

Friends of the
**MISSOURI BREAKS
MONUMENT**

Final Project Completion Report

Project Title: Upper Missouri River breaks National Monument Riparian Restoration and Inventory

Submitted to Northwestern Energy

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Introduction

The condition of riparian vegetation is of vital concern to the Upper Missouri River Breaks National Monument (UMRBNM) because it provides habitat for wildlife, regulates ecological functions, controls bank erosion, and provides beauty and shade to visitors. Native plains cottonwood (*Populus deltoids monilifera*) trees are the keystone species for the area's riparian zones amount to less than 1% of the total land area within the region yet support the majority of fauna. Flood control measures, livestock grazing, and human development have severely limited the opportunities for cottonwood regeneration and young replacement stands of cottonwoods are relatively rare. An overwhelming majority of cottonwood galleries in the UMRBNM are mature with no natural process of regeneration.

The Friends of the Missouri Breaks Monument (FMB) has worked towards improving the sustainability and resilience of the region's ecosystems so it is healthier and more robust. Subsequently, cottonwood populations have been on the rise and noxious weeds have been strategically managed within the 149-mile stretch of Wild and Scenic River, from Fort Benton, MT (R.M. 0) to James Kipp Recreational Area (R.M. 149).

Maintaining an updated weed inventory assists the BLM in implementing more effective management strategies on eradication methods. Noxious weeds are present in the monument, but a major accomplishment by FMB and BLM in recent years is the elimination of Salt Cedar. Renewing the weed inventory provides a visual representation of invasive vegetation, which is used to identify dispersion patterns and effective management efforts. Focusing on the termination of noxious weeds improves the UMRBNM's ecosystem by preventing damage to riparian and grazing areas, wildlife habitat, and native vegetation while promoting bank stability.

This year, 392.2 miles of river and road were surveyed for 21 noxious weeds and 150 cottonwood cuttings were planted on two private properties along the river, managed by separate land owners. Over the now six year life of the cottonwood project, 637 total trees have been planted to provide the Wild and Scenic River's riparian zone with a promising future.

Methods

The window for planting cottonwood cuttings on the Missouri River is narrow due to the limited time available between ice breakup and cottonwood bud break. If it is too early, we are unable to access field sites with jet boats due to ice or by truck due to blown out roads. If it is too late, leafed-out cuttings will invest the majority of their energy into growing new leaves instead of roots, leading to dramatically increased mortality.

Along with timing, planting location is a significant challenge in planting cottonwoods. If trees are planted low enough to immediately reach groundwater they are at risk of being scoured away by ice flows the following year. However, if the trees are planted high enough to avoid ice disturbance they require constant and costly irrigation. Both are major hurdles in establishing a successful cottonwood planting program along the Wild and Scenic Missouri River.

FMB, and our partners, have developed a planting procedure that has provided the project with success rates unheard-of from similar projects in comparable environments, with an equally unheard-of cost/success ratio. Our method is to plant 12 to 14 foot tall, one inch diameter cottonwood cuttings from local sources on the river's bench in an eight foot deep, eight inch diameter holes in early spring. This allows the tree to be protected from ice on the bench and allows our stakeholders and volunteers the ability to safely reach planting sites.

We place eight and a half foot long PVC (or waxed cardboard) pipes with perforations on the bottom 18 inches in the holes with the trees. Using this method, the trees can then be watered

through the PVC pipes at a depth of six to eight feet below the surface. This is important because cottonwoods grow roots where water is available, meaning if they are watered on the surface they will sprout roots at the surface instead of at the water table.

We have found that watering during the first two years after planting has significantly increased the survival rates of the cottonwood saplings. To provide the needed service of watering, FMB has hired seasonal “treekeepers” and Montana Conservation Corps (MCC) crews in the past. For 2018 year, FMB hired seasonal conservation interns through MCC. The watering is done by a two-horsepower trash pump, provided by the BLM, placed at the river’s edge. Small diameter fire hoses are then run from the pump up to each tree, and the water is pumped down the tubes to the tree’s new roots.



