FUTURE FISHERIES IMPROVEMENT PROGRAM GRANT APPLICATION

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

I. APPLICANT INFORMATION

A. Applicant Name: Steve Brown

Mailing Address: 712 North Main Street

City: Darby State: MT Zip: 59829

Telephone: 406-821-4244 E-mail: Steve.brown2@usda.gov

B. Contact Person (if different than applicant): Ben Armstrong

Address: 712 North Main Street

City: Darby State: MT Zip: 59829

Telephone: 970-417-8219 E-mail: Benjamin.armstrong@usda.gov

C. Landowner and/or Lessee Name (if different than applicant): Bitterroot National Forest

Mailing Address:

City: State: Zip:

Telephone: E-mail:

II. PROJECT INFORMATION

A. Project Name: Tolan Creek Meadow Restoration

River, stream, or lake: Tolan Creek

Location: Township: 1S Range: 18W Section: 14

Latitude: 45.78415 Longitude: -113.83395 *Within project (decimal degrees)*

County: Ravalli

Purpose of Project: *(high level, focus on why the project is important)*

B.

Historically, Tolan Creek was a native fish stronghold, supporting a healthy westslope cutthroat trout (cutthroat from here on) population and an isolated Local Population of genetically distinct bull trout. Unfortunately, the 2022 Trail Ridge Fire and heavy precipitation events in 2023 caused debris flows in several tributaries to Tolan Creek; debris deposition into Tolan Creek and onto its floodplain has led to complete channel reorganization at several locations and widespread sedimentation issues. The fire and resulting debris flows caused severe habitat degradation by significantly reducing pool habitat, disconnecting channels from floodplains, destabilizing channel banks, introducing fine sediment that causes embedded substrate in spawning reaches (D50 = 30.5mm) and removing virtually all riparian vegetation necessary for providing cover and shade (see Photos 1-5). Most notably, the post-fire impacts drastically increased temperatures in Tolan Creek to levels unfit for the resident bull trout population (> 20°C). Post-fire electrofishing surveys indicate reductions in both native fish populations. However, effects were significantly worse for bull trout, as only 5 individuals were captured after conducting a 2-pass electrofishing survey of approximately 50% of the occupied bull trout habitat.

Given the timeline for natural recovery is likely over a decade, the purpose of this project is to expedite and facilitate the recovery of a meadow complex that historically provided wetland and riparian habitats at the headwaters of Tolan Creek. Restoration actions are necessary because the observed temperatures, sedimentation, and embedded substrate are hindering cutthroat and bull trout reproduction. This project is designed to provide refugia for the native fishes while the watershed stabilizes and recovers. This will be accomplished by constructing approximately 50 BDAs and installing instream large wood structures. These restoration actions are expected to sort sediment, improve and expand pool habitat, and increase overall habitat complexity. Additionally, 3,500 riparian shrubs will be planted to stabilize banks, improve riparian habitat, and to provide stream shading to restore temperatures to pre-fire levels.

C. Brief Project Description (attach additional information to end of application). Please include the anticipated construction schedule:

Historically, the 27-acre meadow planned for restoration was a low gradient (2.5% slope), multi-channel, perrenial, meandering stream with prolific riparian vegetation. The project is designed to reestablish the former ecological and watershed processes in the meadow using low-tech processed based restoration (LTPBR) techniques.

Beaver dam analogue structures (BDAs) and large wood structures (LWS) will be installed using hand crews (with chainsaws, untreated wood posts, hydraulic post-pounders, shovels, buckets, loppers, and winches). Willow cuttings and slash to thread through wood posts will be salvaged locally. BDAs will be placed at sites below head cuts, in deep incisions, and below bifurcations to promote floodplain connectivity, channel sinuosity and a multi-channel configuration. BDA locations are planned holistically, such that they work in concert with each other. BDAs will be constructed to span bankfull width (20 feet) and require an average of thirteen posts.

LWS will be installed into Tolan Creek and/or tributaries using non-mechanized felling techniques, to enhance aquatic habitat, promote substrate sorting, simulate naturally occurring log jams, and improve floodplain connectivity on an as-needed basis. All materials used for LWS will be sourced on-site, and unburned trees will not be felled so they continue to provide shade. LWS site locations were chosen with the same criteria as BDAs but were prioritized over BDAs when large wood was available at the location of the site (see Photo 2).

Planting of native trees and riparian vegetation will occur on an as-needed basis on bare soils and banks, using hand crews. Tree seedlings and riparian plantings will be sourced commercially, with an option to salvage willow cuttings locally.

