Draft Environmental Assessment

Egge Diversion Dam Removal

August 27, 2015

Grant Proposal F15AF01103 [T-38-D]

Prepared by:

United States Fish and Wildlife Service

Wildlife and Sport Fish Restoration Program

Region 6

Denver, Colorado

&

Montana Fish, Wildlife, and Parks

Helena, Montana

Table of Contents

List of Figures 4
List of Photos 4
List of Tables 4
1.0 Purpose and Need for Action 5
1.1 Proposed Action 5
1.2 Location and Setting 5
1.3 Need for Action 8
1.4 Objectives for Action 8
1.4.1 Objective 1 8
1.4.2 Objective 2 8
1.4.3 Objective 3 8
1.5 Relevant Documents and Plans 8
1.5.1 Egge Diversion Dam Removal Project Report 8
1.5.2 River Assessment Triage Team (RATT) Site Report for Egge Diversion Dam 9
1.5.3 MTFWP Statewide Fisheries Management Plan 2013-2018 9
1.6 Scope of This Environmental Analysis 9
1.6.1 History of the Planning and Scoping Process 9
1.6.2 Issues reviewed 10
1.7 Applicable Permits Licenses, and other Consultation Requirements 10
1.7.1.1 Section 404 of the Clean Water Act 10
1.7.1.2 Montana Stream Protection Act (SPA 124) 11
1.7.1.3 Montana Department of Environmental Quality 318 11
1.7.1.4 Floodplain Permit 11
2.0 Alternatives Including the Proposed Action 12
2.1 Introduction 12
2.2 Action Alternatives 12
2.2.1 Remove Diversion, Preferred Alternative 12
2.2.1.1 Diversion Rubble Placed in Canal for Reclamation 13
2.2.1.2 Diversion Rubble Placed in Canal for Reclamation 13
2.2.2 Leave Diversion in Place, No Action Alternative 13

2.2.3 Leave Diversion in Place and Restore 13
2.2.3.1 Restore Diversion and build fish bypass 14
2.3 Potential Implementation Methods for the Preferred Alternative 14
2.3.1 Control of Water 14
2.3.1.1 Control for Diversion Demolition 14
2.3.1.2 Control for River Bank Restoration and Scour Hole Fill 14
2.3.1.3 Control other water 15
2.3.2 Erosion Control 15
2.4 Estimated Costs for Implementation 15
2.5 Timing for Implementation 15
3.0 Affected Environment 16
3.1 Surface and Groundwater Resources 16
3.2 Soil/Land Resources 17
3.3.1 Prime and Unique Farmland 17
3.4 Air Quality 17
3.5 Water Quality 17
3.6 Vegetation/Wetlands 18
3.6.1 Weeds 18
3.7 Fisheries 18
3.8 Wildlife 19
3.8.1 Threatened and Endangered Species 19
3.8.2 Montana Species of Special Concern 20
Black Tailed Prairie Dog (*Cynomys ludovicianus*) G4 S3 20
Hoary Bat (*Lasiurus cinereus*) G5 S3 20
Great Blue Heron (*Ardea Herodias*) G5 S3 20
Greater Sage Grouse (*Centrocercus urophasianus*) G3G4 S2 20
Spiny Softshell Turtle (*Apalone spinifera*) G5 S3 21
Plains Spadefoot Toad (*Spea bombirons*) G5 S3 21
Northern Redbelly Dace (*Chrosomus eos*) G5 S3 21
Northern Redbelly Dace x Finescale Dace (*Chrosomus eos x Chrosomus neogaeus*) GNA S3 22
3.10 Aesthetics 23
3.11 Recreation 23

3.12 Cultural Resources.....23
3.13 Cumulative Effects 23

4.0 Public Participation 24
5.0 PREPARERS AND CONTRIBUTORS.....25
References 26

List of Figures

Figure 1. Location of Egge Diversion Dam. 7
Figure 2 Location information.....27
Figure 3 Survey Control and Existing Condition Map 28
Figure 4 Project Overview Map 29
Figure 5 Soil Lift and Floodplain Restoration Plans.....30
Figure 6 Best Management Plan Reseeding areas.....31
Figure 7 Control of Water Plan 32
Figure 8 Flood Plain Map of Project Area 33
Figure 9 USFWS National Wetlands Inventory search Results. 34
Figure 10 Prime and Unique Soil Survey Map NRCS.....35
Figure 11 Concurrence Letter from SHPO to MTFWP for EGGE Diversion Dam.....37

List of Photos

Photo: 1 Egge Diversion Dam 11/1/2013 5
Photo: 2 Egge Diversion Aerial image 2011. 6

List of Tables

Table 1 Results of Prime and Unique Soil Survey NRCS. 36

1.0 Purpose and Need for Action

In 2011, a flood along the Musselshell River damaged and breached the edge of the Egge Diversion Dam and created a new 120 foot wide channel around the structure. The flood also damaged an irrigation canal, leaving it unusable. Prior to the flood, the dam was a barrier to fish passage and was a source of water for an irrigation canal. The new river channel was carved into adjacent agricultural land.

Photo: 1 Egge Diversion Dam 11/1/2013

The need is to restore natural flow patterns and bank lines by removing the structure and reconstructing the eroded bank. This will reduce and mitigate the loss of private irrigated land. The private irrigator is undertaking steps to convert to pump supplied irrigation water and intends to abandon the diversion and headgate structure. The diversion is no longer needed for continued agricultural production and is acting as an oversized jetty in the river creating unnecessary erosion and has acted as a collection point for ice jams and other debris in the river.

1.1 Proposed Action

Montana Fish Wildlife and Parks (MTFWP) in cooperation with two affected private landowners, propose to remove the Egge Diversion Dam to restore natural flow patterns and bank lines of the Musselshell River while maintaining fish passage. The action includes a willow soil lift for bank restoration in the flanked area. This will create approximately 24 miles of connected river re-establishing connection between Painted Robe Creek and Big Coulee Creek.

1.2 Location and Setting

Egge Diversion Dam is located about 4.6 miles east of Lavina, MT at Lat. 46.285600 Long. -108.84310 in Township 6 North Range 23 East Section 9 South east north east ¼ section. The Egge Diversion and associated canal system water rights were established February 10th, 1902

to irrigate 146.60 acres of land with a maximum canal flow rate of 15 CFS from April 15th to October 19th annually. The dam, according to area landowners, was originally a beaver willow dam that was subsequently covered in concrete at various times for repair leading to its current condition. Surrounding land use is primarily irrigated agriculture and grazing.

Photo: 2 Egge Diversion Aerial image 2011.

