

**Section I: General Information**

Project Title Brackett Creek Sub-Watershed Sediment Reduction

**Project Sponsor Information**

Name Park Conservation District Tax Identification Number 81-0444222

Address 5242 Hwy 89 South Website www.parkcd.org

City Livingston State Montana Zip Code 59047 County Park

Primary Contact Jessica Anderson

Signatory Dave Haug

Title District Administrator

Title Board Member

Phone Number 406-222-0212 ext. 111

Phone Number 406-222-0212 ext. 111

Fax Number 855-558-5656

Fax Number 855-558-5656

E-mail Address jessica.anderson@mt.nacdnet.net

E-mail Address haugfarms@gmail.com

Signature [Signature]

Signature [Signature]

**Project Funding**

319 Funds Requested \$94,050.00

Does the project sponsor have any open 319 contracts? No

Matching Funds

State Cash Match

Local Cash Match \$52,000.00

In-Kind Match \$6,000.00

Total Match \$58,000.00

Other Federal Funds \$3,900.00

Total Project Budget \$155,950.00

Administrative Fee \$8,550.00

Project Title

DEQ Contract Number

319 Award

Projected Closing Date

Project Title

DEQ Contract Number

319 Award

Projected Closing Date

**Project Location**

Which WRP does this project implement? Shields

What is the status of the WRP? DEQ Accepted

Does the project address impairments in a TMDL? Yes

12 Digit HUC #(s) 10070003

(1) Waterbody Name from 2014 List of Impaired Waters

Shields River

Activity 1 Name Brackett Creek Sediment Reduction

(1) Probable Cause(s) of Impairment to be addressed (ex. metals)

sediment, low flow

Latitude (1) 45.86693 Longitude (1) -110.67648

(2) Waterbody Name from 2014 List of Impaired Waters

Activity 2 Name

(2) Probable Cause(s) of Impairment to be addressed (ex. metals)

Latitude (2)  Longitude (2)

## Section II: Project Description

**Goals and Objectives:** Describe the overall goal and specific objectives for this project.

The measurable objectives of this effort follow the approved WRP developed for the Shields River watershed. The first goal is to reduce or eliminate an average of one sediment source per year for five years. This project will substantially reduce or eliminate sediment loading from 4 highly erodible banks on Brackett Creek, which contribute an average 1,044 tons of sediment yearly. Moreover, this project meets the measurable objective of reducing bank erosion in a high priority watershed. In addition to the programmatic objectives of the watershed restoration plan, these projects will meet the SVWG's mission of improving its land and water resources. Other measurable objectives include TMDL goals, and estimates of sediment loading from bank retreat measurements.

**Methods:** Describe the approach selected to address/correct the problem(s), e.g. types of BMPs to be installed, and other important activities.

This project will reduce sediment loading through the creation of an inset floodplain bench adjacent to a 4 foot long, vertical, highly erodible bank(s). The new benches will have sedge banks, mature willow transplants, and willow spriggings. Design elements such as bank resloping and installation of a rock toe will be specific to each reach of eroding stream bank. A new channel will be excavated adjacent to the floodplain, and will be a lateral scour pool. This restoration approach is identified in Chapter 4, pages 34 and 36 of the Shields WRP. It is also referenced in Chapter 3, Table 6, page 30, number(s) 32 and 33.

**Summary:** Provide a brief summary of the project.

The proposed project includes substantially decreasing or eliminating sediment loading from 4 eroding banks on Brackett Creek, a tributary of the Shields River which has a TMDL for sediment. The project reach of Brackett Creek varies in stream bank stability, riparian health and function, and geomorphic function. The causal factors for degradation are historical removal of beavers and harvesting hay to the edge of stream banks. Combined, these actions caused lateral and vertical adjustments. The channel is incised; however, it's created a new, functioning floodplain within its new channel. Where a functioning riparian area exists, bed load movement is in balance with its supply, and sedges and willows maintain stable banks. Problems remain on the banks where a monoculture of smooth brome occupies the tops of the banks. As Brackett Creek was formerly a beaver-dominated system, fine sediment comprises the existing banks. The shallow roots of the smooth brome do nothing to promote bank stability, and erosion at the toe of the bank results in caving-in of banks ranging from 4 to 15-ft high. Bank retreat in flood years exceeds 20 feet. These 4 banks contributed an estimated 1,511 tons of fine sediment during the 2011 flood.

**Monitoring:** Describe the monitoring you will conduct to measure project effectiveness.

Monitoring will follow a yet-to-be-developed sampling and analysis plan (SAP) for data collection. Parameters may include quantifying bank line vegetation using green line method, evaluating bank retreat rate through biennial aerial photos or field measurements, bank stability, and channel slope, and measures of stream bed composition. Complementary parameters would include estimating sediment load reductions associated with project implementation and developing a photo-point monitoring system to track project success over time.

**Education and Outreach:** Briefly describe the education and outreach component of this project and the target audience.

