Lewis River Aquatic Fund – Proposal

Project: North Fork Lewis River RM 13.5 Habitat Enhancements
Submitted by: Lower Columbia Fish Enhancement Group

ACC and PacifiCorp reviewers:

Enclosed below is our proposal for habitat enhancement work on the mainstem Lewis River near River Mile 13.5. We believe this site offers great opportunity for habitat enhancements that will benefit ESA-listed species that have been affected by hydro-system operations and other impacts. Habitat improvements will also benefit from the high degree of collaboration and cost-sharing with other funding entities (Salmon Recovery Funding Board / LCFRB) and landowners at this site.

We appreciate the review and comments conducted by the Aquatic Coordination Committee (ACC) on our pre-proposal submission. These comments influenced the final submittal and will be helpful for guiding project development if the proposal is accepted. We have chosen to respond directly to the ACC comments at the outset of our proposal, to make sure the reviewers' comments are explicitly and clearly addressed. Some comments are addressed further in the proposal form itself. The original ACC comments and our responses are included below, followed by the Proposal Form.

Thank you for the opportunity to submit our proposal for habitat enhancement on the mainstem Lewis River. We look forward to the opportunity to work with you further on these efforts.

Sincerely,

Tony Meyer
Lower Columbia Fish Enhancement Group

ACC Comments and Responses

The use of log jams is a concern, these are often not successful; please document support for this technique.

The use of log structures (jams and smaller accumulations) has had widespread success in restoring key habitat conditions for salmonids throughout the Pacific Northwest. The LCFEG has successfully implemented many habitat projects in the region using large wood and log jams. The consultant on this project has over 25 years experience enhancing fish habitat on over 500 projects in the Pacific Northwest and worldwide, and has found that additions of large wood are repeatedly successful in improving habitat and providing benefits to fish. This experience is supported by academic research (e.g. see Roni 2001) and by standards and guidelines that have been developed for implementing these types of projects (e.g. Saldi-Caromile et al. 2004). There is little debate within the scientific research community that properly located and constructed habitat structures consisting of large woody debris can persist for long periods and provide important benefits to fish. This is especially the case in the lower mainstem Lewis River, where hydroregulation and stream channel manipulations have had a severe detrimental impact on LWD quantities, LWD jam formation, channel complexity, and stream habitat features.

Concern with the cost of the project versus its biological benefit.

Based on the contributions from other funding sources, in-kind contributions from landowners, and the existing condition of the reach, we anticipate being able to accrue high biological benefit given the cost of the project. This reach currently has 0% pool habitat and is almost completely devoid of large wood. There is no habitat complexity or cover to provide velocity refuge and protection from predators. We anticipate constructing 4-8 habitat structures throughout this reach, but the actual number may be higher if multiple smaller structures are utilized. Even moderate-sized large woody debris jams on a stream the size of the Lewis River can easily cost in excess of $50,000 apiece. Our construction budget assumes the construction of an average of 6 habitat structures consisting of between 10 and 15 logs each. We assumed a cost of $15,000 per structure. Depending on the site analysis, structures may consist of smaller or larger accumulations, or a variety of structure sizes.

Recommend strengthening the description of project benefits related to hydro project impacts.

The proposal was amended to emphasize the benefit of the project with respect to hydro project impacts. In general, it is recognized that hydro-regulation has interrupted wood transport from upstream, thus reducing LWD numbers in the project area. Hydro-regulation has also decreased moderate intensity flood flows, which are important for creating habitat complexity. Hydro-regulation has also *increased* flows during summer and fall, which is expected to have impacts on juvenile fish bio-energetics, thus emphasizing the benefits of velocity refuge habitat.

Recommend the LCFEG strengthen the description of project benefits as they relate to hydro impacts; and describe any potential cost efficiencies that could reduce the requested funding amount, as the requested funding is a large portion of available funding.

See above response with respect to hydro impacts.

It is possible that cost efficiencies can be found that will reduce the cost required to construct habitat structures or that will increase the amount of habitat structures that can be created for a given cost. These savings may come from savings in material costs (i.e. if wood is donated), construction costs (i.e. depending on contractor bid amounts), or if additional cost-sharing can be obtained from landowners or other cooperators. It would also be possible to construct the project in phases; conducting project design as an initial phase and then constructing habitat features as a subsequent phase. Furthermore, the construction itself could also be phased, with construction of a subset of features initially, followed by construction of additional features in subsequent years. We are happy to discuss phasing alternatives further with the ACC.

Details of structure placement and function should be provided to assure the structures will persist and function during high flow events and in concert with the other planned large wood structures on the opposite bank.

It is recognized that it is necessary to design structures to persist and function during high flow events and to act in concert with other planned large wood structures. These considerations are of utmost importance for project design in this reach and will be incorporated into the set of criteria that will guide the design process. Details of structure placement and function depend on a number of considerations including fish use of the project area, scour conditions, seasonal inundation extents, substrate conditions, and feasibility/access conditions. This information will be provided

through survey data, hydraulic modeling and analysis, and geomorphology analysis. For this reason, we have not specifically identified the location of structures and will rely on the analysis and design to make the final determination.

Proposed project area is extremely shallow. Project appears to have limited if any benefit to juvenile fish rearing. One concern is left bank margins are heavily used by wild Winter steelhead for redd construction per Spring 2008 North Fork Lewis River mainstem WDFW and PacifiCorp redd surveys.

Seasonal inundation extents and water depths will be determined through hydraulic analysis as well as interviews with landowners and others familiar with seasonal flow conditions at the site. This information will assist in the final determination of structure placement.

The benefit to juvenile fish rearing is a primary emphasis of the project and we therefore welcome more specifics from ACC members regarding their concerns about the benefit to this life-stage. This project targets juvenile fish rearing, especially for transient spring/early summer rearing of Chinook that originate in upstream spawning reaches as well as year-round steelhead and coho rearing. Cover, complexity, and velocity refuge will be provided for juvenile fish rearing throughout the year. Species use of structures will vary depending on time of year, flow conditions, size of fish, and competition with other species for habitats. Juvenile seining by WDFW in June/July shows significant use of this reach for the early-rearing life-stage of Chinook and some use by other species (WDFW seining data 2004-2008). This seining effort targets juvenile Chinook in June and July; juvenile fish use at other times of the year has not been investigated to our knowledge. However, based on steelhead spawning within this reach (WDFW data 2008), we expect habitat enhancements will benefit 0-age rearing of local-origin steelhead. Enhancements are also expected to benefit rearing of age-1 steelhead that originate elsewhere in the basin. Features will also provide habitat for coho summer and winter rearing and have the potential to enhance early rearing habitat for chum.