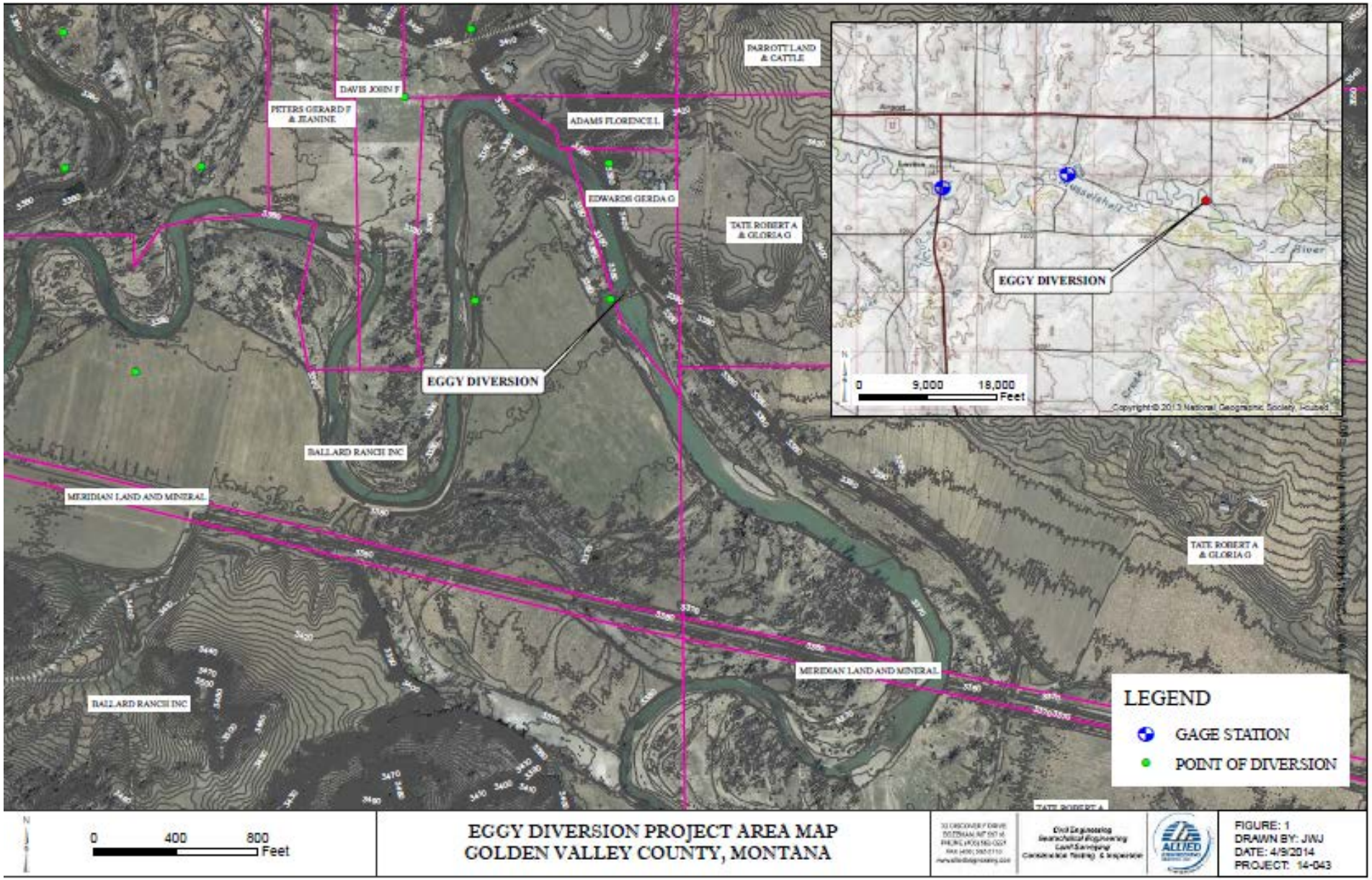


Figure 1. Location of Egge Diversion Dam.

1.3 Need for Action

Diversion dams such as the Egge Diversion Dam restrict fish movement and habitat selection for aquatic organisms. The dam in its current state acts as a jetty and continues to cause unnecessary erosion of adjacent private land. It is an impediment to debris and ice flow and can create potential flood hazards in its current condition. MTFWP Statewide Fisheries Management Plan 2013-2018 identified diversion structures as a major fish habitat concern and opportunities for removal should be investigated (MTFWP 2013). A team of river specialists collectively known as River Assessment Triage Team (RATT) reviewed flood damages in 2011 at many sites. This diversion was one of the site visits. The subsequent report and recommendations identified this diversion was a good candidate for removal with development of pump sites (RATT 2011).

1.4 Objectives for Action

1.4.1 Objective 1

Remove the Egge Diversion to re-establish an unobstructed river channel with natural riverbed and bank conditions on the Musselshell River providing unimpeded access to fish and other aquatic organisms above the dam.

1.4.2 Objective 2

Restore a more natural bank line using a willow soil lift design to replace some of the bank lost during the flanking process. This will be a demonstration project to determine if this approach can work at other flood-impacted sites along the Musselshell River.

1.4.3 Objective 3

Complete the project within the estimated budget. Funds may be provided by the private landowners, MTFWP with State Wildlife Grants and Future Fisheries programs, and Montana Department of Natural Resources and Conservation (MTDNRC) with the Lower Musselshell Conservation District through the “223 Grant Program”.

1.5 Relevant Documents and Plans

1.5.1 Egge Diversion Dam Removal Project Report

Plans and specifications for the Egge Diversion Dam Removal Project (MT FWP #14-38) were prepared by Allied Engineering and completed on July 11th, 2014. This report provides planning, engineering, and alternatives for the project, including a survey control and existing conditions map, project overview map and detail, removal detail, best management practices plan, and control of water overview.

1.5.2 River Assessment Triage Team (RATT) Site Report for Egge Diversion Dam

The Musselshell Water Coalition, Lower Musselshell Conservation District, and MTDNRC pooled resources and managed a team of watershed planners, geomorphologist, biologist, and soil specialists to review damage after the 2011 flood and provide alternatives for restoration of damages for producers throughout the Musselshell River Basin. This project was one of the sites reviewed and one of the alternatives was for diversion removal transitioning to pumps.

1.5.3 MTFWP Statewide Fisheries Management Plan 2013-2018

The MTFWP Statewide Fisheries Management Plan is a publicly reviewed document that provides the reader with general plans for fisheries that do not currently have specific plans associated with them. There were three zones identified for the Musselshell River: Coldwater, Transition, and Warmwater. This proposed project is in the Transition Zone. Issues identified for fisheries in this zone were habitat fragmentation from diversion dams, dewatering, canal entrainment, and dewatering. Game fish numbers are generally low, but reportedly this reach had higher abundances in the 1950's and 1960's. The document also indicated the river has improved potential for re-development of sauger and channel catfish populations. The Musselshell Water Coalition has greatly improved water rights management resulting in better river flows during the past 10 years. The Statewide Fisheries Management Plan supports the proposed project.

1.6 Scope of This Environmental Analysis

1.6.1 History of the Planning and Scoping Process

In 2011, the Egge Diversion Dam was flooded by the Musselshell River on the right abutment of the diversion dam. This flooding created a new 120 foot wide channel around the structure. The neighboring landowner who lost land and has had his field threatened by continued channel change as a direct effect of the diversion in the river, requested the RATT to review his damage and provide some alternatives. The RATT recommended moving affected pump sites to suitable locations and removing the diversion. The land served by the diversion was leased by the landowner. The landowner considered repairing the diversion and fixing the canal, but found it cost prohibitive. He pursued selling his water rights for instream flow and a conservation easement for the property. He has since sold the land to a neighbor, who has also determined repair of the dam and canal is cost prohibitive and would like to have the dam removed as he transitions to pump irrigation.

In 2014, Allied Engineering was contracted to evaluate the current condition of the dam and to develop an engineering plan to restore the bank and remove the diversion as requested by the landowners. Large costs have been and will be incurred by the landowners to restore irrigation

systems, repair fences, and make adjustments as the result abandoning the diversion. The landowners sought assistance to aid with removal of the structure and bank repair and were willing to use the project as a demonstration site in the future. The alternatives to be reviewed are to remove the dam or leave the new river channel on the right side of the diversion dam.

