

1.0 Project Summary Sheet

PROJECT TITLE Upper Sheyenne River Watershed Pilot Project

NAME, ADDRESS, PHONE AND E-MAIL OF LEAD PROJECT SPONSOR/SUBGRANTEE

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WATERSHED Upper Sheyenne River

HYDROLOGIC UNIT CODE 09020203

HIGH PRIORITY WATERSHED (yes/no) yes

E. Coli Bacteria **3** and Implementation **3**. The same reaches are currently included on the Section 303 (d) list due to sedimentation impact to fish and aquatic biota. (Check any that apply)

PROJECT TYPES	WATERBODY TYPES	NPS CATEGORY
<input type="checkbox"/> STAFFING & SUPPORT	<input type="checkbox"/> GROUNDWATER	<input checked="" type="checkbox"/> AGRICULTURE
<input checked="" type="checkbox"/> WATERSHED	<input type="checkbox"/> LAKES/RESERVOIRS	<input type="checkbox"/> URBAN RUNOFF
<input type="checkbox"/> GROUNDWATER	<input checked="" type="checkbox"/> RIVERS	<input type="checkbox"/> SILVICULTURE
<input type="checkbox"/> I&E	<input checked="" type="checkbox"/> STREAMS	<input checked="" type="checkbox"/> CONSTRUCTION
	<input checked="" type="checkbox"/> WETLANDS	<input type="checkbox"/> RESOURCE
	<input type="checkbox"/> OTHER	EXTRACTION
		<input type="checkbox"/> STOWAGE/LAND DISPOSAL
		<input type="checkbox"/> HYDRO MODIFICATION
		<input type="checkbox"/> OTHER

PROJECT LOCATION: LATITUDE _____ MIN. _____ LONGITUDE _____ MIN. _____

The Sheyenne River has its headwaters in Sheridan County, southwest of the City of Harvey, and flows approximately 303 river miles (or 183 valley miles) to Baldhill Dam and the outlet from Lake Ashtabula in Barnes County, upstream of Valley City. The portion of the river upstream of Baldhill Dam is known as the Upper Sheyenne River. Nine counties within the Sheyenne River basin—Sheridan, Pierce, Benson, Griggs, Nelson, Steele, Eddy, Barnes, and Stutsman—form the Upper Sheyenne River Joint Water Resource Board (Joint Board).

SUMMARIZATION OF MAJOR GOALS:

The primary goal of the Upper Sheyenne River Watershed Pilot Project (Project) is to identify and implement channel stability measures in eighteen (18) select areas of high priority across the Upper Sheyenne River, from the headwaters in Sheridan County to Lake Ashtabula. Potential applicable measures to improve channel stability include changes to riparian vegetation, changes to grazing

practices, replacement of road crossing culverts, and targeted bank stabilization measures. These measures will directly benefit in improving Sheyenne River water quality by reduction in sediment loading. Out of eighteen sites identified, the Joint Board selected seven (7) sites for the Project by working collaboratively with multiple stakeholders. For this EPA 319 Grant Application, the Joint Board identified two (2) out of seven (7) sites.

PROJECT DESCRIPTION:

Key river reaches were selected where broad land use changes are indicated. At both the reach-scale and at specific locations, input from the Joint Board, landowners and local stakeholders was used to identify priorities for stabilization and restoration and to guide restoration activities. Once proposed measures are implemented at the following sites, designs can be replicated at similar locations along the Upper Sheyenne River. Potential applicable measures to improve channel stability include changes to riparian vegetation, changes to grazing practices, replacement of road crossing culverts, and targeted bank stabilization measures. Multiple stabilization techniques may be appropriate at individual locations based on the site conditions, adjacent land use, and proximity to public or private infrastructure. Depending on site conditions, both hard armoring and bioengineering stabilization techniques may be appropriate.

2.0 Statement of Need

- 2.1 Portions of the Upper Sheyenne River, including from Harvey Dam in Wells County through Benson County and at Lake Ashtabula, are listed as threatened on the North Dakota Section 303(d) List for the designated use of fish and other aquatic biota with respect to sedimentation/siltation. Lake Ashtabula itself is listed as impaired for the designated use of recreation with respect to nutrient/eutrophication biological indicators. TMDL studies have not yet been performed to address the sedimentation impacts to fish and aquatic biota in the impaired river reaches or the recreational use impairments in the lake. This phase of the project will begin to address the sediment and nutrient sources in the river through the restoration of degraded streambanks identified through the assessment completed in 2019 for the Upper Sheyenne River Corridor.

A comprehensive Erosion and Sedimentation Risk Assessment of Upper Sheyenne River was completed by Barr Engineering Co. (Barr) in February 2019 under the direction from Upper Sheyenne River Joint Water Resource Board (Joint Board) and ND Department of Environmental Quality (ND DEQ). The Upper Sheyenne River Corridor Erosion and Sedimentation Risk Assessment determined that 18 out of the 30 study reaches are at high risk for instability and are likely contributing excess sediment to the river (see Figure 1). The primary source of excess sediment appears to be accelerated bank erosion, which is widespread along the river. This excess sediment is a likely cause of the threatened aquatic uses for sedimentation, and a major contributing factor to the eutrophication impairment in Lake Ashtabula. The Project will address bank erosion at selected sites, which will reduce sediment inputs to the river and help to address the water quality

impairment in Lake Ashtabula.

Given the number of priority sites and the anticipated restoration costs, this is a multi-phased project that will be dependent on several funding sources. For this first phase, Section 319 financial support is being requested for the top two priority sites identified during the assessment previously completed. The locations of these two priority sites are indicated in Figure 1. Primary water quality concerns at these two sites are erosion and sedimentation. Full designs will also be completed during this first phase for seven (7) of the priority sites identified during the assessment, including two (2) sites in Eddy County, for which funding is being requested under this application. In future years, subsequent project phases will use these completed designs to address the sediment and nutrient loading at the remaining priority sites in the project area.