WDFW steelhead redd survey data was obtained in response to this comment. The locations of 2008 redds are included in Figure 1. This comment is very pertinent to project design. Considerations for steelhead spawning will be incorporated directly into project design criteria and will be one of the factors used to determine structure sizes and locations. Depending on objectives, structures can be configured to enhance substrate storage and sorting to provide benefits to spawning. Structures can also be located in proximity to spawning areas in order to enhance the limited habitat diversity that is available following emergence – at the fry colonization and 0-age active rearing life-stages (habitat diversity is the primary limiting factor for these high priority life stages according to the 2004 Recovery Plan). It is also possible to altogether avoid structure placement in or near steelhead spawning areas if this is determined to be the best approach. Project designers anticipate working with the ACC and other technical reviewers to develop design criteria that will address these and other issues.

PROPOSAL FORM -
Lewis River Aquatic Fund

1. Project Title
   North Fork Lewis River RM 13.5 Habitat Enhancements

2. Project Manager
   Tony Meyer
   12404 SE Evergreen Hwy
   Vancouver, WA 98683
   360-882-6671 cwfish@comcast.net

3. Identification of problem or opportunity to be addressed

This project enhances fish habitat conditions along the mainstem Lewis River near River Mile (RM) 13.5. The project entails construction of large woody debris (LWD) and boulder structures along a reach of river that is devoid of complex habitat necessary to provide cover, velocity refuge, sediment sorting, and a source for food production. The proposed statement of work and budget assumes the placement of 4 to 8 habitat structures comprised of LWD, boulders, and slash material. The specific size and location of structures will be determined as part of project design. The general area for habitat enhancements is included in Figure 1.

The project area falls within reach Lewis 5, a Tier 1 reach according to the Lower Columbia Salmon Recovery and Fish & Wildlife Subbasin Plan (LCFRB 2004). Habitat will be created for ESA-listed Chinook, coho, steelhead, and chum. These runs have experienced significant drops in abundance and productivity compared to historical conditions (LCFRB 2004). The fall Chinook run is regarded as one of the most important runs in the Lower Columbia region. The majority of spawning for this population occurs just upstream of the project reach. Enhancement features in the project reach will benefit juvenile fish originating from these upstream spawning grounds. The project will also improve juvenile rearing and adult holding habitat for other species and will provide benefits to spawning habitat through substrate storage and sorting.

The hydropower system, as well as other local and watershed-scale factors, have impacted habitat conditions in the study reach. This reach is currently composed of a long glide with little cover, complexity, or pools. The area has experienced past clearing and snagging, past gravel mining, residential development, blockage of LWD transport due to the dams, and flow regulation. These impacts have reduced LWD loading, reduced channel complexity, and have reduced habitat-forming processes (e.g. floods and LWD recruitment) necessary for creating and maintaining complex habitats. Erosion at the site contributes fine sediment to the project reach and to Tier 1 downstream reaches that have sediment as a primary limiting factor (Lewis 3, Lewis 4A, Lewis 4B, and Lewis 4C).

The project will design and construct LWD/boulder structures along portions of the left and right banks throughout the project area. Final locations and scale of structures will be determined through analysis and design. Structures will provide important velocity refuge, pool formation, and cover habitat that will benefit adult holding and juvenile rearing for chum, coho, winter steelhead, and fall Chinook. Structures constructed along the eroding right bank will reduce persistent inputs of fine sediment into the channel. This project will re-introduce wood quantities to within the range of what would be expected under historical conditions prior to hydroregulation, riparian timber harvest, and river manipulations. Riparian restoration will remove invasive plant species and will include planting of native riparian species throughout the project area.

4. Background

This project is part of a larger cooperative effort along this reach that will enhance off-channel and in-channel habitat. Salmon Recovery Funding Board (SRFB) funds have been awarded to the LCFEG to design and construct 2-4 log jams along a portion of the right bank. SRFB funding has also been obtained to design side-channel, off-channel, and tributary habitat enhancements within the left-bank floodplain area. Funds requested by the Aquatic Coordination Committee (ACC) will be used to complete comprehensive habitat treatments in this area that compliment and enhance the SRFB-funded activities and provide the greatest potential habitat benefit.

Past reach assessments, watershed assessments, and data collection efforts support the implementation of fish habitat enhancements in the project reach. This reach supports multiple salmon and steelhead species life-stages, including spawning, rearing, migration, and adult holding. Reach-scale data on the lower NF Lewis has been recorded as part of re-licensing assessments, WDFW monitoring, LCFRB habitat studies, and assessments conducted by private landowners. In general, these studies have found a lack of quality pool habitat, a lack of off-channel habitat, low LWD quantities, and significant impacts related to recreation, land-use, and hydro-regulation.

Pool habitat, riparian shade, off-channel habitat, and LWD quantities were all in poor condition in this reach according to the 2004 habitat assessment commissioned by LCFRB (R2 Resource Consultants 2004). Habitat unit composition was rated as 0% pool habitat, 48% riffle habitat, and 52% glide habitat. Very little LWD was observed in the reach. Similar results for LWD quantities were obtained as part of re-licensing studies (WTS-3 Relicensing Report, PacifiCorp 2004) and as part of the 2007 LWD assessment (Johnston et al. 2008), which observed only 3 “key”pieces throughout the entire 3 mile reach in which the project area is located. The LWD study noted not only a lack of LWD quantities, but an almost non-existent supply of large wood pieces of the size necessary to self-anchor within the mainstem Lewis and initiate jam formation. This was attributed to blockage of wood transport by the dams, a lack of riparian trees of sufficient size, and channel modifications along the lower river. This condition has resulted in a reach of river that is almost completely devoid of complex habitat structure.

