcom County and several private landowners. WLT has the capacity to design and complete complex conservation projects and responsibly steward the properties and conservation easements it owns. WLT has secured the two match

tracts with private donated funds that are primarily valley bottom farmland that can be offered as exchange - trade. These tracts were recently harvested hybrid cottonwood poplar plantations, and in the short term, WLT plans to lease these tracts to a local dairy farmer for hay and silage production, with eventual trade for riverfront conservation and restoration rights. WLT has completed some appraisals and is in the process of negotiating for the purchase of a 62 acre and a 44 acre tract that have been for listed sale over the past several years. An appraisal is underway on a 74 acre tract along Black Slough with extensive wetlands that would protect floodplain forest, tributary and wetlands. The budget also includes funds to acquire an unspecified 40 acre tract of either riverfront or farmland for trade that may become available over the next 3-4 year period while the grant is open.

Construction Project Element

Nooksack Tribe has completed preliminary design work and is seeking funds for construction of a three phase-instream restoration project. This element will fund the proposed downstream third phase of the Nessel's Reach Construction project slated for construction in 2016, provided that funding is obtained. Nooksack Tribal staff has overseen the construction of 11 log jam projects in 6 reaches in the South Fork and 2 reaches in the North Fork, with 2 additional projects planned for construction in 2014. Nooksack Tribal staff have extensive experience managing consultant contracts, providing technical input into design, preparing permit applications, and documenting as-built conditions.

Design Project Element

Whatcom Land Trust will facilitate a broad-based group to advance the design of an integrated flood risk reduction/salmon recovery project for the South Fork Nooksack River within the proposed work area. WLT will contract with qualified consultants and coordinate a local integrated Design Team to work with the consultants to develop designs for instream construction of log jams and/or removal or setback of levees and/or riprap bank hardening. Design Team members may include staff from Whatcom Land Trust, Whatcom County Public Works (River and Flood Division, Storm water and Natural Resources Division), Nooksack Tribe Natural Resources Department, and Lummi Natural Resources Department, as well as members from the (South Fork) Acme/Van Zandt Flood Control Subzone Advisory Committee. This Task entails outreach to landowners and other stakeholders, development of conceptual design and alternatives analysis for up to three proposed conditions and one no-action alternative, selection of a preferred alternative, hydraulic modeling and geomorphic assessment to inform project design and flood risk analysis, and preparation of preliminary and final design.

10. Pilot project and leverage opportunities (25 points)

- a. If applicable, describe how your project could serve as a pilot effort or result in changes or results with broader impacts to the state. **(10 points)**

Answer question 10.a. here:

Through this strategy, WLT will acquire lands in fee simple for their farmland value, protect them in perpetuity with conservation easements and then exchange the encumbered fee title for conservation easement or fee simple for riverfront farmland. By acquiring fee title

to approximately 200 acres of primarily floodplain farmland, WLT will have the opportunity to trade the protected farmland tracts for conservation easements over farmland with habitat protections along riverfront, channel migration zones and key floodplain wetland areas. This approach, using 1031 like-kind exchanges, enhances the viability of their agricultural operation by reducing fragmentation, development, and adding land to their farming operation and will create a more resilient river corridor to advance salmon recovery, while reducing flooding, and enhancing natural water storage. By employing a purchase, protection, resale / trade approach - WLT has the opportunity to acquire strategically located lands, design conservation measures and then use the land to advance further conservation measures and farming viability. If this proves to be successful, it could offer a new approach to real property conservation acquisitions, and could be used further downstream and possibly elsewhere. While there is some risk, the Purchase, Protect, re-sell / lease / trade model is not unheard of. The Maine Farmland Trust is using a Buy, Protect, Re-sell approach to protecting farmland.

- b. If applicable, describe how your project leverages existing investments, such as SRFB, FCZDs, Dike Districts, TMDLs, WWRP, ESRP, NEP, and other funding sources. Evidence of this will be based on the amount and diversity of the leveraged funding sources. **(10 points)**

Answer question 10.b. here:

Floodplains by Design leverages existing conservation and restoration investments and action on the South Fork floodplain to advance integrated floodplain management and restoration. With prior conservation and public acquisitions upstream of Acme, there is the opportunity to further the implementation and better coordinate the public investment of several phases of fish and flood projects (see attached map). In 2008, Whatcom County completed an in-stream project in the Acme reach just upstream of the Acme SR9 Bridge. Whatcom County is also the right bank owner in the Acme Hutchinson reach and is the primary right bank owner in the Nessel's reach. WLT owns the majority of the left bank in Nessel's reach and Hutchinson reach. In 2014 – 2015, Nooksack Tribe is planning to implement the third phase of in-stream restoration of the Hutchinson Reach (RM 9.6-10.4), and is designing and seeking funding for a three-phase project up-stream in the Nessel's reach (RM 10.3-12). With Floodplains by Design funding, we would be able to integrate these considerable tribal, public agency and private sector resources to achieve effective flood control and salmon recovery.

The Nooksack Tribe has identified the need for \$3,160,000 in salmon recovery funding to implement future projects in the Hutchinson Phase 2a (8 log jams) and Nessel Phase 1 through 3 reaches (55 log jams) of the South Fork of the Nooksack River. This proposed project would fund Phase 3 (downstream portion of restoration is Phase 3 of 3 for a total project build out). This proposed project will also design and construct flood control set-back. This funding will also leverage SRFB funds for the Nooksack Tribe's Nessel's Reach project by employing habitat restoration and flood risk reduction actions.

WLT will provide private match with the recent acquisition of two tracts totaling approximately 84 acres for \$538,000. The land trusts goal is to advance an integrated floodplain project that protects farmland, protects and restores habitat and reduces flood risk.

- c. If applicable, describe how your project addresses inequity or social justice issue by benefitting underserved communities. **(5 points)**

Answer question 10.c. here:

Through this project we aim to promote conservation and restoration of the floodplain ecosystem to support salmon recovery while reducing flood hazards and maintaining and conserving the agricultural land base in the rural community of Acme and Van Zandt.

11. Budget (add more tasks as needed).

South Fork Nooksack Flood Fish Farm Conservation & Restoration Innovation

| Tasks | Amount Requested from Ecology* | Other Funding for Project** (20% of Total Cost Minimum) | Total Cost |
|--|--------------------------------|---|--------------------|
| Task 1—Project Coordination and Administration | \$124,800 | \$0 | \$124,800 |
| Task 2 – Acquisitions and Land Trades | \$1,754,000 | \$538,000 | \$2,292,000 |
| Task 3 – Construction – Nettet’s Reach Phase 3 | \$1,092,358 | \$273,090 | \$1,365,448 |
| Task 4 – Integrated Feasibility and Design | \$245,800 | \$0 | \$245,800 |
| Total | \$3,216,958 (79.86%) | \$811,090 (20.14%) | \$4,063,248 |

*Amount requested from Ecology under this grant program

**Other sources of funding dedicated to this project. Insert narrative below that details what the source of funding is and whether or not it has been received or applied for but not yet received.