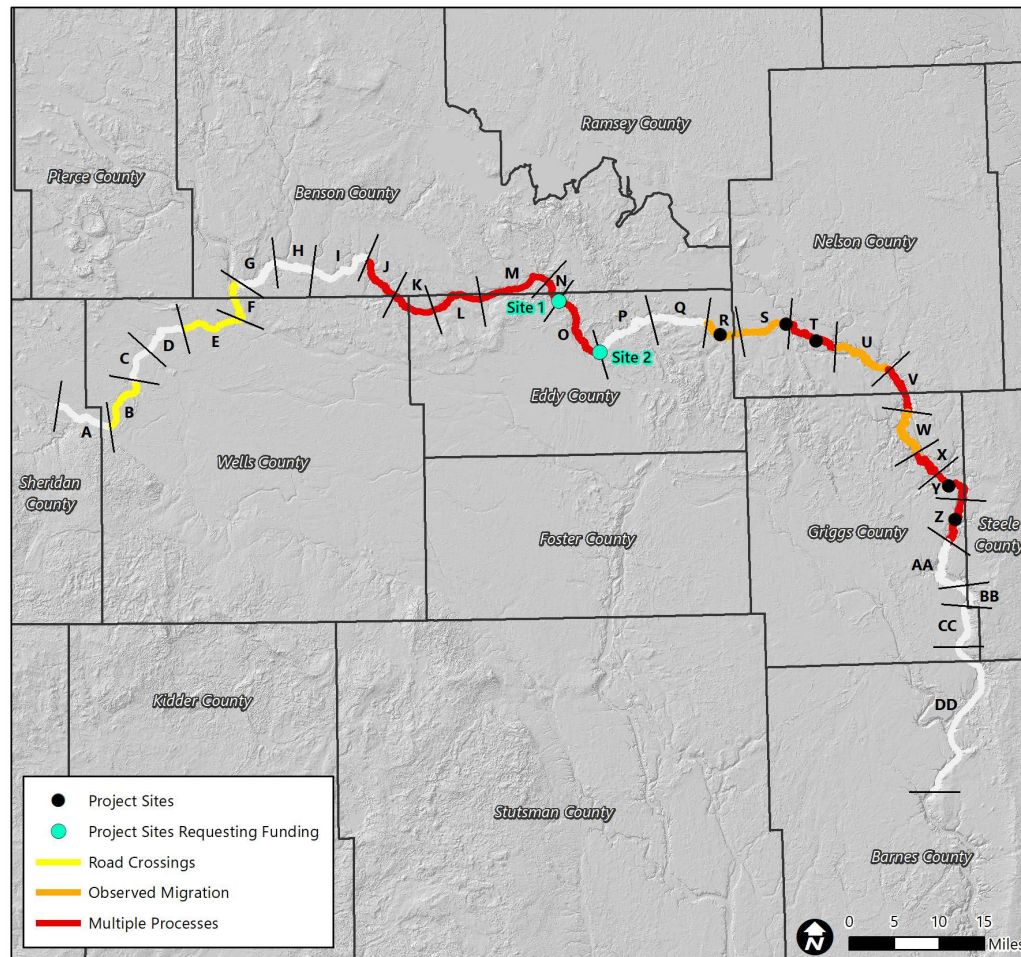


Figure 1 Project Location Map

2.2 The Sheyenne River is a riverine system in North Dakota which supports significant biodiversity, agriculture, and recreation within the region. The Sheyenne River has

its headwaters in Sheridan County, southwest of the City of Harvey, and flows approximately 303 river miles (or 183 valley miles) to Baldhill Dam and the outlet from Lake Ashtabula in Barnes County, upstream of Valley City (Figure 2). Downstream of Baldhill Dam, the river flows south to Lisbon in Ransom County before turning east and north to join the Red River of the North in Cass County near Fargo. The portion of the river upstream of Baldhill Dam is known as the Upper Sheyenne River (Hydrologic Unit 09020204).

The watershed area of the Upper Sheyenne River at Baldhill Dam is 3,900 square miles; however, a significant portion of the watershed consists of landlocked prairie potholes and does not contribute flow to the river under most conditions. The U.S. Geological Survey (USGS) estimates that the total contributing drainage area of the Upper Sheyenne River above Baldhill Dam (gage location 05058000) is 1,910 square miles (U.S. Geological Survey, 2018).

The Upper Sheyenne River is a perennial stream, with estimated bankfull discharge that ranges from 50 cfs at the headwaters to more than 1,200 cfs at the entrance to Lake Ashtabula. Many reaches of the river are at high risk for instability as shown in Figure 1; cross-section surveys and field-stability assessments performed in 2018 at 15 locations (both stable and unstable) revealed that some locations had bank shifts of 10 feet or more since a previous study in 2001. In addition, many of the survey locations in the downstream two-thirds of the study area had poor stability rankings, indicating ongoing channel instability and high potential for bank erosion.

2.3 An overview Upper Sheyenne River watershed is shown in Figure 2.

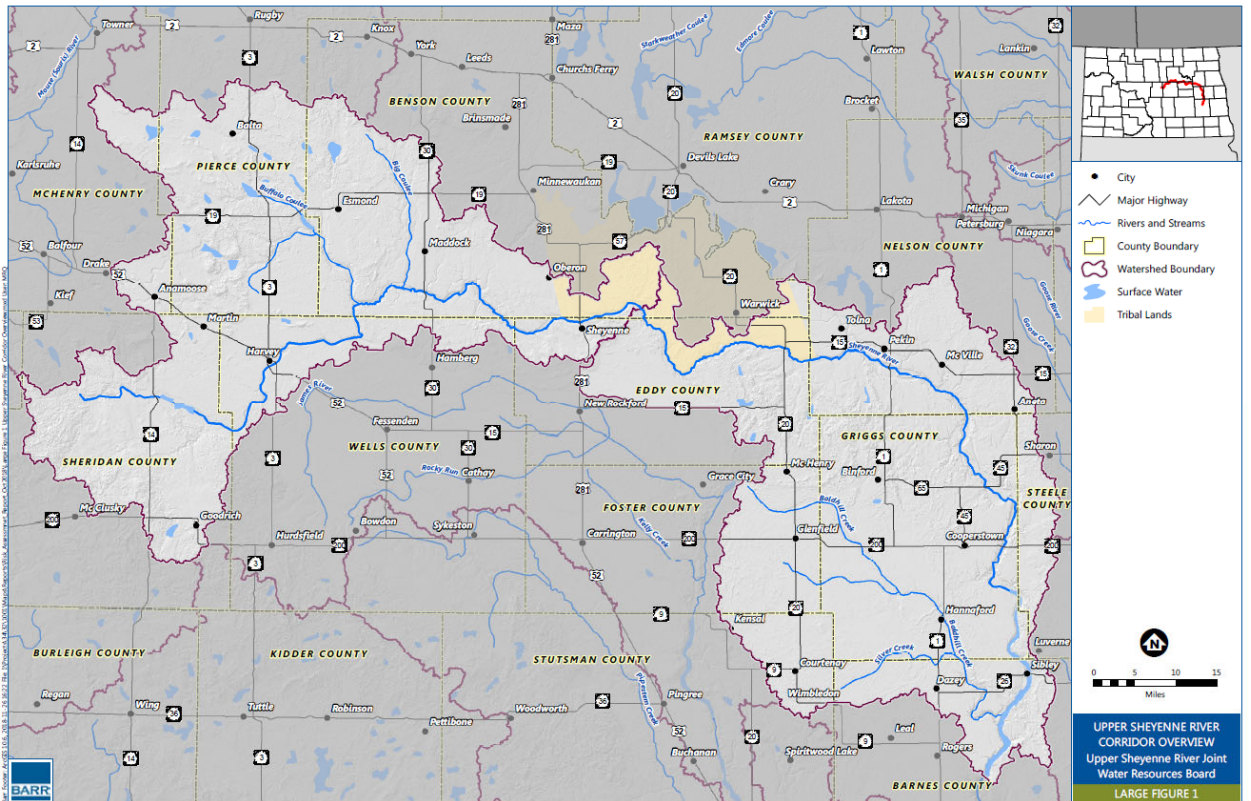


Figure 2 Upper Sheyenne River watershed overview.

Current land use/land cover in the Upper Sheyenne River watershed is shown in Figure 3. According to the available land use/land cover data from the 2011 National Land Cover Database (Homer, et al., 2015), the majority of the riparian corridor is agricultural land. Hay and pasture fields dominate in the middle third of the river valley and cultivated crops dominate in the upstream and downstream sections (Figure 3). There are some forested areas along the river banks throughout the valley, with the presence of forest and wetlands increasing in the downstream portions of the valley. Land cover along the river banks has a significant effect on the ability of the banks to resist erosion, and specific land uses at the river's edge, such as grazing, can cause dramatic increases in erosion.

