



All sections must be addressed, or the application will be considered invalid

--

C. Brief Project Description (attach additional information to end of application):

D. What was the cause of habitat degradation and how will the project correct the cause?

E. Length of stream or size of lake that will be treated (project extent): _____
Length/size of impact, if larger than project extent (e.g., stream miles opened): _____

F. Project Budget Summary:

Grant Request (Dollars): \$ _____

Matching Dollars: \$ _____

Matching In-Kind Services:* \$ _____

**salaries of government employees are not considered matching contributions*

Other Contributions (not part of this app) \$ _____

Total Project Cost: \$ _____

G. Attach itemized (line item) budget – see *budget template*

H. Attach project location map(s) that include:

☐ Extent of the project, including context (relation to major landmark or town)

☐ Indication of public and private property

☐ Riparian buffer locations and widths (if applicable) and grazing locations

I. Attach project plans:

☐ Detailed sketches or plan views with the location and proposed restoration

☐ Pre-project photographs (GPS location strongly recommended)

☐ If water leasing or water salvage is involved, attach a supplemental questionnaire
(<https://myfwp.mt.gov/getRepositoryFile?objectID=36110>)

J. Attach letters or statements of support (e.g., landowner consent, community or public support, and fish biologist support). List any other project partners:

III. MAINTENANCE AND MONITORING (attach additional information to end of application):

A. A 20-year maintenance commitment is required*. Please confirm that you will ensure this protection and describe your approach. Attach any relevant maintenance plans. Yes ☐ No ☐

**If it is a water leasing project, describe the length of the agreement.*

B. Will grazing be part of or adjacent to the project? If so, describe or attach land management plans, including short term and long term grazing regimes. If the landowner is not the applicant, please describe their involvement in the project. *If you want assistance with grazing plan development, note your need.*

- Will the project be monitored to determine if goals were met? If so, what are the short-term and long-term plans to assess benefits and lessons learned? Were pre-project data collected? Will monitoring information be shared with FWP?
- C.

IV. PROJECT BENEFITS (attach additional information to end of application):

- A. What species of fish will benefit from this project?

- B. How will the project protect or enhance wild fish habitat?

- C. What is the expected improvement to fish populations, both short term and long term? How might the project translate to angler success?

- D. Will the project increase public fishing opportunity for wild fish and, if so, how? Is public fishing allowed onsite? If not, describe how the public would access the project benefits.

Public fishing is allowed on Lee Metcalf National Wildlife Refuge and will be maintained. Fishing opportunity will be enhanced by improved habitat on the Refuge.

- E. Aside from angling, what local or large-scale public benefits will be realized from this project?

This project presents a major outreach and education opportunity. The work will take place on an ADA-accessible walking trail that is heavily used by Bitterroot residents, out-of-state visitors and nature education programs. We will take advantage of this opportunity through public tours, signage and collaboration with education programs (e.g. Trout in the Classroom, Montana Natural History Center Visiting Naturalist). Additionally, the riparian restoration will benefit migratory songbirds, a primary goal of the Refuge and partners like Bitterroot Audubon.

- F. Will the project interfere with water or property rights of adjacent landowners? (explain):

No

- G. Will the project result in the development of commercial recreational use on the site (including paid access)? Explain:

No

- H. Is this project associated with the reclamation of past mining activity?

No

Each approved project applicant must enter into a written agreement with Montana Fish, Wildlife & Parks specifying terms and duration of the project. The applicant must obtain all applicable permits prior to project construction. A competitive bid process must be followed when using State funds.

V. AUTHORIZING STATEMENT

I (we) hereby declare that the information and all statements to this application are true, complete, and accurate to the best of my (our) knowledge and that the project or activity complies with rules of the Future Fisheries Improvement Program.

Applicant Signature: Christine Brissette Digitally signed by Christine Brissette
DN: cn=Christine Brissette, o=Trout Unlimited,
ou, email=cbrissette@tu.org, c=US
Date: 2022.11.09 16:09:19 -07'00' Date: 11/15/2023

Submittal: Applications must be signed and received on or before November 15 and May 15 to be considered for the subsequent funding period. Late or incomplete applications will be rejected.

Mail to: FWP Future Fisheries
Fish Habitat Bureau
PO Box 200701
Helena, MT 59620-0701

Email: Future Fisheries Coordinator
FWPFFIP@mt.gov
(electronic submissions must be signed)
For files over 10MB, use <https://transfer.mt.gov> and send
to mmcgree@mt.gov

BUDGET TEMPLATE SHEET FOR FUTURE FISHERIES PROGRAM APPLICATIONS

Both tables must be completed or the application will be returned

PROJECT COSTS					CONTRIBUTIONS			
WORK ITEMS (Itemize by Category)	NUMBER OF UNITS	UNIT DESCRIPTION*	COST/UNIT	TOTAL COST	FUTURE FISHERIES REQUEST	MATCH (Cash or Services)**	OTHER (Not part of this application)	TOTAL
Personnel***								
Survey				\$ -				\$ -
Design				\$ -				\$ -
Engineering				\$ -				\$ -
Permitting				\$ -			-	\$ -
Project Management (Trout Unlimited)	400	hours	\$56.00	\$ 22,400.00			22,400.00	\$ 22,400.00
Oversight (River Design Group)	200	hours	\$120.00	\$ 24,000.00			24,000.00	\$ 24,000.00
				\$ -				\$ -
			Sub-Total	\$ 46,400.00	\$ -	\$ -	\$ 46,400.00	\$ 46,400.00
Travel								
Mileage	1000	miles	\$0.63	\$ 625.00			625.00	\$ 625.00
Per diem				\$ -				\$ -
			Sub-Total	\$ 625.00	\$ -	\$ -	\$ 625.00	\$ 625.00
Construction Materials****								
Wood for bank treatments	1	Lump Sum	\$11,200.00	\$ 11,200.00	11,200.00			\$ 11,200.00
Willow cuttings	13720	EA	\$1.00	\$ 13,720.00	13,720.00			\$ 13,720.00
Plants	350	EA	\$6.00	\$ 2,100.00			2,100.00	\$ 2,100.00
Fencing (welded wire, 5x100 roll)	30	EA	\$185.00	\$ 5,550.00			5,550.00	\$ 5,550.00
T-posts	350	EA	\$6.00	\$ 2,100.00			2,100.00	\$ 2,100.00
Upland seed	33	lbs	\$13.75	\$ 453.75			453.75	\$ 453.75
Floodplain seed	30	lbs	\$90.00	\$ 2,700.00			2,700.00	\$ 2,700.00
Weed mat	350	EA	\$3.00	\$ 1,050.00			1,050.00	\$ 1,050.00
				\$ -				\$ -
			Sub-Total	\$ 38,873.75	\$ 24,920.00	\$ -	\$ 13,953.75	\$ 38,873.75
Equipment, Labor, and Mobilization								
Mobilization	1	Lump Sum	\$25,000.00	\$ 25,000.00		-	25,000.00	\$ 25,000.00
Site Prep and Dewatering	1	Lump Sum	\$35,000.00	\$ 35,000.00	16,250.00		18,750.00	\$ 35,000.00
Earthwork- levee and floodplain grading	373	cubic yards	\$50.00	\$ 18,650.00	9,830.00		8,820.00	\$ 18,650.00
Remove check dam and culverts	1	EA	\$5,000.00	\$ 5,000.00			5,000.00	\$ 5,000.00
Provide 6-inch minus fill	482	CY	\$25.00	\$ 12,050.00			12,050.00	\$ 12,050.00

