

EF 12

Instream Habitat Enhancement – Conceptual Design

Reach: EF Lewis 8B
 River mile: 10.9 to 11.4
 Reference page in main document: 45

Site Description

The meander bend at river mile 11 (see overview photo on page 3) consists of a uniform channel that lacks habitat complexity and in-stream wood structure to support juvenile rearing and adult holding. The frequency and quality of pool habitat is low and there is little to no habitat structure necessary for velocity refuge and rearing cover. Residential development along the south bank limits the ability to fully restore channel migration processes that would create and maintain complex habitats. Adding structural complexity would help to restore habitat conditions within the constraints imposed by surrounding land use.

Portions of adjacent upstream and downstream stream segments, extending from Lewisville Bridge down to Daybreak Bridge, have similar habitat conditions and could also benefit from similar treatments.

This project scored high in the project evaluation process due to its benefit to multiple species life-stages and due to its large size.

Treatment Strategy and Alternatives

Recommended treatments:

- Construct 5-7 meander-bend log jams structures. Ballast logs with boulders, pilings, burial, or attachment to existing trees.
- Add and secure wood on bars to provide floodplain roughness.
- Conduct riparian restoration throughout project area, especially in areas disturbed by construction activities.

Alternatives:

- There are alternatives for log jam size and placement location. These will be determined through analysis and design.
- Similar treatments could be extended into upstream and downstream segments.
- Construction of this project could potentially be combined with off-channel enhancement at project EF-20 (downstream) and EF-16 (upstream).



Example of Constructed Meander-bend Log Jams

Expected Benefits – Limiting Factors Addressed

Physical habitat – Enhanced quantity and quality of habitat features including pools and riffles, bank complexity and cover, and instream woody debris.

Biological – 1) Enhanced winter high flow refuge for coho and steelhead, 2) Enhanced bank margin habitat for Chinook fry colonization and early rearing, and 3) Increased habitat complexity and cover for rearing fish that will provide diverse foraging opportunities and protection from predators.

Access and Landownership

Habitat enhancements would be located on Clark County property. Private property is located across the river. Access could potentially be obtained from the north across private property or from the east (upstream) or west (downstream) through Clark County property. Access could also potentially be gained from across the river through private property. Any access across private property would require the cooperation of willing landowners. Combining construction of this project with construction of project EF-20 (to the west) should be considered in order to combine access.



Data and Analysis Requirements



This area is heavily used by river recreationists and is close to adjacent residences. Recreation access, safety, and flood conditions must be addressed in design. This is a FEMA-regulated floodplain and the design must satisfy a No-Rise condition of the base flood. Hydraulic analysis, flood inundation analysis, and a geomorphic assessment will be required to support final designs.

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	P	
Species Reach Potential (H,M,L)	M	L	M	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	