Cross-sectional surveys and bank stability assessments were performed at 15 locations along the river in 2018 (Figure 4).

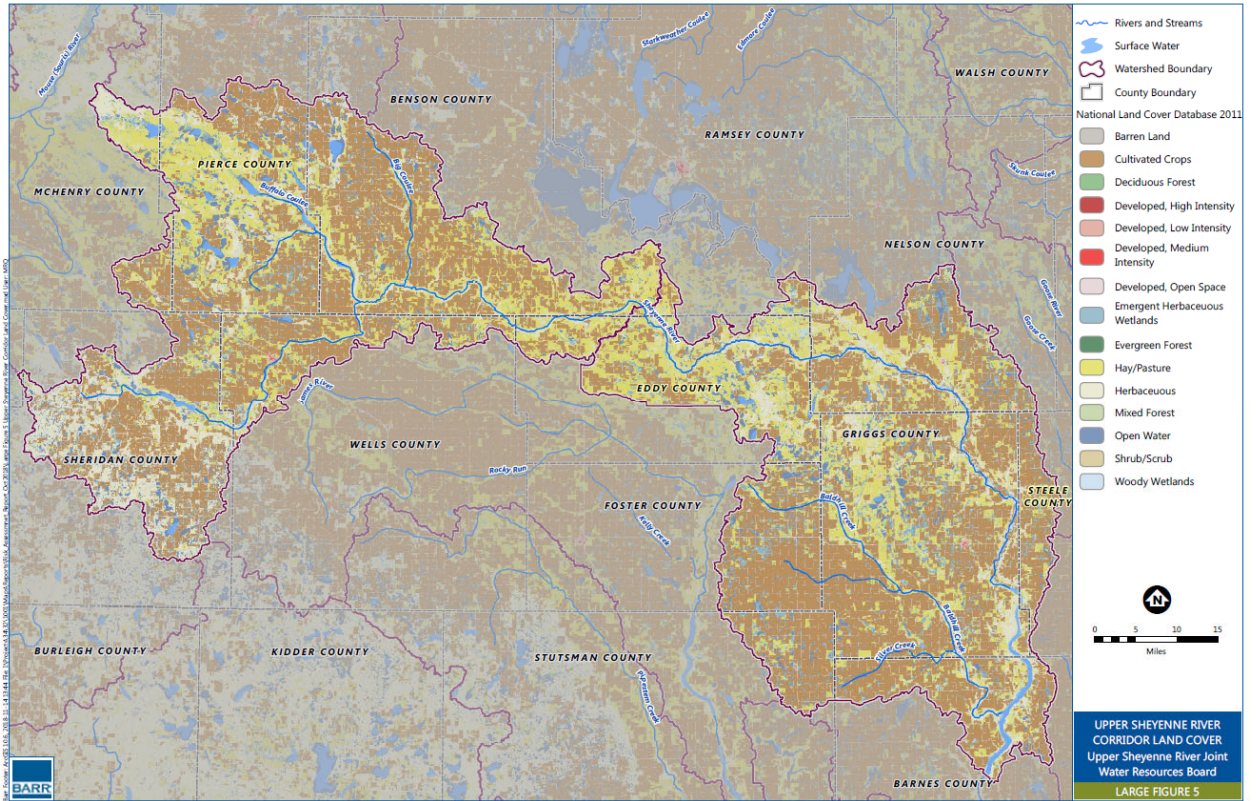


Figure 3 Upper Sheyenne River watershed land use/land cover.

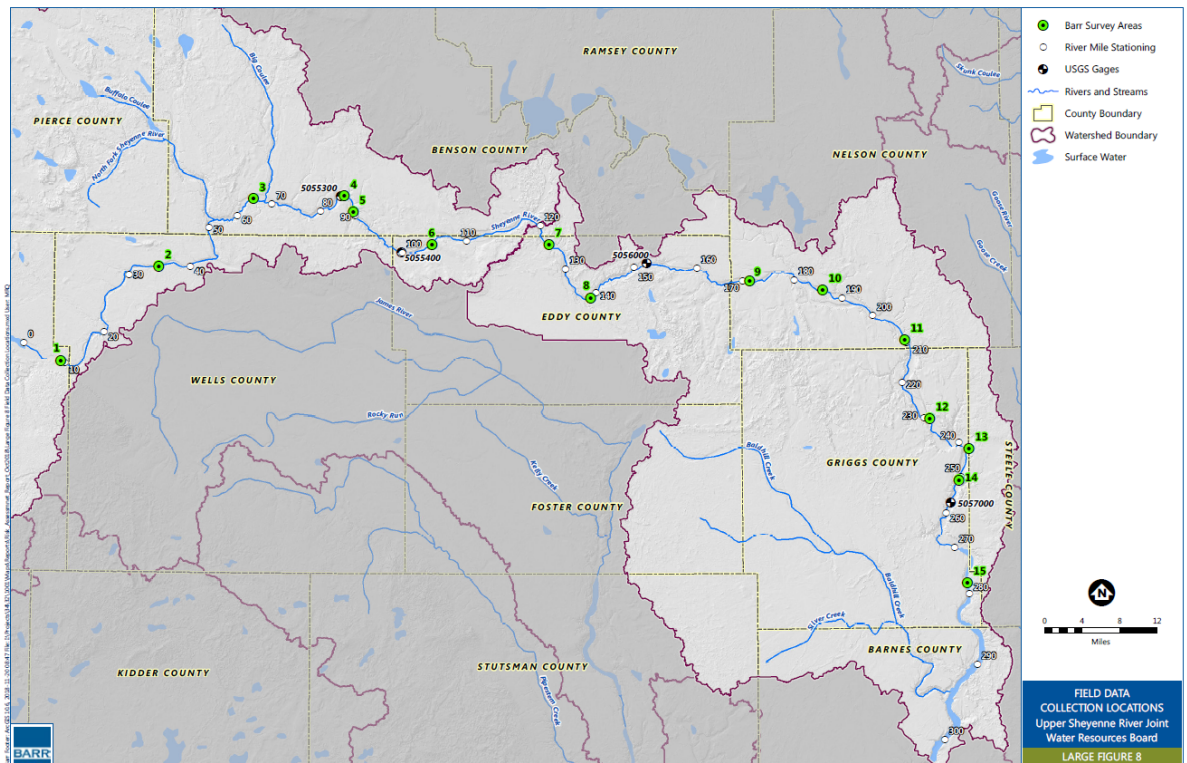


Figure 4 2018 Field Data Collection Locations.

2.4 The Upper Sheyenne River drains much of the physiographic region known as the “glaciated plains” in central North Dakota (Bluemle, et al., 2007). The glaciated plains region consists of rolling topography with a variety of glacial landforms resulting from the depositional and erosional effects of multiple periods of glaciation. The valley of the Upper Sheyenne River is of relatively consistent width, with the valley narrowing significantly only upstream of the confluence with the North Fork of the Sheyenne River in western Benson County. The valley bottom is wide enough in virtually all locations that the river is able to meander freely without being confined by the valley walls. The slope of the Upper Sheyenne River valley bottom ranges from 0.5 to 6.3 feet per mile, with most of the steeper segments concentrated upstream of the confluence with the North Fork. Downstream of the confluence the valley slope is relatively consistent with an average slope of 1.7 feet per mile. The valley walls are gently sloped at approximately 10% towards the river and in places the river runs along the toe of the valley walls.