1.6.2 Issues reviewed

- Surface and Groundwater Resources
- Soil/Land Resources
- Prime and Unique Farmland
- Air Quality
- Water Quality
- Vegetation & Wetlands
- Weeds
- Fisheries
- Wildlife
- Threatened & Endangered Species
- Species of Concern
- Community
- Aesthetics
- Recreation

1.7 Applicable Permits Licenses, and other Consultation Requirements

All permits will be obtained prior to the initiation of any work. Permit applications will be submitted in the order necessary for their review by regulatory offices. Because some applications have a review timeframe of six weeks or more, permit applications to state and federal agencies may be submitted during the public's review of this document. The approval of permits does not determine the outcome of this environmental analysis document.

1.7.1 Permits

1.7.1.1 Section 404 of the Clean Water Act

The US Army Corps of Engineers (USACE) has the authority to regulate wetlands and other waters of the US under section 404 of the Clean Water Act (CWA). A permit is required for filling, excavation in conjunction with filling, or otherwise disturbing existing jurisdictional waters of the US. The USACE also regulates work and the placement of structures in navigable waters of the US under Section 9 and 10 of the Rivers and Harbors Act of 1899 (RHA). As part of the Egge Diversion Dam project, an application will be made to the Montana Regulatory Office

with the removal plans and anticipated impacts to wetland vegetation and work in the Musselshell River channel.

1.7.1.2 Montana Stream Protection Act (SPA 124)

The MTFWP administers a permit program pursuant to the Montana Stream Protection Act (SPA 124) for any project including the construction of new facilities or modification, operation and maintenance of an existing facility that may affect the natural existing shape and form of any stream or its banks or tributaries. This permit is applicable to any federal, state, or local government who proposes work as outlined above. Since removal of the Egge Diversion is being funded by the State of Montana, a permit application will be submitted to MTFWP headquarters office in Helena.

1.7.1.3 Montana Department of Environmental Quality 318

Any person, agency, or entity, both public and private, initiating construction activities that will cause short term or temporary violations of state surface water quality standards for turbidity must apply to the Montana Department of Environmental Quality (MTDEQ) for a "318 permit". The purpose of the law is to provide a short term water quality turbidity standard for construction activities. This includes any activity, in any state water that will cause unavoidable short term violations of water quality standards. "State water" includes any body of water, irrigation system, or drainage system, either surface or underground, including wetlands, except for irrigation water where the water is used up within the irrigation system and the water is not returned to other state water. Activities must be carried out in accordance with conditions prescribed by MTDEQ to protect water quality and to minimize sedimentation. A permit for this project will be obtained prior to the start of the proposed project construction activities.

1.7.1.4 Floodplain Permit

Anyone planning new development within a designated Special Flood Hazard Areas (SFHA) must apply for a floodplain permit pursuant to the Montana Code Annotated (MCA) 76-5-103 (Floodplain Act). Activities requiring a permit include new development including, but not limited to, placement of fill, roads, bridges, culverts, transmission lines, irrigation facilities, storage of equipment or materials, and excavation; new construction/development, placement, or replacement of manufactured homes; and new construction, additions, or substantial improvements to residential and commercial buildings.

The purpose of the Floodplain Act is to promote the public health, safety and general welfare of the residents and to minimize public and private losses due to flood conditions in regulated flood hazard areas. Administrators review and permit appropriate uses, within the designated floodplain and floodway areas, that will not be seriously damaged or present a hazard to life, if

flooded, thereby limiting the expenditure of public tax dollars for emergency operations and disaster relief. Floodplain Development Permits are available from the local floodplain administrator a local official designated by the City or County government.

The Egge Diversion Dam is in a designated floodplain and is listed as Zone A which is an area of 100-year flood; base flood elevations and flood Hazard factors not determined (Figure 8, page 31). A floodplain permit will be obtained for this project.

2.0 Alternatives Including the Proposed Action

2.1 Introduction

Three alternatives are identified including a no action alternative and an alternative that was rejected but considered. Within the diversion removal alternative there are sub alternatives for removal of the demolished rubble from the diversion.

2.2 Action Alternatives

2.2.1 Remove Diversion, Preferred Alternative

The preferred alternative involves removal of the dam and associated structures, and reclamation of the channel and riverbanks.

The diversion is believed to have been built over a beaver dam by the placement of concrete directly over the willows in the 1930's and 1940's. In the 1980's, additional concrete was added to the structure. The removal of the diversion may require physical hammering and cutting, or, if necessary, the use of explosives. The resulting rubble would be removed from the channel and placed in one of the three possible locations. Although estimating the total cubic yards of concrete present in the dam and wing walls is difficult due the unknown nature of the footings and possible cribbing, the removal of approximately 500 cubic yards of concrete is expected. Fill associated with the dam is estimated at 900 cubic yards; it will also be removed to open the river channel. Consequently, the total estimated amount of diversion debris and footing material to be removed is 1,400 cubic yards.

The existing head gate will be removed, and rock will be placed in that area to protect the old canal from being captured by the river. Placement of rock around the wing wall on the bank left of the dam will also be required to protect that area and facilitate vegetation colonization. Soil, salvaged riprap, and willow plantings will be used to reclaim the left bank.

Since the diversion dam was breached on the right side, the associated sediments from the impoundment have been naturally washed out and no action is needed to manage this

material. The right bank will be rebuilt to a pre-2011 alignment by the use of a 180-foot willow soil lift method.

2.2.1.1 Diversion Rubble Placed in Canal for Reclamation

Disposal of the rubble that will be created during the dam demolition can be used to fill in portions of the canal. The preferred location will be approximately 200 yards from the headgate in the canal adjacent to the irrigated lands. The rubble would be placed at the bottom of the canal, the voids filled with gravels and dirt and topped with topsoil and reseeded to meet the landowners' request. This will improve machinery access for production and potentially prepare for pivot sprinklers. This will also help prevent the canal from being fully overtaken by the river in the future and to reclaim the land occupied by the canal.

2.2.1.2 Diversion Rubble Placed in Canal for Reclamation

The landowner immediately next to the diversion and headgate prefers no alteration to the canal on their property. The debris could be used as fill to reclaim a portion of the canal directly associated with the headgate. This option would reinforce the old canal to prevent the river from overtaking the canal during typical floods closer to the river than the preferred alternative. However, at the landowners request this will not be implemented unless agreed upon by all landowners affected by the canal.

2.2.2 Leave Diversion in Place, No Action Alternative

This alternative would result in no action and would leave an abandoned structure in the river. This structure has the potential to capture ice and large wood material creating unnatural flood hazards with the potential for the abandoned canal to be captured by the river and altering the course of the river unnaturally. The landowner on the right bank and the irrigator on the left bank both would like to have the diversion removed. The channel currently is an unstable turn in the river that will result in additional loss of agricultural land if left in place. Leaving the structure in place could ultimately lead the landowner to restore the canal and diversion which would then restore the fish barrier.

2.2.3 Leave Diversion in Place and Restore

Two variations of the alternative were discussed, one with a fish passage and another without a fish passage. This alternative would result with in a functioning diversion dam which would require repair of the associated canal system. The diversion would raise surface water thereby creating a pool and flooding riparian vegetation that has developed while creating habitat for other riparian plants at the new elevation. This would also result in sediment being captured behind the dam. This alternative has been implemented after past floods, but has failed to maintain the channel without loss of associated banks. An estimate to repair the diversion and canal exceeded $200,000 as reported by the adjacent landowner in 2012. The landowner that

has recently purchased the land previously irrigated by the diversion would rather improve the irrigation system by converting to a pump system than investing in the diversion and canal. After 2011, an upstream pumpsite was moved to a lower elevation to restore irrigation capabilities. If the diversion was repaired, this pump site would have to be moved again to avoid being flooded by the backwater created by the diversion. If the diversion were to be repaired, it would be a barrier to fish and other aquatic organisms.