BUDGET TEMPLATE SHEET FOR FUTURE FISHERIES PROGRAM APPLICATIONS

Provide Category 1 rock	50	EA	\$60.00	\$ 3,000.00			3,000.00	\$ 3,000.00
Provide 12"-18" rip rap	140	CY	\$100.00	\$ 14,000.00			14,000.00	\$ 14,000.00
Provide 1.5-inch minus road base	11	CY	\$75.00	\$ 825.00			825.00	\$ 825.00
Provide asphalt surfacing	70	SY	\$50.00	\$ 3,500.00			3,500.00	\$ 3,500.00
Assemble and install box culvert	1	Lump Sum	\$30,000.00	\$ 30,000.00	22,000.00		8,000.00	\$ 30,000.00
Bank treatments	944	Linear ft	\$30.00	\$ 28,320.00			28,320.00	\$ 28,320.00
Install willow trenches	1800	Linear ft	\$7.50	\$ 13,500.00			13,500.00	\$ 13,500.00
Remove reed canary grass	1493	CY	\$17.00	\$ 25,381.00			25,381.00	\$ 25,381.00
Floodplain microtopography	0.73	acre	\$3,000.00	\$ 2,190.00	2,190.00		-	\$ 2,190.00
Provide Misc quantities (silt fence, bulk bags, HDPE bypass	1	Lump Sum	\$3,500.00	\$ 3,500.00			3,500.00	\$ 3,500.00
Aluminum Box Culvert Fabrication & Delivery	1	lump sum	\$100,000.00	\$ 100,000.00		75,190.00	24,810.00	\$ 100,000.00
Revegetation Site Prep	16	hours	\$195.00	\$ 3,120.00			3,120.00	\$ 3,120.00
Planting and fencing (contractor)	72	hours	\$55.00	\$ 3,960.00			3,960.00	\$ 3,960.00
Planting and fencing (volunteers)	320	hours	\$29.95	\$ 9,584.00			9,584.00	\$ 9,584.00
				\$ -				\$ -
			Sub-Total	\$ 336,580.00	\$ 50,270.00	\$ 75,190.00	\$ 211,120.00	\$ 336,580.00
TOTALS				\$ 422,478.75	\$ 75,190.00	\$ 75,190.00	\$ 272,098.75	\$ 422,478.75

OTHER REQUIREMENTS:

All of the columns in the budget table and the matching contribution table MUST be completed appropriately or the application will be invalid. Please see the example budget sheet for additional clarification.

*Units = feet, hours, inches, etc. Do not use lump sum unless there is no other way to describe the costs.

**Can include in-kind materials. Justification for in-kind labor (e.g. hourly rates used). Do not use government salaries as match. Describe here or in text.

***The Review Panel suggests that design and oversight costs associated with a proposed project not exceed 15% of the total project budget. If design and oversight costs are in excess of 15%, applications must include a justification or minimum of two competitive bids for the cost of undertaking the project.

****The Review Panel recommends a maximum fencing cost of \$1.50 per foot. Additional costs may be the responsibility of the applicant and/or partners.

Additional details:

BUDGET TEMPLATE SHEET FOR FUTURE FISHERIES PROGRAM APPLICATIONS

APPLICATION MATCHING CONTRIBUTIONS

(do not include requested funds or contributions not associated with the application)

CONTRIBUTOR	IN-KIND	CASH	TOTAL	Secured? (Y/N)
US Fish & Wildlife Service (Fish Passage Program)	\$ -	\$ 75,190.00	\$ 75,190.00	Y
	\$ -	\$ -	\$ -	
	\$ -	\$ -	\$ -	
	\$ -	\$ -	\$ -	
	\$ -	\$ -	\$ -	
	\$ -	\$ -	\$ -	
	\$ -	\$ -	\$ -	
	\$ -	\$ -	\$ -	
TOTALS	\$ -	\$ 75,190.00	\$ 75,190.00	

OTHER CONTRIBUTIONS

(contributions not associated with the application)

CONTRIBUTOR	IN-KIND	CASH	TOTAL	Secured? (Y/N)
Bitterroot Chapter of Trout Unlimited	\$ 9,584.00	\$ 20,000.00	\$ 29,584.00	Y
Future Fisheries Improvement Program		\$ 39,970.00	\$ 39,970.00	Y
Recreational Trails Program		\$ 69,602.00	\$ 69,602.00	Y
US Fish & Wildlife Service (Fish Passage Program)	\$ -	\$ 124,810.00	\$ 124,810.00	Y
Private donors	\$ -	\$ 65,822.75	\$ 65,822.75	Y
Westslope Chapter of Trout Unlimited	\$ -	\$ 7,500.00	\$ 7,500.00	Y
Lee Metcalf National Wildlife Refuge		\$ 10,000.00	\$ 10,000.00	Y
	\$ -	\$ -	\$ -	
	\$ -	\$ -	\$ -	
TOTALS	\$ 9,584.00	\$ 337,704.75	\$ 347,288.75	

Photopoints: Reconnecting North Burnt Fork Creek on Lee Metcalf National Wildlife Refuge (Trout Unlimited)



This relic water control structure near the mouth of North Burnt Fork Creek, prevents fish passage and obstructs natural sediment and flow processes. This barrier will be removed and replaced with a pedestrian bridge.



View of North Burnt Fork Creek, looking downstream towards the water control structure. from the water control structure proposed for removal, and the area proposed for intensive revegetation.



View of North Burnt Fork Creek, looking upstream from the water control structure. Sediment accumulated above the structure limits aquatic habitat while reed canary grass prevents recruitment of native trees and shrubs, reducing stream shade and bank stability.



The northern channel of North Burnt Fork Creek which dewateres most summers. In this proposal this channel will be recontoured into a series of wetland swales, activated at high flows. Reed canary grass will be removed, and revegetation will occur.

NORTH BURNT FORK CREEK FISH PASSAGE RESTORATION PROJECT

LEE METCALF NATIONAL WILDLIFE REFUGE

100% DESIGN PLAN SET

PROJECT PARTNERS



TROUT UNLIMITED
P.O. BOX 7186
MISSOULA, MT 59807



U.S. FISH & WILDLIFE SERVICE
115 W 3RD ST
STEVENSVILLE, MT 59870

PROJECT DESCRIPTION

LEE METCALF NATIONAL WILDLIFE REFUGE (REFUGE), ESTABLISHED ON FEBRUARY 4, 1964, IS A 2,800-ACRE REFUGE LOCATED IN THE BITTERROOT RIVER VALLEY OF SOUTHWEST MONTANA. THE REFUGE IS KNOWN FOR ITS VARIED HABITAT, INCLUDING PONDS, FLOODPLAINS, RIVERINE WOODLANDS AND GRASSLANDS, WHICH SUPPORT A WIDE RANGE OF WATERFOWL, NEOTROPICAL SONGBIRDS, RAPTORS, REPTILES, AMPHIBIANS, MAMMALS AND FISH SPECIES. THE REFUGE'S WATER RESOURCES ARE AMONG ITS MOST IMPORTANT ASSETS AND INCLUDE A 2-MILE REACH OF NORTH BURNT FORK CREEK AND OVER 5 MILES OF BITTERROOT RIVER FRONTAGE. IN ADDITION TO ITS NATURAL RESOURCE AMENITIES, THE REFUGE PROVIDES OPPORTUNITIES FOR THE PUBLIC TO ENJOY COMPATIBLE WILDLIFE-DEPENDENT PUBLIC USE ACTIVITIES INCLUDING HUNTING, FISHING, WILDLIFE OBSERVATION AND PHOTOGRAPHY, ENVIRONMENTAL EDUCATION, AND INTERPRETATION.

IN 2012, THE U.S. FISH AND WILDLIFE SERVICE ADOPTED THE LEE METCALF NATIONAL WILDLIFE REFUGE COMPREHENSIVE CONSERVATION PLAN (OCP). THE OCP IDENTIFIED THE OVERARCHING VISION FOR THE FUTURE OF THE REFUGE, AND INCLUDED SPECIFIC GOALS TO HELP ACHIEVE THIS VISION, INCLUDING:

- TO MANAGE AND, WHERE APPROPRIATE, RESTORE THE NATURAL TOPOGRAPHY, WATER MOVEMENTS, AND PHYSICAL INTEGRITY OF SURFACE WATER FLOW PATTERNS ACROSS THE BITTERROOT RIVER FLOODPLAIN TO PROVIDE HEALTHY RIPARIAN HABITATS FOR TARGET NATIVE SPECIES.
- TO EDUCATE VISITORS ABOUT THE BENEFITS OF SUSTAINING A MORE NATURAL FLOODPLAIN.
- TO PROVIDE VISITORS OF ALL ABILITIES WITH OPPORTUNITIES TO PARTICIPATE IN AND ENJOY QUALITY, COMPATIBLE WILDLIFE DEPENDENT RECREATION, ENVIRONMENTAL EDUCATION, AND INTERPRETATION PROGRAMS THAT FOSTER AN AWARENESS AND APPRECIATION OF THE IMPORTANCE OF PROTECTING THE NATURAL AND CULTURAL RESOURCES OF THE REFUGE.