The 2007 LWD study recommended installation of large woody debris structures along this segment of stream. This project will help to accomplish this recommendation and will bring LWD quantities back into target ranges for the reach (e.g. >67 pieces per 100m, from LWD Study).

Other past work at this site provides a basis for project implementation. A site survey and hydraulic model are available from a 2005 study at this location conducted by Interfluve. This data will need to be updated but can be used to streamline data collection and analysis. There has also been coordination conducted with landowners by the Lower Columbia Fish Enhancement Group (sponsor) as well as Inter-Fluve. LCFEG and Inter-Fluve have identified this area as a potential project site in the past and have developed a working relationship with the landowners in order to move the project forward.

5. Project Objective(s)

Project objectives will be refined in coordination with technical stakeholders and landowners. Preliminary project objectives include:

1) Increase channel complexity and velocity refuge along channel margins to benefit adult holding and juvenile rearing

2) Promote development of high quality scour pool habitat with wood cover to benefit adult holding and juvenile rearing

3) Increase wood quantities to greater than 67 pieces/100 meters, which is the mean historical value based on empirical equations used to estimate historical wood loading for this reach (from Johnston et al 2008).

4) Restore the native riparian plant community. Riparian areas will be planted with site-adapted native riparian species. Invasive/noxious species will be removed. A long-term riparian maintenance plan will be developed.

This project addresses the following Aquatics Fund objectives (Lewis River Hydroelectric Projects Settlement Agreement, 2004):

Objective 1: Benefit fish recovery throughout the North Fork Lewis River, with priority to federal ESA-listed species. This project benefits fish recovery in the NF Lewis River, with priority given to federal ESA-listed species. Habitat diversity will be increased throughout the project reach and critical habitat will be created for ESA-listed Chinook, coho, steelhead, and chum.

Objective 2: Support the reintroduction of anadromous fish throughout the Basin. Habitat enhancements in this reach will improve migration, holding, and juvenile rearing condtions for fish populations that are reintroduced throughout the basin. Enhancements will have particular benefit to steelhead and spring chinook that are reintroduced to the upper basin. Steelhead juveniles that originate in the upper basin would be expected to rear in the lower river as age-1 fish. Spring Chinook originating in the upper basin would be expected to utilize enhancements for transient rearing during outmigration.

Objective 3: Enhance fish habitat in the Lewis River Basin, with priority given to the North Fork Lewis River. Proposed habitat improvements are located on the NF Lewis River and are configured to benefit multiple species, including Chinook, chum, steelhead, and coho.

This project also addresses the following Aquatics Fund project feasibility considerations (Lewis River Hydroelectric Projects Settlement Agreement, 2004):

Whether the activity may be planned and initiated within one year. This project will be designed this Spring and is targeted for construction in Summer 2009.

Whether the activity will provide long-term benefits. This project will provide long-term habitat enhancements in the form of LWD/boulder habitat structures and a restored riparian community along a reach that currently lacks the habitat features and appropriate diversity for multiple lifestages of ESA-listed fish.

Whether the activity will be cost-shared with other funding sources. This project will compliment and be highly coordinated with SRFB-funded design and construction projects within the project area. Cooperating landowners are contributing $30,000 to habitat enhancements and the LCFEG is providing $20,000 in cost-share.

Probability of success. Project design will be conducted by engineers, habitat biologists, hydrologists, and fluvial geomorphologists who have been successfully designing and constructing similar habitat enhancement features in the Pacific Northwest for decades. The design process will be guided by a set of established design criteria to ensure all objectives are met. These factors, along with a proven track record of experience and past project success, will result in meeting or exceeding the above stated goals and objectives for this project.

Anticipated benefits relative to cost. This project will accrue large benefits per cost due to: 1) the large potential for significantly improving habitat quantity and quality in the reach, 2) efficiency in design and construction due to cooperative landowners, ease of access, complimentary projects, and experience of designers, and 3) cost-sharing with landowners, LCFEG, and the SRFB.

This project addresses the following Recovery Plan Objectives/Measures (LCFRB 2004):

Restore riparian conditions throughout the basin. Riparian restoration will be conducted in association with habitat enhancments and will include invasive species management, re-planting, and maintenance.

Restore channel structure and stability. LWD jams will restore channel structure and stability

Create/restore off-channel and side-channel habitat. Depending on results of the analysis and design, habitat structures may be located within existing off-channel areas along channel margins. All structures will compliment proposed side-channel and off-channel enhancements on the left bank.

This project addresses "stream channel habitat structure and bank stability" and "riparian conditions and functions", both of which are considered a High priority according to the LCFRB 6-year Habitat Work Schedule and Lead Entity Habitat Strategy (LCFRB 2008).

The following species-specific list presents the primary life-stage limiting factors that will be addressed by the project (from EDT limiting factors analysis, LCFRB 2004):

- Chinook –Habitat Diversity, Channel Stability, and Flow (velocity refuge) for fry colonization
- Winter steelhead – Habitat Diversity for summer and winter rearing
- Coho – Habitat Diversity, Channel Stability, and Key Habitat Quantity for juvenile rearing
- Chum – Habitat Diversity and Key Habitat Quantity for prespawning holding. Habitat Diversity, Channel Stability, and Flow (velocity refuge) for fry colonization.

Physical and biological criteria will be used to guide project design and to evaluate project benefits. The following metrics will be included, and possibly others as determined during development of final design criteria:

- Wood pieces (cover) and LWD jams per 100m
- Pool frequency, composition, and quality (i.e. residual depths)
- Velocity refuge/reduction
- Riparian tree canopy cover and species diversity

6. Tasks

Task 1: Coordination, Management, and Reporting

LCFEG will provide project management and will be the primary liason with PacifiCorp and the ACC. Regular progress reporting will be conducted as requested by the ACC and PacifiCorp. Periodic project review meetings will be held with PacifiCorp, the ACC, LCFEG, LCFRB, and Inter-Fluve as appropriate to ensure project milestones are being met.

Deliverables:

- 3 Meetings with landowners, contractors, consultants, and other stakeholders

- Regular progress reporting to PacifiCorp, ACC, and LCFRB TAC
- Coordination and administration of contracts

Task 2: Site Survey

This task will be conducted by Inter-Fluve with cooperation from and coordination with LCFEG staff. Site survey will rely partially on work conducted as part of the SRFB-funded side-channel design project. Additional survey will be conducted to site and design habitat structures and to conduct hydraulics analysis.