The soils present within a river valley and its walls greatly influence the shape and behavior of a river channel. Soils with higher sand content, in particular fine sands, are generally more erodible than other soil types and provide a greater supply of sediment to the river. As expected, based on the geologic setting, the Upper Sheyenne River valley flows through glacial till, with variable soil conditions along its length (Natural Resources Conservation Service, 2018). In general, soils adjacent to the upstream half of the river valley have a higher sand content that peaks in Eddy County near the center of the study area. Sand contents in the river valley walls and uplands decrease as the river approaches Lake Ashtabula.

Based on these characteristics, the entire length of the Upper Sheyenne River valley can be characterized as an unconfined valley, with valley-bottom materials of alluvial origin, containing indicators of fluvial deposition, terraces, and a floodplain (valley type U-AL-FD (Rosgen, 2014)). Such valleys are common in non-mountainous regions and often result in the formation of a stable meandering river with a well-defined floodplain.

2.5 As discussed in Section 2.1, portions of the Upper Sheyenne River are listed as threatened on the 2018 North Dakota Section 303(d) List for the designated use of fish and other aquatic biota with respect to sedimentation/siltation, and Lake Ashtabula itself is listed as impaired for the designated use of recreation with respect to nutrient/eutrophication biological indicators.

Although a detailed identification of the sources of sediment and nutrients to Lake Ashtabula (such as a TMDL study) has not been performed, bank erosion and the accompanying accelerated channel migration is likely a significant contributor of sediment to the lake. Channel migration is widespread throughout the Upper Sheyenne River, and especially in Eddy, Nelson, and Griggs Counties (Figure 5). One factor contributing to the accelerated bank erosion is a shift in the flow-duration distribution in recent years, with longer periods of moderate flows (200 cfs and above) and shorter periods of low flows (Figure). Flows that now persist for half of each year (approximately 200 cfs and above) are likely competent to mobilize the

fine-grained sediment that forms the bed and banks of the Upper Sheyenne River, which may lead to more total sediment being transported throughout the year and therefore increases the potential for erosion and channel enlargement.

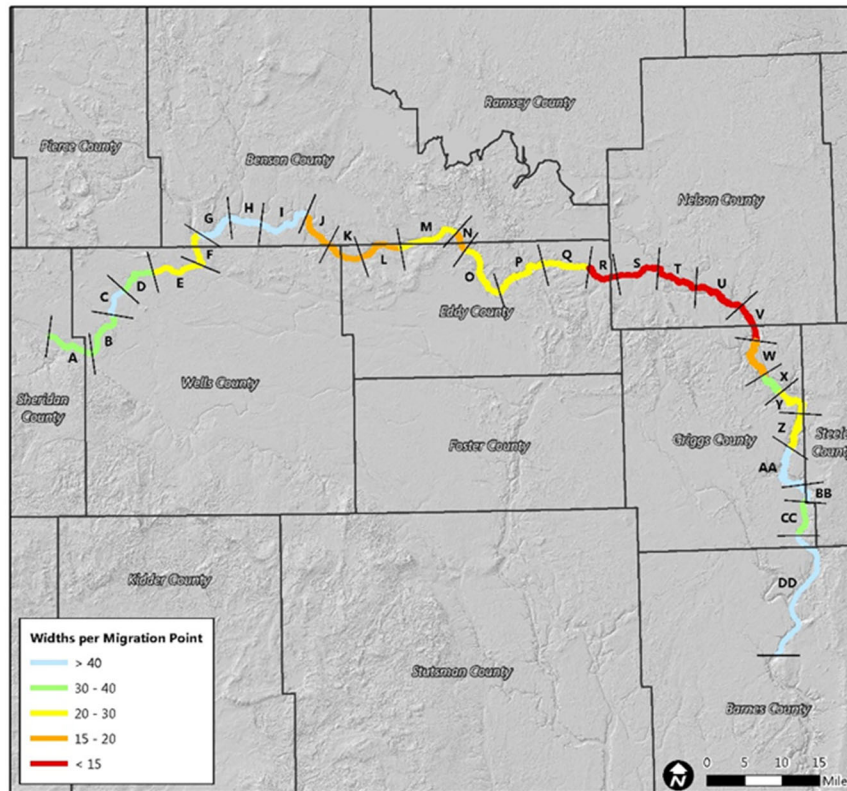
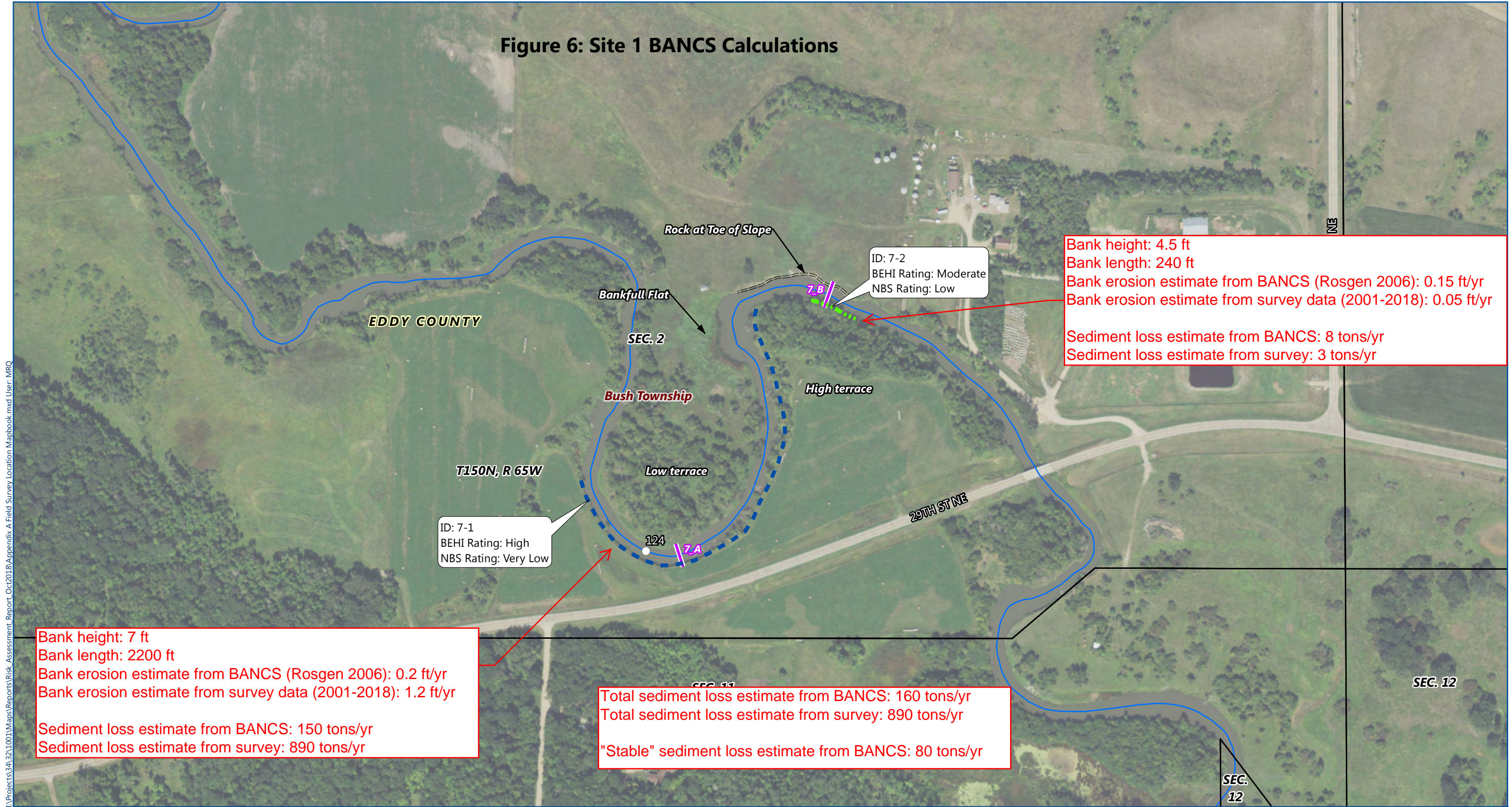


