

EF 05**Off-Channel Habitat Enhancement – Conceptual Design**

Reach: EF Lewis 8B
 River mile: 14
 Reference page in main document: 40

Site Description

This site is located on the river left (south side) across from the Lewisville Park baseball field. It is located on Boy Scouts property. There is a small unnamed but perennial tributary that enters the mainstem. The tributary provides cool water input during the summer. Temperatures in the tributary were 10°F cooler than the mainstem at the time of the survey. There were signs of recent beaver dam construction along the tributary. WDFW data shows there is adjacent Chinook and steelhead spawning in the mainstem. Site observations and temperatures suggest suitable groundwater connectivity and tributary inflow for a beneficial off channel project. This project was carried forward to the conceptual design phase ahead of other, higher ranking projects because of its unique opportunity to provide cool water off-channel refuge habitat. The low benefit score is a result of the small size of the project; the benefit per area of off-channel habitat is expected to be high.



Off-channel habitat enhancement area. The small perennial tributary enters from the right side. The mainstem East Fork Lewis River is on the left side (view looking upstream).

Treatment Strategy and Alternatives

Recommended treatments:

- Excavate approximately 10,000 square foot off-channel area connected with the mainstem at summer low flow periods. Off-channel area will be fed by perennial cool-water tributary.
- Add large wood for habitat complexity and cover.
- Conduct riparian restoration throughout project area, especially in areas disturbed by construction activities.

Alternatives:

- The specific extent of off-channel area will be determined through analysis and design.
- Enhancement of tributary spawning habitat should be evaluated and considered.



Example of Constructed Backwater Habitat with Large Wood Cover

Expected Benefits – Limiting Factors Addressed

Physical habitat – Enhanced quantity and quality of off-channel area, habitat complexity and cover, and large woody debris.

Biological – 1) Enhanced cool water refuge for summer rearing of coho and steelhead, and 2) Enhanced winter high flow refuge for coho and steelhead, and 3) Enhanced fry colonization and early-rearing habitat for Chinook (there are adjacent spawning grounds just upstream on the mainstem).

Access and Landownership

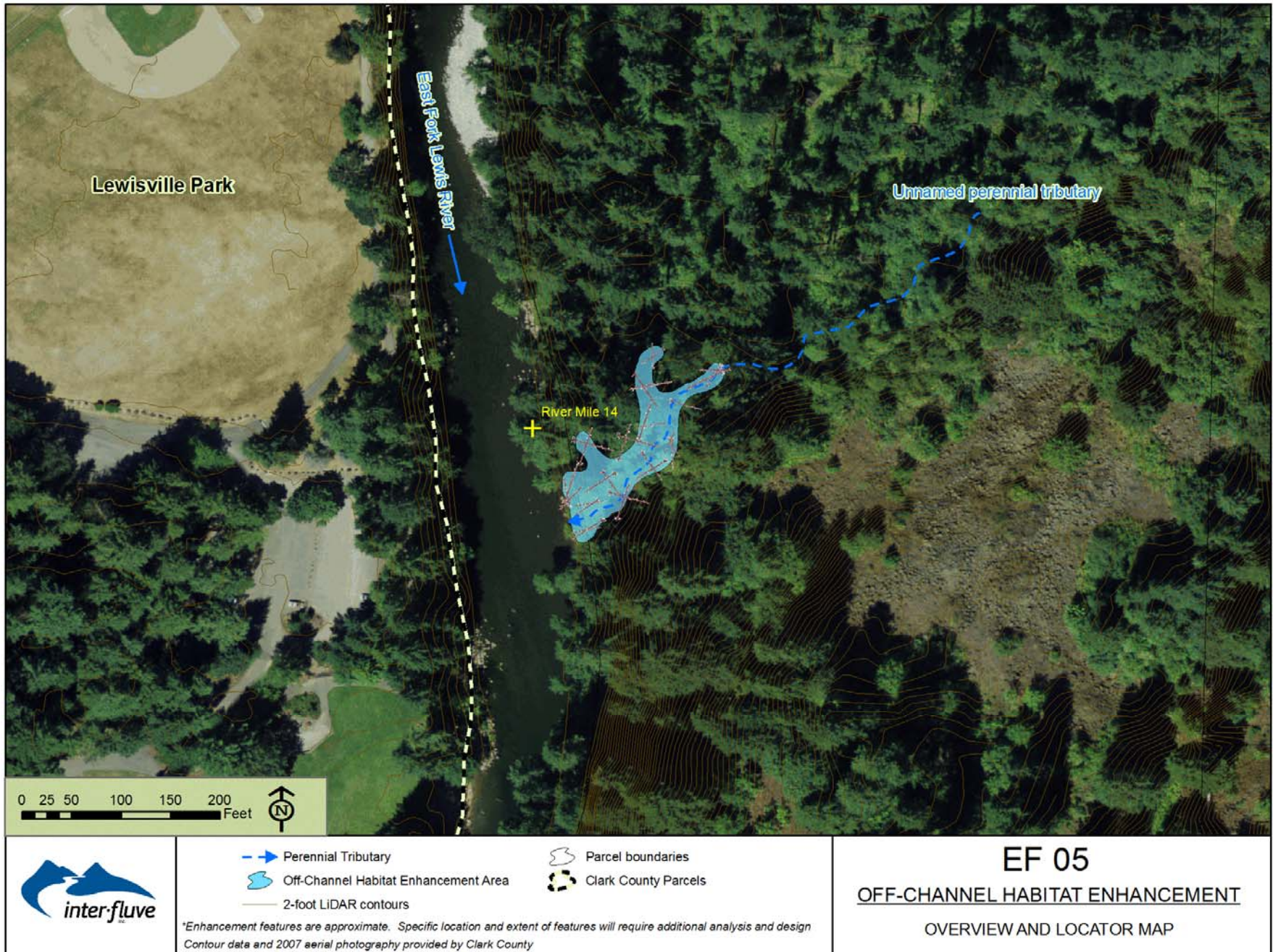
Habitat enhancements would be located on private property (Boy Scouts of America property). The most direct access would be through the old Boy Scout camp area and would only require a couple hundred feet of temporary access road.