The BDAs, LWS, and approximately 2,000 of the 3,500 riparian shrubs will be installed in 2025 during the in-stream work window (July 15th-August 31st). Approximately 1,500 shrubs will be available over the next 3 years to bolster areas that are not naturally recovering.

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

The Trail Ridge Fire in 2022 burned 62% of the Tolan Creek watershed at moderate to high soil burn severity which destabilized soils and stream channels. Subsequent convective thunderstorms in August 2023 resulted in widespread debris flows which severely degraded habitat quality throughout the watershed.

E. Length of stream or size of lake that will be treated (project extent): 27 acres of meadow habitat

Length/size of impact, if larger than project extent (e.g., stream miles opened): Unknown size of impact outside the project area

F. Project Budget Summary:

Grant Request (Dollars):	**$**	**6,885.00**
Matching Dollars:	**$**	**26,230.00**
Matching In-Kind Services:*	**$**	**0**

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

Other Contributions (not used as match)	**$**	**17,815.00**
Total Project Cost:	**$**	**50,930.00**

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

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

- [x] Extent of the project, including context (relation to major landmark or town)
- [x] Indication of public and private property
- [ ] Riparian buffer locations and widths (if applicable) and grazing locations

I. Attach project plans:

- [x] Detailed sketches or plan views with the location and proposed restoration
- [X] 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 support letters or statements of (e.g., landowner consent, community or public support). For FWP statement, attach provided template. List any other project partners:

Bitterroot Water Partnership

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
[ ]	[x]

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

This restoration project on NFS land is intended to effect stream improvements, which are enduring in nature. The U.S. Forest Service will exercise its discretion in protecting the investment in the restoration project following project completion, subject to the availability of funding for such purpose. All future management activities will be in compliance with 1987 Bitterroot National Forest Land Management Plan and in accordance with any existing and/or future rights.

While the BRF cannot legally commit to a 20-year maintenance commitment, it is the intent of the BRF Fisheries Biologist and Hydrologist to continue monitoring the effectiveness of the restoration activities and maintain/install new structures until project goals are fulfilled.

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.*

The project is within an active grazing allotment; however, due to the loss of vegetation from the fire, the lessee does not have cattle in the Tolan watershed.

C. 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?

The short-term goals are to establish riparian vegetation, reinitiate stream aggradation in what has become a degrading reach, increase pool frequency, reconnect the floodplain and reduce bank erosion. The long-term goals are to establish overstory cover to provide stream shading, increase habitat complexity, rehabilitate stream temperatures and native fish populations to pre-fire conditions.

The project goals will be monitored with repeated photo points, measuring summer stream temperature throughout the watershed, conducting fish population estimates with electrofishing surveys, habitat surveys, and water quality monitoring downstream of the project area in the East Fork Bitterroot River. There is existing temperature data spanning back over 20-years. Established electrofishing reaches that overlap the project area will continue to be sampled, and project-specific survey reaches will be established. Photo point monitoring was initiated immediately after the 2022 fire.

The BRF Fisheries Biologist and Hydrologist will leverage the rare opportunity of having abundant pre-fire and pre-project monitoring data to evaluate the success of the project at meeting desired outcomes. The planned monitoring will help inform how LTPBR restoration activities achieve post-fire restoration goals on the BRF. This data will be shared upon request with FWP.

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

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

Bull trout and cutthroat trout

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

Current habitat within the project area of Tolan Creek is characterized by a single thread, incised riffle with no floodplain connection and virtually no riparian vegetation. Improvements to native fish habitat is expected to result from an increase in instream habitat complexity, riparian vegetation, floodplain connectivity, bank stability, and a decrease in sedimentation.

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

Both bull trout and cutthroat trout are severely reduced from historical levels. The expected response for both populations is a short-term and long-term improvement to near or at historical levels. This would lead to an expected increase in angler success for cutthroat.

D. Will the project increase public fishing opportunity for wild fish and, if so, how? Is public fishing allowed onsite? Is it allowed by permission? If not, describe how the public would benefit.

The fishing public would benefit from this project through the expected increase in the cutthroat population from the habitat restoration. The project area is on Bitterroot National Forest lands and is open to fishing.

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

The Tolan Creek bull trout population is an isolated population that is genetically distinct from the East Fork Bitterroot River population; additionally, non-native fish are not present in the upper Tolan Creek watershed. Due to these traits, this area is of high conservation value for the continued preservation of one of thirteen Local Populations of bull trout in the Bitterroot River Core Area.

