



## **Lawrence Creek Off-Channel Habitat Connection Project**

### **Final Report**

#### **Submitted to:**

California Fish Passage Forum & Pacific States Marine Fisheries Commission  
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#### **Submitted by:**

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**PSMFC Grant No.** 22-036G

**USFWS Funding Award ID:** F20AC00007

**Contract Term:** August 1, 2021-October 31, 2022

### **Project Objectives**

The objective of this project was to increase the quality and quantity of winter rearing habitat for Coho Salmon by expanding and enhancing off-channel features in Lawrence Creek, tributary to Yager Creek, in the lower Van Duzen River.

### **Project Location**

The project location is in the Yager Creek watershed, a large sub-watershed of the Van Duzen River, which drains into the Eel River 13 miles upstream with its confluence with the Pacific Ocean. The site can be accessed from Fortuna, CA by travelling about 4 miles south on State Highway 101 and turning east onto California State Route 36. Then travel east on Highway 36 for approximately 5.5 miles and turn left onto Mantova Lane. After about 1.3 miles Mantova Lane becomes Yager Creek/Yager-Lawrence Mainline Rd. Travel north on Yager-Lawrence Mainline Road for approximately 7.3 miles. The project site is immediately adjacent to Yager-Lawrence Mainline Road.

### **Project Team**

- Trout Unlimited (Grantee and Project Manager)
- Pacific Watershed Associates (Engineer)

- VS Shinn (Construction)
- Humboldt Redwood Company (landowner, fish biologist)

## **Work Summary**

### *Grant Administration*

Trout Unlimited worked with its partners to secure subcontractor agreements, coordinate site visits, facilitate meetings, facilitate construction, complete permitting, and to develop and submit invoices and reports.

### *Background*

This project was the third phase of a larger effort to improve off-channel and side channel habitat within the Lawrence Creek watershed. Phase 1 was focused on design of Site 1. During the implementation of Site 1 (Lawrence 2.0), the Project Team identified several other potential locations for a second off-channel habitat feature at Site 2 (Lawrence 3.0). Potential locations for the new site merited field review to assess existing conditions and design suitability. TU convened a field visit in January 2019 to review and select a preferred location; however, this coincided with a federal furlough, and NOAA representative staff were not able to attend. As a result, the Project Team re-convened on May 2, 2019, so the NOAA partners could review and assist with site selection. A location for Site 2 was identified, and PWA staff collected topography data for the site location and monitoring equipment was deployed. The final (100%) engineered design for the 3.0 site was completed and stamped December 31, 2021. The design plans were reviewed by NOAA RC staff and have been approved by the agency engineering staff. The project was designed to increase the quality and quantity of winter rearing habitat for Coho Salmon by expanding and enhancing off-channel riparian area in the Yager Creek / lower Van Duzen River basin. The intended results of the Project were to create and enhance low velocity refugia adjacent to Lawrence Creek and to add complexity to the available aquatic habitat.

All permits necessary for construction were secured in the summer 2020 (401 NOA, 404 NWP 27 Authorization, HREA/1653 Authorization, and NOAA Programmatic BO). Construction was originally planned for the 2020 low-flow season; however, several unforeseen events culminated in delaying construction until 2021. In the Spring 2020, due to the Covid-19 pandemic HRC decided to disband its equipment crew who were originally identified to lead construction on Lawrence 3.0. In response, TU requested cost estimates from three qualified local subcontractors. Two estimates exceeded the total construction budget, but one estimate was within budget and that subcontractor was selected. The project was scheduled to occur in mid-October 2020, however during late September, the August Complex fire entered the Van Duzen basin, leading to further uncertainty about whether construction was feasible during the 2020 construction season, so construction was postponed until 2021.

In July 2021, TU was notified that the contractor selected in 2020 was no longer available to construct the project. TU worked with PWA to identify another qualified contractor, but due to

contractor availability and budget constraints a qualified and willing contractor was not identified, and implementation was postponed until 2022. In September 2021 TU was awarded additional funds from the CA Fish Passage Forum to support construction costs. On October 18, 2021, a subcontract was executed VS Shinn for construction services.

Prior to 2022 implementation, TU was notified by the construction contractor that additional funding was required to cover inflated fuel costs. TU was able to work with Humboldt Sawmill Co. and the CA State and Regional Water Boards to secure funds to cover escalated equipment rates. TU staff also renewed permits and submitted reports to the appropriate permitting agencies to support construction in 2022.

### *Implementation*

This project provides ESA-listed salmonids access to historic floodplain habitats by restoring hydrologic connectivity to side channel features. Constructed features create low velocity refugia adjacent to mainstem Lawrence Creek and add complexity to the available aquatic habitat in this reach. Large wood structures increase flow inundation frequency to the existing side-channel and constructed alcove. In all, five features were constructed: a Venturi Jam, a deflector jam, an apex bar Jam, an inlet Jam, and an alcove.

Fish relocation occurred on September 27, 2022. Construction began September 27 and concluded October 14, 2022. Construction of the alcove included clearing of surrounding vegetation, excavation to achieve grades demonstrated in the plans, and placement of logs. Grading of the alcove invert elevation is relative to the side channel thalweg elevation. The apex bar and deflector wood structures constructed in Lawrence Creek will raise the water surface elevation upstream, inducing more flow into the side channel under high flow conditions. It is anticipated that the off-channel alcove will be hydraulically connected during 15% exceedance flows and greater, or on average 55 days out of the year. Large wood habitat structures were added to the alcove habitat. See as-builts and Table 1 for details of materials used to construct each feature.

Table 1. Materials used in construction, and construction disturbance area.

