
General Information

Project Title	SF TOUTLE LOWER BROWNELL RIPARIAN RESTORATION
Project Short Description	<p>This project will improve water temperature conditions for cold water species in a category 5 listed (listing 72849) reach of the SF Toutle River. The Lower Columbia Fish Enhancement Group is working on a watershed-scale restoration effort on the SFT with projects spanning from the mouth to the base of Mount Saint Helens. This proposal increases the effectiveness of the riparian component of a funded SRFB project (# 21-1061) that will complete instream, floodplain, and riparian work.</p>
Project Long Description	<p>This project complements the #21-1061 SRFB project and initiates restoration activities in the Brownell Reach of the SF Toutle River (RM 6.5 to 8.5) which was designed through SRFB #18-1409. The overall 18-1409 project will be implemented in phases with a bottom-up approach and covers about 2 miles of the SF Toutle River. For Phase 1, the SRFB component will install LWD in the channel and floodplain as well as grow plants at our nursery in partnership with Toutle Lake High School and install them in the floodplain and riparian zones. If funded, this Ecology application will allow us to monitor summer water temperature throughout the site and speed up plant colonization and development by mimicking the natural vegetation colonization trends in the SF.</p> <p>The project will address natural processes to benefit ESA-listed Chinook, coho, and steelhead as well as resident and anadromous lamprey, trout, and a dozen other cold water fish species inventoried in the reach. This project aims to jumpstart riparian and upland plant succession and kickstart a floodplain forest. The project will install shorter term instream and off-channel habitat structures as well as island-forming structures aimed at jumpstarting the establishment of mature floodplain forests in the immediate project reach. The Toutle River was denuded in May 1980 by a lahar and it is still struggling to recover today after 40 years of meandering across its floodplain, exporting the lahar material and recreating bars across a broad floodplain. LCFEG is working on a watershed approach to jumpstart natural recovery of the river by addressing its chronic wood supply shortage.</p> <p>We've currently received funding for floodplain and riparian restoration downstream of this site in the SFT Johnson Reach (SRFB 20-1082) and we've wrapped up three active restoration projects at the confluence with the NF Toutle (SRFB 16-1664) and in the headwaters (SRFB 17-1118 & 17-1119) as we ricochet our attention from the headwaters valley (SRFB 19-1212) to the lower response reach for a multifaceted approach to address key limiting factors for all freshwater life stages of these ESA-listed species. Our approach focuses heavily on re-establishing floodplain forests in the river valley that will provide future woody debris to the channels, shade to the floodplain and waterways, flood refugia, water retention, and a more complex and diverse riparian zone.</p>

General Information

This project covers the lower 3,125' of the Brownell Creek reach of the SFT and over 4,100' of the riparian zone. In this segment of the reach, the SFT floodplain tapers down from about 500' wide down to 170' and transitions from a multi-thread channel to a single thread channel. For the first half of the segment, the floodplain tilts towards river left as it has since at least 1990 with occasional secondary channels occupying the right bank (see Figure 14 in design report).

Primary species include Fall Chinook, coho, and winter steelhead. Fall Chinook return from August to October and primarily spawn in main channels of the SFT wherever they find suitable substrate, depth, and flow, and especially where they find upwelling. In this segment, there are wall-based channels on river right and a geomorphic control at the bottom of the segment which generally suggest this is a gaining reach with abundant upwelling that would attract Chinook for spawning. Coho and steelhead both prefer tributary habitat for spawning but will also spawn in secondary channels of the SFT. Snorkel surveys in this reach show that juvenile Chinook, coho and steelhead prefer shade and structure for rearing habitat and are rarely found more than 3' away from vegetated banks, roots, rocks, woody debris, or other structure where they can find refuge. We plan to activate secondary channels and install instream structures to create long swaths of fully vegetated and shaded channel margins where we currently see the most fish use.

Total Cost	\$1,009,745.63	Total Eligible Cost \$90,464.00
Effective Date	5/1/2023	Expiration Date 11/29/2024
Project Category	<ul style="list-style-type: none"> ✓ Nonpoint Source Activity Onsite Sewage System Stormwater Activity Stormwater Facility Wastewater Facility 	
Will Environmental Monitoring Data be collected?	Yes	
Ecology Program	Water Quality	

General Information

Overall Goal

The overall goal of this proposal is to accelerate the development of floodplain forests in the SF Toutle River valley. The secondary goal is to initiate temperature monitoring in the reach to evaluate our effectiveness.

The floodplain forests are critical to the recovery of ESA-listed species. The highest densities of salmon and steelhead observed during snorkel surveys are along vegetated margins. This Ecology grant will install mature plants along the margins where we anticipate channels to form, shading the channels to reduce solar radiation inputs and providing cover and food. The SRFB grant will install about 12,600 containerized plants and 9,680 bare root into active floodplain and riparian zones. The Ecology grant will install 200 Riparian Plant Pods which are bulk bags filled with organic matter and an array of native primary species.

LCFEG staff will also install hobo temperature data loggers in the reach from June to September to evaluate current 7DADmax temperatures.

WATER QUALITY COMBINED FINANCIAL ASSISTANCE

Organization: Lower Columbia Fish Enhancement Group

WQC-2023-LoCFEG-00134

Project Characterization

Project Themes

Select a primary and secondary theme that best describes the work to be achieved during this project.

Primary Theme:	Nonpoint Source Pollution
Secondary Theme(s):	Riparian/Wetland Restoration
	Monitoring and/or Maintenance

Project Website

If your project has a website, please enter the web address below. After entering a website and saving, another blank row will appear. Up to three websites may be provided.