Match must be at least 20% of Total Project cost.

Narrative and/or Table of other funding sources for project, here:

| Task 1. Project Coordination and Administration Personnel Budget | | |
|--|------------------------|------------------|
| | Cost | Total Cost |
| Salaries Acquisition Staff | 2,400 hours @ \$32/hr. | \$76,800 |
| Fringe Benefits | 30% | \$23,040 |
| Overhead | 25% | \$24,960 |
| Total Cost | | \$124,800 |

Whatcom Land Trust has committed \$538,000 as match for two recently acquired tracts of recently harvested hybrid cotton poplar farmland that can be used as trade potential. Funds that supported these purchases were private donated land acquisition funds. (Please see acquisition budget detail and timeline below)

Task 2. Property Acquisition and Land Trades Budget Detail and Timeline

| Item | Item Description | | | |
|--|------------------------|----------------------------------|----------------------------|--|
| | Estimated Acres | Cost Estimate Land & Incidentals | Projected Acquisition Year | Estimated Trade Value / Acres / Year |
| FBD Grant Match Land Acquisitions | | | | |
| Match Tract 1 – Trade Property | 53 | \$313,000 | 8/2014 | \$275,000 (60 – 90 acres) 2016-2017 |
| Match Tract 2 – Trade Property | 31 | \$225,000 | 9/2014 | \$175,000 (40 – 50 acres) 2016-2017 |
| Match Tract subtotal | 84 | \$538,000 | - | ~120 acres |
| FBD Grant Land Acquisitions | | | | |
| FBD Acquisition Tract 1 – Trade Land | 62 | \$525,000 | 2015-2016 | \$425,000 (80 – 120 acres) 2016-2018 |
| FBD Acquisition Tract 2 – Trade Land | 44 | \$300,000 | 2015-2016 | \$225,000 (40 – 60 acres) 2016-2018 |
| FBD Acquisition Habitat Floodplain / Habitat Tract | 74 | \$500,000 | 2015-2016 | n/a |
| FBD Acquisition Alternate Tract HMZ or floodplain | 40 | \$325,000 | 2015-2017 | n/a |
| FBD Grant Subtotal | 305 | \$1,650,000 | 2015-2016 | ~150 acres |
| Acquisition Personnel | | | | |
| Salaries Acquisition Staff | Cost | | Total Cost | |
| | 2,000 hours @ \$32/hr. | | \$64,000 | |
| Fringe Benefits | 30% | | \$19,200 | |
| Overhead | 25% | | \$20,800 | |
| Total Personnel Cost | | | \$104,000 | |
| FBD Grant Acquisition Task total | | | | |
| Ecology Cost | \$1,754,000 | | WLT Cost | \$538,000 |
| Total Project Cost | | | \$2,292,000 | |

Nooksack Tribe is requesting Salmon Federal Salmon Recovery Funding Board funds for the \$273,090 match contribution to the Nessel Reach Construction. Nooksack Tribe will apply for these funds during the 2015 grant round and funds are expected to be available for construction in the 2016 summer work window.

Task 3. Nessel's Reach Construction - Project Permits & Construction Budget Detail

| Item # | Item Description | Units | Unit Cost (\$) | No. of Units | Subtotal |
|---|---|------------------------|----------------|-------------------|--------------------|
| 1 | Additional survey - subsurface bore holes | Lump Sum (LS) | 20,000 | 1 | 20,000 |
| 2 | Mobilization | LS | 91,000 | 1 | 91,000 |
| 3 | Temporary Access Road | LS | 26,000 | 1 | 26,000 |
| 4 | Temporary Access Bridge | Each (EA) | 10,400 | 3 | 31,200 |
| 5 | TESC Measures | LS | 32,500 | 1 | 32,500 |
| 6 | Dewatering, Diversion | LS | 52,000 | 1 | 52,000 |
| 7 | Side channel excavation and gravel bar nourishment | Cubic Yard(CY) | 13 | 10,000 | 130,000 |
| 8 | Type 2 ELJ | EA | 57,980 | 5 | 289,900 |
| 9 | Type 3 ELJ | EA | 28,990 | 9 | 260,910 |
| 10 | Roadside Restoration | LS | 26,000 | 1 | 26,000 |
| 11 | Levee removal and improvements | LS | 31 | 3,500 | 109,200 |
| 12 | Revegetation | LS | 39,000 | 1 | 39,000 |
| 13 | Supplies (chain, rope, shackles, etc.) | LS | 10,000 | 1 | 10,000 |
| 14 | Unleaded fuel | Gallon (GL) | 5 | 2,955 | 13,298 |
| Construction Contracts Subtotal | | | | | 1,131,008 |
| 15 | Bid Ready Design | LS | 21,000 | 1 | 21,000 |
| 16 | Permit Assistance | LS | 3,000 | 1 | 3,000 |
| 17 | Construction Observation | LS | 18,000 | 1 | 18,000 |
| 18 | Project Management | LS | 6,000 | 1 | 6,000 |
| Engineering and Design Services Contracts Subtotal | | | | | 48,000 |
| 19 | Restoration Technician (crew of 2) | Hour | 28 | 900 | 25,200 |
| 20 | Restoration Crew Lead | Hour | 18 | 900 | 16,200 |
| 21 | Watershed Restoration Coordinator | Hour | 29 | 1500 | 43,500 |
| 22 | Habitat Program Manager | Hour | 37 | 300 | 11,100 |
| 22 | Fish Biologist | Hour | 24 | 160 | 3,840 |
| 23 | Fisheries Technician | Hour | 20 | 160 | 3,200 |
| 24 | Fringe Benefits | 30% of Salaries | | | 30,912 |
| Personnel Subtotal | | | | | 133,952 |
| 25 | Plants and planting supplies | LS | 15000 | 1 | 15,000 |
| 26 | Miscellaneous project supplies (stakes, field gear) | LS | 2000 | 1 | 2,000 |
| 27 | Permit Fees | EA | 2,000 | 1 | 2,000 |
| Other Subtotal | | | | | 19,000 |
| 28 | Overhead | 25% of Direct Costs | | | 33,488 |
| Overhead Subtotal | | | | | 33,488 |
| FBD \$1,092,358 | | Match \$273,090 | | TOTAL COST | \$1,365,448 |

Task 4. Integrated Feasibility and Design Project Budget Detail and Timeline

| Item Description | Cost | Total Cost | Estimated Date of Completion |
|--|---------------------------|------------------|------------------------------|
| Engineering and design services | | | |
| Task 4a. Facilitation – Community Engagement | Lump sum | \$25,000 | 12/31/2016 |
| Task 4b. Hydraulic Modeling | Lump sum | \$60,000 | 3/31/2016 |
| Task 4c. Alternative Analysis | Lump sum | \$50,000 | 6/30/2016 |
| Task 4d. Preliminary Design and Cost Estimates | Lump sum | \$40,000 | 6/30/2016 |
| Task 4e. Design Report | Lump sum | \$30,000 | 8/31/2016 |
| Task 4g. Project Management | Lump sum | \$20,000 | 12/31/2016 |
| | TOTAL COST | \$225,000 | |
| Personnel | | | |
| Salaries: Project Manager | 400 hours @ \$32/hr. | \$12,800 | |
| Fringe Benefits | 30% | \$3,840 | |
| Overhead | 25% | \$4,160 | |
| | Personnel subtotal | \$20,800 | |
| | Task 4 total | \$245,800 | |

If it's not possible to fully fund this proposal, please describe a *phased* approach that would still significantly advance the effort:

As we anticipate two future phases of this project on the South Fork within the proposed project area, advancing design and acquisition now would be the highest priority as these elements are critical to sequencing for successful future projects. If the acquisition scope were to be reduced, removing the alternate 40 acre acquisition from the budget would reduce the scope by \$325,000.