Deliverables:

- Topopgraphic survey of habitat structure locations using a total station instrument
- Contour map of project area

Task 3: Analysis and Design

This task will be conducted by Inter-Fluve Inc. with cooperation from and coordination with LCFEG staff. Analysis and design will focus on determining specific designs and locations of habitat structures in the project area. This will require hydraulics analysis, seasonal inundation analysis, examination of seasonal fish distribution, and determination of machinery access locations.

Preliminary designs will be reviewed prior to carrying them forward to final design. The final design package will include final design drawings, material estimates, specifications, a contractor bid-package, and an engineers cost estimate.

Deliverables:

- Preliminary review drawings
- Final design drawings
- Material quantities, cut and fill quantities, and design specifications
- Contractor bid package
- Engineers cost estimate

Task 4: Permitting

This task will be performed by Inter-Fluve Inc. with support from LCFEG. Permit requirements are included below in Section 10 of this proposal. Permit-specific drawings will be created in order to satisfy agency requirements. Cut and fill quantities and a grading plan will be included as necessary. Inter-Fluve will work in collaboration with LCFEG to complete the narrative portions of permit applications.

Deliverables:

- Permit drawings
- Materials quantities and unit estimates as required by permit agencies
- Collaboration with LCFEG on completing narrative sections of permits

Task 5: Construction

Construction details, including specific number, size, and location of structures will be determined through the design process. A contractor will be selected to perform construction activities according to the LCFEG and granting agency requirements. Materials may be sourced from cooperators, purchased outright, or contracted through the machinery contractor.

Riparian planting will follow construction in Fall 2009 and/or Spring 2010 (assuming 2009 construction).

Deliverables:

- Constructed project features according to final design
- Riparian restoration completed

Task 6. Construction Oversight

Construction oversight will be provided by Inter-Fluve to verify conformance with project designs and to instruct contractors on habitat structure construction. Oversight also covers construction oversight for LWD jams constructed as part of SRFB-funded project. Oversight assumes that at least one staff member is on-site for the duration of construction.

Deliverables:

- Oversight of construction activities (includes oversight for construction of SRFB-funded LWD jams on right bank)

Task 7: Monitoring

Project monitoring will occur pre-implementation, during implementation, and post-implementation. Monitoring will include a habitat survey of the project reach that will include measurement of habitat attributes including LWD counts, pool frequency, pool quality, erosion, riparian cover, and others. The project site will be photo-documented to track changes in condition pre- to post-implementation. Consistent photo points will be established and repeat photographs will be taken over time. See Section 14 for additional information. Snorkel surveys will also be conducted pre- and post-construction in order to document fish use of structures. Specific sampling times and frequency will be determined in conjunction with stakeholders.

Deliverables:

- Monitoring report including pre- and post-implementation habitat surveys, photo-documentation results, and results of snorkel surveys.

7. Methods

The project includes the design and installation of large woody debris structures anchored along lateral channel margins and ballasted through burial, wood piling ballast, and boulder ballast. Specific locations of structures will be determined as part of the design and will depend on the following considerations: 1) channel hydraulics, 2) seasonal inundation extents, 3) specific species life-stage usage in the reach, and 4) access, landowner, and feasibility considerations. Inter-Fluve Inc will perform project design, permitting, and construction oversight. The project sponsor will work closely with the Lewis River ACC and other cooperators to ensure restoration objectives are met.

Methods for design and construction will follow established protocols that have a proven track record for successfully improving habitat conditions in Pacific Northwest rivers. Construction techniques and benefits of wood and rock structures for fish habitat enhancement are well-established (Saldi-Caromile et al. 2004). Furthermore, the project sponsor and project consultants have extensive experience designing these types of enhancement features. Project design will be conducted by engineers, habitat biologists, hydrologists, and fluvial geomorphologists who have

been successfully designing and constructing similar habitat enhancement features for decades. Inter-Fluve has over 25 years of experience designing habitat structures made up of combinations of large wood and rock material. Inter-Fluve has designed and constructed hundreds of these projects, encompassing a range of various structure types depending on objectives and river conditions. LCFEG also has a proven track record of successfully constructing these types of structures throughout the Lower Columbia region. The design process will be guided by a set of established design criteria to ensure all objectives are met.

Riparian restoration will occur throughout the project area in conjunction with other project components. Riparian restoration will utilize local, native species to rebuild the natural riparian plant community and to reduce the incidence of invasive species.

8. Specific Work Products

The following products will be produced:

- Regular progress reports to accompany invoices
- Periodic progress and review meetings
- Survey and analysis results
- Preliminary and final designs
- Design justification narrative
- Contractor bid package
- Permit documents and drawings
- Construction of habitat structures
- Riparian restoration
- Monitoring data and summary reports

9. Project Duration

Project duration is targeted at 15 months, which includes construction in 2009 and completion of post-implementation monitoring in July/August 2010. Duration may extend longer if construction does not occur in 2009.

Target Schedule:

Milestone	**Target Date**
Project initiation:	April/May 2009
Survey:	April/May 2009
Analysis and Design:	April to July 2009
Permitting:	April to July 2009 (May be able to get permit process underway as part of SRFB-funded project).
Construction of habitat structures:	Completed by October 2009 (depending on ability to acquire permits in time for 2009 construction)
Completion of riparian restoration:	Fall 2009 and/or Spring 2010
Completion:	Fall 2009 or 2010, depending on construction timing
Monitoring:	June/July 2009 and June/July 2010

10. Permits

The list below includes potential permitting requirements. The Washington State Joint Aquatic Resource Permit Application (JARPA) would be used to apply for several of these permit requirements with one application process. The permits covered by JARPA are noted. The US Army Corps of Engineers in-water work window for this location is August 1 to August 31.