Website Title/Name	Web Address
LCFEG SF Toutle Story Map	https://arcg.is/0Pb0ia
LCFEG website	www.lcfeg.org

Recipient Contacts

Project Manager

Brice Crayne

Contact Information

Brice Crayne
Project Manager
12404 SE Evergreen Highway
Vancouver, Washington 98683
(360) 882-6671

brice@lcfeg.org

Authorized Signatory

Shauna Hanisch-Kirkbride

Contact Information

Shauna Hanisch-Kirkbride
Managing director
12404 SE Evergreen Highway
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98683
(360) 882-6671

lcfegdirector@outlook.com

Billing Contact

Brice Crayne

Contact Information

Brice Crayne
Project Manager
12404 SE Evergreen Highway
Vancouver, Washington 98683

Recipient Contacts

(360) 882-6671

brice@lcfeg.org

Other recipient signatures on printed agreement

Name

Title

WATER QUALITY COMBINED FINANCIAL ASSISTANCE

Organization: Lower Columbia Fish Enhancement Group

WQC-2023-LoCFEG-00134

Funding Request- Nonpoint Project

Total Eligible Cost: \$90,464

Grant Request: \$67,848

Match Required: \$22,616

IMPORTANT NOTICE. Grants for nonpoint projects require a 25% match. Projects with cash-only match are eligible for up to \$500,000 in grant. Projects with a mix of funds for match are eligible for up to \$250,000 in grant. Cash match includes any eligible project costs paid for directly by the recipient that are not reimbursed by the Ecology grant or another third party. Donations that become the long-term property of the recipient are considered cash match. Loan money provided through the CWSRF is also considered cash match. In-kind contributions are considered non-cash match. More information on match requirements can be found in the Water Quality Combined Financial Assistance Guidelines which are available for download on the Application Menu.

Will your match be cash-only? Yes No

Are you requesting or will you accept loan funds for part or all of the eligible project costs or to meet your match requirement? Yes No

IMPORTANT NOTICE. Ecology may provide special loan funding for nonpoint projects in the following case: (1) projects that meet the criteria for "green project reserve" may receive up to 25% forgivable loan. Ecology will determine eligibility for special funding when developing funding packages.

Do you want your project to be considered for GPR subsidy under the CWSRF program? Yes No

NOTE: Projects are only eligible if they meet EPA's GPR criteria, and applicants accept a CWSRF loan.

Do you have any secured funds committed to this project? Yes No

If Yes, complete the Secured Funds Table, and include any secured matching funds if known.

Source	Type	Amount Committed
State/Federal agency: Salmon Recovery Funding	Grants	\$771,342.00

WATER QUALITY COMBINED FINANCIAL ASSISTANCE

Organization: Lower Columbia Fish Enhancement Group

WQC-2023-LoCFEG-00134

Funding Request- Nonpoint Project

Board
State/Federal agency:
State/Federal agency:
Interlocal contributions:
Interlocal contributions:
Interlocal contributions:
Local agency:
Local agency:
Local agency:
In-kind contributions:Lower Columbia Fish In-kind \$170,539.00
Enhancement Group
In-kind contributions:
In-kind contributions:
Other
Other
Other

Scope of Work - Task 1 Grant and Loan Administration: 1

Task Number	1
Task Title	Grant and Loan Administration
Task Cost	\$3,000.00

IMPORTANT NOTICE. The cost of this task should not exceed 15% of the Total Eligible Costs you entered on the General Information form.

Task Description

A. The RECIPIENT shall carry out all work necessary to meet ECOLOGY grant or loan administration requirements. Responsibilities include, but are not limited to: Maintenance of project records; submittal of requests for reimbursement and corresponding backup documentation; progress reports; the EAGL (Ecology Administration of Grants and Loans) recipient closeout report; and a two-page outcome summary report (including photos, if applicable). In the event that the RECIPIENT elects to use a contractor to complete project elements, the RECIPIENT shall retain responsibility for the oversight and management of this funding agreement.

B. The RECIPIENT shall keep documentation that demonstrates the project is in compliance with applicable procurement, contracting, and interlocal agreement requirements; permitting requirements, including application for, receipt of, and compliance with all required permits, licenses, easements, or property rights necessary for the project; and submittal of required performance items. This documentation shall be available upon request.

C. The RECIPIENT shall maintain effective communication with ECOLOGY and maintain up-to-date staff contact information in the EAGL system. The RECIPIENT shall carry out this project in accordance with any completion dates outlined in this agreement.

Task Goal Statement

Properly managed and fully documented project that meets ECOLOGY’s grant or loan administrative requirements.

Task Expected Outcomes

- * Timely and complete submittal of requests for reimbursement, quarterly progress reports, Recipient Closeout Report, and two-page outcome summary report.
- * Properly maintained project documentation.

Recipient Task Coordinator Brice Crayne

Deliverable #	Description	Due Date	Received? (ECY Use Only)	EIM Study ID	Latitude (expressed in decimals)	Longitude (expressed in decimals)	Location Address
1.1	Progress Reports that include descriptions of work accomplished, project challenges or changes in the project schedule. Submitted at least quarterly.						
1.2	Recipient Closeout Report (EAGL Form)						
1.3	Two-page Outcome Summary Report						

Scope of Work - FOR APPLICATION

Task Number	Task Cost
Task #1	\$3,000.00
Task #2	\$21,680.00
Task #3	\$38,254.63
Task #4	\$4,913.37
Task #5	\$22,616.00
Task #6	\$0
Task #7	\$0
Task #8	\$0
Task #9	\$0
Task Total	\$90,464.00

Task #: 2

Task Title: Purchase 200 Riparian Plant Pods

Task Cost: \$21,680.00

Expected Start Date: 5/1/2023

Expected Finish Date: 11/1/2023

Describe the work that will be billed to this task. (char 3,500)

This task includes purchasing 200 Riparian Plant Pods (RPP) grown for two years prior to the installation period.

RPPs are comprised of 1.0-1.5 cubic yards of organic matter and compost (planting substrate), 12 willow poles of 3 different species (Pacific, Sitka, and scoulers), and 24 native shrubs of at least 3 different species (spirea, dogwood, ninebark, snowberry, or rose) installed into a poly bulk bag. They will be grown at a local nursery starting in spring 2022 so that they have two growing seasons prior to installation.

The contract with the nursery will be established prior to the start of the Ecology grant to be sure the RPPs are grown to size and ready for installation during the 2023 construction season. LCFEG has two projects funded in the SF Toutle (SRFB# 20-1082 and 21-1061) that could be used to pay for these if the Ecology grant is not funded; however, this strategy was not yet developed when those grants were written. This strategy was developed specifically for the Toutle but could also become a new tool for riparian restoration wherever floodplain restoration is being completed. While the 21-1061 SRFB grant does include installation of bare root, cuttings, and container stock, these will take decades to

Scope of Work - FOR APPLICATION

mature and we are using this grant and approach to speed up that timeline.