Nooksack Tribe currently has a PSAR Large Capital Request to implement all Nasset's Reach Phases 1-3. If Nooksack Tribe is funded by PSAR Large Capital, then the construction request and match this grant could be removed, or reduced to facilitate rock set back that salmon grants will unlikely fund.

Cutting the design element of the project would hinder the sequencing and phasing of the project because watershed partners need to have integrated flood-fish restoration actions ready for a future construction request for the next anticipated 2017-19 round. If we had these funds two years ago, WRIA1 project partners would now be implementing a more integrated fish and flood project.

- 12. SCOPE OF WORK:** Please attach a Scope of Work and schedule. If your proposal is a phase of a larger multi-year project, please place this proposal in the context of the overall project and provide preliminary cost projects to complete the project.

Please see attached Scope of Work

We anticipate two more phases of the South Fork Nooksack Floodplains by Design project over the next decade moving downstream of Acme advanced by a watershed partner and working in conjunction and leveraging the ongoing salmon recovery effort on the South Fork. As acquisitions from this first phase of the project create new opportunity and an integrated design completed with the current project, there would be a future Phase II (2017-19) project that might have a more limited scope for acquisition (\$500,000 - \$750,000), integrated fish-flood Design for a different reach (\$200,000) and Construction (\$2-3 million) of the Phase I Design. Then a Phase III Project (2019-21) would likely be \$ 2-3 million for construction and possibly a limited acquisition element if needed at that time.

- 13. Maps:** Please attach at least two (2) maps to your application. The first map should be a vicinity map and the second should be a map of your project.

Please See attached three maps: Vicinity map, Air Photo Map, and Nessel's Reach Project Map. Nessel's Reach Project also includes three 11x17 figures (reduced to letter) of the project area. Full size figures available upon request.

- 14. Planting Maintenance/Survival:** If your project includes plantings, please provide a description of how you will ensure plant survival and maintenance.

Re-establishing riparian forests on newly protected lands currently devoid of riparian forest will be the next step to help address water quality and high temperature TMDL in the South Fork and critical to restoring long term riparian function. This proposed project will facilitate future planting and maintaining of the riparian buffer underwritten by other funding sources likely leveraged by our proposed Floodplain by Design project, but not included as match or funded by this proposal. Riparian planting will likely be funded by Natural Resource Conservation Service Programs like Conservation Reserve Enhancement Program (CREP), Wetland Reserve Program (WRP), or Pacific Salmon Habitat Improvement Partnership (PSHIP).

Nooksack Tribe will replant and control nonnative invasive vegetation on log jams and disturbed access areas as part of the Nessel's Reach construction project.

- 15. Photos:** Photos are not required, but if you think they enhance our understanding of your application, please include them. We are particularly interested in "before" photos that can be matched with "after" photos.

Please see attached Photo Plates with four aerial oblique photos of the project area.

- 16. Executive order 05-05, Archaeological and Cultural Resources** (online at http://www.governor.wa.gov/office/execorders/eoarchive/eo_05-05.pdf) directs state agencies to review all capital construction projects for potential impacts to cultural resources to make sure that reasonable action is taken to avoid adverse impacts to these resources. If this grant program is funded by the 2015 Legislature, successful grant applicants will be required to submit additional information to Ecology to comply with this Executive Order.

Additional factors in ranking and award: This is a very new funding source. To ensure that projects meet the objectives of the program, these additional factors will be considered in creating the proposed funding list:

- **Balance of project types:** Balance funding ready-to-proceed construction projects with funding pre-construction activities. This balance in project types is vital to ensuring success over time.
- **Geography:** There is strong interest in ensuring that projects in all areas of the state receive funding.
- **Advancing multi-benefit floodplain management:** It is important that the project list advance the principles and practical application of multi-benefit floodplain management.

Certification

I certify to the best of my knowledge that the information provided above is true and correct and that I am legally authorized to sign and submit this information on behalf of the organization applying for this grant.