TO ACHIEVE THE REFUGE'S VISION, THE U.S. FISH AND WILDLIFE SERVICE IN PARTNERSHIP WITH TROUT UNLIMITED, RETAINED RIVER DESIGN GROUP, INC. TO PREPARE A PRELIMINARY RESTORATION DESIGN WITH THE AIM OF ENHANCING STREAM AND FLOODPLAIN HABITAT, WATER QUALITY, AND FISH PASSAGE NEAR THE WILDLIFE VIEWING AREA IN THE REFUGE'S SOUTHERN EXTENT. THE DRAWINGS CONTAINED IN THIS PLAN SET REPRESENT A 50% DESIGN-LEVEL EQUIVALENT AND ARE INTENDED TO SUPPORT NEXT STEPS INCLUDING PUBLIC OUTREACH, ENVIRONMENTAL COMPLIANCE, FINAL DESIGN, AND REGULATORY PERMITTING.

REUSE OF DRAWINGS

THESE DRAWINGS, THE IDEAS AND DESIGNS INCORPORATED HEREIN, AS AN INSTRUMENT OF PROFESSIONAL SERVICE, ARE THE PROPERTY OF RIVER DESIGN GROUP, INC. (RDG) AND ARE NOT TO BE USED, IN WHOLE OR IN PART, FOR ANY OTHER PROJECT WITHOUT THE WRITTEN AUTHORIZATION OF RDG. UNLESS, THESE DRAWINGS MAY NOT BE ALTERED OR MODIFIED WITHOUT AUTHORIZATION OF RDG. DRAWING DUPLICATION IS ALLOWED IF THE ORIGINAL CONTENT IS NOT MODIFIED.

LEE METCALF NATIONAL WILDLIFE REFUGE VICINITY MAP



LEGAL DESCRIPTION: SW 1/4 NE 1/4 S15 T9N R20W, P.M., M
RAVALLI COUNTY, MONTANA

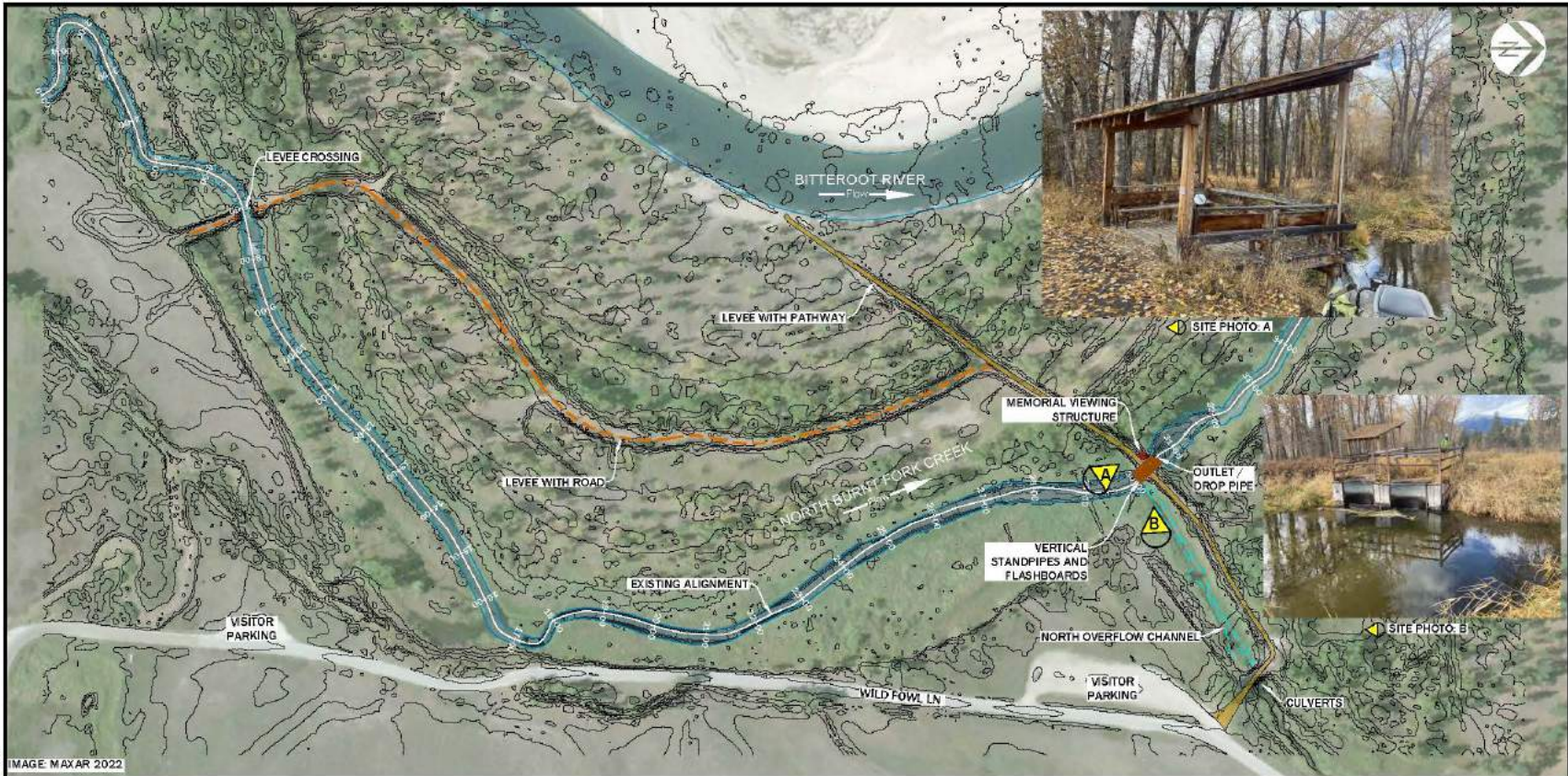
DRAWING INDEX

1.0	COVER SHEET AND NOTES	5.1	NORTH LEVEE CHECK DAM REMOVAL PLAN
2.0	EXISTING CONDITIONS	5.2	NORTH LEVEE GRADING PLAN AND PROFILE
3.0	RESTORATION PLAN	6.0	REVEGETATION PLAN
3.1	MATERIALS AND QUANTITIES	6.1	REVEGETATION PLAN DETAILS
4.0	ACCESS, STAGING AND SURVEY CONTROL	7.0	VEGETATED WOOD MATRIX DETAIL
4.1	WORK AREA ISOLATION PLAN	7.1	FLOODPLAIN ROUGHNESS DETAIL
...	OFFSITE FILL REPOSITORY	7.2	WORK AREA ISOLATION DETAILS
5.0	PLAN AND STRUCTURE LAYOUT	8.0	CULVERT DETAILS



COVER SHEET AND NOTES
NORTH BURNT FORK CREEK FISH PASSAGE RESTORATION
NEAR STEVENSVILLE, MONTANA

NO.	DATE	BY	DESCRIPTION	CHK
0	5/20/22	TH	50% DESIGN	JM
1	12/14/22	LS	100% DESIGN	JM
2	1/11/23	LS	100% DESIGN	JM
3	2/10/23	LS	100% DESIGN	JM
4	4/14/23	LS	100% DESIGN	JM
PROJECT NUMBER RDG-21-189				
DRAWING NUMBER 1.0				
Drawing 1 of 16				



1 EXISTING CONDITIONS PLAN VIEW

1" = 200'

EXISTING CONDITIONS

NORTH BURNT FORK CREEK ORIGINATES IN THE SAPPHIRE MOUNTAINS ON THE EAST SIDE OF THE BITTERROOT VALLEY AND IS A TRIBUTARY TO THE BITTERROOT RIVER. FROM THE CONFLUENCE WITH SOUTH BURNT FORK CREEK TO THE MOUTH OF THE BITTERROOT RIVER, NORTH BURNT FORK CREEK IS LISTED AS IMPAIRED FOR TOTAL NITROGEN, TOTAL PHOSPHORUS, AND SEDIMENT (MONTANA DEPARTMENT OF ENVIRONMENTAL QUALITY, 2016). ADDITIONALLY, A SUBSTANTIAL FISH PASSAGE BARRIER EXISTS, IMPEDING FISH PASSAGE BETWEEN THE BITTERROOT RIVER AND NORTH BURNT FORK CREEK. HISTORICALLY A MAJOR SPANNING TRIBUTARY IN THE LOWER BITTERROOT RIVER, THE BARRIER IS A RELIC CHECK DAM STRUCTURE THAT BIFURCATES NORTH BURNT FORK CREEK. MOST OF THE STREAMFLOW PASSES OVER THE CHECK DAM STRUCTURE WITH LIMITED SEASONAL FLOWS ALSO DIRECTED NORTHWARD THROUGH A NARROW, INTERMITTENT CHANNEL. THE CHECK DAM STRUCTURE HAS CAUSED UPSTREAM AGGREGATION OF SEDIMENTS, PRIMARILY SAND AND SMALL GRAVEL. SEDIMENT DEPOSITION HAS ALTERED CHANNEL GEOMETRY, IMPAIRED HABITAT CONDITIONS, AND IN PART FACILITATED THE CONVERSION OF HISTORICAL SHRUB AND FORESTED RIPARIAN COMMUNITY TYPES TO GRASS MONOCULTURES THAT OUTCOMPETE NATIVE VEGETATION. BARRIER REMOVAL WILL RE-ESTABLISH FISH PASSAGE AND RESTORE FLUVIAL CONNECTIVITY AND ECOSYSTEM FUNCTIONS TO 3.5 MILES OF STREAM CHANNEL.