Deliverables

To Add a Row

Enter a deliverable
 When done, click the **SAVE** button
 After SAVE a new row will appear
 Repeat these steps for each deliverable

To Delete a Row

In the row you want to delete, remove the information in all of the textboxes
 When done, click the **SAVE** button
 After SAVE the row will be deleted

Deliverables Table (Deliverables are documents that can be uploaded into EAGL to show that work was completed; deliverables should align with the detailed budget provided on the Task Costs and Budget Form and the project schedule uploaded on the Project Planning and Schedule Form.)

Deliverables Description	Deliverable Date	Deliverable Budget
Establish contract with nursery to produce 200 RPPs for Fall 2023	2/1/2022	\$10,840.00
Coordinate delivery with nursery for Fall 2023	10/1/2023	\$10,840.00
		Total Deliverable Budget: \$21,680
		Total Task Costs:

Task #: 3

Task Title: Delivery and Installation of Toutle Totes

Task Cost: \$38,254.63

Expected Start Date: 9/1/2023

Expected Finish Date: 11/1/2023

Describe the work that will be billed to this task. (char 3,500)

This task includes transport and installation of 200 Riparian Plant Pods (RPPs).

Scope of Work - FOR APPLICATION

Growing RPPs in bulk bags allows for transportation of 200 individual pods that can be loaded onto a flatbed truck (up to 40 per trip), transported to the construction site, staged in a central location, transferred to an off-road haul truck, and then carried to their designated planting site. The RPPs will be watered immediately before delivery to reduce desiccation between delivery and installation. To maximize efficiency, an excavator will be staged at the staging site and another will be ready to unload the off-road truck and install the plants. The excavator will dig a hole 3-5' wide and deep down to 8-12" below the water table, side casting the spoils. The pod will be lifted into place and then cut open to "plant" the contents and remove the poly bulk bag (which we will attempt to reuse). The native substrate will be carefully installed around any exposed roots. We will water in each pod before proceeding to the next.

All design, permitting, contractor bidding, coordination of delivery, and staff time associated with installation will be charged to the SRFB 21-1061 project.

Deliverables

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Deliverables Description	Deliverable Date	Deliverable Budget
Delivery from nursery to project site	10/1/2023	\$2,000.00
Transportation from staging area and installation of RPPs at project site	11/1/2023	\$36,254.63
		Total Deliverable Budget: \$38,254.63

Task #: 4

Task Title: Water temperature monitoring

Task Cost: \$4,913.37

Scope of Work - FOR APPLICATION

Expected Start Date: 6/1/2023

Expected Finish Date: 11/1/2024

Describe the work that will be billed to this task. (char 3,500)

This reach of the SF Toutle is listed as Category 5 for temperature (Listing ID 72849) because in 2009 the 7 day average daily maximum temperature was calculated at 26.39°C, drastically exceeding the 16.0°C criteria for core summer salmonid habitat. Since the 2009 data was collected, LCFEG doesn't know of any other 7DADmax temperature monitoring completed in this reach.

This task includes purchasing twelve new Hobo water temperature pro v2 data loggers, building protective cases for them out of PVC, installing and retrieving the loggers, and evaluating and consolidating the data into a report. Starting in 2023, the data loggers will be installed in early June and retrieved in mid to late September. We will deploy the data loggers each year until the batteries die. We will install one data logger 1000' downstream of the project area at approximately 46.299633, -122.642104, nine within the Brownell reach in mainstem and side channel habitat, and one upstream of the project area in the canyon reach at approximately 46.274991, -122.627247.

One data logger will be reserved for investigating cold water pockets discovered from the thermal imaging that was written into the SRFB SF Toutle Lower Brownell grant. We will be collecting the thermal imaging data during the late summer/early fall. We have also talked to WDFW about obtaining redd survey data for the reach. We will overlay the GPS locations of the redds in the reach over the thermal imaging map to determine if there are any correlations between spawning site choice with colder pockets of water. Once we identify where the cold water pockets are, we can strategically monitor these sites during peak daily temperatures and compare the data to the seasonal data loggers. The thermal data will be collected in 2022 to help guide instream woody debris design finalization. We will use this imagery to guide data logger placement in 2023.

Deliverables

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WATER QUALITY COMBINED FINANCIAL ASSISTANCE

Organization: Lower Columbia Fish Enhancement Group

WQC-2023-LoCFEG-00134

Scope of Work - FOR APPLICATION

Deliverables Description	Deliverable Date	Deliverable Budget
Purchase data loggers and construct protective cases	6/2/2023	\$1,953.37
Install and retrieve temperature data loggers - 2023	10/1/2023	\$1,280.00
Install and retrieve temperature data loggers - 2024	10/1/2024	\$1,280.00
Evaluate data and write report	11/1/2024	\$400.00
		Total Deliverable Budget: \$4,913.37

Task #: 5

Task Title: Cost share

Task Cost: \$22,616.00

Expected Start Date: 5/1/2023

Expected Finish Date: 11/29/2024

Describe the work that will be billed to this task. (char 3,500)

The cost share for this project will come from the \$771,342 in secured funding from the Salmon Recovery Funding Board.

Deliverables

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Scope of Work - FOR APPLICATION

Project Planning and Schedule Form.)

Deliverables Description

Deliverable Date

Deliverable Budget

Document cost share

11/29/2024

\$22,616.00

Total Deliverable Budget: \$22,616.00

Task #: 6

Task Title:

Task Cost:

Expected Start Date:

Expected Finish Date:

Describe the work that will be billed to this task. (char 3,500)

Deliverables

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Deliverables Description

Deliverable Date

Deliverable Budget

Total Deliverable Budget: \$0

Scope of Work - FOR APPLICATION

Task #: 7

Task Title:

Task Cost:

Expected Start Date:

Expected Finish Date:

Describe the work that will be billed to this task. (char 3,500)

Deliverables

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Deliverables Description

Deliverable Date

Deliverable Budget

Total Deliverable Budget: \$0

Task #: 8

Task Title:

Task Cost:

Scope of Work - FOR APPLICATION

Expected Start Date:

Expected Finish Date:

Describe the work that will be billed to this task. (char 3,500)

Deliverables

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Deliverables Description

Deliverable Date

Deliverable Budget

Total Deliverable Budget: \$0

Task #: 9

Task Title:

Task Cost:

Expected Start Date:

Expected Finish Date:

Scope of Work - FOR APPLICATION

Describe the work that will be billed to this task. (char 3,500)

Deliverables

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Deliverables Description

Deliverable Date

Deliverable Budget

Total Deliverable Budget: \$0

Total Task Costs: \$90,464

Task Costs and Budget

Describe the process used to estimate the cost of the project. If your process included reviewing similar projects, describe how this review affected your estimate.