2.2.3.1 Restore Diversion and build fish bypass

The associated canal, headgate, and diversion would be repaired at a cost estimated over $200,000 as noted above. A similar concept was evaluated in a feasibility study at a diversion in the lower Musselshell. The estimated cost of the bypass was approximately $400,000 with associated estimated engineering costs of approximately $50,000. This alternative would cost approximately $650,000. The cost of the preferred alternative with pumps is estimated at $332,500, a significant overall savings.

This alternative would maintain fish passage in an engineered and constructed channel. It would require annual operation and maintenance unlike the open channel alternative. None of the three adjacent landowners wish to pursue this option.

2.3 Potential Implementation Methods for the Preferred Alternative

2.3.1 Control of Water

Implementation of the preferred alternative would require some control of water with three aspects to facilitate diversion structure demolition and bank restoration:

2.3.1.1 Control for Diversion Demolition

Control of water for diversion structure demolition doesn't require demolition to occur in the dry or dewater conditions. Rather, control of water will be undertaken if and where required to minimize riverbank erosion at ingress and egress routes and temporary access roads. To the extent reasonably possible, this action will occur from the right bank to minimize operations on the left bank. Access to the project from the right bank will be by the use of the canal easement law 70-17-112, MCA.

2.3.1.2 Control for River Bank Restoration and Scour Hole Fill

Diversion of the river flow from the river bank restoration and scour hole fill area to allow placement of fill and river bank restoration elements. Note: it is anticipated construction of the lower elevation of the scour-hole fill will be conducted in the wet.

2.3.1.3 Control other water

Control of any and all groundwater, surface water and storm water in the project area to reduce erosion will be necessary.

2.3.2 Erosion Control

Erosion control measures will be employed to minimize the release of sediment from disturbed areas outside of the river channel. These areas include concrete disposal locations and temporary access roads. Erosion control measures include silt fence and straw waddles, use of erosion control coir fabric, minimal rock riprap replacement at headgate and left wingwall, and willow soil lift on the right bank.

2.4 Estimated Costs for Implementation

The following agencies have committed funding toward the costs of implementing removal of the diversion dam on the Musselshell River:

1. MTFWP through use of State Wildlife Grant (SWG) funds.
2. MTFWP through Future Fisheries Funds (FF).
3. MTDNRC and Lower Musselshell Conservation District (LMCD) through "223 Grant Program" funds.
4. USFWS National Fish Passage (NFP) funds.
5. Landowners

Agency contributions:

- MTFWP-SWG $135,180.00
- MTFWP-FF $20,000.00 for demolition
- MTDNRC & LMCD $19,900 for willow soil lift construction
- USFWS-NFP $20,000 for removal and reclamation,
- Landowners $9,500 in-kind for materials*; $150,000 for pump costs
  * the private landowners will be supplying materials from local sources of rock, soil, and willows to defray costs and will incur costs for conversion to pumps and replacement of pumps.

The total cost is estimated to be $354,580. Costs for piping, site development, and other associated activities are not included and have not been finalized in the estimate but will be assumed by the affected landowners.

2.5 Timing for Implementation

The diversion removal project could occur as early as fall 2015. Initiating the soil lift project is dependent on access for willow cuttings which are typically placed when dormant. This portion

of the project could occur from late fall 2015 to summer in 2016. The project is contingent on the completion of the environmental analysis process, permit approvals, and funding.

3.0 Affected Environment

The Egge Diversion Dam is 112 feet long and over 15 feet wide and extends through the main channel of the Musselshell River. Its presence has resulted in eroding the right bank, creating a new a 120 foot wide river channel. A typical cross section of the Musselshell River in this area has a channel width ranging from about 90 to 150 feet. The area around the diversion contains a mix of irrigated alfalfa field, multi-generational cottonwood forest, and river riparian flora and fauna. Currently, the diversion is not functioning to supply water to the irrigation canal, it is not holding back water and sediments, and it is not acting as a fish barrier. The right (west) bank eroded around the diversion in 2011 during a large flood. The newly formed channel unnaturally went around the diversion and eroded the riparian area and portions of a flood irrigated alfalfa field. This has happened in the past during severe floods and has been an ongoing maintenance issue for adjacent landowners. The 2011 event also flooded the associated canal on the left (east) bank and substantially filled it with sediment, and breached the canal bank in several locations.

The diversion prior to 2011 was a fish and aquatic organism barrier. Currently, fish and other organisms can move around the structure using the newly formed river channel. The diversion is acting as a very large perpendicular jetty in the main river channel unnaturally creating erosion around the structure.

3.1 Surface and Groundwater Resources

Since the river channel has caused erosion around the diversion dam, the retained sediments were dispersed during the flood and the surface elevation of the water was lowered. This changed the waters behind the diversion from a pool environment into a running river environment thereby altering the habitat and associated plant communities at the water's edge. Diversion removal may result in small localized changes in surface and groundwater elevations in the vicinity of the structure but it is unlikely. Since the dam was flanked on the right side by the river, it is probable any associated surface and groundwater changes occurred at that time as a result of the flood. Removal of the diversion will provide unimpeded natural flow and allow channel patterns to resume.

The dam is within the 100-year floodplain per FEMA Flood Insurance Rate Map #3001520400A (see figure 8 on page 32). The placement of rubble in any of the three options will not change the amount of total fill necessary for the bank repair and will not affect the surface water or groundwater resources. Furthermore, the dam removal and associated bank rehabilitation will

not adversely affect the floodplain, because restoration will return the river to its 100-year floodplain.

3.2 Soil/Land Resources

Removal of the diversion could affect the soils immediately adjacent to the Musselshell River and alter erosion patterns, deposition, and siltation. This is an anticipated effect as removal of the diversion will allow the river to flow naturally without impediment. The right bank will be re-built to discourage disruptive flow and future erosion of agricultural land. The left bank will be sloped and shaped as necessary around the area of headgate and diversion abutment removal. All effects should be short term. Erosion control measures and reclamation of disturbed areas would mitigate potential harmful effects.

Placement of the rubble in the old canal would reduce the potential of the river overtaking the old canal thereby protecting soils from erosion and unnecessary channel changes by the river through the property to the east of the diversion.

3.3.1 Prime and Unique Farmland

The Natural Resource Conservation Service soil survey data for prime and unique farmland (as defined by the Farmland Protection Policy Act, P.L. 97098) was reviewed and three soil types were found to comprise the land adjacent to the Egge Diversion Dam. The three soil types present are Havre-Glendive complex, 0 to 2 percent slopes, rarely flooded which is the majority of land irrigated, Havre-Glendive complex, 0 to 2 percent slopes, occasionally flooded which is the floodplain and cottonwood bottom areas, and the upper irrigation land was classified as Delpoint-Vabbart Yamacall loams, 4 to 15 percent slopes. These are listed in Table 1 on page 34, the map (Figure 10, page 34) and display the area of interest, the locations of the three soil types, and the designation showing that these soil types are not present on prime or unique farmland. This project will not change the land classification as the landowner will continue to irrigate using pumps for the water supply rather than the diversion. Rubble placement wouldn't affect any designations in the project area.