Figure 1: Pumping water from the Missouri River to the cottonwood saplings by water pump.

The UMRBNM’ river corridor and road ways, were surveyed for invasive species of concern identified by the BLM Natural Resource Specialist. Seasonal interns documented the range and density of infestations into Trimble GPS units, provided by the BLM. The river corridor was walked or surveyed by canoe while the roads were surveyed by truck. It is important to conduct surveys during the bloom of the plant, most commonly between May and July. If it’s too late in the season, less weeds are as noticeable as they are earlier in the season, making surveying more difficult.

Planting site: Bailey/Hazelwood

Total trees planted: 150



Figure 2: Planting site in respect to location of Great Falls, Montana.

Planting Date: May 5, 2018

Number of trees planted: 70

Number of personnel involved: 11 volunteers, 3 FMB staff, and 2 BLM staff



Figure 3: Bailey/Hazelwood planting site, May 5, 2018.



Figure 4: Volunteers of all ages prepare cottonwood trees to be wrapped in protective wire.



Figure 5: The group of happy planters after a hard day's work making a positive impact on the monument.

Planting Date: May 12, 2018

Number of trees planted: 90

Number of personnel involved: 23 volunteers, 4 FMB staff, and 2 BLM staff



Figure 6: Bailey/Hazelwood planting site, May 12, 2018.



Figure 7: This year's planting event had an exceptionally large volunteer turnout.



Figure 8: A volunteer puts the final touches on a freshly planted cottonwood.

Planting

This year's planting turned out to be the smoothest planting event in terms of operations FMB has had thus far. Nearly 35 volunteers from all ages and walks of life participated, joining from Helena, Butte, Cut Bank, Lewistown, Havre, Emigrant, Sheridan, and local communities within and near the monument. On the day of the plantings, each pre-dug hole was filled with a cottonwood tree, root hormone and wrapped with protective wire. The job finished earlier than expected due to the amount of help present both weekends. We are grateful for the many new and returning volunteers who enjoyed the experience of planting cottonwood trees on the monument, resulting in another successful year of this project.

During the arranged planting dates this spring, the Missouri River was experiencing flood stage levels. The high water created obstacles in accessing the Bailey/Hazelwood site because one of the planting sites had become an island. We opted to travel to the site by jet boat provided by the BLM, which greatly enhanced the event for volunteers and provided us the logistical support we needed.

Post-planting maintenance

The trees received sufficient amounts of water from when they were planted, to the middle of June due to the above average flood season which elevated the water table to reach the sapling's roots. During the hot months of summer, the cottonwood's growth was fostered by the crew of interns hired on by FMB. Watering of the trees planted in 2017 at Little Sandy and Terry Ranch began in May and watering of the Bailey/Hazelwood site began in June when water

levels dropped and the site became accessible. **In total, 273 trees are watered once weekly for four months from June to September.**



Figure 9: All seven of the seasonal interns and Stewardship Coordinator before their training float in June.



Figure 10: Watering the cottonwood trees quickly became an enjoyable task to the conservation interns.

Noxious Weed Inventory

With two interns watering each week, it allowed for the remaining interns to complete the project of updating the Weed Inventory for 21 noxious weeds within the monument. Over the course of three months, 9,030.30 acres of river corridor and 2,854.54 acres of land was surveyed from Fort Benton to James Kipp Recreational Area. The restored data will be processed by the BLM Natural Resource Specialist and compared to the weed inventory of 2009. It is estimated nearly every acre of land contains some noxious underlying the importance of continuing to develop innovative ways to support early detection and rapid response. The most common noxious weeds observed are two types of knapweed (*Centaurea maculosa* and *Rhaponticum repens*), leafy spurge (*Euphorbia esula*), Russian olive (*Elaeagnus angustifolia*), and Canada thistle (*Cirsium arvense*). Less common noxious weeds include common reed (*Phragmites australis*), common tansy (*Tanacetum vulgare*), and hoary cress (*Lepidium draba*). In total, 17 species of the 21 noxious weeds were documented in the UMRBNM.