This project was designed in 2018-2020 with Smayda Environmental Associates. All costs were broken down in the cost estimate found in PRISM (SRFB# 18-1409). Using the overall cost estimate we broke the project into four phases to best fit the sponsors capacity and typical project size for the target funding source (SRFB). The first phase was funded through the SRFB in 2021 and includes installation of 22,280 plants which is about 1000 plants/acre. This is a light application but helps jumpstart riparian recovery. Typically, LCFEG installed instream and floodplain wood during the first phase and then follows up with subsequent grants a few years later to give the river time to recalibrate to the new structure in the floodplain. However, LCFEG has observed that while plant survival is quite good, growth is limited by the amount of nutrients and organic matter in the floodplain substrate. Thus, we are using this Ecology grant to increase the amount of organic matter and overall plant material installed to accelerate floodplain forest regeneration. We are also installing the woody debris into the natural orientation of the existing floodplain; adding wood where wood is already accumulating and encouraging vegetated areas to mature.

Actual costs of these activities are based on construction costs in the SF Toutle in 2015, 2016, 2017, 2019, and 2020. We are actively working in this watershed and are familiar with the construction costs associated with these projects. We verify anticipated cost increases with local contractors to estimate \$/cubic yard of excavation and discuss plant development costs with suppliers during the grant writing process. We use previous costs to administer similar grants and to supervise construction activities to estimate LCFEG costs. We used real costs from websites to predict costs for monitoring equipment.

Has the proposed project been demonstrated to be the lowest cost solution to the problem?

If the proposed project is not the lowest cost, describe the other benefits or considerations such as feasibility, community acceptance, or coordination with other projects that influenced the decision making process.

LCFEG has tried every type of planting BMP in the SF Toutle watershed including installing live stakes, installing live poles, bare root, container stock, watering, mulching, and some other innovative strategies including plow planting with an excavator and mixing large amounts of organic matter into the native substrate. Plow planting includes using a 3-4' deep plow attached to the arm of an excavator which tracks backwards to create a cavity for bare root stock to be installed into; two planters walk alongside the plow with one person installing the plants and the other handing them the plant material. This strategy was developed in the Toutle floodplain with SRFB funds (SRFB 16-1694). The other innovative strategy is importing free organic matter from local wood processing that is mixed into the native substrate to increase the available soil organic matter. These strategies are not the lowest cost solutions. However, LCFEG has been installing plants in the SF Toutle floodplain for over a decade and what we have observed is that plant establishment is not difficult; the water table is high enough during critical summer flows that even bare root stock has high survival rates (>90%) in most areas. That said, survival doesn't equate to success. Many of the bare root plants installed are very stunted due to an overall lack in NPK, mycorrhizae, or organic matter. Further, we've also tested nearly every tool available to install plants including shovels, rock bars, one-person earth augers, two-person earth augers, excavators, and skid steers. What we've determined is that the plow method with an excavator is the quickest method of installing bare root stock or large willow cuttings and produces

Task Costs and Budget

good survival, especially when coupled with immediate watering to eliminate air pockets. With this "plow" method we installed 75-100 plants per hour versus a hand planter who had to dig individual holes could only install about 10-30 per hour. We only use the plow method in areas that are void of existing vegetation. Look at the Google Earth imagery at 46.331791°, -122.710574° for an aerial example of this strategy.

With this experience we believe that some areas can be planted by hand using bare root stock at an inexpensive rate but other areas in the SF Toutle floodplain require equipment-based planting. For this proposal, we continue our innovative restoration techniques with the first use of Riparian Plant Pods. See the task description for more details.

Upload a detailed budget for the project and any supporting documentation, including engineers estimates, cost analysis, etc.

Upload Documents

Click the Browse button

Select your file

Click Save, your file will appear in the List of uploaded documents

Repeat for each file

To Delete a file, select the Delete checkbox next to the file and click SAVE

Ecology budget - detailed

https://ecyeagl/IntelliGrants_BASE/_Upload/185763_936438_1-Budget_LCFEG_SFTLowerBrownellRiparianRestoration.xlsx

WATER QUALITY COMBINED FINANCIAL ASSISTANCE

Project Team

Fill out the following table to describe your Project Team, including staff, contractors, and partner agencies:

Team Member Name/and or Title	Agency/ Company Name	Key Responsibilities	Qualifications/ Experience	Estimated Total Hours Devoted to the Project	Who will take over the person's responsibilities if they are unable to work on the project?
Brice Crayne / Project Manager	Lower Columbia RFEG	Project manager. Design finalization. Material sourcing. Bid documents. Permitting. Contracting. Reporting. Billing.	PM with LCFEG since 2015. See https://www.lcfeg.org/staff for more details.	88.00	The director will re-assign.
Shauna Hanisch-Kirkbride, PhD / Managing Director	Lower Columbia RFEG	Billing. Contracting. Reporting.	Managing director of LCFEG since 2018. See https://www.lcfeg.org/staff for more details.	30.00	The board will re-assign.
Chelsey Pacanins / Stewardship Coordinator	Lower Columbia RFEG	Assisting with temperature data logger installation.	Intern (2019) and now Stewardship Coordinator since 2020. See https://www.lcfeg.org/staff for more details.	16.00	Another technician or Brice will solicit help from volunteers.
Jesse Barr / Restoration Coordinator	Lower Columbia RFEG	Assisting with temperature data logger installation.	Field technician (2020) and now Restoration Coordinator since 2021. See https://www.lcfeg.org/staff for more details.	24.00	Another technician or Brice will solicit help from volunteers.
Bill Berry / Nursery Owner/Manager	Natural Systems Recovery - Nursery	Growing Riparian Plant Pods	Bill has been working on supplying restoration organizations for decades in SW WA.	80.00	If NSR needs to move the RPPs before Fall, 2023 we can move them to another one of LCFEGs nurseries
Tom Smayda, PE / Environmental Engineer	Smayda Environmental Associates	Engineer for the original 18-1409 project	Tom has been working in the habitat restoration business for over 20 years.	200.00	LCFEG established a team of consultants for the upstream STHD project. Any of them could

Project Planning and Schedule

Project Start Date

9/23/2021

The date the actual work will start, or if interim refinance, the date the work started.