Figure 5 Observed Frequency of Highly-Migrating Meander Bends.

Two priority sites considered under this application are both located in Eddy County. For Site # 1 in Eddy County, the BANCS (Rosgen, 2006) erosion estimate is approximately 0.2 ft/year, estimating over 160 tons/year of total sediment loss. For Site # 2 in Eddy County, the BANCS (Rosgen, 2006) erosion estimate is ranges from 0.15 ft/year to 0.85 ft/year, estimating over 240 tons/year of total sediment loss. After implementation of proposed bank stabilization projects, the “Stable” bank is expected to have less than 80 tons/year total sediment loss, indicating significant improvement. Figures 6 and 7 below show the summary of BANCS estimate corresponding to field work observations at both sites in Eddy County.

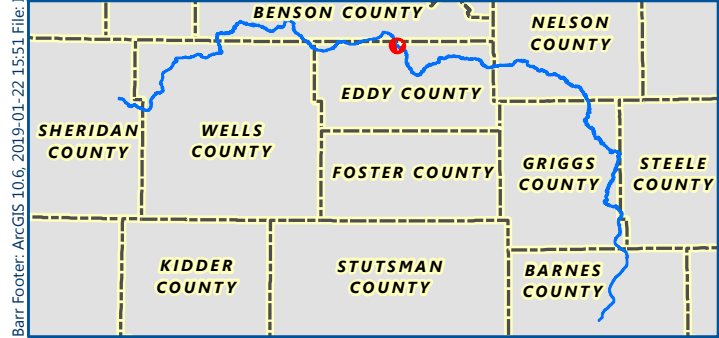
Figure 6: Site 1 BANCS Calculations



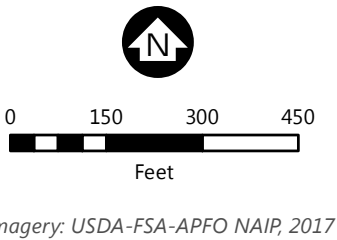
Bank height: 7 ft
 Bank length: 2200 ft
 Bank erosion estimate from BANCS (Rosgen 2006): 0.2 ft/yr
 Bank erosion estimate from survey data (2001-2018): 1.2 ft/yr
 Sediment loss estimate from BANCS: 150 tons/yr
 Sediment loss estimate from survey: 890 tons/yr

Bank height: 4.5 ft
 Bank length: 240 ft
 Bank erosion estimate from BANCS (Rosgen 2006): 0.15 ft/yr
 Bank erosion estimate from survey data (2001-2018): 0.05 ft/yr
 Sediment loss estimate from BANCS: 8 tons/yr
 Sediment loss estimate from survey: 3 tons/yr

Total sediment loss estimate from BANCS: 160 tons/yr
 Total sediment loss estimate from survey: 890 tons/yr
 "Stable" sediment loss estimate from BANCS: 80 tons/yr



○ River Mile Stationing	BANCS - BEHI Rating	■■■■ Very Low	— Low
— Barr Cross Section Location	— Extreme	■■■■■■ Very High	— Very Low
— County Boundary	— Very High	■■■■ High	
— Public Land Survey Township	— High	■■■■ Moderate	
— Public Land Survey Section	— Moderate	■■■■ Low	
		■■■■ Extreme	
		■■■■ Very High	
		■■■■ High	
		■■■■ Moderate	



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Figure 7: Site 2 BANCS Calculations

Bank height: 5.0 ft
 Bank length: 120 ft
 Bank erosion estimate from BANCS (Rosgen 2006): 0.85 ft/yr
 Sediment loss estimate from BANCS: 25 tons/yr

Bank height: 6.0 ft
 Bank length: 120 ft
 Bank erosion estimate from BANCS (Rosgen 2006): 0.15 ft/yr
 Sediment loss estimate from BANCS: 5 tons/yr

Bank height: 5.0 ft
 Bank length: 190 ft
 Bank erosion estimate from BANCS (Rosgen 2006): 0.6 ft/yr
 Sediment loss estimate from BANCS: 27 tons/yr

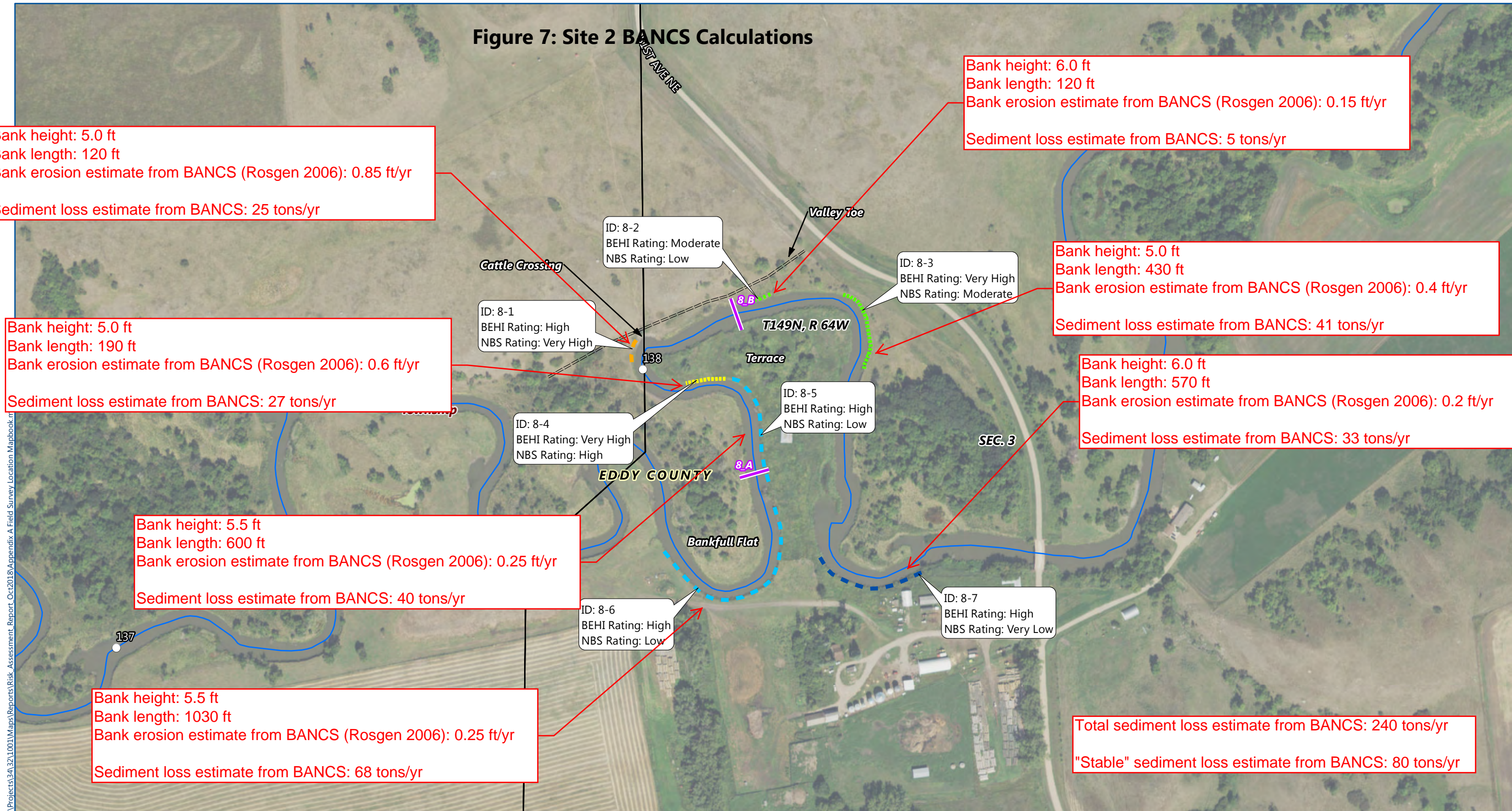
Bank height: 5.0 ft
 Bank length: 430 ft
 Bank erosion estimate from BANCS (Rosgen 2006): 0.4 ft/yr
 Sediment loss estimate from BANCS: 41 tons/yr