Other noxious weed project accomplishments include two miles of noxious weeds removal and 15,000 biocontrol wasps and 1,200 biocontrol beetles were released, targeting knapweed and leafy spurge.

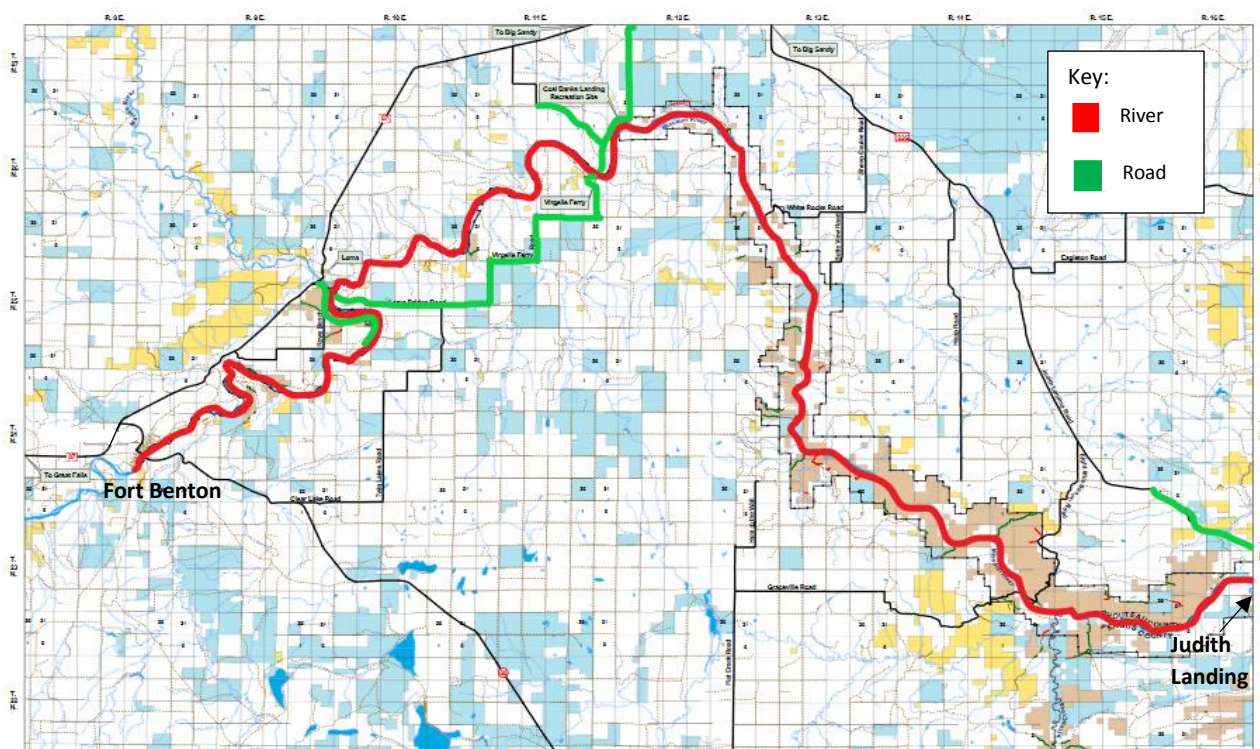


Figure 9: River and road segments surveyed from Fort Benton to Judith Landing

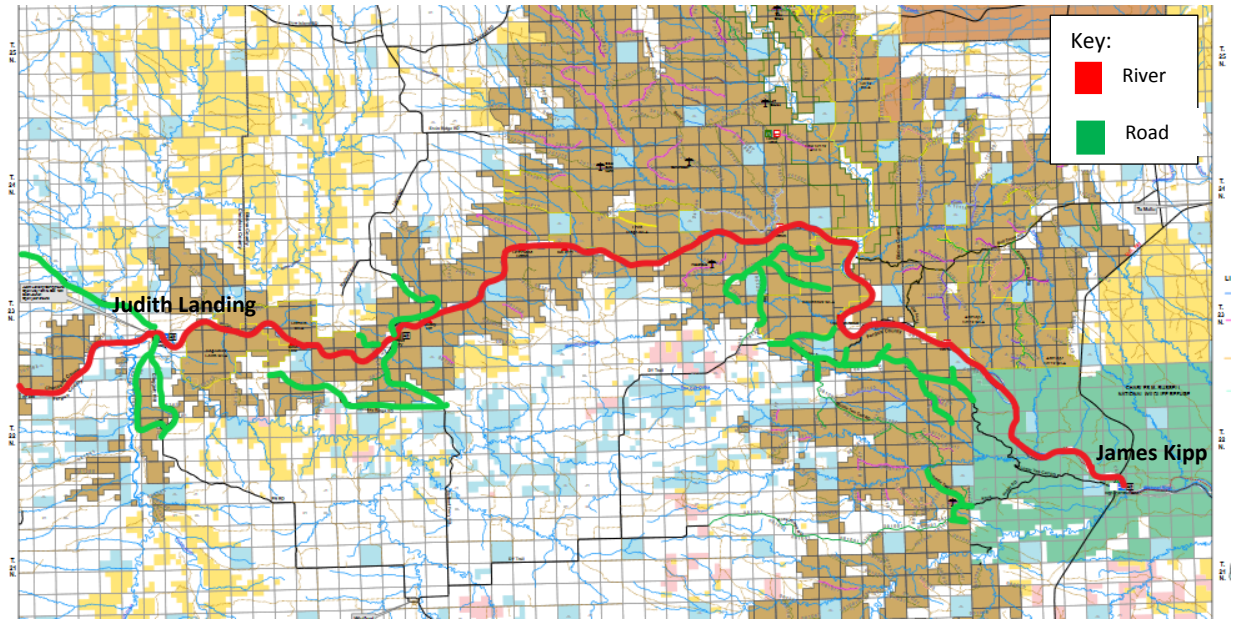


Figure 10: River and road segments surveyed from Judith Landing to James Kipp Recreational Area.



Figure 11: Intern plots data points while surveying for 21 noxious weeds on the lower half of the UMRBNM.



Figure 12: FMB's Interns collecting biocontrol bugs in Fort Benton to be released.

Budget

Through the planning and design process we were able to adjust a few of the costs. First, FMB was able to utilize BLM vehicles for many of the projects. As a result of this FMB was able to forgo leasing trucks. We had a few more days of car rentals but a cost savings never the less. As well, FMB was able to secure an additional conservation intern position which raised our efficiency in the field. The total proposed project cost was 166,731.00 and at the end of the project the total is \$163,775.00. Please see following page for complete breakout.

