

MN 02

Manley Creek Habitat Enhancement – Conceptual Design

Reach: Manley Creek 1B - 1C
 River mile: 0.2 to 0.75
 Reference page in main document: 69

Site Description

This site is located on lower Manley Creek below 259th Street. This reach follows the south margin of the EF Lewis floodplain located between EF Lewis river miles 9.5 and 10. The site is located on County property (Lower Daybreak). There is a concurrent master planning effort for this site that will have to be considered when developing proposed treatments in this reach. It is estimated that historically Manley Creek entered the EF Lewis further upstream from its present location, although the exact location of the historical alignment is unknown. The lower section of the creek was likely realigned against the valley wall to accommodate agriculture / grazing uses. The current channel alignment has been relatively unchanged at least since the 1939 aerial photograph series.

Vegetative conditions along Manley Creek in the reach aligned with the valley wall include a relatively intact riparian canopy and a mix of native and invasive understory species. In this reach, instream habitat structure is lacking though several beaver dam complexes are present which lend habitat complexity. It is likely that the presence of the beaver dam complexes in combination with road crossings (culverts) and previous dammed ponds have limited incision in Manley Creek. In the upper section of the project reach, the channel alignment departs from the valley wall and has been significantly impacted by prior land use practices including a road crossing. Riparian vegetation and habitat conditions are severely degraded, lacking canopy trees and dominated by invasive reed canary grass and Himalayan blackberry. Instream habitat quality is poor due to highly simplified channel conditions that lack structure and cover. Current average channel slope for this site is 0.3%.

This site offers a good opportunity to restore a low gradient tributary that will potentially provide suitable channel habitat for a range of life history needs (spawning, rearing, high flow refugia) for coho, steelhead and chum (potential). This project scored high in the project evaluation process due to its benefit to multiple species life-stages and due to its large size. Although the project is located in a Tier 2 reach, the project was ranked as a Tier 1 reach due to its potential to benefit fish originating in downstream Tier 1 reaches (i.e. Lower Manley and the mainstem EF Lewis).



Beaver pond complexes in lower section of MN 02.

Treatment Strategy and Alternatives

Recommended treatments:

- Select grading and channel realignment in the upper portion (1,500 ft) of the reach. Create pool-riffle sequences. Install habitat enhancement features including large woody debris.
- Enhance habitat conditions in the lower section of the project reach through supplemental addition of large woody debris.
- Remove or retrofit the existing road crossing in the upper section of the reach if consistent with future use of the property.
- Control invasive species and restore native riparian habitat.

Alternatives:

- There are numerous channel re-alignment alternatives that could be considered in order to accomplish restoration objectives and to accommodate future land-use at the site.
- Connected backwater channels could be constructed along the southern side of the channel in order to enhance off-channel rearing habitat and to collect cool springflow from the valley-wall.
- It would be possible to only treat a portion of the project reach (e.g. the upstream portion that is most degraded) or to phase treatments over time as available resources allow.



Examples of typical restored channels

Expected Benefits – Limiting Factors Addressed

Physical habitat – 1) Enhanced quantity and quality of habitat features including pools and riffles, bank complexity and cover, and instream woody debris, 2) Enhanced availability of tributary habitat throughout the year, 3) Enhanced stream shading, 4) Enhanced channel stability.

Biological – 1) Enhanced winter high flow refuge for coho and steelhead, 2) Enhanced spawning for coho and steelhead, with potential benefits to chum spawning, 3) Enhanced quantity and quality of cool-water summer rearing for coho and steelhead, 4) Increased habitat complexity and cover for rearing fish that will provide diverse foraging opportunities and protection from predators, 5) Improved fish passage conditions.

Access and Landownership

The property is currently owned by Columbia Land Trust, with a memorandum of understanding with Clark County that the property will eventually be transferred to County ownership. Projects need to be consistent with the County’s master planning process at this site. Projects need to take into consideration the future of the house that is located at the site, bank erosion, flood damage protection, and the relationship with potential future recreation facilities. Mitigation credits should be pursued. Additional funding sources may be available. Access can be obtained from 259th Street at the upstream end and from the existing access road that enters the west end of the site off of 259th Street. The project will need to be developed in conjunction with the park master planning process at this site and the proposed bank stabilization project (West Daybreak) on the mainstem EF Lewis.