- Aquatic Lands Use Authorization – Dept of Natural Resources (JARPA)
- Dredge/Fill Permit (Section 404) – US Army Corps of Engineers (JARPA)
- Hydraulics Project Approval (HPA) – Dept of Fish & Wildlife (JARPA)
- Water Quality Certification (Section 401) – Dept of Ecology (JARPA)
- Fish Habitat Enhancement Projects – Dept of Fish & Wildlife (JARPA) – If project fits within this category then permitting can be streamlined to avoid SEPA and local permits.
- Archeological & Cultural Resources – Dept of Archeology and Historic Preservation
- Endangered Species Act Compliance (ESA) – US Fish & Wildlife Service/NMFS. ESA compliance can be streamlined through LCFEG's 10a1a permit.
- No rise certification – Federal Emergency Management Agency (FEMA) - The design will need to satisfy a no-rise condition of the FEMA base flood water surface elevation.
- Local permits (e.g. Shorelines Conditional Use, Shorelines Substantial Development) – Clark and/or CowlitzCounty
- SEPA/NEPA – Habitat enhancement projects are often exempted. If not, review typically takes the form of a checklist that is reviewed and approved by the lead agency.

Permit applications (i.e. JARPA) will be submitted as soon as possible to ensure approvals are obtained prior to the desired start date for implementation.

11. Matching Funds and In-kind Contributions

- Lower Columbia Fish Recovery Board (LCFRB) / Salmon Recovery Funding Board (SRFB) – SRFB funds have been awarded for construction of 2-4 log jams on the right bank and for design of side-channel and off-channel habitat within the left bank floodplain. The LCFRB staff and TAC have assisted with review of the proposed treatments and will be important cooperators throughout project implementation.
- Lower Columbia Fish Enhancement Group: LCFEG has agreed to provide $20,000 of in-kind services and materials as part of the SRFB-funded project. The LCFEG has conducted numerous stream habitat projects in the region and will play an active role in design and implementation of enhancements.
- Sam Kysar (left bank landowner): Sam is very supportive of this effort and will play an active role in project planning, implementation, maintenance, and monitoring. Sam owns and operates a heavy-machinery company and has indicated his interest in providing project support in the form of labor and materials and long-term maintenance and monitoring.

- Bill Sheretz (right bank landowner): The Sherertz family will be contributing an in-kind contribution ($30,000) for streambank treatments on the right bank along their property. The Sherertz family commissioned an initial study of project alternatives at this site in 2005 that was conducted by Inter-Fluve Inc. Data collection and analysis performed as part of this study will provide an initial basis for project design.

12. Peer Review of Proposed Project

We believe the high degree of technical experience and local knowledge of ACC members and PacifiCorp staff will allow for an adequate independent peer review of this proposal. We welcome any comments, input, or questions about the proposal and are happy to provide any additional information that is requested.

13. Budget

The budget is included as Figure 2.

14. Photo Documentation (Per National Marine Fisheries Service's Biological Opinion for Relicensing of the Lewis River Hydroelectric Projects):

Photo documentation will be performed throughout the project area. Photo points will be established that provide both general and close-up views of the project area and specific project components. Photos will be taken prior to construction, during construction, and post-construction. Each photo will be labeled with date, time, project name, photographer's name, and documentation of the subject activity.

References:

Johnston, G., M. Fox, and J. Lando. 2008. Lewis River Large Woody Debris Assessment. Prepared for PacifiCorp, Portland, OR.

LCFRB (Lower Columbia Fish Recovery Board). 2004. Lower Columbia Salmon and Steelhead Recovery and Subbasin Plan. Prepared for Northwest Power and Conservation Council.

PacifiCorp. 2004. Stream channel morphology and aquatic habitat study (WTS-3 Study). Final Licensees' 2001 Technical Studies Status Report for the Lewis River Hydroelectric Projects.

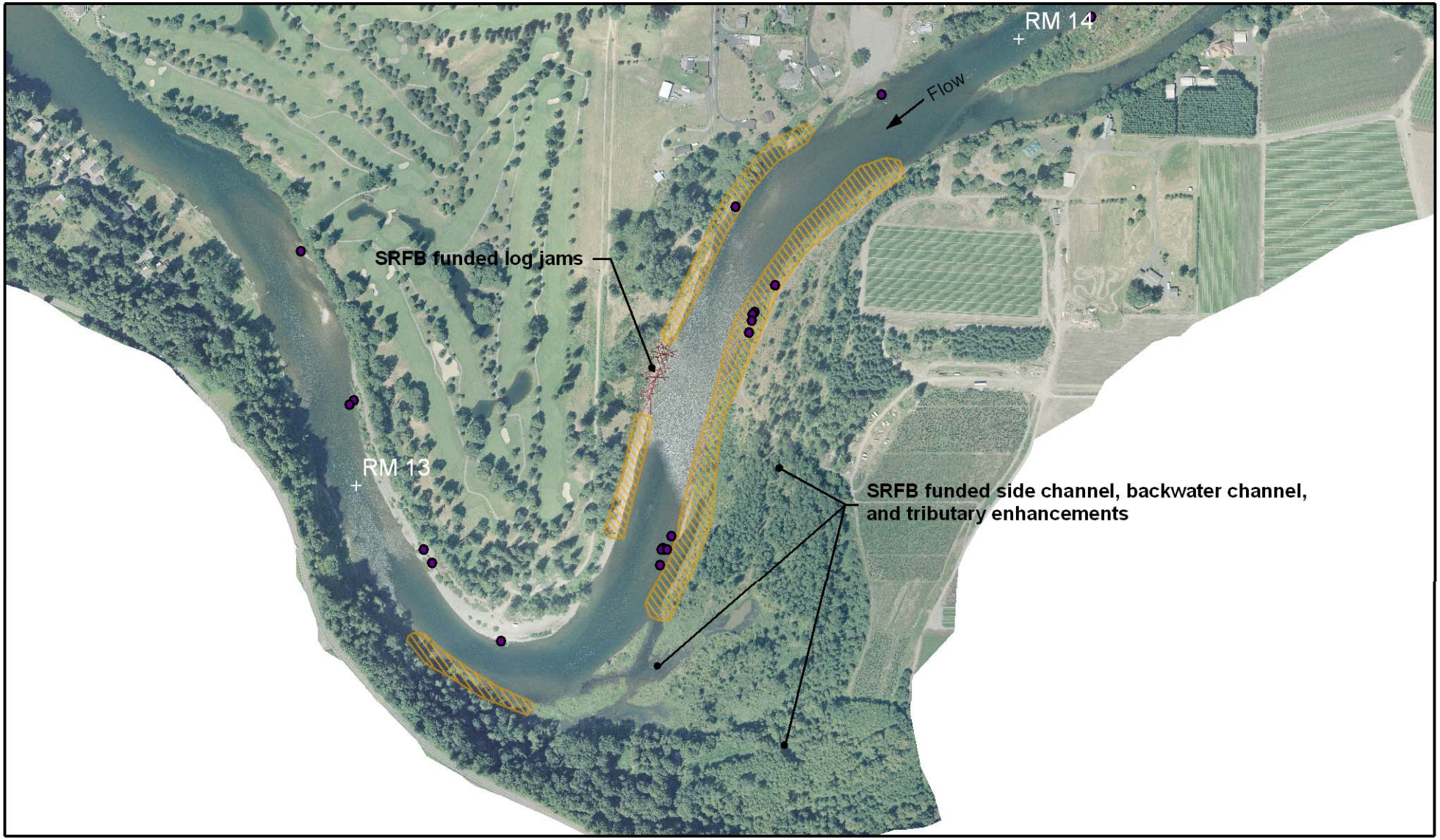
R2 Resource Consultants. 2004. Kalama, Washougal and Lewis River Habitat Assessments Chapter 3: The North Fork Lewis River Basin.