The expected benefits from this project will likely extend to the numerous terrestrial species that were affected by the fire. The riparian vegetation and connected floodplain associated with a restored meadow complex will provide ecosystem services for birds, insects, and mammals which will benefit the public in numerous ways (i.e. hunting, bird-watching).

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

No, the project is on USFS lands and located 5.8 miles above private property.

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

No, it is not expected for this project to lead to the development of recreational use on the site. The project area is a headwater tributary to the East Fork Bitterroot River and is not an area of targeted commercially use.

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: STEPHEN BROWN Digitally signed by STEPHEN BROWN Date: 2024.11.07 16:24:45 -07'00' Date: _____

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 appropriately or the application will be invalid. Please see the example budget sheet for clarification.

PROJECT COSTS					GRANT REQUEST AND FUNDING			
Work Items (Itemize by Category)	**Number of Units**	**Unit Description***	**Cost/Unit**	**Total Cost**	**FUTURE FISHERIES REQUEST**	**Matching Contributions (Cash or In-Kind)*** **	**Other Contributions (Funds not used as match)**	**Total Funding**
**Units = feet, hours, cubic yards, etc. Do not use lump sum unless necessary.*								
Personnel								
Survey	30	hrs	$31.75	$ 952.50			952.50	$ 952.50
Design	20	hrs	$31.75	$ 635.00			635.00	$ 635.00
Engineering				$ -			-	$ -
Permitting	30	hrs	$31.75	$ 952.50			952.50	$ 952.50
Oversight	60	hrs	$31.75	$ 1,905.00			1,905.00	$ 1,905.00
Maintenance**	80	hrs	$31.75	$ 2,540.00			2,540.00	$ 2,540.00
			Sub-Total	$ 6,985.00	$ -	$ -	$ 6,985.00	$ 6,985.00
Travel								
Mileage	1000	miles	$0.67	$ 670.00			670.00	$ 670.00
Per diem				$ -				$ -
			Sub-Total	$ 670.00		$ -	$ 670.00	$ 670.00
Construction Materials								
Riparian shrubs	4000	each	$1.64	$ 6,560.00	4,085.00	2,475.00		$ 6,560.00
BDA posts (6.5'x3.5")	700	each	$4.00	$ 2,800.00	2,800.00			$ 2,800.00
				$ -				$ -
				$ -				$ -
				$ -				$ -
				$ -				$ -
				$ -				$ -
				$ -				$ -
			Sub-Total	$ 9,360.00	$ 6,885.00	$ 2,475.00	$ -	$ 9,360.00
Equipment, Labor, and Mobilization								
Hydraullic post pounder	1	each	$11,275.00	$ 11,275.00		11,275.00		$ 11,275.00
Labor	320	hours	$31.75	$ 10,160.00			10,160.00	$ 10,160.00
Herbicide treatment (backpack)	78	hours	$160.00	$ 12,480.00		12,480.00		$ 12,480.00
				$ -				$ -
				$ -				$ -
				$ -				$ -
				$ -				$ -
				$ -				$ -
				$ -				$ -
				$ -				$ -

BUDGET TEMPLATE SHEET FOR FUTURE FISHERIES PROGRAM APPLICATIONS

				$ -				$ -
			Sub-Total	$ 33,915.00	$ -	$ 23,755.00	$ 10,160.00	$ 33,915.00
			OVERALL TOTALS	$ 50,930.00	$ 6,885.00	$ 26,230.00	$ 17,815.00	$ 50,930.00

OTHER REQUIREMENTS:

**For projects that include a maintenance request, it cannot exceed 10% of the total project cost.

***Match can include in-kind materials or labor. Justification for in-kind labor (e.g. hourly rates used) can be noted below. Do not use government salaries as match.