Data and Analysis Requirements

Detailed site survey, hydraulic analysis, flood inundation analysis, and a geomorphic assessment will be required to support final designs. Effects of past and potential future inputs of fine sediment originating from the TEBO mine should be evaluated as to the potential impact on habitat conditions in the project reach. Prior to habitat enhancement work, there needs to be assurance that no significant future inputs of fine sediment will occur. Habitat enhancements will be subject to significant potential impact from beavers; these impacts should be addressed as part of project design.

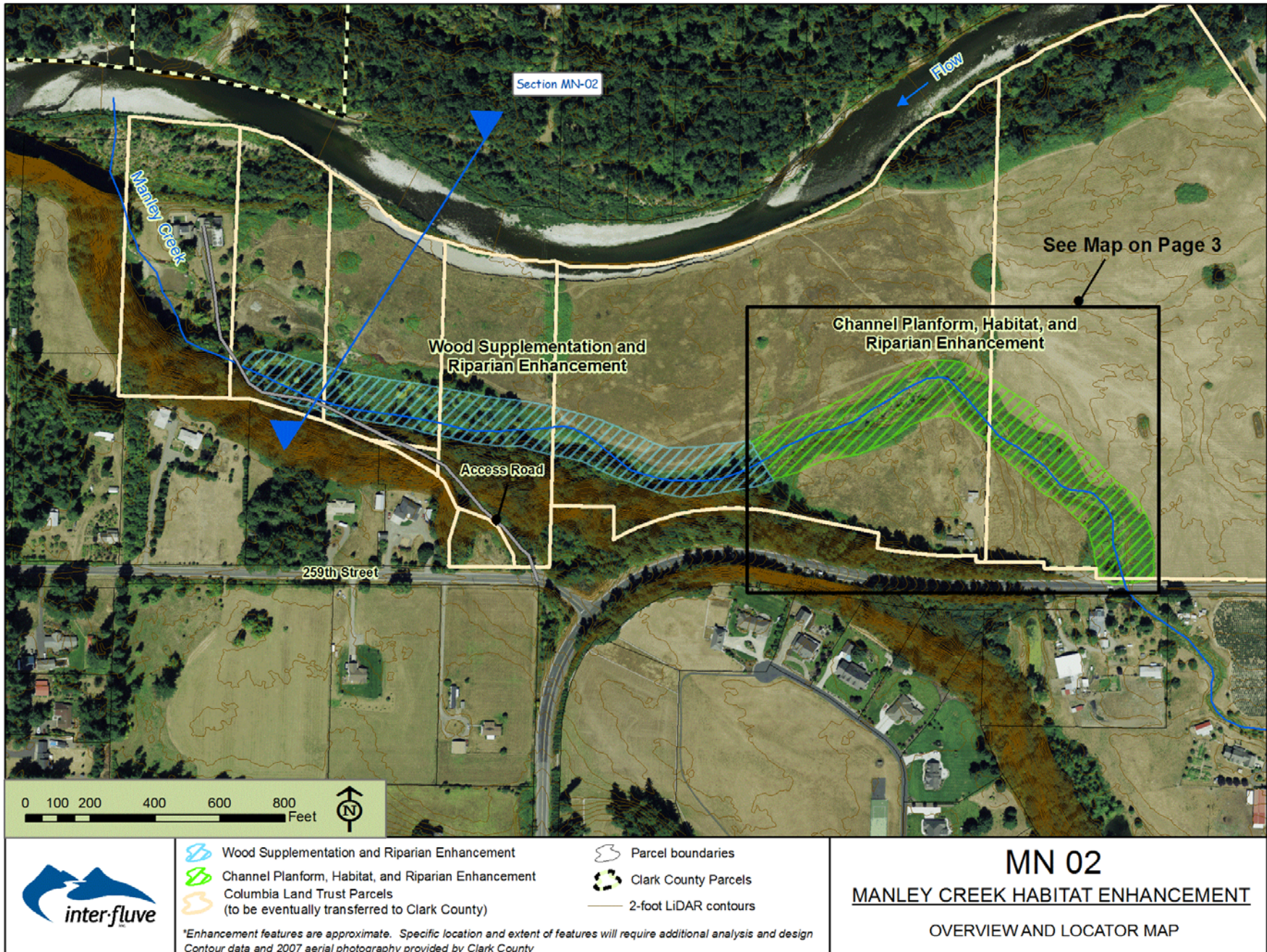
LCFRB Habitat Strategy Summary