List and describe the criteria you used to determine the value and feasibility of the project.

Examples: useful life, installation cost, site suitability, and environmental justice.

This project is part of a watershed-scale restoration strategy. Within the Toutle watershed, there are three primary rivers including the NF, the SF, and the Green Rivers. During the 1980 eruption the NF was completely changed forever due to the massive landslide in its headwaters, the SF valley was filled in with a lahar flow but its source and valley shape were unchanged, and the Green had a minor lahar deposit that flushed out in the first five years following the eruption. Following the eruption a sediment retention system was installed on the NF to prevent flooding in the lower Cowlitz communities. A hatchery is maintained by WDFW at the mouth of the Green River where they raise fall Chinook and coho ; they don't raise steelhead as the Green was designated as a wild steelhead gene bank. Thus, the SF Toutle has little hatchery influence and no dam or impassible falls preventing wild fish from accessing the entire watershed. As such, LCFEG and the Lower Columbia Fish Recovery Board has prioritized the SF Toutle for restoration activities.

This site was chosen as a natural progression up the watershed. LCFEG started working on the SF Toutle in 2007 in the Steelhead Landing development at about RM 2.0 and continued upstream through the Johnson Creek reach which was completed in 2018. Upstream of the Johnson Creek reach the SF Toutle tier ranking from the EDT model changes from Tier 1 to Tier 2. Thus, LCFEG followed this tiering and looked upstream to the next Tier 1 reach which began at the confluence of Brownell Creek near the 4700 road bridge. In 2018 we received funding to create a restoration plan for the Brownell reach of the SF Toutle spanning over two miles from RM 6.5 to 8.9. A complete design report for this project can be found in the SRFB project search under project number 18-1409. A complete grant application for the SRFB 21-1061 project can also be reviewed from the attached documents; this application outlines the other components of the larger project. Herein we have focused on the installation of the Riparian Plant Pods (RPPs). Mr. Berry was instrumental in developing the RPPs. He has access to many of the materials, equipment, space, and water necessary to construct them for a very reasonable rate. It will cost more to install the mature RPPs over the course of a week than to grow them over a two year period. Installation costs are based on recent construction costs in the SF Toutle watershed with some allowances for inflation. Since the SRFB project is already in motion and funded, this component of the project will simply increase its effectiveness and reduce the time it takes for the floodplain to generate a floodplain forest .

The real value of this project is in the promise of the SF Toutle for becoming a stronghold for wild Chinook , coho, steelhead, and other native aquatic and riparian species of concern. Where else in the PNW can you find a watershed without any hydro systems or hatcheries, with minimal development in the floodplain, with only four landowners upstream of RM 4 that are all held accountable from forest practices, with zero risk to infrastructure? The SF Toutle has tremendous potential. There are no natural falls preventing Chinook or coho from migrating all the way to the flanks of Mount Saint Helens; in fact, there is a broad valley in the headwaters with miles of habitat planned out for restoration. There is no overallocation of water withdrawals; in fact, there are dozens of acres of floodplain habitat in the headwaters and lower valley where beaver are

Project Planning and Schedule

building dams and improving the river's climate resiliency. The opportunity to really restore a fully functional PNW river from its mouth to its source is before us. Three ESA-listed species could develop a stronghold in the SF Toutle if we take action. This project continues that opportunity.

Briefly describe all project alternatives (including the preferred alternative) considered, and explain how each alternative met or failed to meet the criteria listed above.

Use one line for each alternative and click "save" to enter additional alternatives.

Description of Alternative

Planting without associated LWD

Criteria

As seen in sheet 4 of the attached design document, the SF Toutle is slowly regenerating a floodplain forest. In fact, there are nearly twice as many acres of dense riparian vegetation and four times as many acres of sparsely vegetated areas in the project reach between 2009 and 2021. However, large flood events like those in 2008/9 and 2015/16 cause detrimental damage to the new vegetation and cause complete resets on acres of the floodplain. Unless there is structure in the floodplain to disperse the river's energy and to force it to spread out and drop its washload, this decadal reset will continue to hinder forest development.

Completing the SRFB project without Riparian Plant Pods or Ecology funding

Through the 18-1409 design we developed a strategy for adding instream structure and floodplain roughness. We also mapped out where the trajectory for floodplain forest development based on 30 years of channel migration imagery. We created a multi-phased plan for restoring a balanced floodplain using natural process-based restoration techniques. However, as a preliminary design, we didn't necessarily have every strategy for implementing the plan ironed out. Our design has a planned adaptive management approach. We will implement the project in phases so that we have time to evaluate specific strategies and adapt subsequent phases on our observations. The development of Riparian Plant Pods is based on adapting our riparian restoration techniques based

Project Planning and Schedule

Incorporating Riparian Plant Pods into the first phase of restoration of the Lower Brownell reach of the SF Toutle

on the best available knowledge of the SF Toutle watershed. We believe that incorporating this strategy will accelerate floodplain forest establishment. This belief is based on observations made from over a decade of restoration activities in the SF Toutle watershed.

Adaptive management and consistent brainstorming with other salmon habitat practitioners has encouraged us to get increasingly aggressive with our riparian restoration activities just as we are with floodplain-wide woody debris projects.

LCFEG has developed the RPPs with Bill Berry based on several key factors impacting plant establishment in the SF Toutle floodplain. The first limiting factor is carbon. The historical drifts and logjams in the SF Toutle were yarded out and burned in the 1960s and 70s. Soon thereafter, the SF Toutle floodplain was devastated by the 1980 lahar associated with the Mount Saint Helens eruption. This event destroyed all living vegetation in the floodplain from the flanks of the Mountain to the Cowlitz River. Subsequently, landowners impacted by the blast were allowed to salvage trees from the floodplain to recover revenue lost from the eruption. These events eliminated the source of carbon from the floodplain and after forty years, the SF Toutle remains carbon starved. Thus, the RPPs are comprised of nearly 100 percent organic matter. Installing 200 totes at about 1.25 cubic yards per tote will add about 250 cubic yards of organic carbon to the floodplain in a state that can't wash away with the first high water event because it is already bound up in a robust root system and buried in the floodplain.