3.4 Air Quality

Construction operations and post-construction exposed soil can result in increased dust in the area that could become a temporary nuisance for nearby residents and farming operations. Dust abatement measures could be taken if necessary. As vegetation grows in the spring, dust concerns should be greatly reduced.

3.5 Water Quality

Diversion removal could have significant short-term water quality effects during and following construction due to demolition activity and fill operations. Turbidity generated may exceed the

MTDEQ standards which will require a “318 permit” to allow for the potentially significant short term change in water quality. Since the dam was flanked any sediment the dam held was eroded away in 2011 or subsequent years. There is a small amount of bank that has developed adjacent to the diversion near the headgate structure. This will be removed during demolition. Downstream of the diversion is an eroded pool that will be filled to meet the existing channel grade above and below the diversion.

3.6 Vegetation/Wetlands

A review of the US Fish and Wildlife Service National Wetlands Inventory found the site is classified as riverine with no described wetlands adjacent to the site (see figure 9 on page 33). A review of the Montana Natural Heritage database for plant species of concern and threatened and endangered species found no species occurrences in Township 6 Range 23 E of which this project is located. Since the diversion was flanked on the right by flooding, the back water behind the dam was lost, and any changes to the riparian area upstream of the diversion has taken place naturally. The removal of the dam with heavy equipment will disturb the existing riparian and wetland vegetation. However, the right bank will be re-established using a willow soil lift design which will encourage vegetation growth. Part of the design for the bank includes a small flood plain area that is anticipated to recolonize with riparian and wetland plants and become beneficial habitat for amphibians, birds, and fish. If the canal is not reclaimed immediately adjacent to the headgate, but at the preferred location 200 yards away, the old canal may develop into a small wetland over time.

3.6.1 Weeds

Construction operations will leave some soils seeded, but some soils will be disturbed and bare of vegetation. Weeds could develop, as a result of disturbing soils, however, the landowners will likely continue managing weeds on their respective properties. The adjacent lands have large spotted knapweed infestations at this time with most landowners working to address this issue.

3.7 Fisheries

Although removal of the diversion is anticipated to improve and maintain connectivity in this reach of the Musselshell River, construction operations and demolition could have temporary effects; fish would be expected to avoid the area during work activities. Overall, this project will have positive effects to fisheries resources by providing improved habitat through bank and vegetation restoration efforts when the dam is removed and by providing barrier-free passage in this stretch of the Musselshell River drainage.

Fish species present include: *goldeye (*Hiodon alosoides*), common carp (*Cyprinus carpio*), *northern redbelly dace (*Chrosomus eos*), *northern redbelly dace x finescale dace hybrid

(*Chrosomus eos x Chrosomus neogaeus*), *flathead chub (*Hybopsis gracilis*), *lake chub (*Couesius plumbeus*), *emerald shiner (*Notropis atherinoides*), *sand shiner (*Notropis stramineus*), *brassy minnow (*Hybognathus hankinsoni*), *plains minnow (*Hybognathus placitus*), *western silvery minnow (*Hybognathus nuchalis*), *fathead minnow (*Pimephales promelas*), *longnose dace (*Rhinichthys cataractae*), *River carpsucker (*Carpiodes carpio*), *shorthead redhorse (*Moxostoma macrolepidotum*), *longnose sucker (*Catostomus catostomus*), *white sucker (*Catostomus commersoni*), *mountain sucker (*Catostomus platyrhynchus*), black bullhead (*Ictalurus melas*), *channel catfish (*Ictalurus punctatus*), *stonecat (*Noturus flavus*), green sunfish (*Lepomis cyanellus*), smallmouth bass (*Micropterus dolomieu*). Fish names preceded with an * indicates native species.

3.8 Wildlife

Short duration disturbance of terrestrial and aquatic wildlife could occur during demolition and bank restoration activities as a result of increased construction activities. During the anticipated time of work in the spring, many species are not very active or have not returned from winter migrations. If the project is initiated in the fall, they will have already migrated away from the project area. Overall, the negative impacts to wildlife are expected to be short term and minor. As this is a fisheries project, benefits to the fish species listed in this draft environmental assessment are the primary focus. It is most likely that restoring the river to its original course will also benefit terrestrial species that exist or frequent the riparian zone.

3.8.1 Threatened and Endangered Species

A review of the Montana Natural Heritage Program's database for township 6 north and Range 23 east indicates no threatened or endangered species have been observed in the project area. The review was conducted for clams, crayfish, vertebrates, and wildlife. For this reason, and because of the nature of the work proposed, FWP has determined that the project will have ***no effect*** on T&E species.

A Section 7 evaluation was completed and concurred with by the USFWS ESA field office in Helena, MT on July 23, 2015. In their evaluation, the USFWS determined that the project site is located within the historical ranges of four listed species; black-footed ferret (E), red knot (T), greater sage grouse, and Sprague's pipit (C). The Section 7 concurrence determined ***No Effect*** for black-footed ferret, ***May Affect, but Not Likely to Adversely Affect*** for red knot, and ***May Affect but Not Likely to Jeopardize candidate species*** for greater sage grouse and Sprague's pipit.

3.8.2 Montana Species of Special Concern

Black Tailed Prairie Dog (*Cynomys ludovicianus*) G4 S3
This species has been classified as a species of concern in Montana due to declines in abundance and a variety of threats to the population. A conservation plan is in place for Montana. This species is not present near the proposed project and likely will not be affected.

Hoary Bat (*Lasiurus cinereus*) G5 S3
This species is migratory and occurs in Montana from May through October. The proposed project is to be initiated in March 2016 and completed by the end of April 2016. There should be no effect on this species. Since the diversion dam was flanked on the right abutment by the river and the backwater was dewatered during the flooding event, no expected change will occur as a result of this action, in the current production of insects the bats may forage on in this area. The horary bat is a tree rooster and no trees are being removed as part of this project, so negative affects to this species are not likely.

Great Blue Heron (*Ardea Herodias*) G5 S3
This species is ranked an S3 due to small breeding population size, evidence of recent declines, and declining regeneration of riparian cottonwood forests due to altered hydrology and grazing. The project is approximately 800 yards upstream of a small rookery by direct measurement. There are many large cottonwoods between the nesting area and the project which provide some buffering. It's reported the birds can inhabit urban as well as wilderness areas. Mating is initiated in March with egg laying starting in April and extending to early May with subsequent hatching in May to June and fledging in July and August. The proposed project would start during the courtship and early nesting of this species or after fledging if the project is moved to the summer or fall. This colony has been exposed to agricultural machinery and other activity. Its anticipated little disturbance to the colony would occur, but it is possible noise and increased activity could temporarily disturb the birds. If it appears the project is keeping herons off the nests, the timing of project may be re-evaluated. These particular birds have been tolerant of previous activity and successfully recruited juveniles last year. After construction, it is anticipated fish populations could increase as a result of expanded/connected habitats which would be a benefit in the long term for the great blue heron.

Greater Sage Grouse (*Centrocercus urophasianus*) G3G4 S2
The greater sage grouse is the highest ranked species of concern listed for this township and range. The nearest mapped site for observation is over 5 miles to the east. Since this bird is associated with sagebrush benches in the Spring through July, it is unlikely the project will disrupt any mating or nesting individuals in this area.