This component will include presentations to SVWG on project progress. It will also include one-on-one presentations to Brackett Creek landowners with the goal of generating additional projects. Yearly status updates of the restoration will demonstrate the extent of recovery and potentially identify unsuccessful components. Furthermore, a minimum of two (2) project tours will be held for the SVWG membership and other interested parties.

**Partners and Roles:** Identify the project partners and their roles.

Partner	Role
Montana Fish, Wildlife & Parks	Permitting, restoration planning assistance
Enrico Ranch	Landowner, cash-match funding
Shields Valley Watershed Group (SVWG)	watershed group support and involvement



### Section III: Scope of Work

#### Task 1 Title Consultant Selection

319 Funds

Non-Federal Match

Other Federal Funds

Total Cost

##### Description

Using their established protocols, the Park CD and Shields Valley Watershed Group will select a contractor for the Survey & Design, SAP Development, and Construction tasks.

Timeline July 2016 - September 2016

#### Task 2 Title Survey and Design

319 Funds

Non-Federal Match

Other Federal Funds

Total Cost

##### Description

Surveys of channel cross-sections, bed slope, and other parameters needed to develop designs that are consistent with natural fluvial form and function will be performed. The area FWP Yellowstone Cutthroat trout biologist will provide notable consultation in finalizing design parameters. Expected design elements include setting the floodplain bench at the bank full height, dimensions of the floodplain bench, harvest and installation of sod mats, dimensions of the new channel, plans for transplanting mature willows, and rock to provide temporary stabilization of the toe of the bank.

Timeline August 2016 - September 2016

#### Task 3 Title Permitting

319 Funds

Non-Federal Match

Other Federal Funds

Total Cost

##### Description

Montana Fish, Wildlife & Parks' Yellowstone cutthroat trout biologist will complete the joint permit application, submit copies to the appropriate agencies, and attend the 310 site visit. Furthermore, given the project is within a designated floodplain, additional assistance from the consultant for floodplain permitting will be necessary.

Timeline August 2016

#### Task 4 Title SAP Development & Implementation

319 Funds

Non-Federal Match

Other Federal Funds

Total Cost

##### Description

In conjunction with DEQ and the SVWG, a private consultant will develop a sampling and analysis plan (SAP). The SAP will follow existing plans developed for other watersheds and will address sediment loading, channel morphology, and revegetation success. These results will be reported in the final grant report.

Timeline July 2016 - September 2017

#### Task 5 Title Construction

319 Funds

Non-Federal Match

Other Federal Funds

Total Cost

##### Description

The consultant will subcontract with a heavy equipment firm to implement the approved design. The consultant will provide oversight to ensure plan view and cross-sectional design elements are met. Specific activities will include harvest, transport, and installation of mature willows, harvest and installation of sod mats to create the new bank, excavation of a new channel, mobilization, and demobilization, purchase and installation of construction materials.

Timeline Sept. 2016 - Sept. 2017

Task 6 Title Education and Outreach

319 Funds

Non-Federal Match

Other Federal Funds

Total Cost

Timeline July 2016 - November 2017

Description

This component will include presentations to SVWG on project progress. It will also include one-on-one presentations to Brackett Creek landowners with the goal of generating additional projects. Yearly status updates of the restoration will demonstrate the extent of recovery and potentially identify unsuccessful components. Furthermore, a minimum of two (2) project tours will be held for the SVWG membership and other interested parties.

Task 7 Title Contract Administration

319 Funds

Non-Federal Match

Other Federal Funds

Total Cost

Timeline July 2016 - December 2017

Description

Contractor shall oversee and be accountable for the completion of all tasks. Contractor shall prepare and submit billing statements, status reports, annual reports, and a final report. Contractor shall maintain regular contact as defined by the DEQ project manager.

Task 8 Title

319 Funds

Non-Federal Match

Other Federal Funds

Total Cost

Timeline

Description

Task 9 Title

319 Funds

Non-Federal Match

Other Federal Funds

Total Cost

Timeline

Description

Comments: Use the space provided for any additional information that may not have been captured elsewhere in this proposal form.

The proposed approach is a widely used and effective method of bank restoration. A "new" channel is excavated next to the current channel, and that material is used as back fill behind the sod mat banks. The constructed floodplain will be at the same bank-full height as the opposite bank, and flood flows will no longer crash into the toe of the eroding bank, but the force will be dissipated across the entire floodplain. HEC-RAS modeling on a similar project found it would take a 500-year event to reach the vertical wall over a 10-ft wide constructed floodplain. Meanwhile, the sedge mat banks will have the benefit of a fine root system that binds soil particles and holds stream bank together. Although an emergent wetland will exist for a short time after sod mat harvest, sedges quickly re-invade. Transplanted mature willows bring considerable structural stability to stream banks, and produce suckers for more recruitment. Fortunately, this property has sufficient wetland sod on site to construct banks, and plentiful willows for sprigging or transplanting. Although construction of the floodplain decreases channel length slightly, this is not expected to have a significant impact on bed shear. Nonetheless, channel design will consider features such as radius of curvature and channel slope. Some vertical banks may remain in place, as re-sloping increases project costs, and the banks naturally settle into an angle of repose.