AN EXISTING LEVEE SYSTEM EXISTS IN THE PROJECT AREA. THE LEVEE SYSTEM PROVIDES FLOOD PROTECTION FOR THE REFUGE, AND PORTIONS OF THE LEVEE FORM AN ADA-COMPLIANT WALKING TRAIL. THE LEVEES AND TRAIL SYSTEMS HAVE BEEN COMPROMISED BY ACCELERATED RIVER BEND MIGRATION AND EROSION FROM THE BITTERROOT RIVER. REMOVAL OF PORTIONS OF THE LEVEE SYSTEM TO REACTIVATE FORESTED FLOODPLAIN SURFACES AND SIDE CHANNEL HABITATS WAS IDENTIFIED AS A REFUGE GOAL IN THE CCP. LEVEE REMOVAL WILL INCREASE FLOODPLAIN CONNECTIVITY AND RESTORE NATURAL RIVERINE PROCESSES INCLUDING THE TRANSPORT AND DISTRIBUTION OF FLOW, NUTRIENTS, AND SEDIMENTS ACROSS FLOODPLAIN SURFACES AS WELL AS PROMOTE NATURAL REGENERATION OF FLOODPLAIN VEGETATION. THESE BENEFITS WILL BE CONSIDERED AGAINST THE VALUABLE USER ACCESS CURRENTLY PROVIDED BY THE LEVEE SYSTEM.

RIVER CHARACTERISTICS

DRAINAGE AREA	9.1 SQUARE MILES
MEAN ANNUAL PRECIPITATION	30 INCHES
STREAM GRADIENT	0.02%
STREAMBED D50	COARSE SAND
STREAM TYPE	C5/E5
25 YEAR DISCHARGE (4% EXCEEDANCE)	1,060 CFS*

*DERIVED FROM USGS WESTERN REGIONAL REGRESSION CURVES.

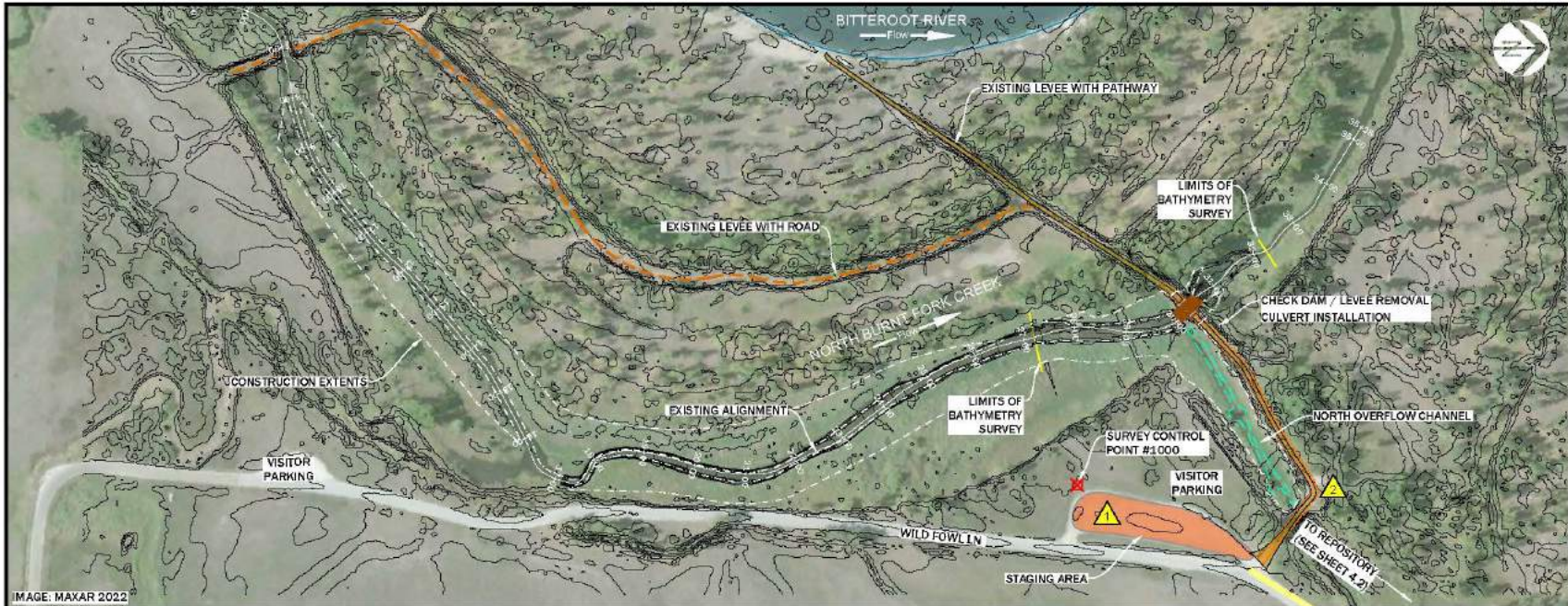


IMAGE: MAXAR 2022

1 ACCESS, STAGING AND SURVEY CONTROL PLAN PLAN VIEW

1" = 200'

ACCESS AND STAGING

FROM HIGHWAY 203 (EASTSIDE HIGHWAY) IN STEVENSVILLE, MONTANA, TURN WEST ONTO WILD FOWL LANE. CONTINUE ON WILD FOWL LANE FOR 1.2 MILES. FOLLOW THE LANE AS IT HEADS SOUTH THROUGH LEE METCALF WILDLIFE REFUGE FOR AN ADDITIONAL 1.2 MILES.

UTILIZE THE EXISTING VISITOR PARKING LOT (LOCATED ON THE WEST SIDE OF THE ROAD) AS A TEMPORARY STAGING AREA AND USE EXISTING PATHWAY TO ACCESS THE SITE.

NOTES: CONTRACTOR IS RESPONSIBLE FOR MAINTAINING ACCESS ROADS AND TEMPORARY HAUL ROADS. EQUIPMENT, MAINTENANCE AND MATERIALS TO BE STAGED MINIMUM 150' FROM RIVER.

CONTROL POINT

POINT NUMBER	EASTING	NORTHING	POINT ELEVATION	RAW DESCRIPTION
1000	813795.6'	868480.2'	3262.591'	5/8" REBAR WITH A 2" ALUMINUM CAP MARKED "RDG"

PROJECT DATUM

THE PROJECT COORDINATES ARE BASED ON THE FOLLOWING:

HORIZONTAL PROJECTION:	MONTANA STATE PLANE
HORIZONTAL DATUM:	NAD83 (2011)
UNITS:	US SURVEY FEET
VERTICAL DATUM:	NAVD88 (GEOID 9)

TOPOGRAPHY AND CROSS SECTION GROUND LINES ARE BASED ON SURVEY WORK PERFORMED BY RDG IN NOVEMBER 2011. LIDAR DATA WAS CREATED IN 2008 AND COMBINED BY RDG.