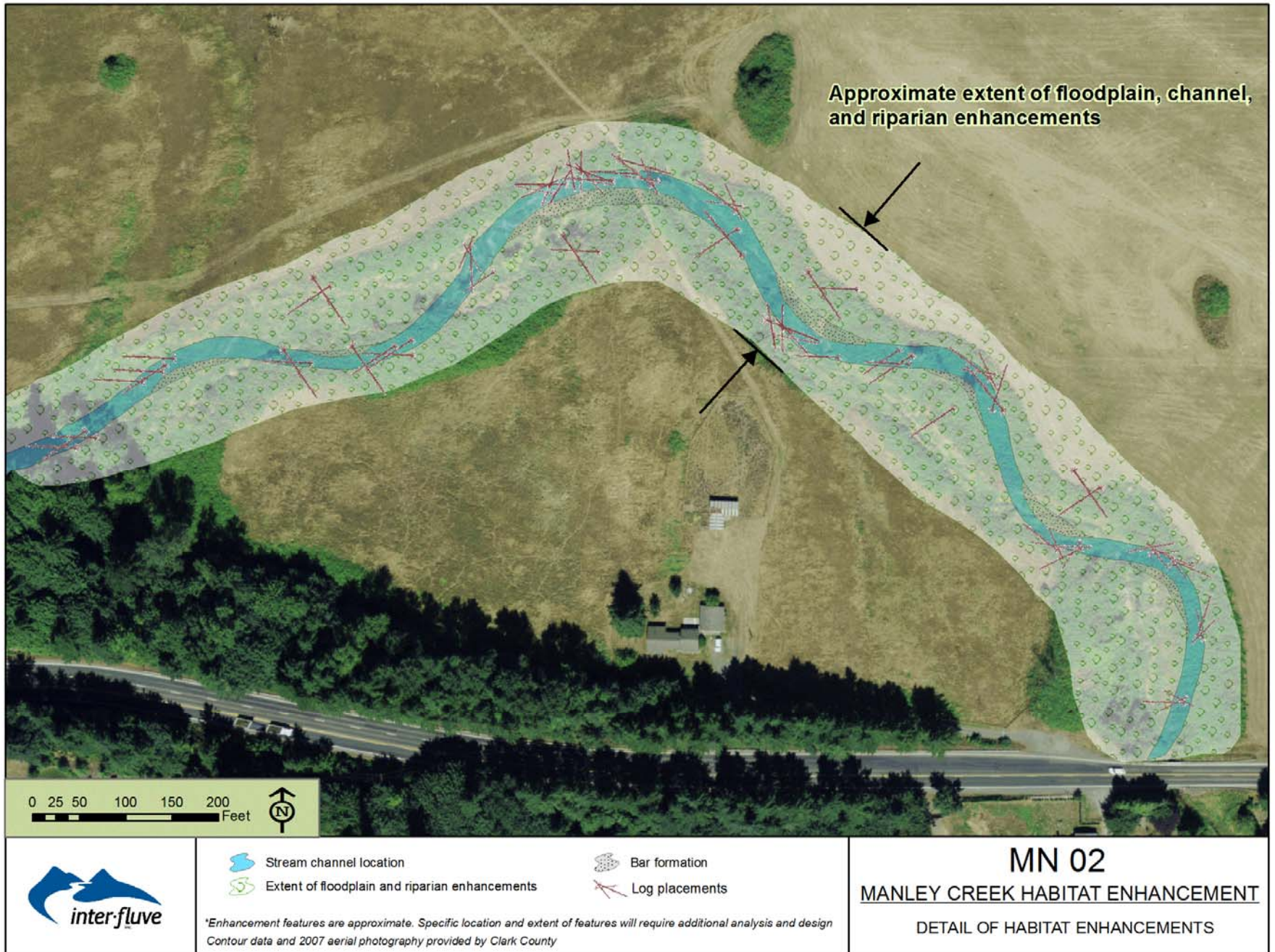
Manley Cr 1B							
	Tier	2					
	Length (m)	708					
	Population	WSTH	SSTH	FCH	Coho	Chum	Multi Species
Recovery Plan Priority	P				P	P	
Species Reach Potential (H,M,L)	L				M	L	
Restoration Value	30%				91%	72%	64%
Preservation Value	70%				9%	28%	36%
Access to blocked habitats	-	-	-	-	-	-	L
Stream channel habitat structure & bank stability	M	-	-	-	H	M	H
Off channel & side channel habitat	M	-	-	-	H	M	H
Floodplain function and channel migration processes	M	-	-	-	H	M	H
Riparian conditions & functions	M	-	-	-	H	M	H
Water quality	M	-	-	-	M	L	H
Instream flows	M	-	-	-	H	M	H
Regulated stream management for habitat functions	-	-	-	-	-	-	L
Watershed conditions & hillslope processes	M	-	-	-	H	H	H