Additional budget detail:

APPLICATION MATCHING CONTRIBUTIONS

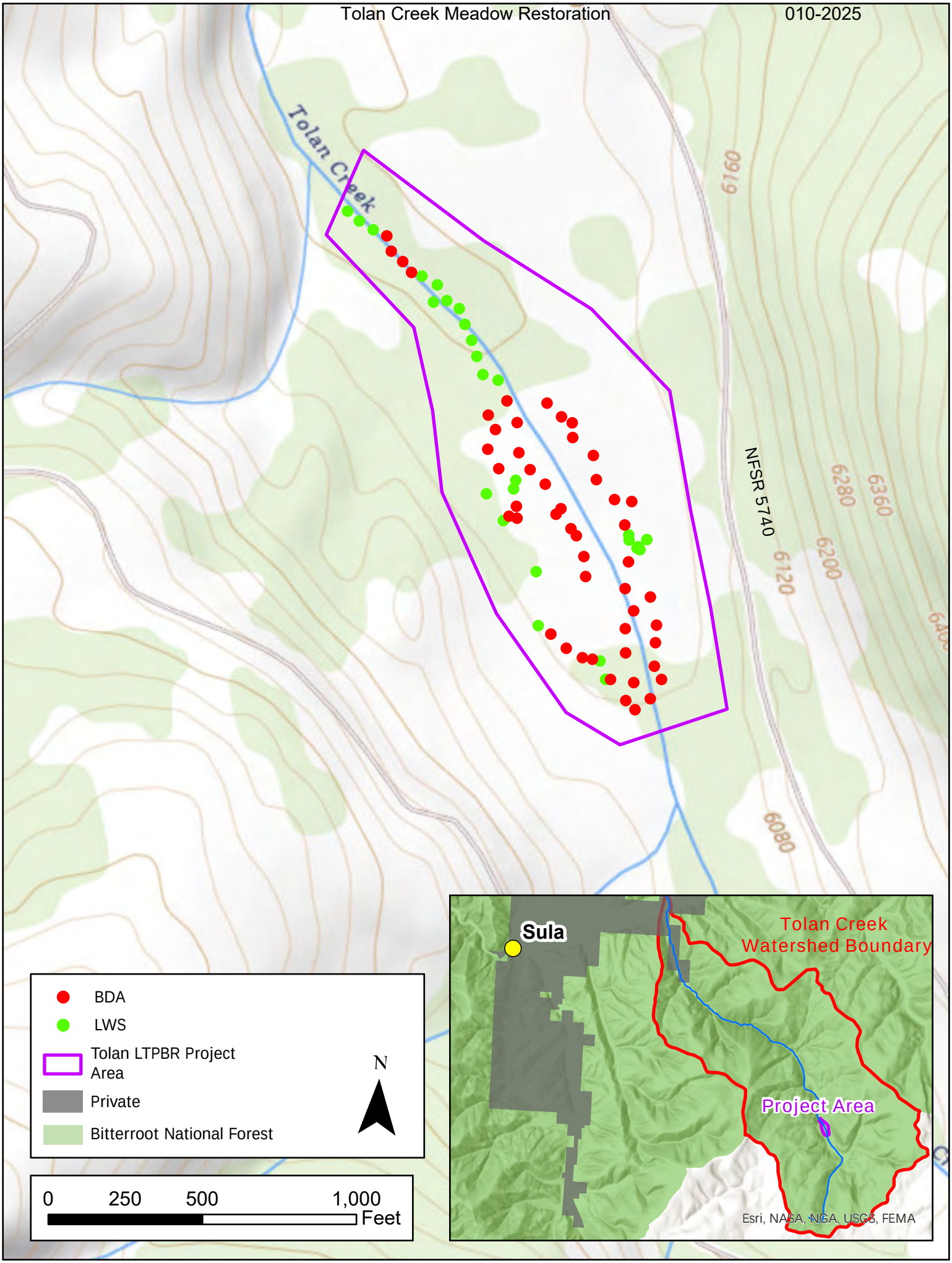
Total should equal match listed above; do not include requested funds

CONTRIBUTOR	IN-KIND	CASH	TOTAL	Secured? (Y/N)
Burned Area Rehabilitation (BAR) funds	$ -	$ 14,955.00	$ 14,955.00	Y
Bitterroot Water Partnership	$ -	$ 11,275.00	$ 11,275.00	Y
	$ -	$ -	$ -	
	$ -	$ -	$ -	
	$ -	$ -	$ -	
	$ -	$ -	$ -	
	$ -	$ -	$ -	
	$ -	$ -	$ -	
TOTALS	$ -	$ 26,230.00	$ 26,230.00	