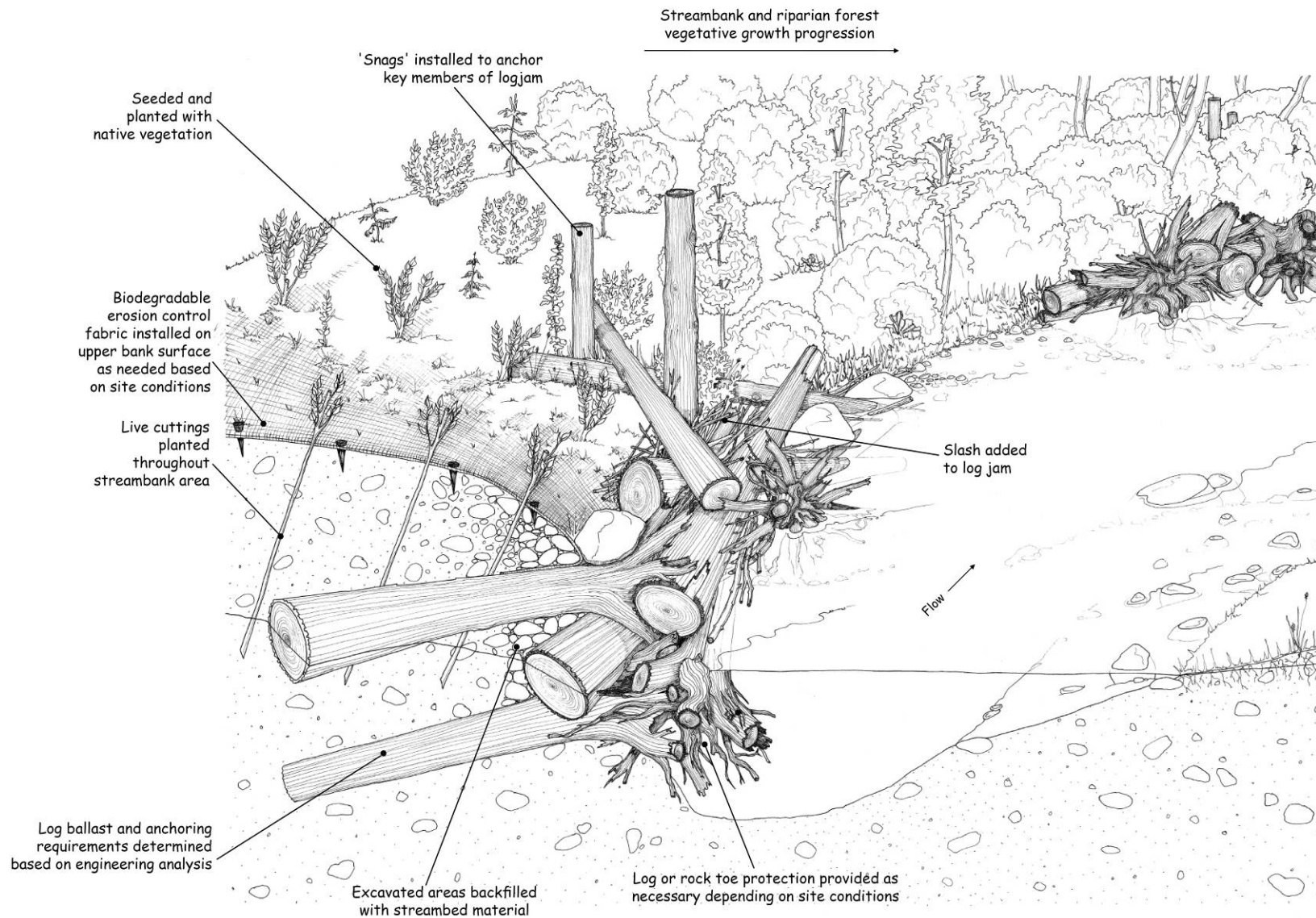
 Habitat Enhancement Area
 2-foot LIDAR contours

 Parcel boundaries
 Clark County Parcels

 Log placements

**Enhancement features are approximate. Specific location and extent of features will require additional analysis and design. Contour data and 2007 aerial photography provided by Clark County*

EF 12
INSTREAM HABITAT ENHANCEMENT
 OVERVIEW AND LOCATOR MAP



TYPICAL MEANDER-BEND LOG JAM
3-D RENDERING

EF 12
INSTREAM HABITAT ENHANCEMENT

Planning-level cost estimate for EF 12

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/Assumption
Mobilization and demobilization	LS	1	\$13,000	\$13,000	Calculated at 5% of construction sub-total
Temporary access road	LF	500	\$40	\$20,000	Assumes one access from private land owner and post construction rehabilitation.
Large wood purchased and delivered to site	EA	150	\$500	\$75,000	Assumes 30% delivered with root wads attached. Assumes 25 pieces per jam plus floodplain wood.
Boulder ballast purchased and delivered to site	EA	225	\$100	\$22,500	Assumes 1.5 - 2 yard boulders. Assumes 1.5 boulders per log.
Log jam construction	EA	5	\$10,000	\$50,000	Wood placed in jams to withstand Lewis River floods. Ballast will be completed through burial, attachment to existing trees, and cable boulder ballast.
Dewatering and sediment control	LS	1	\$25,000	\$25,000	Assumes water will be encountered during log jam construction.
Revegetation	SF	30,000	\$1	\$30,000	Assumes 6,000 SF revegetation associated with each log jam.
Construction oversight	HR	270	\$130	\$35,100	Assumes 3 weeks of construction oversight, construction staking and associated coordination, 12 hour days, 1.5 staff.
Construction Sub-Total				\$270,600	
Concept Level Construction Contingency (20%)				\$54,120	
Construction Total				\$324,700	
Project Delivery					Items below are calculated as a percent of the construction sub-total
Permitting (4%)				\$10,824	
Detailed Engineering Design (15%)				\$40,590	
Contract Administration (5%)				\$13,530	
Project Delivery Sub-Total				\$64,900	
TOTAL ESTIMATE				\$390,000	rounded to nearest \$1,000

General Notes:

Cost includes a 20% construction contingency

Costs assume all materials (wood and rock) are purchased and hauled to the site from a nearby source. Significant savings could be accrued if materials are donated.

Reducing the number of log jams could reduce costs

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