Manley 1C							
Tier	2						
Length (m)	676						
	Population	WSTH	SSTH	FCH	Coho	Chum	Multi Species
Recovery Plan Priority	P				P	P	
Species Reach Potential (H,M,L)	L				M	L	
Restoration Value	27%				92%	72%	64%
Preservation Value	73%				8%	28%	36%
Access to blocked habitats	-	-	-	-	-	-	L
Stream channel habitat structure & bank stability	M	-	-	-	H	H	H
Off channel & side channel habitat	M	-	-	-	H	H	H
Floodplain function and channel migration processes	M	-	-	-	H	H	H
Riparian conditions & functions	M	-	-	-	H	H	H
Water quality	M	-	-	-	M	M	H
Instream flows	M	-	-	-	H	H	H
Regulated stream management for habitat functions	-	-	-	-	-	-	L
Watershed conditions & hillslope processes	M	-	-	-	H	H	H

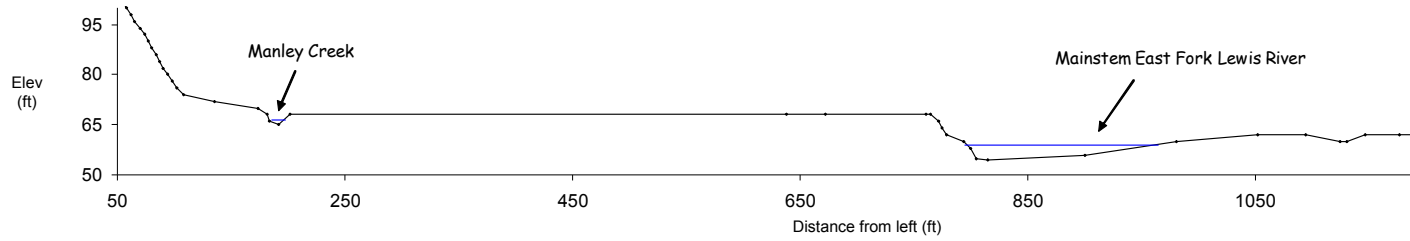
Manley 1A							
Tier	1						
Length (m)	241						
	Population	WSTH	SSTH	FCH	Coho	Chum	Multi Species
Recovery Plan Priority	P				P	P	
Species Reach Potential (H,M,L)	L				H	L	
Restoration Value	40%				92%	72%	68%
Preservation Value	60%				8%	28%	32%
Access to blocked habitats	-	-	-	-	-	-	L
Stream channel habitat structure & bank stability	M	-	-	-	H	M	H
Off channel & side channel habitat	H	-	-	-	H	M	H
Floodplain function and channel migration processes	M	-	-	-	H	M	H
Riparian conditions & functions	H	-	-	-	H	M	H
Water quality	H	-	-	-	H	L	H
Instream flows	H	-	-	-	H	M	H
Regulated stream management for habitat functions	-	-	-	-	-	-	L
Watershed conditions & hillslope processes	H	-	-	-	H	H	H

Note: Manley Creek 1A is included due to the benefit of this project for rearing for fish that originate in Manley 1A. This project was ranked as a Tier 1 reach in order to reflect this benefit.