Spiny Softshell Turtle (*Apalone spinifera*) G5 S3

The spiny softshell turtle is abundant above and below the diversion in this area. It is reported the turtles overwinter with increased activity starting in May and June in Montana. It may be possible some individuals will be overwintering in or near the work area and may inadvertently be disturbed. A recent Master's Thesis*, Movements, Habitats, and Nesting Ecology of Spiny Softshells in the Missouri River: The Influence of Natural and Anthropogenic Factors* by Brian Tornabene in April 2014 reports the turtle in the upper Missouri River in Montana initiates nesting after peak flows typically in June and July. While the potential exists for injury to individuals as a result of the effort overall the Thesis work indicated, "Preservation of natural streamflow regimes and protection of habitats from anthropogenic disturbance may facilitate continued existence of spiny softshell turtles in the Missouri River in Montana." The objective of this effort is to return the river to a more natural state which should benefit this species. MTFWP may electrofish the pool to initiate avoidance response in turtles and may move any fish or turtles caught downstream to the next large pool. If the project occurs in the summer potential nesting sites would be identified and left in place if possible. A summer and fall timed project would allow the turtles to more actively avoid the site during construction.

Plains Spadefoot Toad (*Spea bombirons*) G5 S3

This species uses upland habitat as adults and relies more on off channel habitats during the summer. Breeding can occur in May or June once the toads emerge. This species breeds in ephemeral water bodies and flooded fields in the uplands, not in river pools. This project should have limited effects on this species as the work is anticipated to be completed prior to emergence and breeding.

Northern Redbelly Dace (*Chrosomus eos*) G5 S3

The northern redbelly dace is found in this reach of the Musselshell and associated tributaries that will be connected, Painted Robe Creek and Big Coulee Creek. Maintaining this open river reach is anticipated to be a benefit to this species in particular. Short term turbidity during demolition may disturb fish but likely will not increase mortality as most species in the middle Musselshell have evolved with turbid water. The willow soil lift bank construction will provide better habitat than a traditional riprap bank. Collections by the author of the EA in the Musselshell have found them more associated with grass or willow banks than open bar habitats. This species will benefit in the long term from improved habitat connectivity which is an objective this effort. This project will maintain an open reach of 24 miles; however multiple dams exist between this reach and Roundup. Therefore concerns about additional non-native game fish entering into this reach are not founded at this time.

Northern Redbelly Dace x Finescale Dace (*Chrosomus eos x Chrosomus neogaeus*) GNA S3
This hybrid is a unique fish in Montana as no finescale dace have ever been documented. It has similar habits as the redbelly dace and similarly should benefit from this project. The Northern Redbelly x Finescale Dace hybrid is a Montana Fish Species of Special Concern. It was placed on the species of concern list due to its rarity and unusual form of genetic reproduction. Montana appears to be the only state that designates special status for this hybrid fish and it is not ranked globally.

The following text was taken from the Montana Natural Heritage webpage, "The hybrid persists due to a unique strategy. Typically, hybrid females breed with Redbelly Dace males, but the male's genetic material is not incorporated during egg development and is not passed on to the next generation. The offspring are all female and clones of the mother (that is, they are genetically identical to the mother). Unisexuality is not common among vertebrates but has been found in amphibians and reptiles, as well as in fishes.

Two years of experiments on New England populations indicate that the hybrid dace utilize a unique reproductive strategy called gynogenesis (Dawley et al. 1987). The hybrid dace are female clones with identical eggs. In gynogenesis, sperm from the male of a sexually reproducing related species is needed to stimulate egg development, even though the genetic material is not incorporated into the offspring. Entire populations can have the same genes.

The Montana Chapter of the American Fisheries Society Species Status Account states, "In Montana, preliminary studies indicate that at least two genetically distinct clones occur in the Pine Butte Fen (Allendorf 1991). Studies by Goddard et al. (1998) have shown that some female hybrid dace clones reproduce by cloning while other individuals make haploid eggs that can be fertilized by Northern Redbelly Dace to produce diploid Northern Redbelly Dace offspring." *Chrosomus* (*Phoxinus*) spp. spawn in the spring and early summer (Scott and Crossman 1973).

3.9 Community Impact

Dam removal could impact downstream water users due to short-term increased turbidity; however, it is unlikely sediments will carry beyond the 3 miles of river adjacent to land managed by the landowners interested in having the project completed. Since sediment isn't backed up behind the diversion due to it being flanked, the sediment load should be limited. The upstream landowner has already modified a pump site to accommodate the loss of head the dam provided prior to being flanked in 2011. No additional change in base river elevation or flood crest elevations are expected as a result of this proposed action.

3.10 Aesthetics

Dam removal will change the appearance of the river. Use of the willow soil lift method of bank restoration should leave the bank looking and acting natural. The river will have a natural appearance after the project is completed improving the viewscape. The vegetation will better stabilize the banks and may reduce negative impacts from future floods. The landowner on the left bank views the diversion as a compliment to the landscape.

3.11 Recreation

Removal of the diversion could have a positive affect recreation in the area in terms of fishing and floating. It is expected fishing will improve in this connected reach. Floaters could put in near Lavina at the highway bridge and take out 16 miles downstream at the Dean Creek Road without portaging around any diversion. Since no public land exists between the bridges any floaters that wished to use the shore would need landowner permission. A summer project period would have little to no effect on recreational use of this site. A fall project period could interrupt some hunting activities as game may avoid the project area.

3.12 Cultural Resources

Removal of the diversion will change the anthropogenic disturbance to the site. The water rights associated with the diversion have a priority date of 1902. The concrete in its current state was updated in the 1980's. The headgates appear to have been updated as well. The Montana State Historic and Preservation Office (SHPO) has been notified of the project and a preliminary review found no assessments had been made in this section, thus they requested a cultural resource inventory be completed prior to the implementation of any work. A third-party resource inventory was completed in May 2015 and submitted to SHPO for review. Subsequently, SHPO determined the site is not eligible for the National Register of Historic Places and thus, the proposed project will have no effect on Historic Properties (Figure 11 page 36). Results of the inventory will be sent to USFWS so they may complete the Section 106 process under the National Historic Preservation Act of 1966, as amended. The report, "A Class III Cultural Resource Inventory and Assessment of the Egge Irrigation Ditch and Diversion, Golden Valley County, Montana", is available upon request.

3.13 Cumulative Effects

Secondary and cumulative effects to consider include changes in water consumption and improvements in fisheries. The canal was not an overly efficient canal although not measured, it is anticipated the conversion to pump irrigation will result in less water required to flood the fields than was required to fill the ditch to supply water. This could potentially improve delivery of water to downstream water rights at times and better support aquatic organisms. Another effect that is anticipated but can't be measured yet is the potential for this associated fishery to

improve as the fish will have access to a larger portion of the river providing better habitat selection for spawning, rearing, winter refugia, and during hot-low water periods in the summer. Restoration of channel catfish is anticipated in this reach of river with the expanded area available for habitat. In March 2014, a channel was cut off during the ice jam flood. It's possible a large amount of ice collected on the diversion and broke loose quickly resulting in a jammed channel downstream at the next bend creating a shorter channel. Removal of the diversion could reduce some flooding issues as it will not capture ice and other debris.

4.0 Public Participation

Limited public participation is anticipated due to limited public use in the area. Adjacent landowners and irrigators have been involved and have helped direct and build the project. The Musselshell Water Coalition recently ranked projects for the Musselshell Basin, this project ranked in the top 4 out of more than 50 projects.