<b>AS-BUILT MATERIALS COUNT</b>		
<b>CATEGORY</b>	<b>UNIT</b>	<b>QUANTITY</b>
LARGE WOODY MATERIAL W/ ROOTWAD	EACH	29
LARGE WOODY MATERIAL W/O ROOTWAD	EACH	35
MEDIUM WOODY MATERIAL (~16" x ~10')	EACH	22
EARTHWORK	CY	2,100
30" MINUS ROCK	TON	25
1 TON BOULDERS	EACH	5
4 FOOT BOULDERS	EACH	2
ANCHOR BOLTS (INCLUDING 1 CABLE)	EACH	18
DISTURBED AREA (PROJECT)	SF	23,200
DISTURBED AREA (ACCESS)	SF	12,500

Following construction, slash was spread across the entire site, including the equipment access route, to prevent erosion and runoff. Straw, mulch, and seed were also spread on the site. As-builts were overlaid on the construction plans after implementation and are attached to this report.

## Final Budget

The California Fish Passage Forum originally awarded \$48,029 towards the total cost of this project. Trout Unlimited expended \$48,028.85, returning \$0.15 to the funder, as described in Table 2, below. Additional funding was provided to this award by the landowner, Humboldt Redwood Company (HRC), through in-kind contributions of construction materials and staff time for fish relocation and monitoring services. Funding was also provided by the Humboldt Sawmill Company (\$18,990) through a SEP award from the North Coast Regional Water Quality Control Board and through an award from the NOAA Restoration Center where \$37,306 was expended on construction costs, engineering oversight, and fish relocation supplies. All sources of cost share are considered leverage, not direct match. The total project cost was estimated to be \$131,268.85 at the time of this report; future expenditures and cost share will be documented through September 2023 when the primary funding (NOAA) expires.

Table 2. Final Budget- Fish Passage Forum, Lawrence Creek Hydrologic Reconnection Phase III

	Proposed Budget	California Fish Passage Forum	Humboldt Redwood Company	Humboldt Sawmill Co. - SEP Funds	NOAA Restoration Center	TOTAL
<b>PERSONNEL</b>						
Project Director	\$ 6,000.00	\$ 6,283.74	\$ -	\$ 380.70	\$ -	\$ 6,664.44
Project Manager	\$ 4,025.00	\$ 4,208.45	\$ -	\$ 835.86	\$ -	\$ 5,044.31
Grants Accountant	\$ 1,200.00	\$ 514.89	\$ -	\$ -	\$ -	\$ 514.89
Subtotal Personnel	\$ 11,225.00	\$ 11,007.08	\$ -	\$ 1,216.56	\$ -	\$ 12,223.64
Benefits	\$ 5,276.00	\$ 5,413.79	\$ -	(included above)	\$ -	\$ 5,413.79
<b>TOTAL PERSONNEL</b>	<b>\$ 16,501.00</b>	<b>\$ 16,420.87</b>	<b>\$ -</b>	<b>\$ 1,216.56</b>	<b>\$ -</b>	<b>\$ 17,637.43</b>
<b>OPERATING EXPENSES</b>						
<i>Subcontractors</i>						
Pacific Watershed Associates	\$ 5,000.00	\$ 5,000.00	\$ -	\$ -	\$ 14,367.93	\$ 19,367.93
Heavy Equipment Operator (VS Shinn)	\$ 20,000.00	\$ 20,000.00	\$ -	\$ 15,500.00	\$ 19,467.50	\$ 54,967.50
Materials (logs and rootwads)			\$ 26,944.00	\$ -	\$ -	\$ 26,944.00
<b>Subtotal Subcontractors</b>	<b>\$ 25,000.00</b>	<b>\$ 25,000.00</b>	<b>\$ 26,944.00</b>	<b>\$ 15,500.00</b>	<b>\$ 33,835.43</b>	<b>\$ 101,279.43</b>
<i>Other Operating Expenses</i>						
Supplies (native grass seed)	\$ 50.00	\$ 50.00	\$ -	\$ -	\$ 79.11	\$ 129.11
Mileage (federal rate)	\$ 676.00	\$ 719.75	\$ -	\$ -	\$ -	\$ 719.75
<b>Subtotal Other Operating Exp</b>	<b>\$ 726.00</b>	<b>\$ 769.75</b>	<b>\$ -</b>	<b>\$ -</b>	<b>\$ 79.11</b>	<b>\$ 848.86</b>
Indirect	\$ 5,802.00	5838.23	\$ -	\$ 2,273.44	\$ 3,391.45	\$ 11,503.12
<b>TOTAL BUDGET</b>	<b>\$ 48,029.00</b>	<b>\$ 48,028.85</b>	<b>\$ 26,944.00</b>	<b>\$ 18,990.00</b>	<b>\$ 37,306.00</b>	<b>\$ 131,268.85</b>

## Project Photographs

*The following photos are a subset of photo point pre-implementation and post-implementation monitoring. The full set of pre- and post- implementation photos have been stored in electronic format.*



Photo 1a (left) shows the location of the apex bar jam pre-construction and 1b (right), shows the constructed apex bar jam. Photo 1a was taken 9/27/22 and 1b was taken 10/10/22.





Photo 2 shows the constructed deflector jam (10/6/22).



Photo 3a (top) shows the side channel pre-construction. Photo 3b (bottom) shows the completed Venturi structure, inlet jam, and entrance to the alcove situated in the existing side channel. Photo 3a was taken 9/27/22 and 3b was taken 10/11/22





Photos 4a (top) and 4b (bottom) show the off-channel alcove following construction. Both photos were taken 10/28/22.