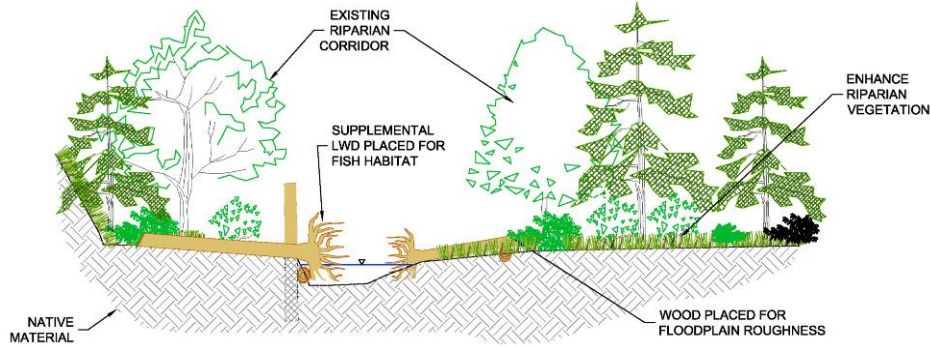




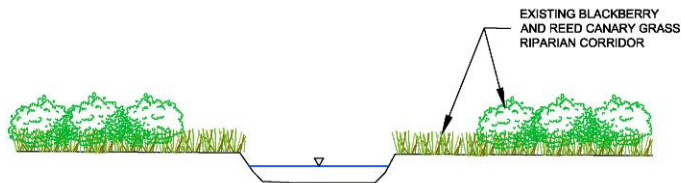
Cross-Section MN-02



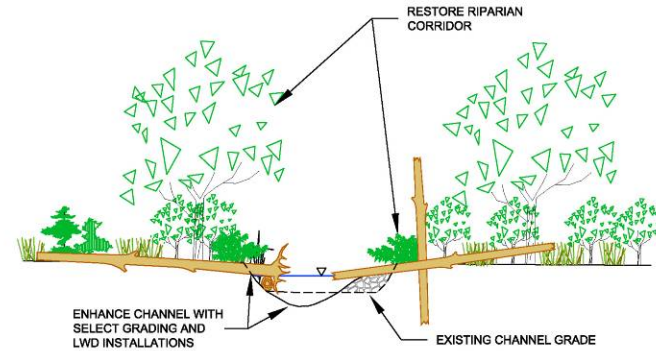
Typical Enhancement Section View– Lower Reach




Typical Existing Condition Section View– Upper Reach



Typical Enhancement Section View– Upper Reach



	<p>CROSS-SECTIONS AND TYPICALS</p> <p>Notes: Cross-section MN-02 is derived from LiDAR contours. Bathymetry is estimated based on site and aerial photograph observations. In some cases, minor corrections are made to LiDAR data that is believed to be representative of vegetation and not the ground surface.</p>	<p>MN-02</p> <p><u>INSTREAM HABITAT ENHANCEMENT</u></p>
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Planning-level cost estimate for MN 02

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	\$13,000	\$13,000	Calculated at 5% of construction sub-total
Channel earthwork and reshaping	LF	1,000	\$40	\$40,000	Assumes two-thirds of upstream portion of project area receives channel re-grading improvements
Large wood purchased and delivered to site	EA	150	\$400	\$60,000	Assumes 20% delivered with root wads attached. Frequency of LWD = >20 pieces/100 meters in upstream portion and supplementation at >10 pieces/100 meters in downstream portion.
Wood placement	EA	150	\$300	\$45,000	Wood placed in small jams and individual placements
Dewatering and sediment control	LS	1	\$25,000	\$25,000	Assumes water will be encountered throughout construction.
Streambank revegetation	SF	22,500	\$1	\$22,500	Assumes average of 5 feet on each bank for upper portion and 5 feet on one bank for lower portion.
Riparian revegetation (above bank)	AC	2	\$15,000	\$30,000	Assumes 20 feet revegetation on each side of channel for upstream portion and on only 1 side for downstream portion. Includes follow-up maintenance.
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) is purchased and hauled to the site from a nearby source.

Savings could be gained by reducing the total length of treatments.

Assumes wood ballast is provided through burial. Cost will increase if boulder ballast is required.

Costs do not include wetland inventory and impacts analysis

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