The project was successfully approved for recommendation to the MTFWP Commission for additional funds by a public board for Future Fisheries (The Future Fisheries Panel is composed of: two legislators, a representative of conservation districts, a representative with expertise in commercial agriculture, a representative with expertise in irrigated agriculture, a private fisheries restoration professional, two members who are licensed Montana anglers, a representative with expertise in silviculture, a Montana high school student, a representative with expertise in mining reclamation techniques, a representative with expertise in fisheries, and one ex officio member from the Montana Department of Transportation who has experience in highway impacts mitigation.) A five member Resource Conservation Advisory Council appointed by the Governor under direction of the MTDNRC to review 223 proposals supported this project which was sponsored by the Lower Musselshell Conservation District board.

The above groups and various boards represent a diverse review with the outcome being support for the project.

The public will be encouraged to comment on the draft EA through:

- Legal notices published in local and regional newspapers including the Billings Gazette, Harlowton Times-Clarion, and the Roundup Record Tribune.
- Legal notice and posting of draft EA on the FWP website: http://fwp.mt.gov/publicnotices
- Direct notice to adjacent landowners.
- The draft EA will be available at Region 5 headquarters in Billings and the FWP state Headquarters in Helena.

Written comments may be emailed to mikeruggles@mt.gov, or sent to the following address:

Montana Fish Wildlife and Parks
Mike Ruggles, Fisheries Biologist
2300 Lake Elmo Drive
Billings, MT 59105.

Coordination and Review of the EA

The Service is seeking public review of the proposed action and will accept all public comments related to this proposed action for thirty days (30) from the date the assessment is published on the Service website. The Draft EA can be found at:

http://www.fws.gov/mountain-prairie/R6Update/wsfr/nepa.php. Written comments will be accepted until 5:00pm, September 15, 2015, and can be mailed to the address below:

Draft Environmental Assessment –Egge Diversion Dam Removal.

U.S. Fish and Wildlife Service

Wildlife and Sport Fish Restoration Program

134 Union Blvd., Denver Federal Center

Lakewood, CO 80228

5.0 PREPARERS AND CONTRIBUTORS

List of Preparers:

Name	Organization	Project Role
Eddie N. Bennett	U.S. Fish and Wildlife Service (WSFR)	Grant Manager
Mike Ruggles	Montana Fish, Wildlife and Parks	Fisheries Biologist

List of Contributors:

Scott Anderson	US-NRCS, Roundup MT
Jim Ballard	Private Landowner
Lauri Hanauska-Brown	Montana Fish, Wildlife and Parks, Wildlife, Helena

Rebecca Cooper	Montana Fish, Wildlife and Parks, Helena
Gerda Edwards Family	Private Landowner
Ken Frazer	Montana Fish, Wildlife and Parks, Fisheries, Billings
Bryce Maxwell	Senior Zoologist, Montana Natural Heritage Program, Helena
Megan O'Reilly	Montana Fish, Wildlife and Parks, Wildlife, Billings
Paul Sanford, PE	Allied Engineering Services, Inc. Bozeman
Trent Wallis	Private Landowner
Barry Williams	USFWS Region 6 - Archaeologist (ND, SD, MT), Bismarck

References

FEMA 2014. Flood Map Service Center. Retrieved December 15, 2014 from https://msc.fema.gov/portal

MTFWP. 2013. Montana State Wide Fisheries Management Plan 2013-2018. Montana Fish Wildlife and Parks Helena, MT

NRCS. 2014. Web Soil Survey. Retrieved December 22, 2014 from http://websoilsurvey.sc.egov.usda.gov/App/WebSoilSurvey.aspx

River Assessment Triage Team (RATT) Site Report. Egge Diversion/Jim Ballard. 2011. Lower Musselshell Conservation District, Roundup, MT.

Tornabene, Brian James. 2014. Movements, Habitats, and Nesting Ecology of Spiny Softshells in the Missouri River: The Influence of Natural and Anthropogenic Factors. Master's Thesis. Montana State University, Bozeman, MT.

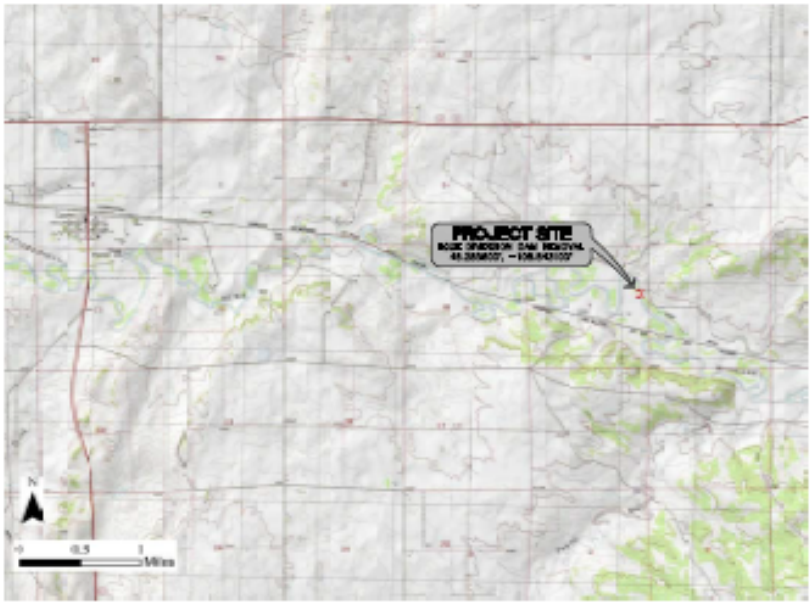
USFWS. 2014. National Wetlands Inventory. Retrieved December 15, 2014 from http://www.fws.gov/wetlands/Data/mapper.html

EGGE DIVERSION DAM REMOVAL, FWP #14-38

Dam Removal and Site Reclamation on the Musselshell River

LOCATED IN SECTION 9, TOWNSHIP 6N, RANGE 23E
IN GOLDEN VALLEY COUNTY, MONTANA
LATITUDE = 46.285600, LONGITUDE = -108.843100
PROJECT SPONSOR: MONTANA DEPARTMENT OF FISH WILDLIFE AND PARKS

JULY 11TH, 2014 SET NO. _____



VICINITY MAP

32 DISCOVERY DRIVE
BOZEMAN, MT 59718
PHONE (406) 585-0221
FAX (406) 582-5770
www.alliedengineering.com

Civil Engineering
Geotechnical Engineering
Land Surveying

MONTANA
PAUL J. SANFORD
No. 12580 PE
LICENSED PROFESSIONAL ENGINEER

Paul Sanford
2014.07.11
13:48:29 -06'00'

PROJECT MANAGER: PAUL SANFORD, PE
DESIGN ENGINEER: JENNIFER JOHNSON, EI

CONSTRUCTION PLANS

SHEET INDEX

SHEET NO.	DESCRIPTION
1	COVER
2	SURVEY CONTROL AND EXISTING CONDITIONS
3	PROJECT OVERVIEW
4	EGGE PLAN
5	EGGE PLAN
6	EGGE PLAN
7	CROSS-SECTIONS
8	CROSS-SECTIONS
9	BEST MANAGEMENT PRACTICES PLAN
10	DIVERSION OF WATER DURING