DRAWING LEGEND

SYMBOL

	SITE ACCESS TAG
	SURVEY CONTROL POINT
	EXISTING ALIGNMENT
	GRADING EXTENTS
	CHANNEL FLOW DIRECTION
	STAGING
	TEMPORARY ACCESS ROAD



ACCESS, STAGING AND SURVEY CONTROL NORTH BURNT FORK CREEK FISH PASSAGE RESTORATION NEAR STEVENSVILLE, MONTANA

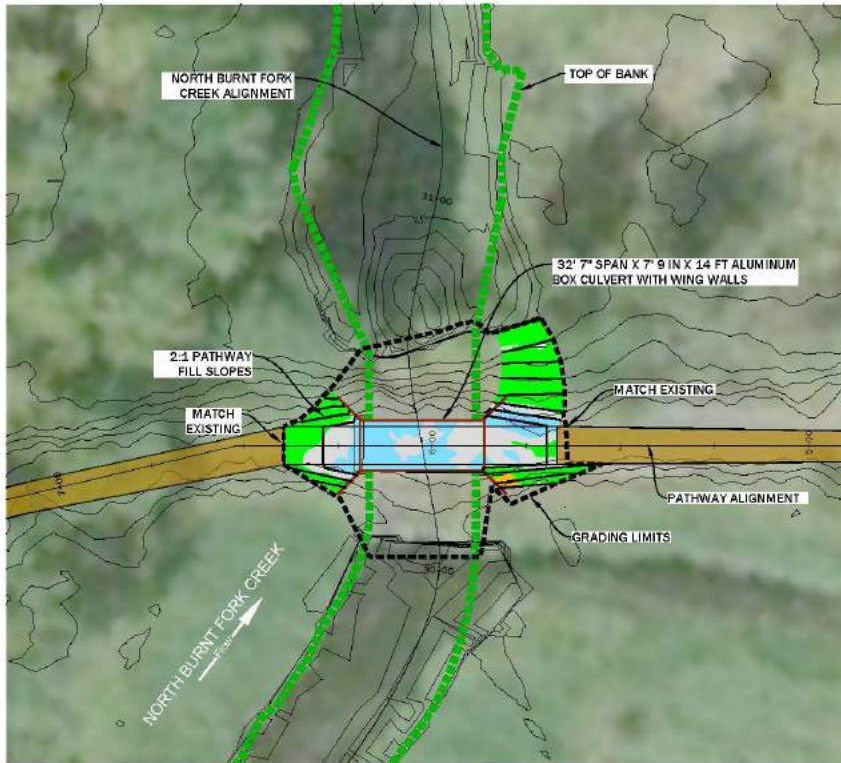
NO.	DATE	BY	DESCRIPTION	CHK
1	8/20/22	TH	RAW DESIGN	SM
2	12/14/22	LS	100% DESIGN	JM
3	1/11/23	LS	100% DESIGN	JM
4	2/7/23	LS	100% DESIGN	JM
5	4/14/23	LS	100% DESIGN	JM

PROJECT NUMBER
RDG-21-15B

DRAWING NUMBER

4.0

Drawing 5 of 16

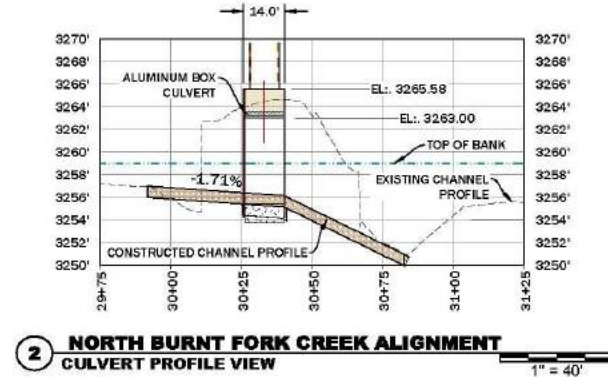


1 NORTH LEVEE PLAN VIEW
1" = 30'

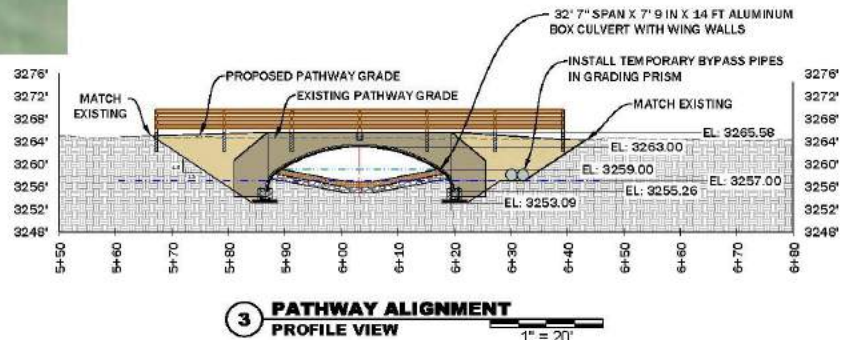
EARTHWORK VOLUMES	
ITEM	QUANTITY (CY)
CUT	373
BACKFILL	230
NET CUT	143

NOTE:
VOLUMES ARE NEATLINE. CONTRACTOR TO APPLY EXPANSION FACTORS TO DETERMINE A MORE ACCURATE BACKFILL VOLUME.

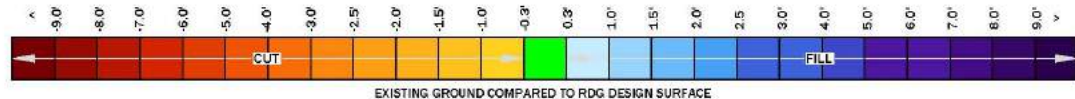
LEGEND	
---	EXISTING GRADE (EG)
---	WATER SURFACE
---	FINISHED GRADE (FG)
█	CUT
█	FILL



2 NORTH BURNT FORK CREEK ALIGNMENT CULVERT PROFILE VIEW
1" = 40'



3 PATHWAY ALIGNMENT PROFILE VIEW
1" = 20'



NO.	DATE	BY	CHK	DESCRIPTION
1	8/20/22	TH	JM	SWA DESIGN
2	12/14/22	LS	JM	100% DESIGN
3	2/10/23	LS	JM	100% DESIGN
4	4/14/23	LS	JM	100% DESIGN