9/8/2014

Signature

Date

Craig Lee, Executive Director

Printed name and Title

Whatcom Land Trust

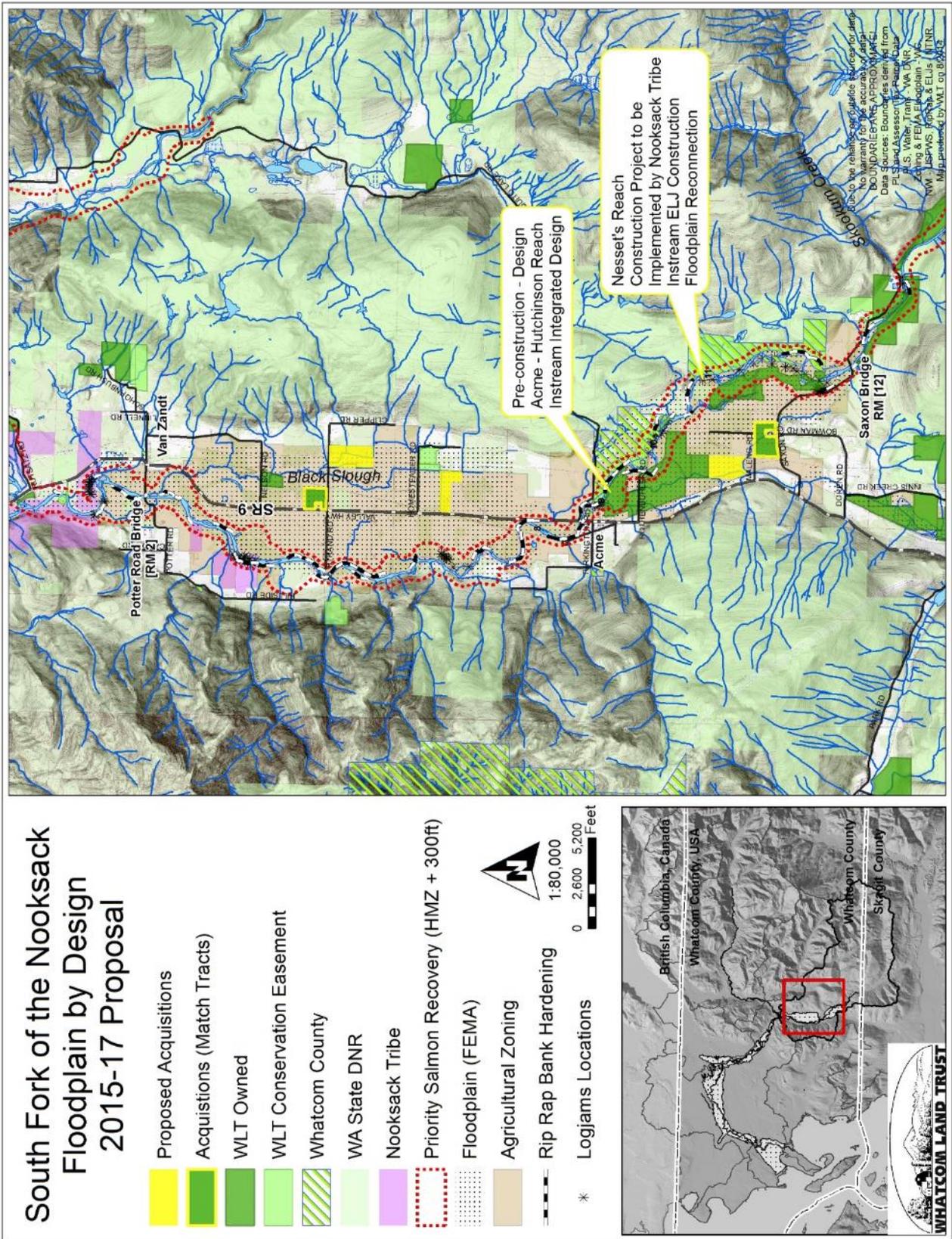
Name of Organization Applying for Grant

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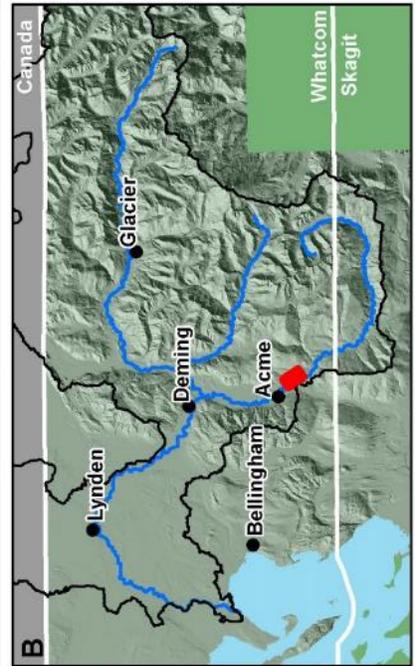
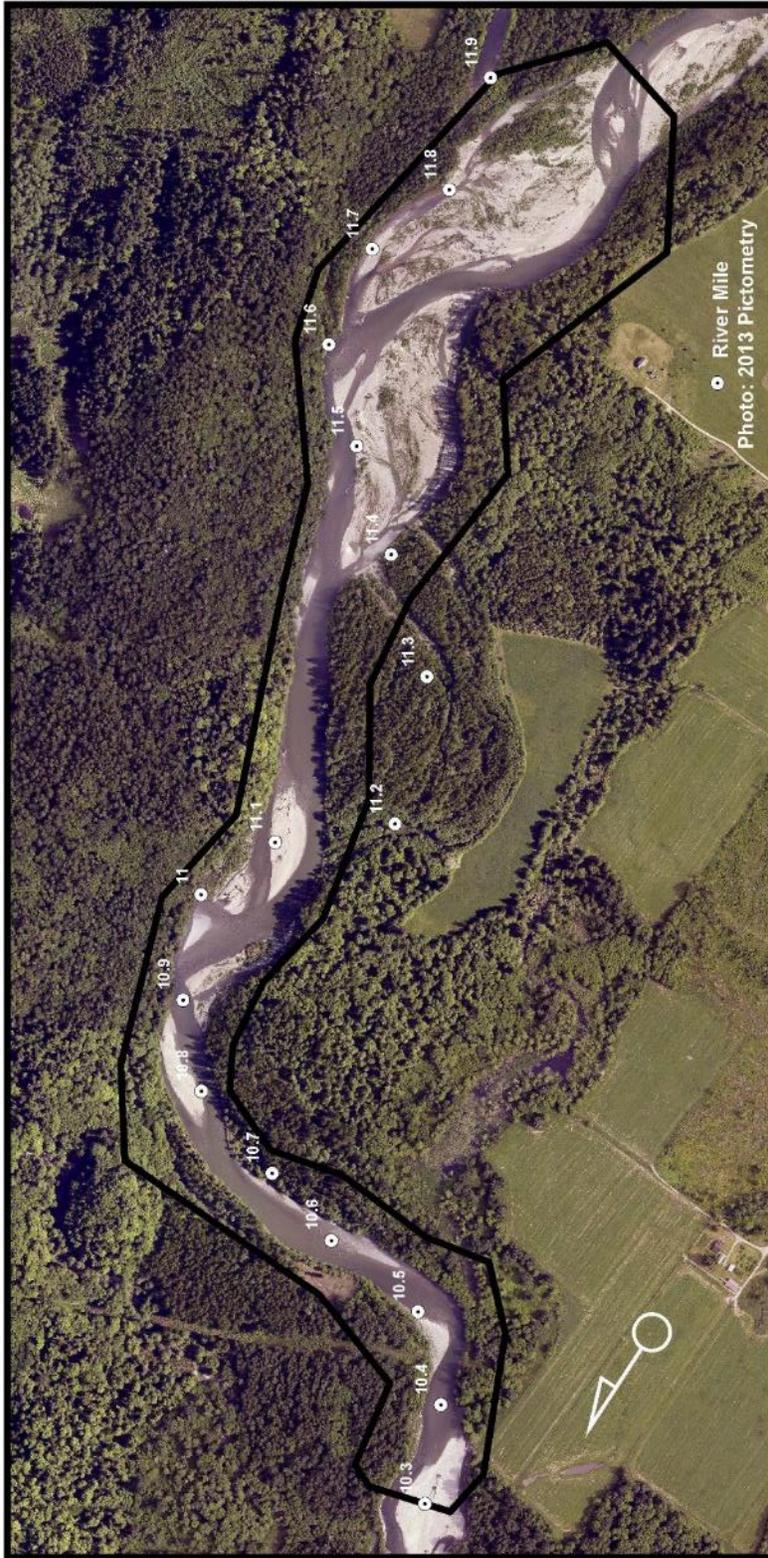
Map 1. Vicinity Map