Roni, P. 2001. Responses of fishes and salamanders to instream restoration efforts in western Oregon and Washington. Project Completion Report. National Marine Fisheries Service – Northwest Fisheries Science Center, Seattle, WA.

Saldi-Caromile, K., K. Bates, P. Skidmore, J. Barenti, D. Pineo. 2004. Stream Habitat Restoration Guidelines: Final Draft. Co-published by the Washington Departments of Fish and Wildlife and Ecology and the U.S. Fish and Wildlife Service. Olympia, Washington.

Figure 1: Lewis River Aquatic Fund - Proposal

Plan View for: North Fork Lewis River RM 13.5 Habitat Enhancements



Legend

- Potential locations for habitat structures
- 2008 Winter Steelhead redd locations (WDFW data)
- SRFB-funded log jam placements

0 125 250 500 750 1,000 Feet

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2005 aerial photography obtained from PacifiCorp

LOWER COLUMBIA FISH ENHANCEMENT GROUP

inter·fluve

Figure 2: Budget

Lewis River Aquatic Fund proposal - Lewis River (River Mile 13.5) Habitat Enhancement

Lower Columbia Fisheries Enhancement Group

	ESTIMATED HOURS BY RESOURCE				LABOR COSTS BY RESOURCE					DIRECT COSTS BY ITEM			
	Executive Director	Project Manager	Staff	Operations Director	Executive Director $50.00	Project Manager $50.00	Staff $50.00	Operations Director $50.00	Total	Trans.	Supplies	Contractual	Total
Task 1: Coordination, Management, and Reporting													
Coordination and oversight (Tony Meyer)	100				$5,000	$0	$0	$0	$5,000				$0
Project management (Pete Barber)		130			$0	$6,500	$0	$0	$6,500				$0
Contract administration and reporting (Tammy Weisman)				30	$0	$0	$0	$1,500	$1,500				$0
SUB TOTAL	100	130	0	30	5,000	6,500	0	1,500	13,000	0	0	0	0
TASK 1.0 ESTIMATE $13,000									$13,000				$0
Task 2: Site Survey													
Consultant Services					$0	$0	$0	$0	$0			$7,000	$7,000
SUB TOTAL	0	0	0	0	0	0	0	0	0	0	0	7,000	7,000
TASK 2.0 ESTIMATE $7,000									$0				$7,000
Task 3: Analysis and Design													
Consultant Services					$0	$0	$0	$0	$0			$17,000	$17,000
SUB TOTAL	0	0	0	0	0	0	0	0	0	0	0	17,000	17,000
TASK 3.0 ESTIMATE $17,000									$0				$17,000
Task 4: Permitting													
Consultant Services					$0	$0	$0	$0	$0			$8,000	$8,000
SUB TOTAL	0	0	0	0	0	0	0	0	0	0	0	8,000	8,000
TASK 3.0 ESTIMATE $8,000									$0				$8,000
Task 5: Construction													
Contractor + materials					$0	$0	$0	$0	$0			$110,000	$110,000
LCFEG construction assistance			160		$0	$0	$8,000	$0	$8,000				$0
SUB TOTAL	0	0	160	0	0	0	8,000	0	8,000	0	0	110,000	110,000
TASK 3.0 ESTIMATE $118,000									$8,000				$110,000
Task 6: Monitoring													
Consultant Services					$0	$0	$0	$0	$0			$11,000	$11,000
SUB TOTAL	0	0	0	0	0	0	0	0	0	0	0	11,000	11,000
TASK 3.0 ESTIMATE $11,000									$0				$11,000
Task 7: Construction Oversight													
Consultant Services					$0	$0	$0	$0	$0			$16,000	$16,000
SUB TOTAL	0	0	0	0	0	0	0	0	0	0	0	16,000	16,000
TASK 3.0 ESTIMATE $16,000									$0				$16,000
TOTAL ESTIMATE **$190,000**									**$13,000**				**$169,000**