Bank height: 6.0 ft
 Bank length: 570 ft
 Bank erosion estimate from BANCS (Rosgen 2006): 0.2 ft/yr
 Sediment loss estimate from BANCS: 33 tons/yr

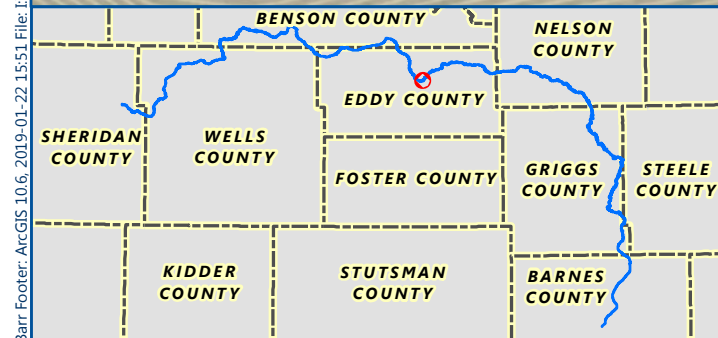
Bank height: 5.5 ft
 Bank length: 600 ft
 Bank erosion estimate from BANCS (Rosgen 2006): 0.25 ft/yr
 Sediment loss estimate from BANCS: 40 tons/yr

Bank height: 5.5 ft
 Bank length: 1030 ft
 Bank erosion estimate from BANCS (Rosgen 2006): 0.25 ft/yr
 Sediment loss estimate from BANCS: 68 tons/yr

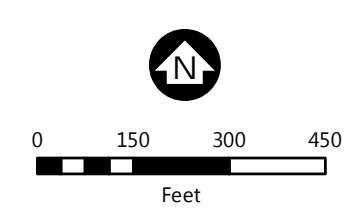
Total sediment loss estimate from BANCS: 240 tons/yr
 "Stable" sediment loss estimate from BANCS: 80 tons/yr



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○ River Mile Stationing	BANCS - BEHI Rating	■■■■ Very Low	— Low
— Barr Cross Section Location	— Extreme	■■■■■ Very High	— Very Low
— County Boundary	— Very High	■■■■ Extreme	
— County Boundary	— High	■■■■ Very High	
— Public Land Survey Township	— Moderate	■■■■ High	
— Public Land Survey Section	— Low	■■■■ Moderate	



Imagery: USDA-FSA-APFO NAIP, 2017

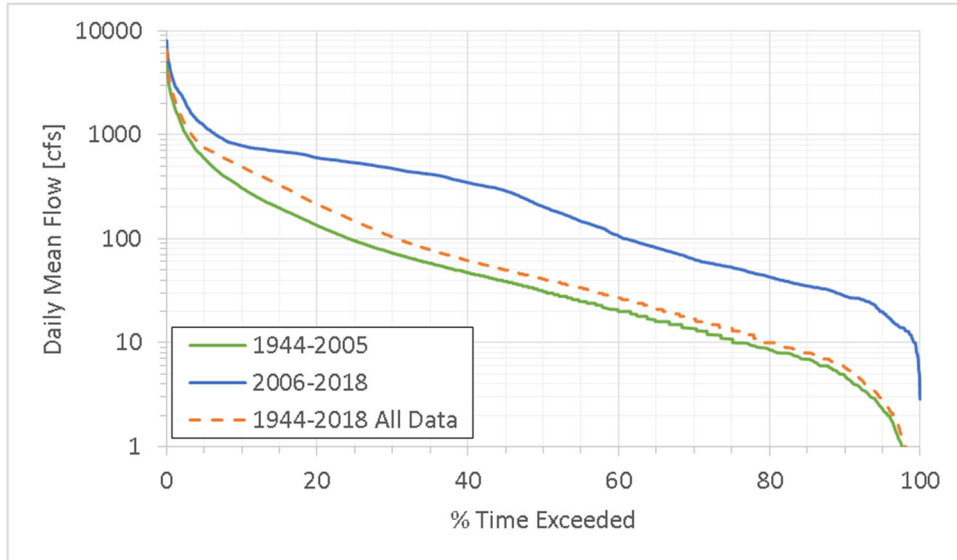


Figure 8 Flow-Duration Distributions for USGS Gage 05057000 (Sheyenne River near Cooperstown, ND), Showing Distinct Shift in Recent Years.

3.0 Project Description

- 3.1 The long term goal is to achieve fully supporting status for fish and aquatic life uses in the river above Lake Ashtabula by addressing sediment loading at the 18 priority sites identified through a previous assessment. As a secondary goal, nutrient load reductions achieved through the streambank restorations will also benefit recreational uses in Lake Ashtabula and in the Sheyenne River. These goals will be accomplished by implementing channel stability measures in areas of high priority across the Upper Sheyenne River, from the headwaters in Sheridan County to Lake Ashtabula. Potential applicable measures to improve channel stability include changes to riparian vegetation, changes to grazing practices, replacement of road crossing culverts, and targeted bank stabilization measures.
- 3.2 Out of 18 sites identified as requiring restoration measures, the Joint Board identified seven potential project sites located within Eddy, Nelson, and Griggs Counties. The sites were selected based on the apparent existence of significant bank erosion and accompanying impacts to public infrastructure, private structures, and downstream water quality. The risk assessment methods used for this study were developed by Dave Rosgen as part of his Watershed Assessment of River Stability and Sediment Supply and are referred to as RRISSC: the Rapid Resource Inventory for Sediment and Stability Consequences (Rosgen, 2009). The mainstem Upper Sheyenne River was divided into 18 reaches during the Study. Out of 18 reaches, 15 reaches were identified to be in need of restoration measures. Out of 15 reaches studied and analyzed, proposed pilot project sites are located on reaches 7, 8, 9, 10, 11, 13, and 14.