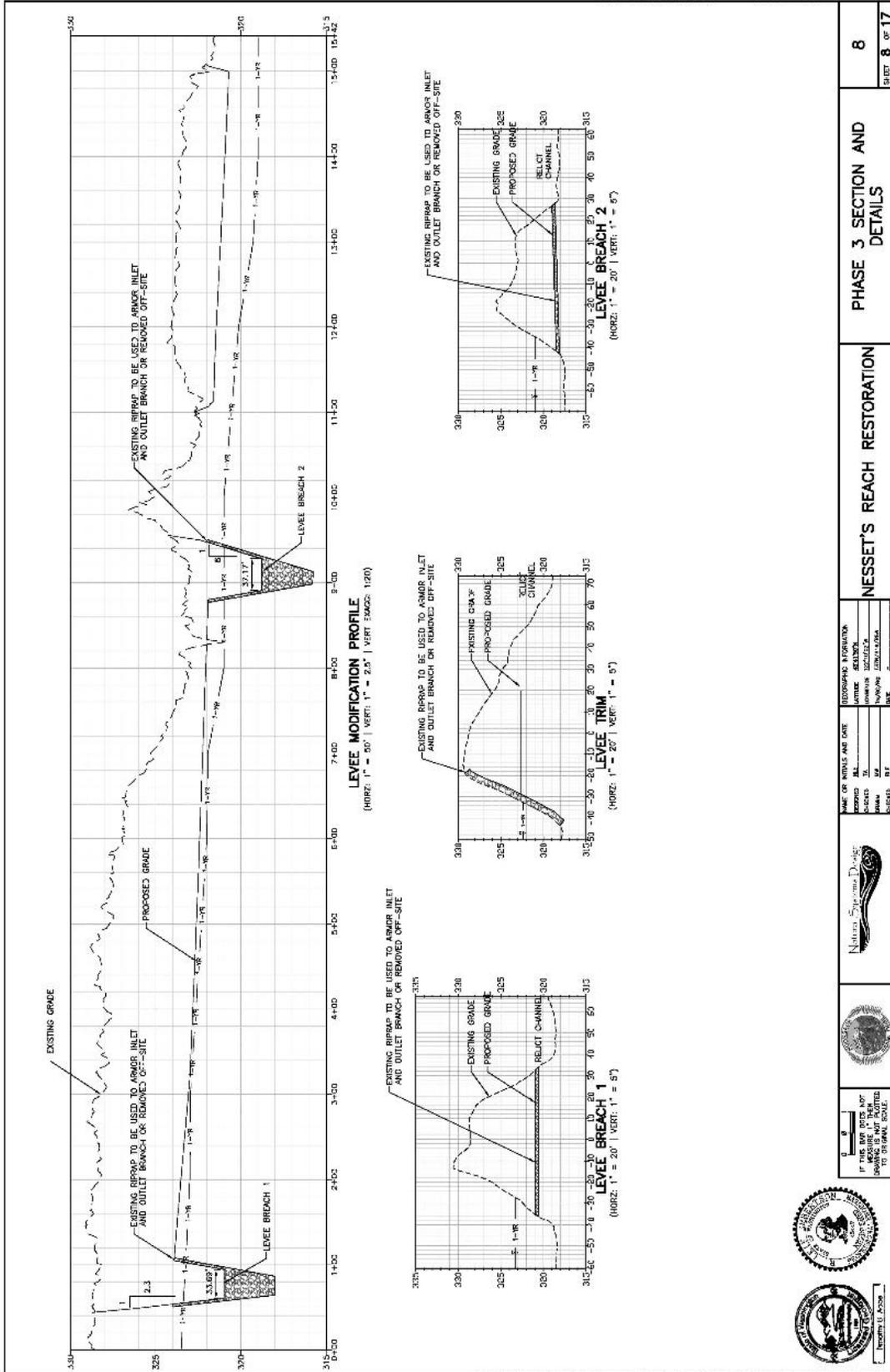
Map 2. Air Photo Map of overall project area.



Map 3. Nessel's Reach Overview



Vicinity Map, showing location of South Fork Nooksack River, Nessel Reach, within WA State (A) and Nooksack River watershed (B).



| | | | | | | | |
|---|--|----------------------------|--|---|--|-----------------------------|--|
| | | | | | | | |
| IF THIS MAP WILL NOT BE PRINTED TO ORIGINAL SCALE | | NATURE SYSTEMS DESIGN | | NAME OF PERSONS AND DATE DRAWN BY: [] CHECKED BY: [] DESIGNED BY: [] DATE: [] | | PHASE 3 SECTION AND DETAILS | |
| 8 | | NESSET'S REACH RESTORATION | | 8 | | SHEET 8 OF 17 | |

Photo Plates of Project Area



Photo 1. View of South Fork of the Nooksack River from Saxon Bridge (River Mile 12) facing North. Photo shows ELGs that have been constructed (Saxon Reach), and river has broader floodplain to occupy primarily due to a conserved reach of the river along Nessel's Reach (WLT-Skurlock 2013).



Photo 2. View of the South Fork of the Nooksack River (RM 5) near Strand Road facing West. Photo shows lack of riparian forest along bank hardened river and adjacent farmlands. (WLT-staff 2011)



Photo 3. View of South Fork of the Nooksack River from Hutchinson Creek (RM 10) facing Northwest. Photo shows ELGs that have been constructed (Nooksack Tribe 2012), and river has broader floodplain to occupy in a largely conserved reach of the river with large restoration sites on both left (WLT owned) and right bank (County Park owned) (WLT-Skurlock 2013).



Photo 4. View of the South Fork of the Nooksack river near Mosquito Lake Road facing Southeast - upstream. Photo shows area for proposed integrated design (RM9). County Park on left side of photo (WLT-Skurlock 2013).

Scope of Work

Project Title: South Fork Nooksack Flood, Fish, Farm Conservation & Restoration Innovation

Description: This project involves three different project elements to advance construction, design, and acquisition within the valley bottom floodplain of the South Fork of the Nooksack River from Saxon Road Bridge (RM 12) to Potter Road Bridge (RM 2). The project involves acquisition of wetland and riparian habitats, as well as acquisition of farmland and subsequent exchanges for riverfront farmland to advance floodplain restoration and flood risk reduction. The project involves instream construction to reduce flood risk, reconnect floodplain and restore salmon habitat. The project involves feasibility and alternatives analysis and design to advance future phase of restoration construction that may include removal and or set back of bank hardening and ELJ construction and large woody debris installation.

Work The Recipient will perform the following scope of work and is responsible for terms in this grant agreement.

Project: South Fork Nooksack River Mile 2 – 12

Location: Latitude: 48° 42' 53"N; Longitude: 122° 11' 34"W
Sections, Township 37 & 38N, Range 5E
GPS Coordinates: N 627900, E 1311700

Task 1: Project Coordination and Administration

The Recipient will coordinate, throughout the grant period, with Ecology and other Federal, state, local or tribal agencies, partners, or private landowners as necessary to ensure the objectives of this funding opportunity are met, permits have been obtained, reporting requirements are met, and that the project is on track and within budget. Coordination issues include, but are not limited to the following: land acquisition, flood plain management, construction, habitat and fish protection and restoration, cultural and archaeological resources, and permitting.

