

Project Completion Report – Lower Jack Creek Restoration, Phase II



Abstract:

Phase II of the restoration work on the Lower Jack Creek Project was designed to improve two degraded sections of stream on an important tributary to the Madison River. This work, just upstream of the confluence with the Madison River, restored two badly eroding streambanks to a more naturally functioning state. Prior to this work, these vertical streambanks contributed large sediment loads to the mainstem river, and were devoid of any riparian vegetation due to the entrenchment and height of these eroded banks. The bioengineered solution used on this project created a natural floodplain through the use of coir fabric soil lifts, and provided a source of natural riparian vegetation through the installation of nearly 8,000 willow stakes. Furthermore, instream fish habitat was enhanced by providing improved pool and riffle sections throughout the project area. Together, these strategies have created a more stable, resilient, and productive stream going into the Madison River.

Project Name: Lower Jack Creek – Phase II

Project Purpose: This project completes treatment of a 3,600-foot reach of degraded stream channel across three private landowners on Jack Creek near the confluence with the Madison River. Phase II of this restoration work improved two sections of badly eroding streambank that impacted fish habitat and prevented a riparian community from establishing. This stream restoration effort incorporated soil willow lifts to re-establish a riparian community and help reconnect the stream to a more natural floodplain. The results will provide improved water quality, enhanced fish habitat, and connection to a functioning riparian area and floodplain before Jack Creek enters the Madison River.

Timeline: Conceptual designs for this project began in 2015, followed by an engineered design in 2017. The first phase of construction was completed in spring 2018. After extensive fundraising efforts, Phase II of construction was initiated in fall 2019. The project is now complete, with the exception of containerized plantings which will be installed in spring 2020.

Project Accomplishments: Two sections of streambank were reconstructed and restored to develop a functioning riparian floodplain, and in-stream channel features were constructed in pool and riffle sections. Bioengineered streambanks were constructed with woody material, biodegradable coir fabric, gravel, cobbles, soil, and willows to create fabric encapsulated soil lifts, which produce a naturally stable streambank with well-developed riparian vegetation. Modifications to the streambed and banks created a vegetated riparian buffer, and a bankfull bench, which will allow for increased floodplain connectivity and enhanced natural channel migration. Riparian plantings using native vegetation will be installed to enhance the riparian buffer along the entire project reach, in the area immediately behind the bioengineered streambank.

Summary of Accomplishments:

Description	Units	Description	Units
Landowners	2	Linear feet of stream improved	690
Funding Partners	9	Willow stakes harvested and installed	7800
Volunteer hours	142	Riparian/floodplain miles enhanced	.13
Volunteers	21	Riparian acres enhanced	.33

Long Term Benefits:

The net increase in riparian and instream functions includes 1) increased pool quality and spawning habitat 2) expanded riparian and wetland corridor 3) reduced water temperatures 4) reduced sediment loads from eroding streambanks 5) improved hydrologic connectivity with the floodplain and 6) natural channel migration.

Future Opportunities:

In spring 2020, 250 containerized plants will be installed in the two project sections. These plants will then be caged with browse protection, and applied with repellent to minimize browse from native ungulates. Finally, annual monitoring will be conducted to meet Army Corps of Engineers specifications.

To ensure success for this project, the Madison CD will assist the landowners in implementing a maintenance plan for watering and browse protection of the riparian vegetation. Additionally, the Madison CD will work with the two landowners, and its project partners at Trout Unlimited, to develop and implement a monitoring plan beginning spring 2020. This monitoring will build upon the existing photo-point and temperature data being collected in the upper reach, and fulfill monitoring requirements by the Army Corps of Engineers. The length of time for this monitoring is dependent upon meeting those requirements.

Summary of Project Costs:

Description (expended costs – Fall 2019)	Cost
Construction, mobilization, labor, and materials for bioengineered streambanks	\$68,467.80
Project Management (Madison Conservation District)	\$6,580.00
Volunteer Support	\$1,000.00
Collection of Vegetative Materials	\$3,030
Construction Supervision (Trout Unlimited, RESPEC, Woodard & Curran)	\$20,950.00
Montana Conservation Corps (vegetation material collection)	\$5,000.00
Containerized Plantings Deposit (50% of \$2,128.00)	\$1,064.00
Total	\$106,091.80
Description (remaining costs – Spring 2020)	Cost
Containerized Plantings (50% + \$300 delivery)	\$1,364.00
Installation of Containerized Plantings	\$6,363.00
Browse Protection for Containerized Plantings	\$9,009.00
Additional Project Management, Monitoring, & Reporting (Madison Conservation District)	\$1,102.20
Total	\$17,838.20
Project Total	\$123,930.00

Project Partners & Support:

Name	Status	Funding Amount
Madison Valley Ranch, Fasules Trust	Landowners/Partners/Funders	\$6,000.00
NorthWestern Energy	Funder	\$44,000.00
Montana DNRC 223 Grant Program	Funder	\$22,000.00
The Trout and Salmon Foundation	Funder	\$5,000.00
Yellow Dog Community and Conservation Foundation	Funder	\$5,000.00
Montana Trout Foundation	Funder	\$5,000.00
Madison Gallatin Trout Unlimited	Funder	\$15,900.00
Montana Watershed Coordination Council	Funder	\$20,000.00
USFS- Beaverhead Deerlodge National Forest	In-Kind	\$900.00
Madison/Gallatin Valley Resident Volunteers	In-Kind	\$2,130.00
Montana Conservation Corps	Contractor/Partner	
Trout Unlimited	Contractor/Partner	
RESPEC	Contractor/Partner	
RE Miller	Contractor/Partner	
Total Cash Support		\$120,900.00
Total In-Kind Support		\$3,030.00
Total Project Support		\$123,930.00

Attachment A: Detailed Project Budget

Project Area	Description	Estimated Quantity	Unit Measure	Unit Price	Amount
4,5	Construction Supervision, Army Corps Monitoring Assistance	1	EA	\$20,950.00	\$20,950.00
4,5	Project Management, Monitoring, and Reporting (Madison CD)	223.72	Hours	\$35.00	\$7,830.20
4,5	Project Management Travel	10	Trips	\$9.00	\$90.00
4,5	Volunteer Labor Support	1	EA	\$1,000.00	\$1,000.00
4,5	Volunteer Labor & In-Kind	600	Hours	\$15.00	\$9,000.00
4,5	MCC Crew	1	EA	\$3,000.00	\$5,000.00
		Project Support Total			\$43,870.20
4	Bioengineered Streambank	310	LF	\$38.00	\$11,780.00
4	Excavate, Short Haul	575	CUYD	\$15.00	\$8,625.00
4	Excavate, Use in Vegetated Soil Lifts	92	CUYD	\$11.00	\$1,012.00
4	Imported Cobble	135	CUYD	\$43.00	\$5,805.00
4	Vertical Willow Planting	620	EA	\$2.70	\$1,674.00
4	Containerized Plantings Installation (5 Gallon)	10	EA	\$27.00	\$270.00
4	Containerized Plantings Installation (1 Gallon)	124	EA	\$23.00	\$2,852.00
4	Containerized Plants (5 Gal)	10	EA	\$18.00	\$180.00
4	Containerized Plants (1 Gal)	124	EA	\$6.00	\$744.00
4	Browse Protection	134	EA	\$33.00	\$4,422.00
				Site 4 Total	\$37,364.00
5	Bioengineered Streambank	317	LF	\$38.00	\$12,046.00
5	Excavate, Short Haul	900	CUYD	\$15.00	\$13,500.00
5	Excavate, Use in Vegetated Soil Lifts	94	CUYD	\$11.00	\$1,034.00
5	Imported Cobble	135	CUYD	\$43.00	\$5,805.00
5	Vertical Willow Planting	634	EA	\$2.70	\$1,711.80
5	Containerized Plantings Installation (5 Gallon)	11	EA	\$27.00	\$297.00
5	Containerized Plantings Installation (1 Gallon)	128	EA	\$23.00	\$2,944.00
5	Containerized Plants (5 Gal)	11	EA	\$18.00	\$198.00
5	Containerized Plants (1 Gal)	128	EA	\$6.00	\$768.00
5	Browse Protection	139	EA	\$33.00	\$4,587.00
4,5	Plant delivery	1	EA	\$300.00	\$300.00
				Site 5 Total	\$43,190.80
4, 5	Mobilization	1	LS	\$5,475.00	\$5,475.00
		MobilizationTotal			\$5,475.00
			Phase 2 Total		\$129,900.00

Attachment B: Photos - Volunteer Willow and Conifer Harvest

Attachment C: Photos – Before and After Construction**Site 4: Looking Downstream**

Top photo: (Before) April 6, 2017. Bottom photo: (After) November 13, 2019

Site 4: Looking Downstream

Top photo: (Before) April 6, 2017. Bottom photo: (After) November 13, 2019

Site 4: Looking Downstream



Top photo: (Before) April 6, 2017. Bottom photo: (After) November 13, 2019

Site 4: Looking Upstream

Top photo: (Before) April 6, 2017. Bottom photo: (After) November 13, 2019

Site 5: Looking Downstream

Top photo: (Before) April 6, 2017. Bottom photo: (After) November 13, 2019

Site 5: Looking Upstream

Top photo: (Before) April 6, 2017. Bottom photo: (After) November 13, 2019