The next limiting factor is shade. We've seen north-facing banks of the SF Toutle that were graded clean in 2018 in the Johnson Creek reach producing a diverse array of deciduous and coniferous species due to the leaf litter dropped by overhanging alders and maples and the shade provided by

Project Planning and Schedule

these mature plants during peak summer temperatures. Similarly, it has been documented that lupines that germinated on the flanks of Mount Saint Helens after the eruption contributed organic matter and shade for other primary succession species to germinate and get established. By growing these RPPs for two seasons in controlled conditions, we will be installing pockets of taller plants that will assist germination and development of other native plants on the existing moonscape floodplain. These plants will also contribute shade to the channel sooner than traditional revegetation strategies, reducing solar inputs to the Category 5 listed waters. The strategy of planting whole willow trees has been used in the Toutle with limited success. Generally, this results in the plant killing off its top and re-sprouting from the soil surface but without the necessary nutrients the plant struggles to get reestablished. LCFEG worked with Bill Berry to develop the RPP strategy to reduce desiccation associated with harvesting whole willow trees during the in water work window when they are still growing. The RPPs also add organic matter to the otherwise sterile substrate, reducing transplant shock and helping future plant growth. The SF Toutle floodplain has a high water table which allows native plants to survive when installed as bare root, but the overall lack in nutrients stunts growth and plants eventually get buried during a flood. The RPPs will be installed as established plant material in the wake of newly constructed floodplain roughness structures as shown on the design plans attached. This strategy mimics the natural regeneration commonly found in the SF Toutle where bands of willow and alder germinate on the margins of oxbow channels, creating 5-10' wide strips of densely packed vegetation amongst an otherwise moonscape of a floodplain. When bands of plants are installed relatively parallel to the flow, they slow water velocities encouraging deposition of

Project Planning and Schedule

finer and small organic matter which encourages additional plant germination and colonization. The more mature plants also provide shade for newly germinating plants during peak summer temperatures allowing for natural recovery.

This strategy is LCFEG's newest innovative tool for generating floodplain forests in the SF Toutle valley. We are constantly trying

List project stakeholders and provide documentation showing key stakeholders have been identified and will support the project.

Stakeholders include:

Weyerhaeuser - landowner acknowledgement form signed for SRFB 21-1061 project; they participated in design meetings

Washington Dept. of Fish and Wildlife - LCFEG PM Brice Crayne regularly communicates with both fish and wildlife biologists; for example, western toads are a species of concern in the SF Toutle and communication with WDFW habitat biologists have determined that activation of off-channel habitats (especially those connected to groundwater inputs) are key for critical western toad lifestages.

Toutle Community - We have hosted annual volunteer planting events on Earth Day at Harry Gardner Park in Toutle since 2015 and we also present annually at the Toutle Lake HS where students are recruited to grow willows for restoration projects in the SFT. It has been rewarding to run into past students at Harry Gardner Park who talk about their memories potting willows and then planting them at HGP. See letter of support attached.

Lower Columbia Fish Recovery Board - The LCFRB staff have attended each of the stakeholder meetings we've hosted and provided feedback on the design development. They have also helped us brainstorm funding mechanisms for the various projects we have going in the SFT watershed.

Mount Saint Helens Institute - LCFEG PM Brice Crayne presented at the MSHI views and brews virtual tour on restoration activities in the SF Toutle including outlining restoration activities in this reach. The storymap and presentation can be viewed here: <https://youtu.be/TXSuMqTL7w0>

Describe the steps you have taken to be ready to start the project by May 1, 2023. Provide detailed information and documentation on project elements such as status of designs, permits, interlocal agreements, landowner agreements, easements, other secured funding, staff, or agency approvals.

Project Planning and Schedule

This project is unique in that we already have SRFB funding secured that began on 9/23/2021. We will use this SRFB funding to complete the majority of this \$1 million project (76%). Every component of the project except for the Riparian Plant Pods will be completed using the SRFB funding including design, permitting, contractor bidding and hiring, woody material sourcing and installation, as well as a significant amount of riparian work. This project is a continuation of work in the SF Toutle where LCFEG has been working since 2007 and we have built a network of contractors, wood suppliers, consultants, nursery infrastructure, and local volunteers to support the restoration effort.

For the Ecology component, the Riparian Plant Pods need to be 2 years old before installation to establish a robust root matrix. To accomplish this, LCFEG will set up a contract with the nursery to build 200 RPPs and to grow them for 2 seasons. We have already drafted the contract and will be signing it before the end of the year. The nursery will get all 200 RPPs prepared by the end of April, 2022 so that the plants can grow throughout the 2022 and 2023 growing seasons before being lifted, transported, and installed in September or October of 2023.

For stormwater facility and wastewater facility projects: Do you own or have clear control over the entire project area?Yes No Not Applicable

Please explain why you selected not applicable: This is not a stormwater or wastewater project

For stormwater facility and wastewater facility projects requiring road cuts: When was the last time the road was resurfaced or reconstructed? This is for informational purposes; no points are associated with this question.

Date:

Have you reviewed the area of potential effect (APE) in the Washington Information System for Architectural and Archaeological Records Data (WISARRD) database? This is for informational purposes; no points are associated with this question Yes No Not Applicable

Upload a project schedule that includes all tasks necessary to complete the project, including tasks that are not part of the funding request.

Upload any other supporting documentation.