This Task also covers expenses to administer the grant, including but not limited to the following: bid preparation and advertisement, contracting, contract monitoring, coordination between the Recipient and other entities as needed to ensure project concurrence, staff reviews, construction management, and project reimbursement requests, including quarterly as well as final reports.

The Recipient will coordinate throughout the grant period with Ecology and other federal, state and local agencies, and Indian tribes as appropriate. In its commitment to providing technical assistance throughout the grant period, Ecology will meet with the Recipient present and discuss approaches to floodplain construction.

This Task also covers expenses to administer the grant, including, but not limited to: contracting; contract monitoring; coordination between the Recipient other

entities as needed, and coordination with other parties; staff reviews; construction engineering management; etc.

During the planning and design stage and prior to any ground disturbing activities, the RECIPIENT will submit to the DEPARTMENT's Project Manager one of the following:

- a. If Cultural Resources Review (Executive Order 05-05) is complete, a copy of the letter of concurrence from the Department of Archaeology and Historic Preservation (DAHP) and correspondence from any tribes.
- b. If Cultural Resources Review (Executive Order 05-05) is not complete, the RECIPIENT will submit a DAHP EZ-1 form to the DEPARTMENT's Project Manager to initiate review of project activities by DAHP and tribal governments.

WLT Cost: \$0
Ecology Cost: \$124,800

Deliverable: Progress Reports are **due** quarterly for all years per the matrix that follows:

| Progress Report | Reporting Period | Date Due |
|-----------------------------|-------------------------|------------|
| First Quarter (Year 1) 2015 | August 1 – September 30 | October 30 |
| Second Quarter | October 1 – December 31 | January 30 |
| Third Quarter (Year 2) 2016 | January 1 – March 31 | April 30 |
| Fourth Quarter | April 1 – June 30 | July 30 |
| First Quarter | July 1 – September 30 | October 30 |
| Second Quarter | October 1 - December 31 | January 30 |
| Third Quarter (Year 3) 2017 | January 1 – March 31 | April 30 |
| Fourth Quarter | April 1 – June 30 | July 30 |
| Third Quarter (Year 4) 2018 | January 1 – March 31 | April 30 |
| Fourth Quarter | April 1 – June 30 | July 30 |

| Task 1. Project Coordination and Administration Personnel Budget | | |
|--|------------------------|------------|
| Salaries Acquisition Staff | Cost | Total Cost |
| | 2,400 hours @ \$32/hr. | \$76,800 |
| Fringe Benefits | 30% | \$23,040 |
| Overhead | 25% | \$24,960 |
| Total Cost | | \$124,800 |

Task 2: Property Acquisitions

The Recipient will acquire either fee title or conservation easement interests of floodplain riparian and wetland habitats in valley bottom floodplain. Tracts identified in the grant proposal for acquisition may serve as either farmland that can be traded for riverfront conservation and restoration, or direct acquisition of riverfront tracts for conservation and restoration. Restrictions from future development will be placed on the deeds and will be recorded on the titles. Ecology shall be in receipt of complete documentation before payment is released for the acquisition. The Recipient may acquire tracts that will be used primarily as farmland within the valley bottom floodplain and offered as trade for conservation easement interests in riverfront tracts that will provide for both habitat protection and restoration. The adjacent farmland will also be protected from subdivision and development. Restrictions from future development will be placed either on the deeds or as conservation easements held by the Recipient. Ecology shall be in receipt of complete documentation before payment is released for the acquisition.

WLT Cost: \$538,000

Ecology Cost: \$1,754,000

Deliverable: (Two copies) Acquisition Report to include but not limited to:

1. A map showing the location of properties purchased;
2. List of properties with names / addresses acquired
3. Acquisition documents for each property including:
 - a. Title Reports
 - b. Appraisals
 - c. Environmental Assessments
 - d. Clean Site Certifications
 - e. Closing Statements
 - f. Offer Letters
 - g. Recorded Deeds and Easements *with* title restrictions
 - h. (Digital) photographic documentation of project properties before and after project implementation in sufficient quantity / quality to effectively illustrate project progress / demolition work.

A Status of Property Acquisitions Report will be updated and included with each quarterly progress report.

Date Due: July 30, 2018

| Task 2. Property Acquisition Timeline and Budget | Item Description | | | |
|--|-----------------------|----------------------------------|-------------------------------|--|
| | Estimated Acres | Cost Estimate Land & Incidentals | Projected Date of Acquisition | Estimated Trade Value / Acres / Year |
| FBD Grant Match Land Acquisitions | | | | |
| Match Tract 1 – Trade Property | 53 | \$313,000 | 8/2014 | \$300,000 (60 – 90 acres) 2016-2017 |
| Match Tract 2 – Trade Property | 31 | \$225,000 | 9/2014 | \$175,000 (40 – 50 acres) 2016-2017 |
| Match Tract subtotal | 84 | \$538,000 | - | ~120 acres |
| FBD Grant Land Acquisitions | | | | |
| New Acquisition Tract 1 – Trade Land | 62 | \$525,000 | 2015-2016 | \$425,000 (80 – 120 acres) 2016-2018 |
| New Acquisition Tract 2 – Trade Land | 44 | \$300,000 | 2015-2016 | \$225,000 (40 – 60 acres) 2016-2018 |
| New Acquisition Habitat Floodplain / Habitat Tract | 74 | \$500,000 | 2015-2016 | n/a |
| New Acquisition Alternate Tract HMZ or floodplain | 40 | \$325,000 | 2015-2017 | n/a |
| FBD Grant Subtotal | 305 | \$1,650,000 | 2015-2016 | ~150 acres |
| Acquisition Personnel | | | | |
| Salaries Acquisition Staff | Cost | | Total Cost | |
| | 2000 hours @ \$32/hr. | | \$64,000 | |
| Fringe Benefits | 30% | | \$19,200 | |
| Overhead | 25% | | \$20,800 | |
| Total Cost | | | \$104,000 | |
| FBD Grant Acquisition Task total | | | | |
| Ecology Cost | \$1,754,000 | | WLT Cost | \$538,000 |

Task 3: Construction and Floodplain Habitat Restoration: Nessel's Reach

Through an inter-local agreement, the Recipient will work with project partner, Nooksack Tribe, to prepare applications for and obtain all necessary permits for and construct Phase 3 of the Nessel Reach project, which involves lowering and breaching of the right bank levee and construction of 14 log jams to restore floodplain connectivity and increase flood storage. Recipient through or project partner will contract with qualified construction contractors to implement the following specific project elements:

- Access road improvements
- Deployment of temporary erosion and sediment control measures, including silt fencing and coffer dams as necessary;
- Lowering of ~1500 feet of levee to natural floodplain grade
- Breaching of levee at upstream and downstream ends to reconnect relict channel, with armoring of inlet and outlet to prevent avulsion;
- Materials and construction of 14 engineered log jams;
- Site grading post-construction; and

The Recipient, project partner and/or engineering consultant will also:

- Develop bidding documents;
- Provide construction supervision and inspection;
- Provide construction support by a licensed professional engineer;
- Acquire and install plant materials on log jams and disturbed areas; and
- Prepare as-built drawings and an as-built report to document final location of all structures and site topography.