PROJECT NUMBER
RDG-21-156

DRAWING NUMBER

5.2

Drawing 10 of 16

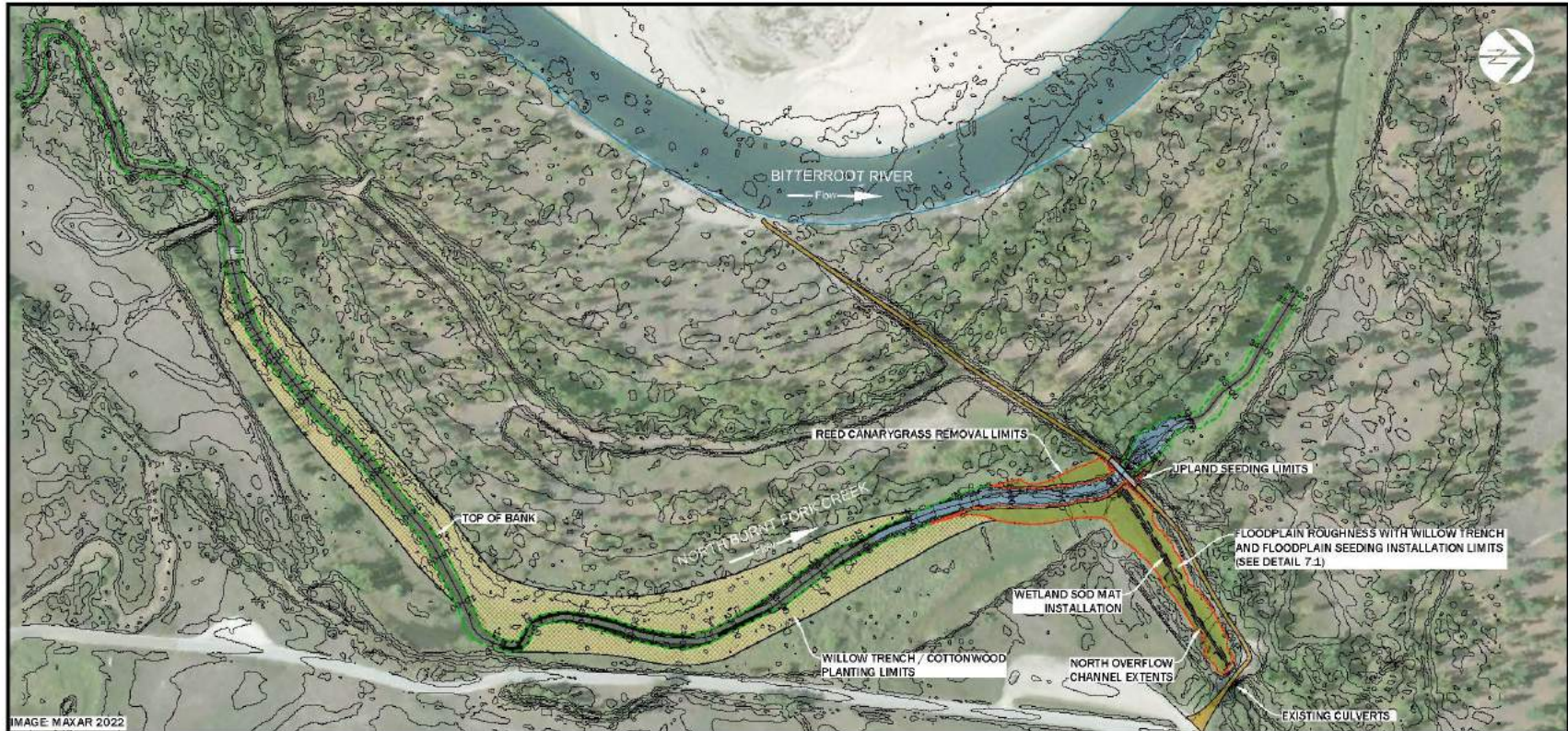


IMAGE: MAXAR 2022

1 PLANTING PLAN PLAN VIEW

1" = 200'

SEEDING SCHEDULE			
LOCATION	SPECIES	PLS LBS / ACRE	TOTAL PLS LBS
FLOODPLAIN	SLENDER WHEATGRASS	<i>ELYMUS TRACHYCAULUS</i>	13.50
	BLUEJOINT REEDGRASS	<i>CALAMAGROSIS CANADENSIS</i>	6.00
	TUFTED HAIRGRASS	<i>DESCHAMPSIA CAESPITOSA</i>	0.38
	MEADOW BARLEY	<i>HORDEUM BRACHYANTHERUM</i>	9.38
	TOTAL		20.48
UPLAND	STREAMBANK WHEATGRASS	<i>ELYMUS LANCEOLATUS</i>	12.00
	WESTERN WHEATGRASS	<i>PASCOPYRUM SMITHII</i>	21.33
	IDAHO FESCUE	<i>FESTUCA IDAHOENSIS</i>	5.93
	TOTAL		0.77

WETLAND SOD SCHEDULE			
LOCATION	SPECIES	DIMENSIONS	
WETLAND SOD MAT	BEAKED SEDGE	<i>CAREX UTRICULATA</i>	392 LINEAR FEET OF SOD 3.2 FT WIDE
	ARCTIC RUSH	<i>JUNCUS ARTICUS</i>	
	NEBRASKA SEDGE	<i>CAREX NEBRASCENSIS</i>	

PLANTING SCHEDULE					
LOCATION	SPECIES	SIZE	MINIMUM SPACING (FT)	NUMBER	
WILLOW TRENCHES / COTTONWOOD PLANTING	SANDBAR WILLOW	<i>SALIX EXIGUA</i>	6-8 FT LIVE CUTTING	5 PER FT	5,000
	BLACK COTTONWOOD	<i>POPULUS TRICHOCARPA</i>	TALL 1-GALLON CONTAINER WITH INDIVIDUAL BROWSE PROTECTION CAGES	30 FT ON CENTER	200
FLOODPLAIN ROUGHNESS AND FLOODPLAIN SEEDING	SANDBAR WILLOW	<i>SALIX EXIGUA</i>	6-8 FT LIVE CUTTING	5 PER FT	4,000

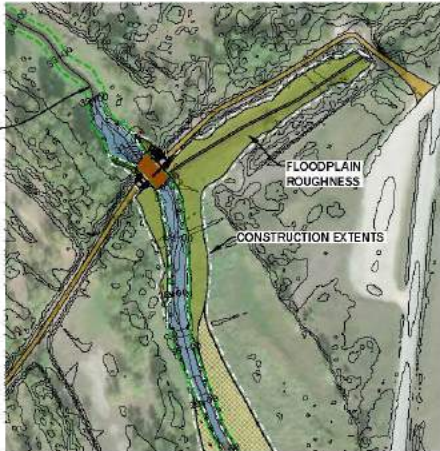
REVEGETATION LEGEND	
SYMBOL	
	WILLOW TRENCHES / COTTONWOOD PLANTING
	WETLAND SOD MAT
	UPLAND SEEDING
	REED CANARYGRASS REMOVAL
	FLOODPLAIN ROUGHNESS AND FLOODPLAIN SEEDING (SHEET 7.1)



PLANTING PLAN NORTH BURNT FORK CREEK FISH PASSAGE RESTORATION NEAR STEVENSVILLE, MONTANA

NO.	DATE	BY	DESCRIPTION	CHK
0	3/20/22	TH	50% DESIGN	JM
1	12/10/22	LS	100% DESIGN	JM
2	1/10/23	LS	100% DESIGN	JM
4	4/15/23	LS	100% DESIGN	JM
PROJECT NUMBER R04-21-168				
DRAWING NUMBER 6.0				
Drawing 11 of 15				

NORTH BURNT FORK CREEK ALIGNMENT



FLOODPLAIN ROUGHNESS

CONSTRUCTION EXTENTS

AREAS TO RECEIVE FLOODPLAIN ROUGHNESS

1 FLOODPLAIN ROUGHNESS

PLAN VIEW

1" = 200'



EXAMPLE OF CONSTRUCTED FLOODPLAIN ROUGHNESS



EXAMPLE OF WILLOW TRENCH

DESIGN INTENT

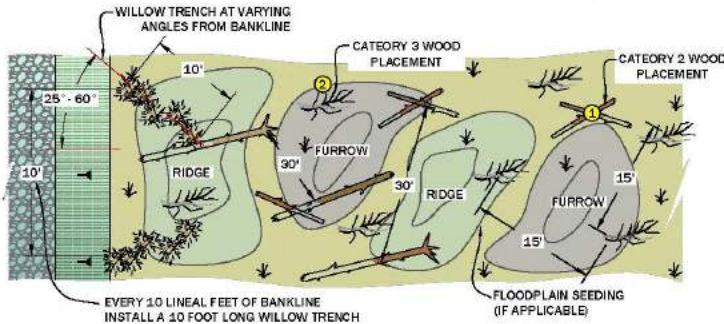
PURPOSE: THE PURPOSE OF THIS TREATMENT IS TO CREATE CHARACTERISTICS ON NEWLY CONSTRUCTED FLOODPLAIN SURFACES THAT ARE SIMILAR TO THE CONDITIONS ON NATURAL, VEGETATED FLOODPLAIN SURFACES.

PLACEMENT CRITERIA: TREATMENTS ARE APPLIED TO FLOODPLAIN SURFACES THAT LACK ROUGHNESS ELEMENTS AND VEGETATION.

SUPPLEMENTAL INFORMATION: FLOODPLAIN ROUGHNESS TREATMENTS REDUCE THE RISK OF SURFACE EROSION AND INCREASE THE RETENTION OF SEDIMENT AND NUTRIENTS FOR THE DEVELOPMENT OF RIPARIAN VEGETATION. FLOODPLAIN ROUGHNESS IS APPLIED USING TWO METHODS: (1) MICROTOPOGRAPHY GRADING AND (2) WOODY DEBRIS PLACEMENT. MICROTOPOGRAPHY GRADING WILL CREATE AN UNEVEN SURFACE OF FURROWS AND RIDGES ON THE FLOODPLAIN. WOODY DEBRIS WILL PROVIDE STABILITY AND CONTRIBUTE ORGANIC MATTER TO FLOODPLAIN SOILS. PROPER ANCHORING OF WOODY DEBRIS IS REQUIRED TO PREVENT MOVEMENT DURING OVERBANK FLOWS.

