

Phase I – Design Summary Fact Sheet for Hocker Flat

Project Name:	<i>Hocker Flat Rehabilitation Site</i>
Project Location:	<i>River Mile 78.0 to 79.1</i>
Project Ownership: (Private/Public)	<i>Private and Public (BLM)</i>
Principal Designer(s):	<i>Scott Kennedy</i>
Date Design Completed:	<i>Fall 2004</i>
Total Earthwork Volume: (Cut & Fill)	<i>93,400 CY</i>
Year Constructed:	<i>2005</i>
Total Cost of Construction:	<i>\$774,250</i>
Construction Contractor:	<i>Erick Ammon, Inc.</i>
Design Hypotheses (Goal/Objective) (Reach Scale):	<p><i>Increase the diversity and area of habitat for salmonids, particularly habitat suitable for rearing.</i></p> <p><i>Increase the structural and biological complexity of habitat for various species of wildlife associated with riparian habitats.</i></p> <p><i>Integrate known fluvial and ecological theories and relationships with the sites measured physical and biological attributes and evaluate the response over a definitive time frame.</i></p> <p><i>Maximize the rivers ability to rehabilitate itself during high flows and reduce implementation cost and complexity.</i></p>
Hypothesized Design Evolution (Reach Scale):	<i>Channel migration and subsequent bar building, increased sinuosity, natural riparian regeneration on constructed floodplains</i>

Individual Features - Design Purpose

Code	Type	Earthwork (CY) (Cut or Fill)	Purpose
<i>R-1</i>	<i>Tailings Pile – Gravel Source</i>	<i>0</i>	<i>Not constructed. No work is performed here because this gravel source is being actively naturally recruited.</i>
<i>R-2</i>	<i>Floodplain and Gravel Bar</i>	<i>14,800 Cut</i>	<i>Re-activate floodplain to facilitate meandering and increase the quantity of rearing habitat on the gravel bar over a range of flows. Provide an area for the natural recruitment of riparian vegetation.</i>
<i>R-3</i>	<i>Floodplain</i>	<i>0</i>	<i>Not constructed. Design team chose to retain existing functional features and use this area as an untreated control.</i>
<i>R-4</i>	<i>Floodplain</i>	<i>37,300 Cut</i>	<i>Re-activate the floodplain and encourage channel migration into the left bank that shows signs of scour and where a faint gravel bar is forming on the right bank.</i>
<i>R-5</i>	<i>Floodplain and Gravel Bar</i>	<i>30,400 Cut</i>	<i>Re-activate floodplain to facilitate meandering and increase the quantity of rearing habitat on the gravel bar over a range of flows. Provide an area for the natural recruitment of riparian vegetation.</i>
<i>R-6</i>	<i>Floodplain and Gravel Bar</i>	<i>7,000 Cut</i>	<i>Re-activate floodplain to facilitate meandering and increase the quantity of rearing habitat on the gravel bar over a range of flows. Provide an area for the natural recruitment of</i>

			<i>riparian vegetation.</i>
R-7	Wetland	3,900 Cut	<i>Increase quantity of wetland habitat adjacent to Hocker Creek.</i>
R-8	Floodplain	0	<i>Not constructed. Design team chose to retain existing functional features and use this area as an untreated control.</i>
U-1	Terrace	14,000 Fill	<i>Stockpile area for excavated material.</i>
U-2	Terrace	21,000 Fill	<i>Stockpile area for excavated material.</i>
U-3	Terrace	17,100 Fill	<i>Stockpile area for excavated material.</i>
U-4	Terrace	30,400 Fill	<i>Stockpile area for excavated material.</i>
U-5	Terrace	7,900 Fill	<i>Stockpile area for excavated material.</i>
U-6	Terrace	3,000 Fill	<i>Stockpile area for excavated material.</i>
U-7	Contractor Use Area	0	<i>Temporary contractor use area for access, staging, material storage, etc.</i>

Design Milestone Timeline

Date (Month/Year)	Milestone	Notes (Reference Document)
8/2002	Topographic Surveying	Total station and GPS surveying to supplement the 2001 photogrammetry
1/2003	Begin Developing Alternatives	Collaborative process involving all program partners
3/2004	50% Design Presented	
6/2004	Public Scoping Meeting	
9/2004	90% Designs Due	
2/2005	Construction Begins	
?	Site is Replanted	Site is replanted after earthwork completion

Design Analysis Performed

Type of Analysis	Reason Performed	Date Completed & Software Used
1-D Hydraulic Analysis	To determine 100 yr. floodplain water elevation surface for FEMA requirements	COE HEC-RAS
1-D Hydraulic Analysis	To determine 6,000 cfs design floodplain elevations	2004; COE HEC-RAS
Topographic Terrain Model Development	To determine cut and fill volumes and for development of construction drawings	AutoDesk Land Development Desktop

Design Criteria

- Do not change water surface elevation for FEMA 1% chance annual flood
- Floodplains should be inundated to 0.5' of water depth when 6,000 cfs is flowing in the river
- Positive drainage must occur from all constructed surfaces back to the river to reduce the chance of fish stranding

Design Constraints

- In-channel earthwork was not allowed.
- Avoid disrupting or impacting existing gravel mining operation on left bank

- *Changing the water surface elevation for flood flows is not permitted under FEMA regulations without the submission and acceptance of letters of map revision.*
- *Avoid performing construction activities adjacent to or across the river from the bedrock outcrop and hole that is on the right bank just upstream of area R-4*
- *Avoid earthwork activities or the removal of riparian vegetation near the left bank gravel mining operation downstream of area R-4. The landowner does not want the river to migrate into the gravel mine until gravel mining operations are complete.*

Design Modifications Made in the Field During Construction

- *One large pine tree was saved at the upstream end of -R5. The contractor excavated around the tree, leaving it on a small island in the floodplain.*

Designer Notes

- *The team realized immediately after construction that not enough effort went into the removal of willow roots along the river's edge. Significant re-growth of willows would likely quickly occur.*

Citation/References

- *Hocker Flat Environmental Assessment/Draft Environmental Impact Report (August 2004)*