Upload Documents

https://ecyeag/IntelliGrants_BASE/_Upload/185923_936443-SFTLowerBrownell-SCHEDULE.docx

Schedule_SFT Lower Brownell

Project Planning and Schedule

https://ecyeagl/IntelliGrants_BASE/_Upload/185923_936443_2-ProjectApplicationReport-21-1061.pdf	SRFB 21-1061 grant application
https://ecyeagl/IntelliGrants_BASE/_Upload/185923_936443_3-LetterofSupportLCFEG_TLHS.pdf	TLHS Letter of Support
https://ecyeagl/IntelliGrants_BASE/_Upload/185923_936443_4-21-1061PlantingPlan.xlsx	Planting Plan
https://ecyeagl/IntelliGrants_BASE/_Upload/185923_936443_5-SRFBGrantApplicationBudgt_forreferenceonly_21-1061.xlsx	SRFB 21-1061 cost estimate
https://ecyeagl/IntelliGrants_BASE/_Upload/185923_936443_6-ProjReviewCommentsLE,21-1061R(compl10_11_2112_04).pdf	LCFRB LE Comments on SRFB 21-1061 proposal
https://ecyeagl/IntelliGrants_BASE/_Upload/185923_936443_7-ProjReviewCommentsInitial,21-1061R(compl10_11_2112_04).pdf	SRFB Review Panel Comments on SRFB 21-1061 proposal

Water Quality and Public Health Improvements

To go to the Water Quality Atlas, follow this link: <https://fortress.wa.gov/ecy/waterqualityatlas/StartPage.aspx>.

Name the specific water body(ies) this project will improve or protect and the parameters it will address.

This project is located in the mainstem SF Toutle River in WRIA 26. This reach of the SF Toutle is 303d listed as impaired for temperature. This site has a broad floodplain which provides ample opportunity for a floodplain forest development and an anastomosing channel network which encourages hyporheic exchange.

Is the project planning, implementation, or a combination? (For facility projects: check "Planning" for planning and design projects; check "Implementation" for construction projects; check "Planning/Implementation" for combined design/construction projects.)

Planning

✓ Implementation

Planning/Implementation

What type of plan or regulatory requirement does this project address?

TMDL/TMDL Alternative (approved or in development)/Straight to Implementation

Wastewater Engineering Report/Sewer Plan

Permit

✓ Salmon Recovery Plan

Watershed Plan

Shoreline Master Plan

Administrative Order or Other Legal Action

Capital Improvement Plan

Puget Sound Action Plan

Mitigation

✓ Other 303d listing

Not Applicable

Enter the implementation action and plan reference in the Action Table. If this is a planning-only project, you may enter, "Not applicable, planning-only".

Water Quality and Public Health Improvements

To add multiple implementation actions:
 Enter the implementation action and plan reference.
 When done, click the **SAVE** button.
 After SAVE a new row will appear.
 Repeat these steps for each implementation action.

Action Table

Action	Reference the document that describe the action, including page numbers and where a copy can be obtained.
#1 - Protect stream corridor structure and function	WA Lower Columbia Salmon Recovery and Fish & Wildlife Subbasin Plan, May 2010. Table I-14. Prioritized measures for the Toutle River Basin. The mainstem Toutle, lower NF Toutle, and lower SF Toutle were heavily dredged, rip rapped and confined shortly following the 1980 Mt. St. Helens eruption, seriously compromising floodplain function (Wade 2000). The upper SF Toutle and upper NF Toutle (above the SRS) contain functioning floodplains but remain heavily aggraded with eruption sediments. The upper Green River (upstream of the hatchery) also contains functioning floodplains. Riparian areas were severely impacted by the eruption and subsequent timber harvests. Protecting floodplains, channel migration processes, and riparian areas from further degradation will be an important component of recovery.
#4 - Restore floodplain function and channel migration processes	WA Lower Columbia Salmon Recovery and Fish & Wildlife Subbasin Plan, May 2010. Table I-14. Prioritized measures for the Toutle River Basin. Portions of the mainstem Toutle, lower NF Toutle, lower SF Toutle, and Green River all suffer from channel confinement and bank hardening in some areas. There is significant potential for restoration of floodplain

Water Quality and Public Health Improvements

function and channel migration processes that could improve flow conditions and create key habitat types. Selective breaching, setting back, or removing confining structures would help to restore floodplain and CMZ function as well as facilitate the creation of off-channel and side channel habitats. There are challenges with implementation due to private lands, existing infrastructure already in place, potential flood risk to property, and large expense.

#6 - Restore riparian conditions throughout the basin

WA Lower Columbia Salmon Recovery and Fish & Wildlife Subbasin Plan, May 2010. Table I-14. Prioritized measures for the Toutle River Basin. Riparian areas were severely degraded from mudflows from the 1980 Mt. St. Helens eruption and subsequent timber harvest. Riparian impairment is a concern throughout the basin. There is a high potential benefit of riparian restoration due to the many limiting factors that are addressed. The increasing abundance of exotic and invasive species in riparian areas is a particular concern. Riparian restoration projects are relatively inexpensive and are often supported by landowners.

#7 - Restore channel structure and stability

WA Lower Columbia Salmon Recovery and Fish & Wildlife Subbasin Plan, May 2010. Table I-14. Prioritized measures for the Toutle River Basin. Channel structure and stability was severely compromised due to mudflows associated with the 1980 eruption. Channels remain highly aggraded and unstable. Much of the large wood was transported through the system or buried in sediments during or shortly after the eruption. As channels naturally become more stable, large wood installation projects

Water Quality and Public Health Improvements

may be appropriate. Care should be taken to acknowledge that structural enhancements may not succeed if channels are too unstable or if artificial confinement structures are inhibiting natural flow processes.

#8 - Restore degraded water quality with emphasis on temperature impairments

WA Lower Columbia Salmon Recovery and Fish & Wildlife Subbasin Plan, May 2010. Table I-14. Prioritized measures for the Toutle River Basin. There are a few stream segments on the draft 2002-2004 303(d) list for temperature impairment and one stream segment included as a concern for temperature impairment. Despite the few listed segments, elevated stream temperature is believed to be a concern throughout the basin due to high channel width-to-depths and lack of riparian cover. High suspended sediment levels are also a concern but are related primarily to high sediment loads and unstable channels due to the 1980 eruption.

#11 - Create/restore off-channel and side-channel habitat

WA Lower Columbia Salmon Recovery and Fish & Wildlife Subbasin Plan, May 2010. Table I-14. Prioritized measures for the Toutle River Basin. There was significant loss of off-channel and side-channel habitats due to mudflows associated with the 1980 eruption. Sediment loading and subsequent channel braiding may set the stage for the creation of quality side channel and off-channel habitats as stream channels slowly stabilize and fines are transported out of the system. Dredging and levee construction following the eruption will limit side-channel and off-channel creation in places. Creating habitats may be warranted in some areas, especially targeted for chum spawning; however, processes limiting habitat creation and maintenance (i.e. instability, confinement) must be addressed for them to be successful.