CONSTRUCTION NOTES

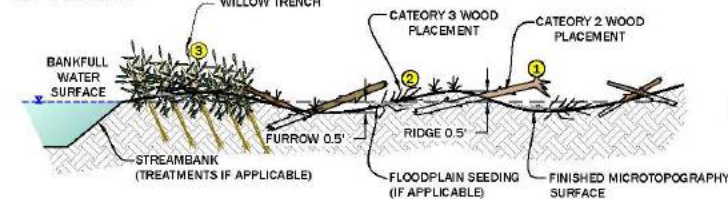
1. CONSTRUCTION OF FLOODPLAIN TREATMENT WILL OCCUR AFTER CONSTRUCTION OF THE CHANNEL STREAMBED, INSTALLATION OF LARGE WOOD STRUCTURE BANK TREATMENT, INSTALLATION OF VEGETATED WOOD MATRIX BANK TREATMENT.
2. FLOODPLAIN ROUGHNESS CONSTRUCTION AFTER FINISHED FLOODPLAIN GRADING AND PRIOR TO SEEDING, PLANTING AND FENCING.
3. GRADE FURROWS AND RIDGES INTO THE FINISHED FLOODPLAIN GROUND SURFACE.
4. PARTIALLY BURY CATEGORY 2 WOOD INTO FURROWS AND RIDGES WITH ONE HALF THE WOOD LENGTH BELOW THE SURFACE.
5. PARTIALLY BURY CATEGORY 3 WOOD INTO FURROWS AND RIDGES WITH ONE HALF THE WOOD LENGTH BELOW THE SURFACE.



2 MICROTOPOGRAPHY AND FLOODPLAIN WOOD PLACEMENT

PLAN VIEW

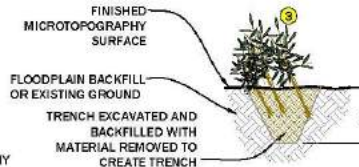
NTS



3 MICROTOPOGRAPHY AND FLOODPLAIN WOOD PLACEMENT

SECTION VIEW

NTS



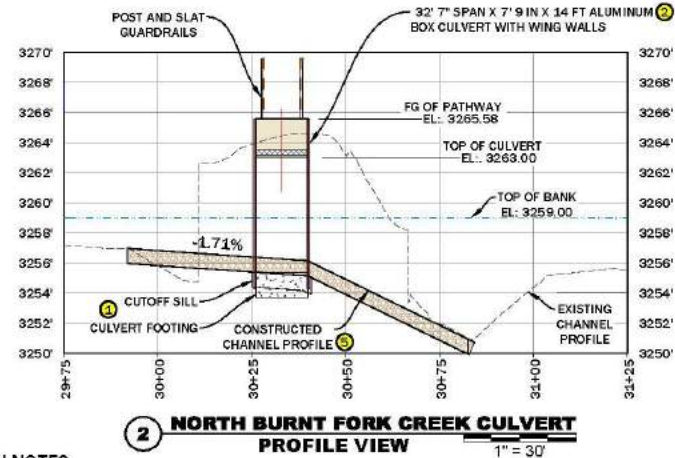
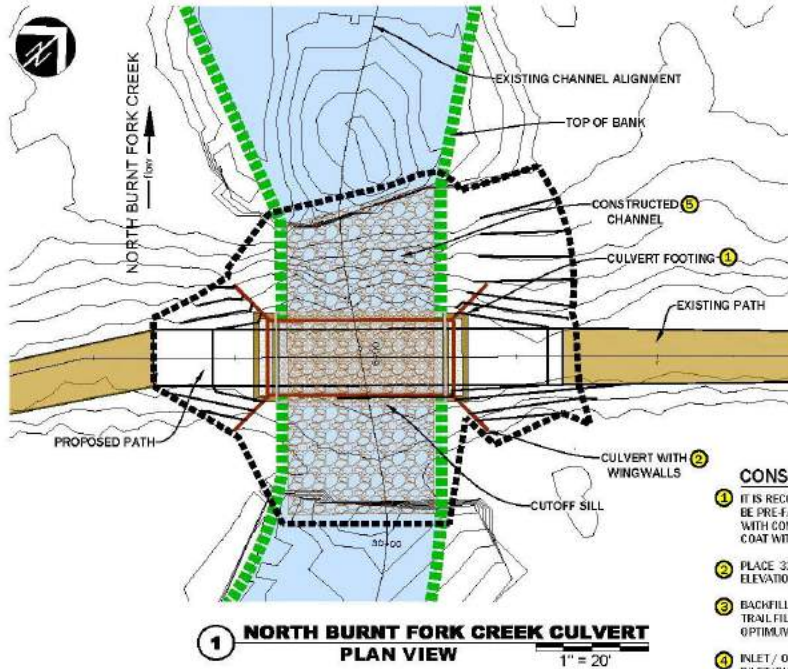
4 WILLOW TRENCH

SECTION VIEW

NTS

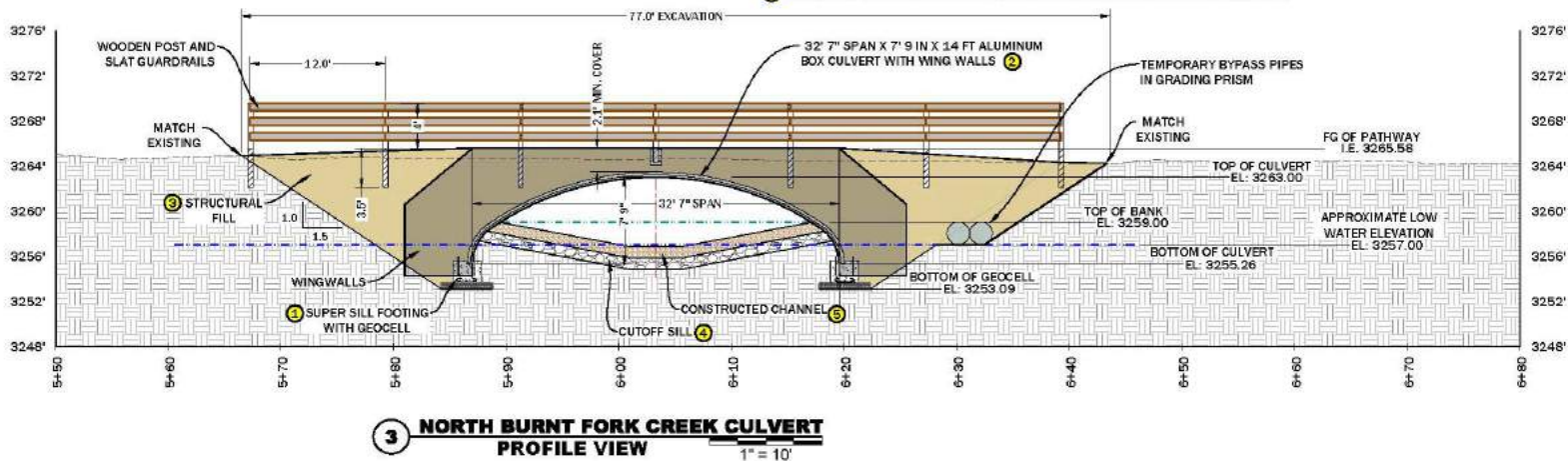
FLOODPLAIN TREATMENT MATERIAL SCHEDULE (PER ACRE)				
ITEM	DIA.	LENGTH	QUANTITY (EA)	UNIT
① CATEGORY 2 WOOD	3" - 6"	10'-12'	50	EA
② CATEGORY 3 WOOD	<3"	10'-12'	50	EA
*APPROXIMATELY 100 PIECES / ACRE				

WILLOW TRENCH MATERIAL SCHEDULE (PER LINEAL FOOT)			
ITEM	DIA.	LENGTH	QUANTITY (EA)
③ WILLOW CUTTINGS	0.25" - 1"	6' - 8'	5



CONSTRUCTION NOTES

- 1 IT IS RECOMMENDED THAT FOOTINGS FOR PROJECT OPTIMIZATION SHOULD BE SUPPLIED BY CULVERT CONTRACTOR. PRE-ENGINEERED FOOTING SYSTEM SHALL BE PRE-FABRICATED STEEL SUPER SILL MANUFACTURED BY TRUE NORTH STEEL OR APPROVED EQUAL. PRE-ENGINEERED FOOTINGS SHALL BE READY TO FILL WITH CONCRETE (F_c = 4000 PSI) ONCE INSTALLED AND REQUIRE NO ADDITIONAL REINFORCING STEEL TO PERFORM PROPERLY. ONCE THE SILL IS FABRICATED COAT WITH COROTHANE URETHANE (OR EQUIVALENT) COATING.
- 2 PLACE 32' 7" SPAN X 7' 9" IN X 14 FT ALUMINUM BOX CULVERT WITH WING WALLS ONTO BEDDING AT DESIGN GRADE. ENGINEER SHALL VERIFY INVERT ELEVATIONS PRIOR TO BACKFILL.
- 3 BACKFILL CULVERT WITH PREVIOUSLY EXCAVATED ROAD GRADE MATERIAL TO DEVELOP A 10 FT WIDE TRAVEL SURFACE A MINIMUM OF 24 IN ABOVE CULVERT. TRAIL FILL SHALL BE COMPACTED TO 90% RELATIVE DENSITY USING ASTM D698 AS A STANDARD. FILL SHOULD BE COMPACTED AT PLUS OR MINUS 2% OF OPTIMUM MOISTURE CONTENT.
- 4 INLET / OUTLET PROTECTION CONSISTS OF 1 FT LAYER OF CLASS 1 CUT OFF SILL AT CULVERT ENDS UNDER THE CONSTRUCTED CHANNEL. INTENT OF INLET/OUTLET PROTECTION IS TO PREVENT SCOUR OF STREAMBED CHANNEL.
- 5 GRADE AND CONSTRUCT CHANNEL WITH STREAMBED ALUMINUM TO RESTORE CHANNEL PROFILE.