WLT Cost: \$273,090

Ecology Cost: \$1,092,358

Deliverables:

1. Permit applications
 - a. U.S. Army Corps of Engineers *Restoration Programmatic for the State of Washington: Specific Project Information Form*
 - b. *WASHINGTON STATE Joint Aquatic Resource Project Application*
 - c. WA Department of Natural Resources *DNR Public Safety Checklist for Large Woody Debris Projects*
 - d. U.S. Army Corps of Engineers *Restoration Programmatic for the State of Washington: Specific Project Information Form*
 - e. Whatcom County *SEPA Environmental Checklist*
 - f. Whatcom County *Application for Shoreline Exemption*
 - g. Submittal for Whatcom County Floodplain Development Permit
 - h. Submittal for Cultural Resources compliance
2. Permits
 - a. WA Department of Fish and Wildlife Hydraulic Project Approval
 - b. WA Department of Natural Resources Aquatic Lands Conservation License

- c. Army Corps of Engineers Nationwide Permit: Aquatic Habitat Restoration, Establishment, and Enhancement Activities
 - d. Endangered Species Act compliance
 - e. Cultural Resources compliance
 - f. Whatcom County Shoreline Management Program Exemption
 - g. SEPA Determination
3. As-built drawings, signed and sealed by a professional engineer licensed in the State of Washington.
4. As-built project report, signed by the Project Engineer declaring that the project was, to the best of his/her knowledge, constructed and completed in accordance with the construction plans and specifications and generally accepted engineering/construction practice.
5. Digital photographic documentation of the project before and after construction in sufficient quantity to effectively illustrate important phases of construction and project progress.

Date Due: January 30, 2017

Task 3. Project Permits & Construction – Nessel’s Reach

| Item # | Item Description | Units | Unit Cost (\$) | No. of Units | Subtotal |
|---|---|------------------------|----------------|-------------------|--------------------|
| 1 | Additional survey - subsurface bore holes | Lump Sum (LS) | 20,000 | 1 | 20,000 |
| 2 | Mobilization | LS | 91,000 | 1 | 91,000 |
| 3 | Temporary Access Road | LS | 26,000 | 1 | 26,000 |
| 4 | Temporary Access Bridge | Each (EA) | 10,400 | 3 | 31,200 |
| 5 | TESC Measures | LS | 32,500 | 1 | 32,500 |
| 6 | Dewatering, Diversion | LS | 52,000 | 1 | 52,000 |
| 7 | Side channel excavation and gravel bar nourishment | Cubic Yard(CY) | 13 | 10,000 | 130,000 |
| 8 | Type 2 ELJ | EA | 57,980 | 5 | 289,900 |
| 9 | Type 3 ELJ | EA | 28,990 | 9 | 260,910 |
| 10 | Roadside Restoration | LS | 26,000 | 1 | 26,000 |
| 11 | Levee removal and improvements | LS | 31 | 3,500 | 109,200 |
| 12 | Revegetation | LS | 39,000 | 1 | 39,000 |
| 13 | Supplies (chain, rope, shackles, etc.) | LS | 10,000 | 1 | 10,000 |
| 14 | Unleaded fuel | Gallon (GL) | 5 | 2,955 | 13,298 |
| Construction Contracts Subtotal | | | | | 1,131,008 |
| 15 | Bid Ready Design | LS | 21,000 | 1 | 21,000 |
| 16 | Permit Assistance | LS | 3,000 | 1 | 3,000 |
| 17 | Construction Observation | LS | 18,000 | 1 | 18,000 |
| 18 | Project Management | LS | 6,000 | 1 | 6,000 |
| Engineering and Design Services Contracts Subtotal | | | | | 48,000 |
| 19 | Restoration Technician (crew of 2) | Hour | 28 | 900 | 25,200 |
| 20 | Restoration Crew Lead | Hour | 18 | 900 | 16,200 |
| 21 | Watershed Restoration Coordinator | Hour | 29 | 1500 | 43,500 |
| 22 | Habitat Program Manager | Hour | 37 | 300 | 11,100 |
| 22 | Fish Biologist | Hour | 24 | 160 | 3,840 |
| 23 | Fisheries Technician | Hour | 20 | 160 | 3,200 |
| 24 | Fringe Benefits | 30% of Salaries | | | 30,912 |
| Personnel Subtotal | | | | | 133,952 |
| 25 | Plants and planting supplies | LS | 15000 | 1 | 15,000 |
| 26 | Miscellaneous project supplies (stakes, field gear) | LS | 2000 | 1 | 2,000 |
| 27 | Permit Fees | EA | 2,000 | 1 | 2,000 |
| Other Subtotal | | | | | 19,000 |
| 28 | Overhead | 25% of Direct Costs | | | 33,488 |
| Overhead Subtotal | | | | | 33,488 |
| FBD \$1,092,358 | | Match \$273,090 | | TOTAL COST | \$1,365,448 |

Task 4: Integrated Project Design Plans

This Task involves the design of an integrated flood risk reduction/salmon recovery project for the South Fork Nooksack River within the proposed work area. The Recipient will contract with qualified consultants and coordinate a local integrated Design Team to work with the consultants to develop designs for instream construction of log jams and/or removal or setback of levees and/or riprap bank hardening. Design Team members may include staff from Whatcom Land Trust, Whatcom County Public Works (River and Flood Division, Storm water and Natural Resources Division), Nooksack Tribe Natural Resources Department, and Lummi Natural Resources Department, as well as members from the (South Fork) Acme/Van Zandt Flood Control Subzone Advisory Committee. This Task entails outreach to landowners and other stakeholders, development of conceptual design and alternatives analysis for up to three proposed conditions and one no-action alternative, selection of a preferred alternative, hydraulic modeling and geomorphic assessment to inform project design and flood risk analysis, and preparation of preliminary and final design.