Adjusted Budget for 2018 NWE Final Grant Report

Costs based on 18 week field schedule

Personnel Costs

Item	# of		NWE Grant	Matching	Total Cost
	People	Hours		Funds	
Executive Director @ \$28/hr	1	720	\$4,032.00	\$16,128.00	\$20,160.00
Stewardship Director @ \$21/hr	1	720	\$7,560.00	\$7,560.00	\$15,120.00
Outreach Manager @ \$17/hr	1	720	\$0.00	\$12,240.00	\$12,240.00
Invasive Leader @ \$15/hr	1	720	\$0.00	\$10,800.00	\$10,800.00
3 Seasonal Invasives Techs @ \$13/hr	3	720	\$0.00	\$28,080.00	\$28,080.00
2 Outreach @ \$13/hr	2	720	\$0.00	\$18,720.00	\$18,720.00
5 Conservation Techs @ \$13/hr	5	720	\$25,740.00	\$21,060.00	\$46,800.00
Total Personnel			\$37,332.00	\$114,588.00	\$151,920.00

Travel & Food Costs

Item	NWE Grant	Matching	Total Cost
		Funds	
Lease of 2 Crew Cab Pick-ups	\$0.00	\$0.00	\$0.00
Car Rental @ \$115/day for 45 days	\$5,000.00	\$175.00	\$5,175.00
Food for Natural Resource Team hitches (2 people for 72 days @ \$12/day)	\$1,254.00	\$474.00	\$1,728.00
Food for Invasive Strike Team hitches (4 people for 24 days @ \$12/day)	\$864.00	\$288.00	\$1,152.00
Total Travel & Food	\$7,118.00	\$937.00	\$8,055.00