NO.	DATE	BY	DESCRIPTION	CHK
1	03/04/23	TH	50% DESIGN	AM
2	03/14/23	LS	100% DESIGN	AM
3	04/04/23	LS	100% DESIGN	AM

PROJECT NUMBER
RDS-21-156

DRAWING NUMBER

8.0

Drawing 17 of 16



Region 2 Headquarters
3201 Spurgin Road
Missoula, MT 59804
Phone 406-542-5500

November 7, 2022

Future Fisheries Improvement Program
c/o Michelle McGree
Montana Fish, Wildlife & Parks
P.O. Box 200701
1420 E. 6th Avenue
Helena, MT 59620-0701

RE: Reconnecting North Burnt Fork Creek on Lee Metcalf National Wildlife Refuge

Dear Future Fisheries Panel:

I am writing in support of the *Reconnecting North Burnt Fork Creek on the Lee Metcalf National Wildlife Refuge* application submitted by Christine Brissette of Trout Unlimited. This barrier removal and habitat enhancement project is an important step toward improving connectivity and fish habitat conditions in lower North Burnt Fork Creek. This work will complement other completed and planned restoration actions in the Burnt Fork drainage and is expected to provide a number of public benefits.

North Burnt Fork Creek was historically an important spawning tributary for trout occupying the middle Bitterroot River, including native westslope cutthroat trout and bull trout. However, the man-made barrier present on the Lee Metcalf National Wildlife Refuge a few hundred feet from the stream mouth has effectively blocked fish passage and altered ½ mile of habitat for over 50 years. The investment into restoring connectivity and habitat conditions at this site will not only contribute to restoring the quality of aquatic resources in North Burnt Fork Creek, but it will also help improve trout recruitment to the Bitterroot River by opening access to an additional 2.5 miles of spawning and rearing habitat. The middle Bitterroot is considered to be recruitment limited, which is a direct result of the lack of quality spawning and rearing tributaries in the reach. Improving connectivity and habitat conditions in larger streams like North Burnt Fork Creek is one of the most attainable solutions we have to help improve recruitment of fish to this portion of the river.

In addition to having direct fisheries benefits, this project also offers a great opportunity for public outreach regarding riparian health and the importance of tributaries as critical spawning and rearing habitat. The location of this project is within a public recreation area on the Lee

Metcalf National Wildlife Refuge that sees numerous visitors each and every day. Outreach and interpretive signage will be educational for many of the visitors frequenting the site. This will create a more informed public in an area of the state that is seeing rapid population growth and increased development pressures placed on our stream and riparian resources.

Please contact our Fisheries Biologist, Jason Lindstrom, with any questions for FWP regarding this project.

Jason Lindstrom, Fisheries Biologist
Montana Fish, Wildlife & Parks
Phone: (406) 529-8058
Email: Jason.Lindstrom@mt.gov

Thank you for considering funding this application.

Sincerely,



Randy Arnold
Fish, Wildlife & Parks
Regional Supervisor, Region 2
rarnold@mt.gov
(406) 542-5504



United States Department of the Interior

FISH AND WILDLIFE SERVICE

Lee Metcalf Wildlife Refuge
4567 Wildfowl Lane
Stevensville MT, 59870
(406) 777-5552



November 9, 2022

Montana Fish, Wildlife, and Parks
Future Fisheries Review Panel
1420 East Sixth Avenue
P.O. Box 200701
Helena, MT 59620

Dear Future Fisheries Review Panel:

I am writing to you in support of Trout Unlimited's (TU) grant application for the: North Burnt Fork Creek Culvert Removal and Restoration project. Lee Metcalf National Wildlife Refuge (Refuge) has worked with TU for the past three years in planning for this fish passage removal in an important bull trout (*Salvelinus confluentus*) spawning tributary to the Bitterroot River. Trout Unlimited identified historic channel migration and modification of the Bitterroot River and North Burnt Fork Creek near the confluence of these two watersheds and has identified the historic alignment for reconnection of North Burnt Fork Creek. The Refuge fully supports the proposed project as it accomplishes a number of the resource goals identified in our 2012 Comprehensive Conservation Plan. Specifically, the project would:

- 1) Restore natural topography, surface water flow patterns, and channel integrity across the Bitterroot floodplain within the Refuge;
- 2) Remove relic infrastructure that stores sediment, impedes natural hydrology, and impedes fish passage up North Burnt Fork Creek for 2 ½ miles from its mouth with the Bitterroot River;
- 3) Provide excellent opportunities to interpret to the public the value of natural river migration and ecological processes;
- 4) Enhance native fisheries habitat, including cutthroat (*Oncorhynchus clarkia*) and bull trout habitat on lower North Burnt Fork Creek as well as enhance the public's fishing opportunities through this portion of the Refuge.
- 5) Provide an opportunity to restore and enhance the riparian corridor along the historic channel of North Burnt Fork Creek and interpret that restoration to the public.

The completed project would enhance native fish habitat on lower North Burnt Fork Creek and serve as a demonstration area for further riparian restoration upstream and off of public land.

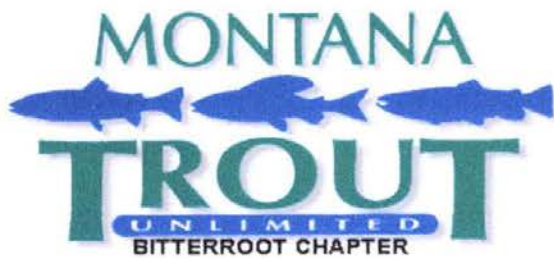
The Refuge fully supports this grant application and is enthusiastic about the prospects of restoring this section of riparian habitat on the Refuge.

Please contact me if I can provide any additional information. Thank you.

Sincerely,

A handwritten signature in dark ink, appearing to read "Tom Reed", is written over a horizontal line.

Tom Reed
Refuge Manager



P. O. Box 262
Hamilton, MT 59840

November 2, 2022

Future Fisheries Review Panel
Montana Fish Wildlife and Parks
1420 East 6th Avenue
PO Box 200701
Helena, MT 59620-070

RE: Future Fisheries Grant

Greetings:

I am the president of the Bitterroot Chapter of Trout Unlimited. This is a letter of support for a Future Fisheries Grant by Christine Brissette of Trout Unlimited. Bitterroot TU supports Trout Unlimited's efforts to remove a fish passage barrier and improve habitat on North Burnt Fork Creek. Over the past three years, we have provided funding for the initial development of this project. Our chapter has been very involved in helping to plan and fundraise for this important project. We have volunteers lined up who will execute the more than 300 hours that will be needed to do the planting related to this project.

BRTU has a long history of involvement in education programs in the Bitterroot Valley. Our Buggers program has been conducted annually for nearly 30 years. The program helps young students learn the basics of stream entomology, fly tying, and fly fishing. Hundreds of people in our area have completed this program over the years.

This year we have expended our Trout in the Classroom (TIC) program to four high schools in the Bitterroot Valley. Trout in the Classroom exposes science classes to the science involved in successfully hatching and raising trout from fertilized to a releasable size. Management of the water quality and chemistry is a major part of the effort. At the end of the school year the fish are released into a local pond under supervision of the local FWP biologist.

We plan to have the TIC classes visit the Lee Metcalf Wildlife Preserve and see the details and impacts of the project.

Regards,

A handwritten signature in blue ink that reads "David Ward". The signature is fluid and cursive, with the first name "David" being more prominent than the last name "Ward".

David Ward, President
Bitterroot Trout Unlimited