WLT Cost: \$0

Ecology Cost: \$245,800

Deliverable: Conceptual design for three proposed alternatives
 Preliminary design drawings
 Final design drawings
 Construct quantities and cost estimate
 Final design report (includes geomorphic assessment and hydraulic modeling results)

Date Due: January 30, 2017

| Item Description | Cost | Total Cost | Estimated Date of Completion |
|--|----------------------|------------------|------------------------------|
| Task 4. Integrated Project Design Plans | | | |
| Engineering and design services | | | |
| Task 1. Facilitation – Community Engagement | Lump sum | \$25,000 | 12/31/2016 |
| Task 2. Hydraulic Modeling | Lump sum | \$60,000 | 3/31/2016 |
| Task 3. Alternative Analysis | Lump sum | \$50,000 | 6/30/2016 |
| Task 4. Preliminary Design and Cost Estimates | Lump sum | \$40,000 | 6/30/2016 |
| Task 5. Design Report | Lump sum | \$30,000 | 8/31/2016 |
| Task 6. Project Management | Lump sum | \$20,000 | 12/31/2016 |
| | Subtotal | \$225,000 | |
| Personnel | | | |
| Salaries: Project Manager | 400 hours @ \$32/hr. | \$12,800 | |
| Fringe Benefits | 30% | \$3,840 | |
| Overhead | 25% | \$4,160 | |
| | Personnel subtotal | \$20,800 | |
| | Task 4 total | \$245,800 | |

Schedule

Please include a project schedule depicting the start and end dates for each task, during each year the work will be conducted.

| Task | 2015 | | | | | | 2016 | | | | | | | | | | | | 2017 | | | | | |
|------|-------------------------------------|-------------------------------------|-------------------------------------|-------------------------------------|-------------------------------------|-------------------------------------|-------------------------------------|-------------------------------------|-------------------------------------|-------------------------------------|-------------------------------------|-------------------------------------|-------------------------------------|-------------------------------------|-------------------------------------|-------------------------------------|-------------------------------------|-------------------------------------|-------------------------------------|-------------------------------------|-------------------------------------|-------------------------------------|-------------------------------------|-------------------------------------|
| | J | A | S | O | N | D | J | F | M | A | M | J | J | A | S | O | N | D | J | F | M | A | M | J |
| 1 | <input checked="" type="checkbox"/> |
| 2 | <input checked="" type="checkbox"/> |
| 3 | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| 4 | <input type="checkbox"/> | <input type="checkbox"/> | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |

| Task | 2017 | | | | | | 2018 | | | | | | | |
|------|-------------------------------------|-------------------------------------|-------------------------------------|-------------------------------------|-------------------------------------|-------------------------------------|-------------------------------------|-------------------------------------|-------------------------------------|-------------------------------------|-------------------------------------|-------------------------------------|-------------------------------------|-------------------------------------|
| | J | A | S | O | N | D | J | F | M | A | M | J | J | A |
| 1 | <input checked="" type="checkbox"/> |
| 2 | <input checked="" type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| 3 | <input type="checkbox"/> |
| 4 | <input type="checkbox"/> |



Nooksack Indian Tribe

August 25, 2014

Adam Sant
Washington State Department of Ecology
Shorelands and Environmental Assistance Program
P.O. Box 47600
Olympia, WA 98503
Adam.Sant@ecy.wa.gov

Dear Mr. Sant and Floodplains by Design grant application reviewers,

On behalf of the Nooksack Indian Tribe, I would like to express our strong support for the *FY 2015-2017 Floodplains by Design Project Grant Application* entitled "South Fork Nooksack River – Flood, Fish, Farm Conservation & Restoration Integration" that has been submitted by the Whatcom Land Trust. Whatcom Land Trust's proposed project has the potential to significantly advance integrated floodplain management in the lower South Fork Nooksack River, benefitting the Tribe and the broader community by reducing flood risk, advancing salmon recovery, sustaining the agricultural land base, and improving water quality. We look forward to partnering with the Land Trust on this important project.

Regards,

Robert J. Kelly
Chairman

cc: Eric Carabba, Director of Lands, Whatcom Land Trust

5016 Deming Road • P.O. Box 157 • Deming, WA 98244
Administration: (360) 592-5176 • Fax: (360) 592-2125

WHATCOM COUNTY
PUBLIC WORKS DEPARTMENT

FRANK M. ABART
DIRECTOR



RIVER AND FLOOD
322 N. Commercial Street, Suite 120
Bellingham, WA 98225-4042
Phone: (360) 676-6876, (360) 398-1310
www.whatcomcounty.us

September 5, 2014

Adam Sant
Washington State Department of Ecology
Shorelands and Environmental Assistance Program
P.O. Box 47600
Olympia, WA 98503
Adam.Sant@ecy.wa.gov

Dear Mr. Sant and Floodplains by Design grant application reviewers,

On behalf of Whatcom County River and Flood, I would like to express our strong support for the *FY 2015-2017 Floodplains by Design Project Grant Application* entitled "South Fork Nooksack River – Flood, Fish, Farm Conservation & Restoration Integration" that has been submitted by the Whatcom Land Trust. Whatcom Land Trust's proposed project has the potential to significantly advance integrated floodplain management in the lower South Fork Nooksack River, benefitting the broader community by reducing flood risk, advancing salmon recovery, sustaining the agricultural land base, and improving water quality.

The Land Trust's efforts to work with agricultural landowners to reconfigure land use and ownership in the South Fork Nooksack floodplain to improve restoration opportunities and agricultural viability could also serve as a pilot program for future similar efforts in the Lower Nooksack River floodplain. As the County and Flood Control Zone District embark on updating the Comprehensive Flood Hazard Management Plan, it is likely that opportunities to improve habitat and flood protection may be improved if there is a viable way to reconfigure the ownership and land use within the floodplain.

We look forward to the possibility of working with the Land Trust to advance this important project.

Sincerely,

A handwritten signature in blue ink that reads "Paula J. Cooper".

Paula J. Cooper, P.E.
River and Flood Manager

Cc: Eric Carabba, Director of Lands, Whatcom Land Trust

WHATCOM COUNTY
Parks & Recreation
3373 Mount Baker Highway
Bellingham, WA 98226-9097



Michael G. McFarlane, Director
Christ Thomsen, Operations Manager

August 29, 2014

Adam Sant
Washington State Department of Ecology
Shorelands and Environmental Assistance Program
P.O. Box 47600
Olympia, WA 98503

Dear Mr. Sant and Floodplains by Design grant reviewers,

On behalf of the Whatcom County Parks & Recreation Department, I would like to express our support for the *FY 2015-2017 Floodplains by Design Project Grant Application* entitled "South Fork Nooksack River-Flood, Fish, Farm Conservation & Restoration Integration" that has been submitted by the Whatcom Land Trust.

Whatcom Land Trust's proposed project has the potential to significantly advance integrated floodplain management in the lower South Fork Nooksack River, benefitting the broader community by reducing flood risk, advancing salmon recovery, sustaining the agricultural land base, and improving water quality. Whatcom County owns 603 acres on the right bank of the South Fork upstream of Acme.

Whatcom Land Trust holds conservation easements on these parklands, and as conservation partner with the Trust we look forward to the multiple benefits approach advanced by this important project enhancing the public value of these lands.

Regards,

A handwritten signature in blue ink, appearing to read "Michael McFarlane", is written over the typed name and title.

Michael McFarlane
Director

Cc: Eric Carabba, Director of Lands, Whatcom Land Trust