Out of 7 (seven) selected sites (2022-2023), the Joint Board selected 2 (two) priority sites for further work over the next 2-year period. These sites (Sites 1 and 2) are part of the funding request for this EPA 319 application. A summaries of Sites 1 and 2 are provided Table 1. Site photographs for all sites, channel stability ratings and

BEHI scores for all reaches, and other relevant details are provided in the Upper Sheyenne River Erosion & Sedimentation Risk Assessment Report, located on the Joint Board's website under following pathway: <https://uppersheyennejointboard.weebly.com/important-documents.html>. Priority rankings for potential stabilization projects were assigned to each of the sites based on the following criteria: protection of public infrastructure, protection of actively-used private structures, and significant reductions in sediment loading that could improve downstream water quality. For each of the potential projects, a planning-level design and cost estimate was developed. A Project Prioritization Memo for all sites, including early planning-level design and cost estimates are included in Appendix A.

Table 1 Project Prioritization Site Summary

Site Number	County	Description	Planning-level Cost
1	Eddy	Stability of 1,700 feet of stream banks that will protect a nearby County highway and reduce sediment loading to the river.	\$ 709,383
2	Eddy	Implement bank stabilization BMPs along 1,150 feet of stream bank. Measures to be implemented will be bioengineering bank stabilization such as toe wood and log vanes, grading to establish a bankfull bench, and native vegetation establishment.	\$862,674

Objective 1: Complete preconstruction planning activities on seven priority sites to prepare for construction and assist with the solicitation of additional funding.

Task 1 – Develop full site designs for seven priority sites

Deliverable: Bid-ready package and permits

Cost: \$419,780

Task 2- Secure additional financial support (in addition to requested 319 funds) to install planned practices at five priority sites

Deliverable: Submit grant funding applications to USDA NRCS for RCPP grant, US FWS, Garrison Diversion Conservancy, and ND Outdoor Heritage Fund

Cost: \$20,000

Objective2 : Reduce channel migration at two selected project sites to reduce sediment loading to the river and protect public and private infrastructure, and to improve downstream water quality.

Task 3: Site 1- Implement bank stabilization BMPs along 1,700 feet of stream bank. The recommended bioengineering measures include the use of logs embedded in the river bank, which will improve aquatic habitat in the river channel. In addition, in-channel measures such as log vanes are proposed to direct flows towards the center of the channel and further reduce erosion pressure on the river banks. Disturbed areas will be stabilized with deep-rooted native vegetation, including cuttings of woody species where appropriate..

Product: Stability of 1,700 feet of stream banks that will protect a nearby County highway and reduce sediment loading from current estimated 160 tons/year to less than 80 tons/year to the river.

Cost: \$ 709,383

Task 4: Site 2 - Implement bank stabilization BMPs along 1,150 feet of stream bank. The recommended bioengineering measures include the use of logs embedded in the river bank, which will improve aquatic habitat in the river channel. In addition, in-channel measures such as log vanes are proposed to direct flows towards the center of the channel and further reduce erosion pressure on the river banks. Disturbed areas will be stabilized with deep-rooted native vegetation, including cuttings of woody species where appropriate..

Product: Stability of 1,150 feet of stream banks that will protect a nearby farmstead and reduce sediment loading from current estimated 240 tons/year to less than 80 tons/year to the river.

Cost: \$ 862,674

Objective 3: Evaluate options to develop a long-term plan for identifying and addressing water quality and quantity management needs throughout the Upper Sheyenne Joint Water Resource Board Watershed Area.

The Joint Board intends to start a parallel track process of developing a watershed planning effort for the Upper Sheyenne River watershed. The Joint Board has begun preliminary discussions with North Dakota office of the NRCS on early planning process. The Joint Board also intends to engage with North Dakota Department of Environmental Quality for opportunities to partner. The watershed planning effort is expected to take between two to three years for completion after kick off and expected to identify multiple issues across the watershed such as nutrient and sediment loading, vegetation and biota changes, soil characterization, etc. The exact scope and timing of watershed planning effort is still unknown and is expected to be clear by late summer/early fall 2022. It is expected that the watershed planning effort will identify future project needs within the watershed where the Joint Board may request partnering opportunities with the EPA on implementation of those projects. Note that Objective 3 outlined here and estimated cost associated with it is not part of the current funding request under this application.

Task 5: Implement a process to facilitate discussions on the steps needed to initiate the develop of a comprehensive water resource management plan for the counties within the project area.

Product: Establish a Joint Board subcommittee; 4 subcommittee meetings; Resident/Partner survey/feedback; and Outline of key elements to address in the long-term plan.
Cost: \$20,000

3.3 The Project will begin engineering design in December 2021. The following table shows estimated milestone completion of critical path items.

Table 2 Estimated Critical Path Items and Milestone Completion Dates

Task	Estimated Start Date	Estimated Completion Date	Comments
Topographic Survey (at 7 sites)	December 2021	April 2022	Driven by weather and surveyor schedule
10% Design (at 7 sites)	February 2022	March 2022	10% alternatives evaluation
30% Design (at 7 sites)	March 2022	April 2022	30% design plans and engineer's opinion of probable cost (OPC)
60% Design (at 7 sites)	April 2022	May 2022	60% design plans and engineer's opinion of probable cost (OPC)
Permit Applications (for 7 sites)	June 2022	December 2022	Local, State, and Federal permit applications submitted at 60% design completion
90% Design (at 7 sites)	July 2022	October 2022	90% design plans and engineer's opinion of probable cost (OPC)
Bid Preparation (at 7 sites)	November 2022	December 2022	Prepare construction bids for project
Project Bidding (for 2 sites)	January 2023	January 2023	Issue bids for project construction/implementation
Construction / Implementation (for 2 sites)	May 2023	December 2023	Construction will take place between May 2023-July, 2023 and September 2023-December 2023to account for spring and summer runoff season

3.4 We estimate the following permits for the Project

Table 3 List of Permits Required

Permit	Agency	Type of Permit/Approval
1	USACE	Section 10 Work in Navigable Waters
2	USACE	Section 404 Authorization
3	USACE	T&E Review
4	USACE/SHPO	Cultural Resource Review
5	ND DEQ	General Construction SWPPP Permit
6	Office of State Engineer	Sovereign Lands Permit
7	Office of State Engineer	Construction Permit

3.5 The Joint Board is the appropriate entity to coordinate and implement the Project because of the integral role the Joint Board plays in the watershed. The Joint Board was established in 1985 with following mandate: "Providing a coordinated and cooperative approach to planning and implementing a comprehensive water management program in the Upper Sheyenne Watershed." The Joint Board works collaboratively with multiple local, state, and federal stakeholders. The Joint Board has expertise and leadership to execute the Project. Upon implementation, the pilot project will benefit overall water quality of the Sheyenne River by addressing ongoing erosion and sedimentation issues along the mainstem Sheyenne River.