Equipment & Supply Costs

Item	NWE Grant	Matching	Total Cost
		Funds	
Personal Protection Equipment	\$550.00	\$550.00	\$1,100.00
Total Equipment & Supply	\$550.00	\$550.00	\$1,100.00

Subtotal Direct Costs **\$45,000.00** **\$116,075.00** **\$161,075.00**

Indirect Costs

Item	NWE Grant	Matching	Total Cost
		Funds	
Indirect costs @ 6% include: postage, printing, office and utilities	\$0.00	\$2,700.00	\$2,700.00
Total Indirect Costs	\$0.00	\$2,700.00	\$2,700.00

Total Costs **\$45,000.00** **\$118,775.00** **\$163,775.00**
27.48% 72.52% 100.00%

Issues

At the beginning of this year's cottonwood project, we had intended on planting at upper Eagle Creek Developed Boat Camp, river mile 52.5-53.5L and Pablo Rapids Boat Camp, river mile 72.3L. In early spring, the landowner at Eagle Creek notified us that due to recent personal reasons, they requested to move the planting at upper Eagle Creek back a year. The route to Pablo Rapid Boat Camp lies within a coulee and this spring's powerful runoff blew through the stream crossings on the roads, causing substantial damage. These circumstances forced FMB to go with the Bailey/Hazelwood site, which was designated to host a double planting of 150 trees in 2019. FMB is examining the access issues surrounding Pablo Rapid Boat Camp and anticipates to have impediments overcome in 2019 to access the site.

In 2018, the Missouri River experienced the third highest runoff in 120 years. The pre-dug holes were $\frac{1}{2}$ to $\frac{3}{4}$ full of water. This made it difficult to pack in the soil around the cottonwood cutting but was ultimately managed. The heightened water table submerged the plant's roots for a whole month's period, limiting the need to add additional water.

Future

We are continuing to see exceptional success rates with the Cottonwood Restoration Program and the Noxious Weed Survey also proved to be highly successful. All of this stewardship work is showing that the Upper Missouri River Breaks National Monument displays an upward trend in ecological health. A large aspect of improvement from previous years is the expansion of the FMB conservation interns. These young people are able to provide the necessary boots on the ground and the leadership to guide volunteers and work crews in the field. A great example of this model is from our outreach and education programming. FMB utilizes two Big Sky Watershed Corps (BSWC) Interns to aid in outreach and education. FMB has these two travelling the state and providing informational presentations about the monument and why it is important. Hundreds of individuals and visitors from near and far have been reached and educated about this special place and methods to conserve it for future generations. Since these two interns are with FMB for an entire year they also are able to be integral factors in planning our field season and easing the onboarding of the conservation interns in the spring.

As we continue to evaluate potential factors in cottonwood restoration and use our data to mitigate potential factors in the planting and aftercare of cottonwood saplings. FMB is in discussion and planning with the BLM and looking to the future of the Cottonwood Restoration Program. FMB has advocated for a full assessment of the river so that we can continue the Cottonwood Restoration Program without having to wait for Environmental Assessments. This would also be advantageous in that we would have more sites to choose from when it comes to access issues and major water events.

Our 2019 planting sites of this riparian restoration project are upper Eagle Creek Developed Boat Camp, Pablo Rapids Boat Camp, and Hole-in-the-Wall Campground. For 2019, road damage at Pablo Rapids Boat Camp will be mitigated by the BLM. This will accommodate equipment and volunteer access to plant at this site. Permission has already been granted to access the planting site at upper Eagle Creek Developed Boat Camp and Hole-in-the-Wall Campground.

The Upper Missouri River Breaks National Monument is a living museum of geology, vegetation, and wildlife. Northwestern Energy's financing and support throughout the years has left a timeless and unique impact on the UMRBNM's ecosystem. FMB, and the monument, sincerely thank you for your continued support.