Lewis River Aquatics Fund - Proposal

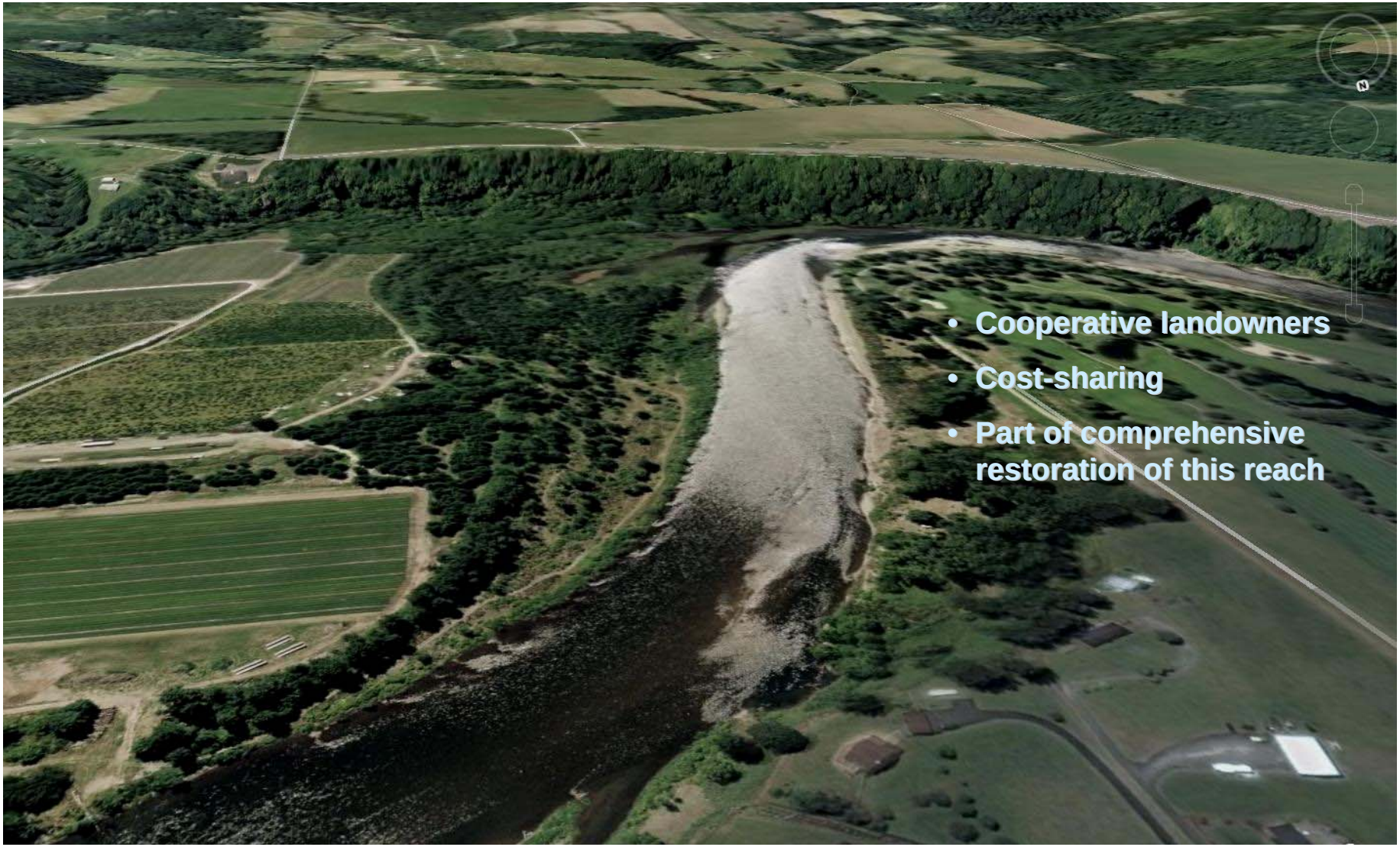
Lewis River – RM 13.5 Habitat Enhancements

Lewis River Aquatics Fund - Proposal

Lewis River – RM 13.5 Habitat Enhancements

Lewis River Aquatics Fund - Proposal

Lewis River – RM 13.5 Habitat Enhancements



Lewis River Aquatics Fund - Proposal

Lewis River – RM 13.5 Habitat Enhancements

Lewis River Aquatics Fund - Proposal

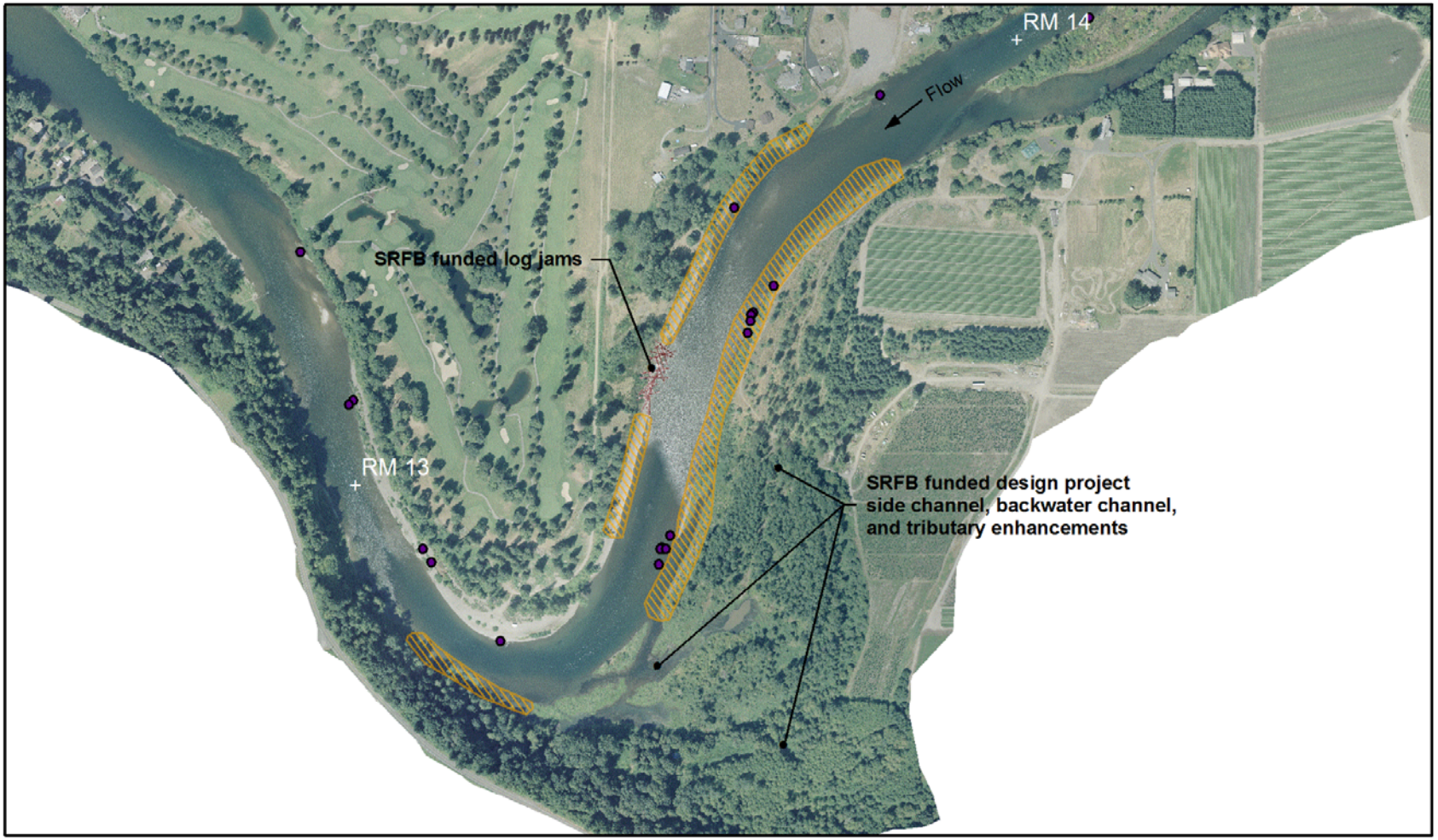
Lewis River – RM 13.5 Habitat Enhancements