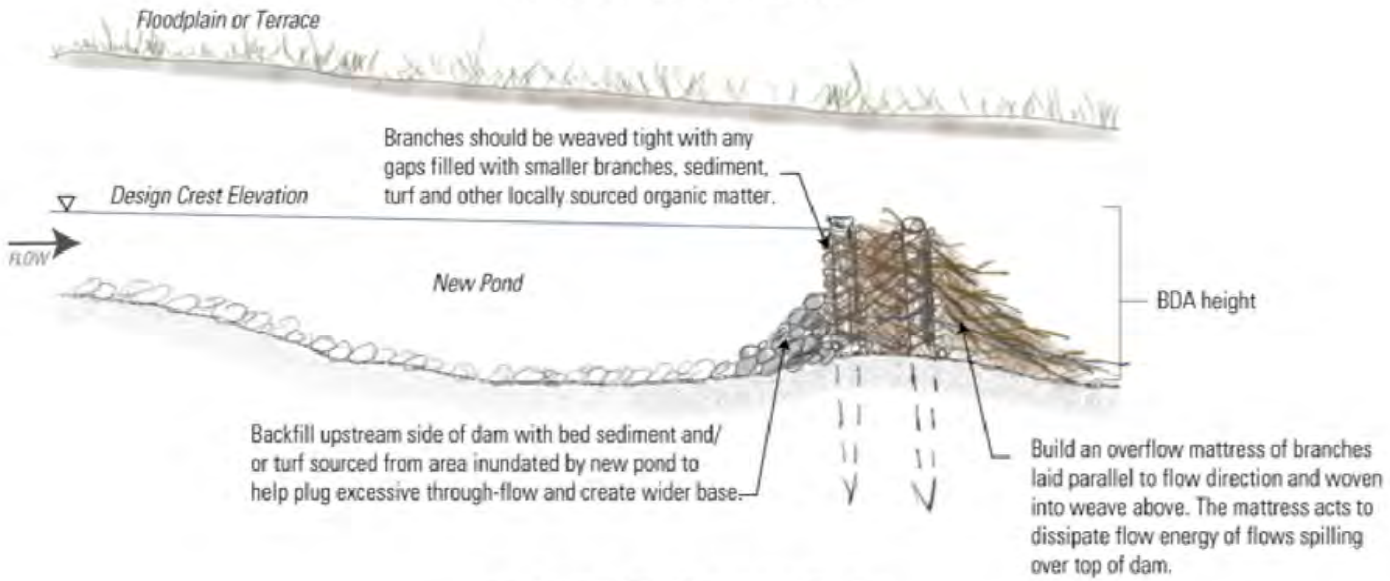
OTHER CONTRIBUTIONS

Total should equal other contributions listed above; these are funds not specically matched to the Future Fisheries application

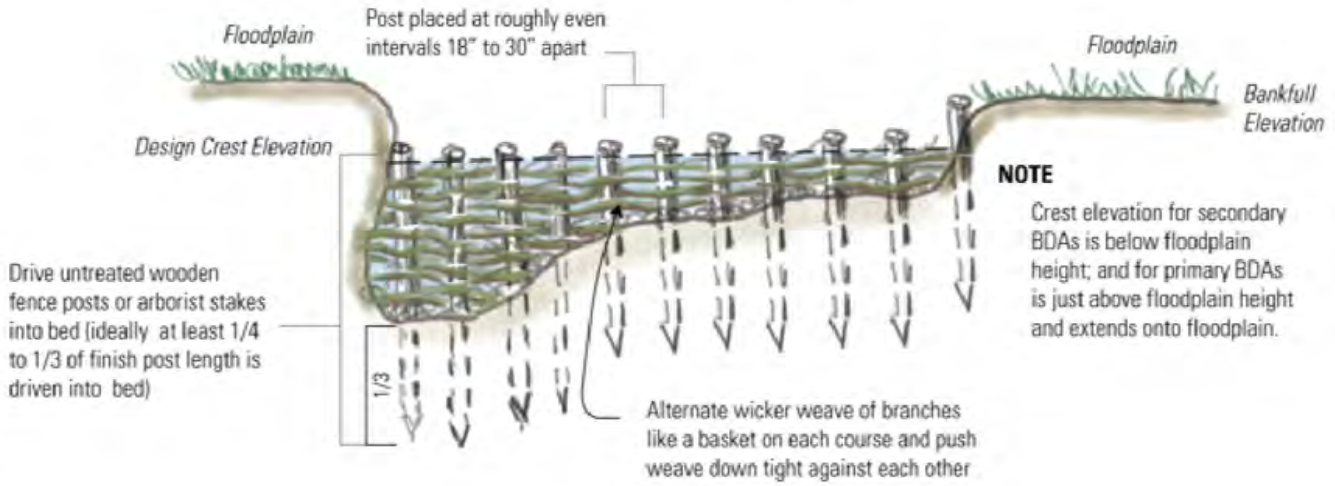
CONTRIBUTOR	IN-KIND	CASH	TOTAL	Secured? (Y/N)
U.S. Forest Service	$ 17,815.00	$ -	$ 17,815.00	Y
	$ -	$ -	$ -	
	$ -	$ -	$ -	
	$ -	$ -	$ -	
	$ -	$ -	$ -	
	$ -	$ -	$ -	
	$ -	$ -	$ -	
	$ -	$ -	$ -	
TOTALS	$ 17,815.00	$ -	$ 17,815.00	