Did you discuss this project with Ecology staff? If yes, provide the name of the staff and the last date of contact.

Water Quality and Public Health Improvements

Yes. We corresponded with Leanne Whitesell and Devan Rostorfer through the notice of intent review process .

Describe how the project drainage area connects to the water body.

Examples: surface flow, ditch, pipe, groundwater, infiltration, and path/distance to outfall/discharge.

The SF Toutle begins on the flanks of Mount Saint Helens in a small glacier as well as in Blue Lake which feeds into the Goat Creek Marsh . The SFT flows through a 10-mile long headwaters valley before necking down into a 10-mile long canyon reach. The canyon reach opens up into a response reach and this project is located near the top of the response reach. The SFT continues another 6.5 miles to its confluence with the NF Toutle, onto the Cowlitz and Columbia Rivers and out to the Pacific Ocean. There are no manmade barriers on this route.

Describe the measure and method that will be used to determine the water quality benefit and overall success of the project.

If you need help determining a water quality metric, please refer to the Funding Guidelines for suggested metrics by project type.

We will be collecting water temperature data annually between June and September to document the 7DADmax in main channels, side channels, and beaver pond habitats in the reach to gain a good understanding of the diverse habitats within the reach. We will also be obtaining thermal imaging data (relative) to guide us on selecting both the hottest and coldest reaches to collect temperature data. With this baseline data we will be able to evaluate our effectiveness over time at keeping the SFT within the core rearing temperatures for salmon and steelhead (<16°C).

Using the method described above, estimate the water quality and public health benefits that will be achieved by the project.

The project aims at developing floodplain forests that will ultimately shade the SF Toutle . The project also aims to establish an anastomosing channel network which reduces channel widths and increases the effectiveness of shade as well as improving hyporheic exchange . By addressing known water quality issues we will improve habitat conditions for ESA-listed Chinook, coho, and steelhead which are core species interwoven into the culture of the PNW.

How long will the project provide benefits after the funding assistance ends? Who will be responsible for maintaining the benefits during its useful life?

This project will restore natural processes and was designed to be self-sustaining. LCFEG will monitor our effectiveness at establishing floodplain forests and if supplemental efforts are necessary, we will be responsible for finding additional funding to address these concerns. As a phased project, we can write in small pots of funding into future grant requests to tweak and enhance previously completed phases within the same reach.

How will greenhouse gas emissions be reduced or mitigated under this project? And what policies or measures has your organization put in place to reduce greenhouse gas emissions apart from this project?

This project aims to capture mobile carbon currently flushing out of the watershed. While limited, we intend to increase carbon loading in the headwaters valley which will contribute future wood supply to this reach. We also intend on establishing mature floodplain forests that are protected by forest practices and cannot be logged, therefore are carbon sinks.

Water Quality and Public Health Improvements

Are you aware of any Category I or Category II wetlands on the site or downstream from the site? This is for informational purposes; no points are associated with this question.

Yes No Not Applicable

Upload a map that shows an aerial view of the project area, an estimated direction of flow for the project area, potential locations for the proposed facility or activity, and how the project connects to the water body named above.

The map does not need to be precise, but it should help reviewers with a general understanding of the area. If access to GIS software is not available, screen shots or snips from Google Maps with arrows and text added using a paint program may be used.

Upload Documents

Click the Browse button

Select your file

Click Save, your file will appear in the List of uploaded documents

Repeat for each file

To Delete a file, select the Delete checkbox next to the file and click SAVE

https://ecyeag/IntelliGrants_BASE/_Upload/186511_9 Project visuals_SFT Lower Brownell_ECY319 application

36442-SFToutleLowerBrownellRiparianRestoration_E

CY319grant_2021-10-21_final.pdf

WATER QUALITY COMBINED FINANCIAL ASSISTANCE

Organization: Lower Columbia Fish Enhancement Group

WQC-2023-LoCFEG-00134

Environmental and Cultural Resources Documentation

The purpose of this form is for you to note which documents you have provided your grant or loan manager and/or environmental/cultural resource reviewer for all Water Quality Combined Funding Program projects, regardless of funding source or project category. It is not a location for sensitive documentation such as cultural resource reports. Those will be removed if you upload them. Once you have provided the following documents, check them off and upload any non-sensitive documents.

Cultural Review Final Determination

Date of Final Determination:

DAHP Letter of Concurrence

✓ Completed activity/location specific Inadvertent Discovery Plan (IDP). An IDP is not associated with consultation and is required in the event of a discovery during ground disturbance.

If you are applying for or have received a loan from the CWSRF, when applicable upload any of the following documents provided to support completion of environmental requirements.

NEPA Environmental Assessment or Impact Statement

SEPA Checklist

SEPA Threshold Determination

SEPA Environmental Impact Statement

Affidavit of Publication of SEPA Threshold Determination

Public Engagement and Outreach documentation, including Environmental Justice information

SERP Information Packet Coversheet

SERP request for NEPA Categorical Exclusion

SERP SEPA Finding of Categorical Exemption

SERP Determination

Other supporting environmental documentation as requested by Ecology

If you have a stormwater facility project, and you are applying for or have received state funding via SFAP and no federal funds under CWSRF, when applicable upload the following documents.

SEPA Checklist

SEPA Threshold Determination

Affidavit of Publication of SEPA Threshold Determination

Upload Documents

Any documents marked sensitive or do not disclose will be removed from EAGL by Technical Reviewers. If you received such a document, such as a cultural resource survey or monitoring report, send it directly to your Project Manager or Cultural Resource Contact.

Click the browse button

Select your file

Click Save, your file will appear in the list of uploaded documents

WATER QUALITY COMBINED FINANCIAL ASSISTANCE

Organization: Lower Columbia Fish Enhancement Group

WQC-2023-LoCFEG-00134

Environmental and Cultural Resources Documentation

Repeat for each file

To Delete a file, select the Delete checkbox next to the file and click SAVE

Description

SFT Inadvertent Discovery Plan

Attachments

https://ecyeagl/IntelliGrants_BASE/_Upload/186538_936979-InadvertentDiscoveryPlan_SFT.pdf