Project Objectives

- Increase channel complexity and velocity refuge along channel margins to benefit adult holding and juvenile rearing
- Promote development of high quality scour pool habitat with wood cover
- Increase wood quantities
- Restore the native riparian plant community

Lewis River Aquatic Fund - Proposal

Plan View for: North Fork Lewis River RM 13.5 Habitat Enhancements



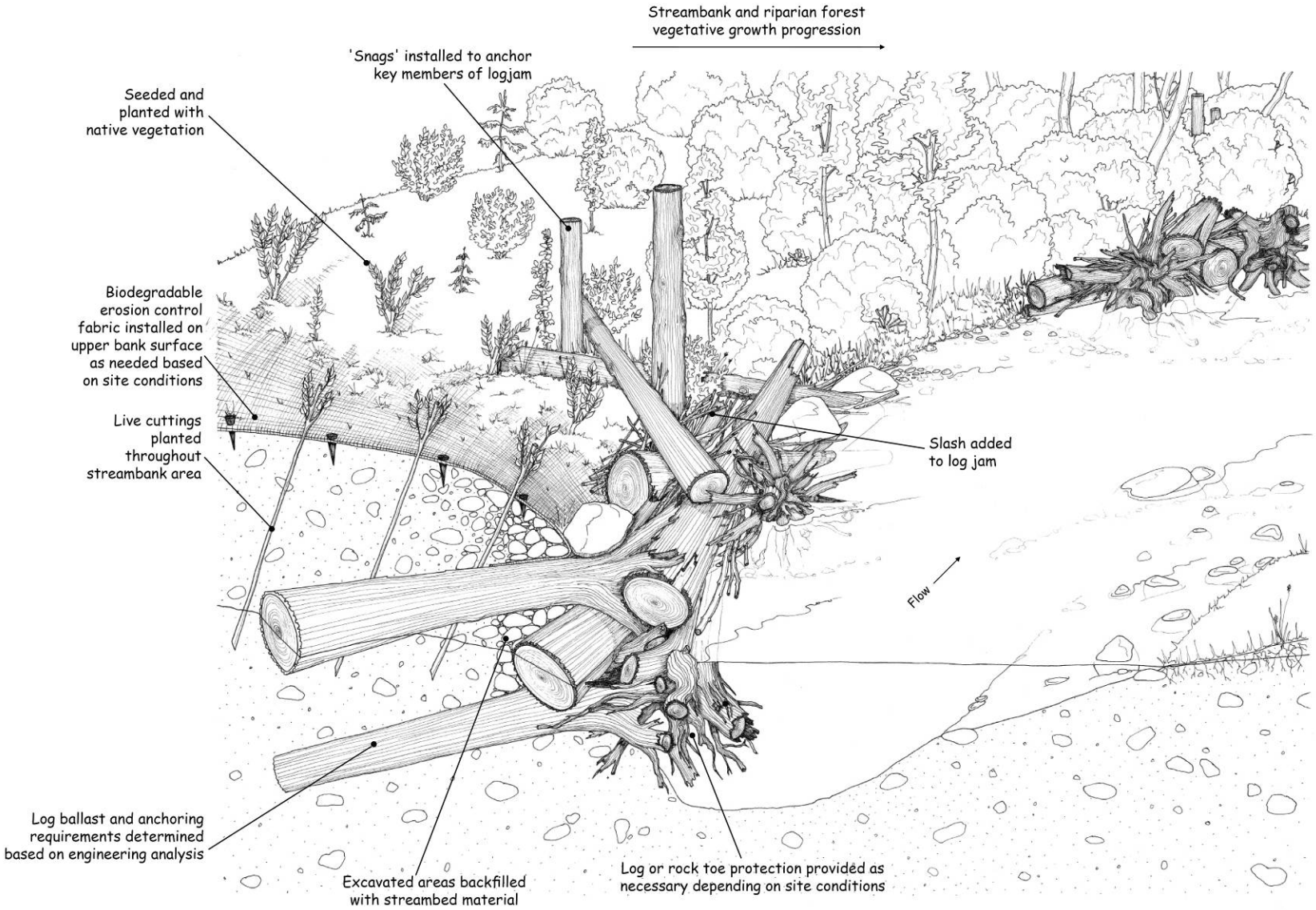
Legend

- Potential locations for habitat structures
- 2008 Winter Steelhead redd locations (WDFW data)
- SRFB-funded log jam placements

0 250 500 1,000 1,500 2,000 Feet

N

2005 aerial photography obtained from PacifiCorp


Streambank and riparian forest vegetative growth progression
'Snags' installed to anchor key members of logjam
Seeded and planted with native vegetation
Biodegradable erosion control fabric installed on upper bank surface as needed based on site conditions
Live cuttings planted throughout streambank area
Slash added to log jam
Flow
Log ballast and anchoring requirements determined based on engineering analysis
Excavated areas backfilled with streambed material
Log or rock toe protection provided as necessary depending on site conditions