Tolan Creek Meadow Restoration
010-2025
Tolan Creek
NFSR 5740
6160
6280
6360
6200
6120
6080
BDA
LWS
Tolan LTPBR Project Area
Private
Bitterroot National Forest
N
0
250
500
1,000
Feet
Sula
Tolan Creek Watershed Boundary
Project Area
Esri, NASA, NGA, USGS, FEMA

PROFILE VIEW



X-SECTION VIEW



United States Department of Agriculture
Forest Service

TOLAN CREEK MEADOW RESTORATION PROJECT

POST-ASSISTED BDA STRUCTURE

BITTERROOT NATIONAL FOREST

DRAWING SOURCE

LOW TECH PROCESS BASED RESTORATION MANUAL
Wheaton J.M., Bennett S.N., Bouwes, N., Maestas J.D. and Shahverdian S.M. (Editors). 2019. Low-Tech Process-Based Restoration of Riverscapes: Design Manual. Version 1.0. Utah State University Restoration Consortium. Logan, UT. 286 pp. DOI: 10.13140/RG.2.2.19590.63049/2.

Photo 1. Bare soils where riparian vegetation will be planted (45.78437, -113.83489). Undefined Rosgen classification.

Photo 2. Incised riffle reach where large wood structures will be installed and riparian vegetation will be planted (45.78486, -113.83526). Rosgen type C channel

Photo 3. Incised channel where a beaver dam analog will be installed and bare soil where riparian vegetation will be planted (45.78415, -113.83341). Rosgen type B channel.

Photo 4. Incised channel where a beaver dam analog will be installed (45.78498, -113.83509). Rosgen type B channel.

Photo 5. Historical channel that was abandoned after debris flows where beaver dam analogs will be constructed to spread flow throughout the meadow (45.78517, -113.83471). Undefined Rosgen classification.

MONTANA FISH, WILDLIFE & PARKS

Future Fisheries Improvement Program

Appendix: FWP Statement

Project Title: Tolan Creek Meadow Restoration

Please describe the potential impact of the project, including the priorities of the Fisheries Division and the importance to Montana's anglers.

Tolan Creek is a tributary to the East Fork Bitterroot River. The stream supports native westslope cutthroat trout and Federally Threatened bull trout. However, the Tolan drainage was severely burned in the 2022 Trail Ridge Fire. Heavy rainfall events in 2023 subsequently lead to widespread mass failures. The resulting debris flows caused severe habitat degradation by significantly reducing pool habitat, disconnecting the channel from the floodplain, destabilizing stream banks, and removing virtually all riparian vegetation in large portions of the drainage. Sedimentation impacts were observed as far as 80 miles downstream in the lower Bitterroot River on several occasions. Some reaches in Tolan Creek were left severely incised while other areas saw massive amounts of alluvial deposition completely filling in the historic channel. The proposed project area was left entrenched, disconnected from the floodplain, and with numerous head-cuts still seeking equilibrium.

The low-tech process based restoration techniques discussed in the application are appropriate to address project objectives. Properly implemented, the beaver dam analog structures and strategic large wood placements, in conjunction with riparian plantings, will accelerate the natural recovery of the area. It will help to aggrade the stream bed and reconnect the stream to the floodplain. This will raise the water table enough to allow riparian vegetation to re-establish. It will also increase habitat complexity and pool habitat which is needed to help restore the fishery.

Tolan Creek historically provided a source of fish recruitment to the East Fork and upper Bitterroot River. Accelerating the recovery of stream habitat to allow the fishery to reestablish in Tolan Creek is important. This proposed project complements the the current FWP management direction in the drainage, which is to conserve and enhance migratory and resident native trout populations.

Name of FWP Biologist Jason Lindstrom, R2 - Bitterroot Date: 11/8/2024

Please attach to the FFIP application and materials and submit according to listed deadlines.