Data and Analysis Requirements

WDFW steelhead redd survey data shows redds located near the tributary outlet. The effect of the project on steelhead spawning needs to be evaluated. A topographic survey will be needed to determine final excavation volumes and extent. At least one summer season of temperature and dissolved oxygen monitoring should be conducted to characterize the condition of tributary flow and groundwater flow that would be expected to contribute to the backwater area. Flood inundation analysis and a geomorphic assessment will be required to support final designs. Habitat enhancements will be subject to significant potential impact from beavers; these impacts should be addressed as part of project design.

LCFRB Habitat Strategy Summary

EF Lewis 8B							
	Tier	1					
	Length (m)	8,801					
	Population	WSTH	SSTH	FCH	Coho	Chum	Multi Species
Recovery Plan Priority		P	P	P	P	P	
Species Reach Potential (H,M,L)		M	L	M	M	H	
Restoration Value		66%	43%	38%	83%	52%	56%
Preservation Value		34%	57%	62%	17%	48%	44%
Access to blocked habitats		-	-	-	-	-	L
Stream channel habitat structure & bank stability		H	M	H	H	H	H
Off channel & side channel habitat		H	M	H	H	H	H
Floodplain function and channel migration processes		H	M	H	H	H	H
Riparian conditions & functions		H	M	M	H	M	H
Water quality		H	M	M	M	L	H
Instream flows		H	M	H	H	H	H
Regulated stream management for habitat functions		-	-	-	-	-	L
Watershed conditions & hillslope processes		H	M	H	H	M	H



Planning-level cost estimate for EF 05

Note: This is a preliminary cost estimate for planning purposes. Actual costs for design and construction activities may vary substantially from these estimates. Assumptions for time requirements and material quantities have been made based on limited information that is available for the site. Additional information obtained during site investigations will be needed to determine actual quantities and costs. Estimates based on 2009 costs.

Description	Unit	Quantity	Unit Cost	Total Cost	Comment
Mobilization and demobilization	LS	1	\$6,000	\$6,000	Calculated at 5% of construction sub-total
Temporary access road	LF	200	\$40	\$8,000	Assumes access can be obtained through Boy Scout Camp area
Excavate & stockpile/dispose	CY	3,000	\$15	\$45,000	Excavation quantity is based on 10,000 square foot extent with an average excavation depth of 8 ft. Final design criteria and analysis will likely alter these estimates up or down. Assume haul will be less than 1,500 feet. Haul distances greater than 1,500 feet off site on road will substantially increase haul costs.
Large wood purchase and installation	EA	40	\$800	\$32,000	Assumes 30% delivered with root wads attached. Cost includes placement
Dewatering and sediment control	LS	1	\$15,000	\$15,000	Assumes water will be encountered throughout construction.
Streambank revegetation	SF	2,000	\$1.50	\$3,000	Assumes average of 5 feet on each bank for entire length
Riparian revegetation (above bank)	AC	0.2	\$15,000	\$3,000	Assumes 20 feet revegetation on each side of channel. Includes follow-up maintenance.
Construction oversight	HR	180	\$130	\$23,400	Assumes 2 weeks of construction oversight, construction staking and associated coordination, 12 hour days, 1.5 staff.
Construction Sub-Total				\$135,400	
Concept Level Construction Contingency (20%)				\$27,080	
Construction Total				\$162,500	
Project Delivery					Items below are calculated as a percent of the construction sub-total
Permitting (4%)				\$5,416	
Detailed Engineering Design (15%)				\$20,310	
Contract Administration (5%)				\$6,770	
Project Delivery Sub-Total				\$32,500	
TOTAL ESTIMATE				\$195,000	rounded to nearest \$1,000

General Notes:

Cost includes a 20% construction contingency

Costs assume all materials (wood) is purchased and hauled to the site from a nearby source.

Savings could be gained by reducing the extent of the off-channel area.

Key

LS = Lump sum

CY = Cubic yard

LF = Lineal foot

SF = Square foot

AC = Acre

EA = Each

FF = Face foot (square foot of bank face)

HR = Hours