- 3.6 The Project is estimated to have minimal annual Operation and Maintenance (O&M) cost associated due to incorporation of bio engineering and rock riffles, where necessary. However, the Joint Board will implement a robust annual O&M program, which will include annual inspection of pilot project sites and periodic review of BMPs. Additionally, the Joint Board will outline landowner responsibilities associated with land management BMPs as part of a contract if land management practices are part of the Project.

4.0 Coordination Plan

- 4.1 The Joint Board will serve as the lead project sponsor. The Joint Board has entered into a cooperative agreement with North Dakota State Water Commission (SWC) for watershed pilot project, as approved by the state legislature during 2021-2023 biennium under House Bill 2020. Under the cooperative agreement, the legislature awarded \$1,100,000 towards project implementation and execution. The Joint Board is also working with other federal partners (such as USDA NRCS and US FWS) and state partner (such as ND Outdoor Heritage Fund) on securing additional funding. However, those requests are still in progress and commitments have not been made yet at this time. Barr Engineering Co. will serve as the Joint Board's engineer of record on the Project.

The Joint Board is in the process of developing USDA NRCS grant application for FY2022, due in April 2022. The Joint Board has had early discussions with the Garrison Diversion Conservancy District (District) to request \$150,000 in funding support over a two-year period (FY22-23). The District is expected to make a decision on the Joint Board's request in spring 2022. The Joint Board is in the process of making funding request to US FWS for FY22-23. North Dakota Outdoor Heritage Fund will also be considered as a funding partner on implementation of the Project. Based on current schedule, the Joint Board plans to submit a funding application to ND OHF in fall 2022 for FY23 grant, with an intent that the grant will be used exclusively for construction and implementation.

- 4.2 The Joint Board held six (6) public meetings within Upper Sheyenne River watershed across multiple counties in 2018 to identify issues associated with Upper Sheyenne River erosion, sedimentation, bank loss, and associated impacts on water quality. These public meetings were well attended by area land owners, and by ND DEQ and ND SWC staff. Input was also sought from Griggs County and Wells County Soil Conservation Districts early on to identify ongoing projects within their jurisdiction. These public meetings and early planning input from stakeholders helped guide field work locations as well as selection of project sites. There is broad support on implementation of watershed pilot project within the Upper Sheyenne River watershed among the community due to its benefits on addressing ongoing issues associated with the river and improving water quality.
- 4.3 The Joint Board will communicate and coordinate with ND DEQ and EPA diligently and effectively if and when additional funding becomes available from other

partners. At this time, that is not the case.

- 4.4 Upper Sheyenne River Watershed Pilot Project is a unique and first of its kind project being implemented across the State of North Dakota where a watershed-based approach is executed through legislative support. The Joint Board is committed to making this a successful project so that in future, more watershed-based projects across the state will avail same benefits of similar opportunities.

5.0 Evaluation and Monitoring Plan

- 5.1 Evaluation and monitoring plan will be developed, as needed, upon completion of engineering design of the project and before construction is complete. The monitoring plan may include periodic water quality sampling at key locations to compare water quality characteristics before and after implementation of the Project. Additionally, the NDDEQ collected data at ambient site 380009 on the Sheyenne River east of Cooperstown, which will be used as a long-term site for evaluating trends in TSS, nitrogen, and phosphorus concentrations.

6.0 Budget

- 6.1 Total estimated cost for engineering design, permitting, and construction of the 4 sites listed above in Table 1 of Section 3.2 is \$1,572,057. See budget table below (Part 1: Funding Sources).

Table 4 Part 1: Funding Sources

PART 1: FUNDING SOURCES	21	22	23	TOTAL
EPA SECTION 319 FUNDS				
1) FY22 Funds (FA)		\$ 100,000	\$284,248	\$384,248
Subtotals		\$100,000	\$284,248	\$384,248
OTHER FEDERAL FUNDS				
1) NRCS (FA)				
2) USFWS (FA)				
Subtotals				
STATE/LOCAL MATCH				
1) DWR (FA)	\$35,000	\$465,000	\$550,000	\$1,100,000
2) GDCD (FA)				
3) ND OHF (FA)				
4) Joint Board (FA)	\$2,000	\$30,000	\$55,809	\$87,809
Subtotals				
TOTAL BUDGET	\$37,000	\$595,000	\$890,057	\$1,572,057

FA: Financial Assistance
DWR: Department of Water Resources
NRCS: Natural Resources Conservation Service
USFWS: U.S. Fish and Wildlife Service
GDCD: Garrison Diversion Conservancy District
OHF: Outdoor Heritage Fund

Please note that these budget estimates are preliminary and subject to change. As project engineering design is complete, the planning level costs estimated are expected to refine further.

Part 2: Funding Breakdown is presented in the table below.

UPPER SHEYNNNE RIVER WATERSHED PILOT PROJECT BUDGET

Part 2 - Funding

Section 319/Non-federal Budget	21	22	23	COSTS	Cash Match*	In-kind Match*	\$319
OBJECTIVE 1 Complete pre-construction planning activities on seven priority sites to prepare for construction and assist with the solicitation of additional funding							
- Develop bid-ready designs for 7 priority sites	\$ 10,000	\$ 409,780		\$419,780	\$ 391,780	\$ 391,780	
- Secure additional financial support		20,000		20,000	8,000	8,000	
Subtotals	<u>\$ 10,000</u>	<u>\$ 429,780</u>		<u>\$439,780</u>	<u>\$ 399,780</u>	<u>\$ 399,780</u>	
OBJECTIVE 2: Reduce Channel Migration at two selected project sites							
-Site1 bank stabilization along & BMP implementation	\$ 1,000	\$ 50,000	\$ 479,000	\$530,000	\$ 388,029	\$ 388,029	\$ 141,971
-Site 2 bank stabilization along & BMP implementation	1,000	50,000	551,277	602,277	381,000	381,000	224,277
Subtotals	<u>\$ 2,000</u>	<u>\$100,000</u>	<u>\$1,155,646</u>	<u>\$ 1,113,277</u>	<u>\$ 769,029</u>	<u>\$ 769,029</u>	<u>\$ 366,248</u>
ADMINISTRATIVE							
Secretary/Manager	\$1,000	\$10,000	\$4,000	\$15,000	\$15,000	\$ 15,000	\$ 13,000
JB/Coordination Meetings		2000	2,000	4,000	4,000	4,000	3,000
Travel		2,000	2,000	3,000	3,000	3,000	2,000
Subtotals	<u>\$ 1,000</u>	<u>\$14,000</u>	<u>\$ 8,000</u>	<u>\$ 22,000</u>	<u>\$22,000</u>	<u>\$ 22,000</u>	<u>\$ 18,000</u>
TOTAL 319/NON-FEDERAL BUDGET	<u>\$ 13,000</u>	<u>\$ 543,780</u>	<u>\$ 1,162,646</u>	<u>\$1,575,057</u>	<u>\$ 1,190,809</u>	<u>\$ 1,190,809</u>	<u>\$ 384,248</u>

* Includes match from both State and local sources

7.0 Public Involvement

The Joint Board will work collaboratively with the public. Public information meetings will be held within respective counties where projects will be executed to share 30% preferred design alternatives with public. At these meetings, an overall milestone schedule will also be shared with the attendees. Any additional public input required towards successful execution of the Project will be sought by means of the local county water resource board channels, with the Joint Board leading this effort.