EGGE DIVERSION DAM REMOVAL
1 COVER SHEET

EGGE DIVERSION DAM REMOVAL

Figure 2 Location information

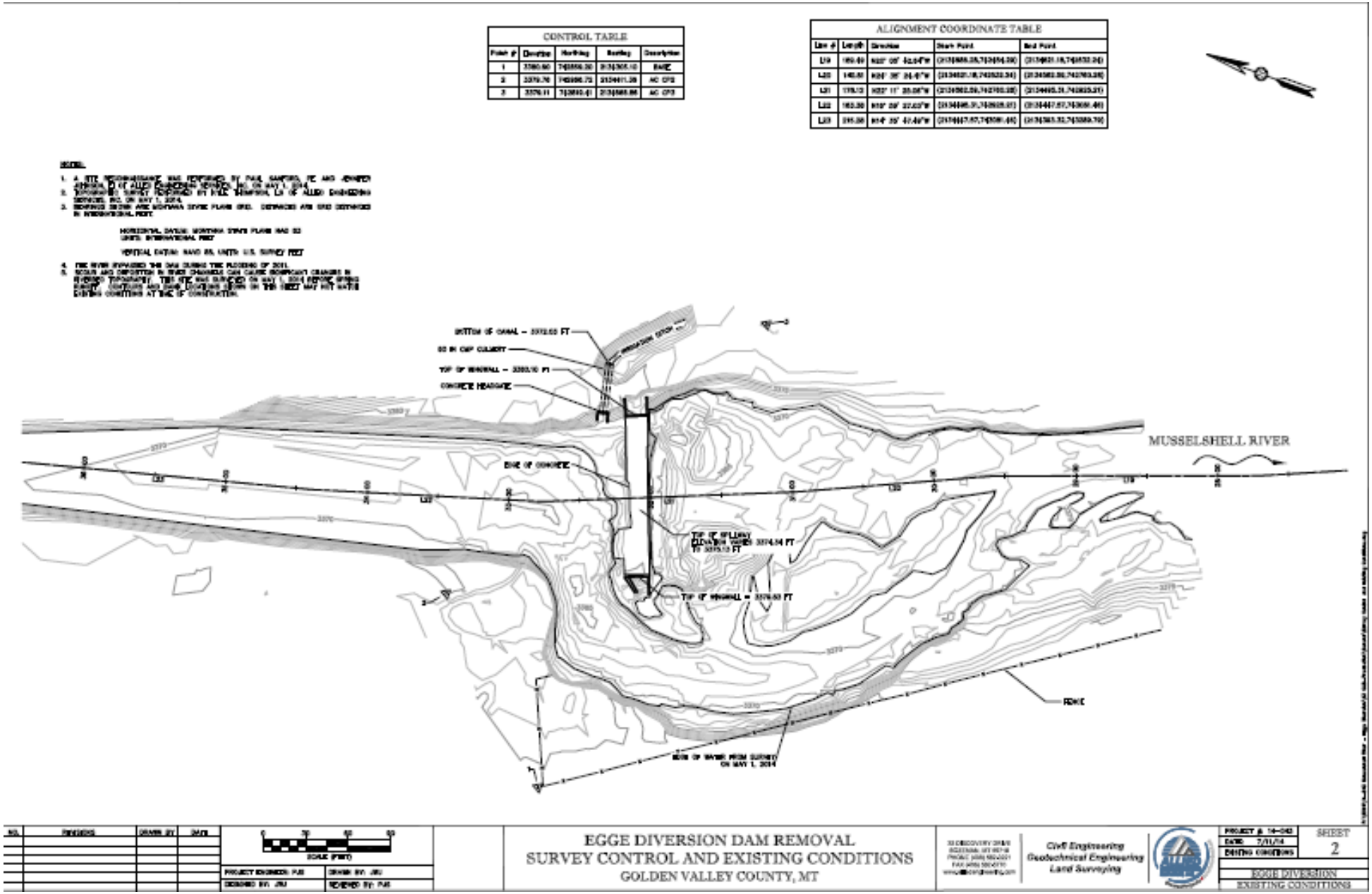


Figure 3 Survey Control and Existing Condition Map

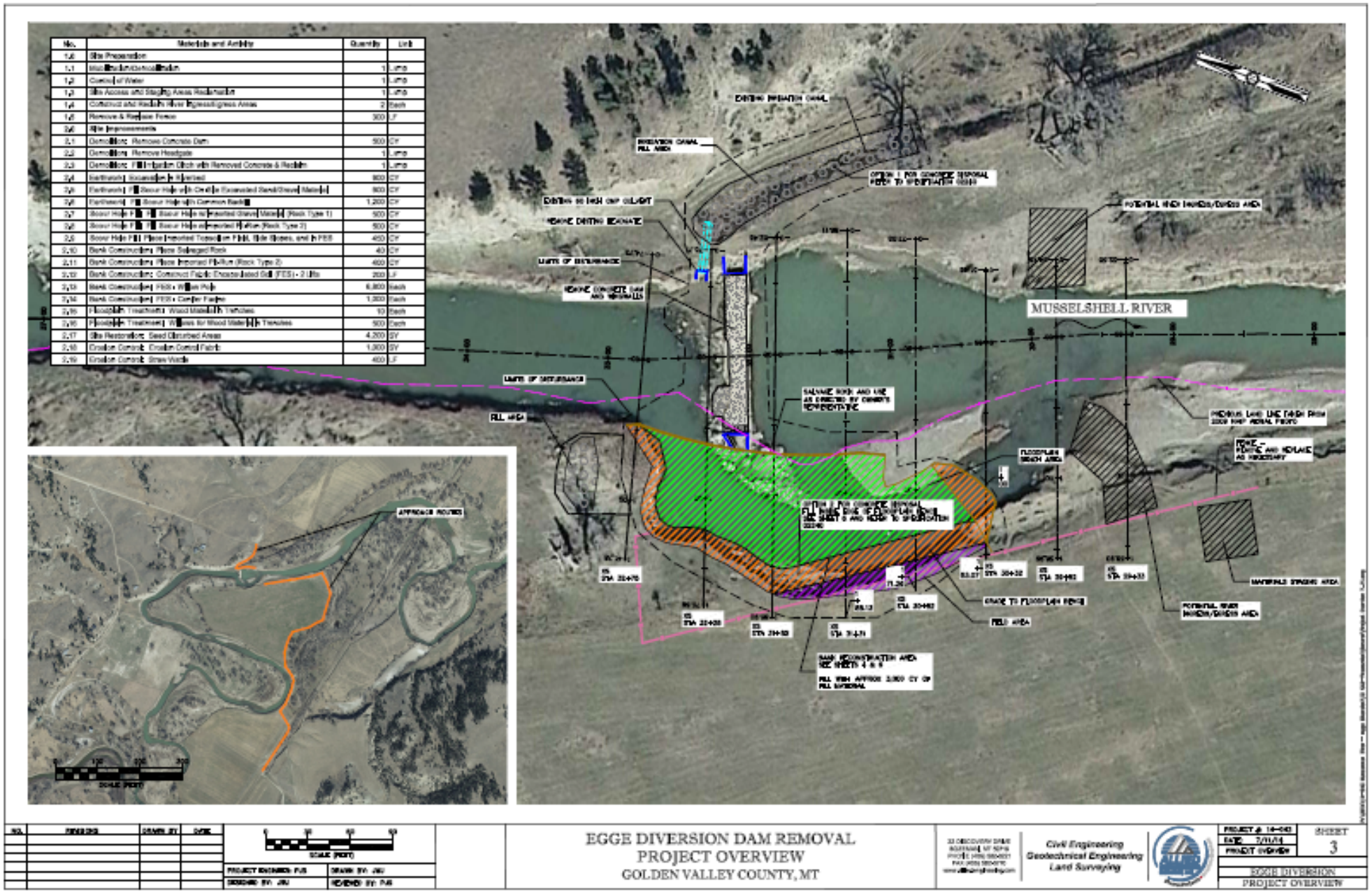


Figure 4 Project Overview Map

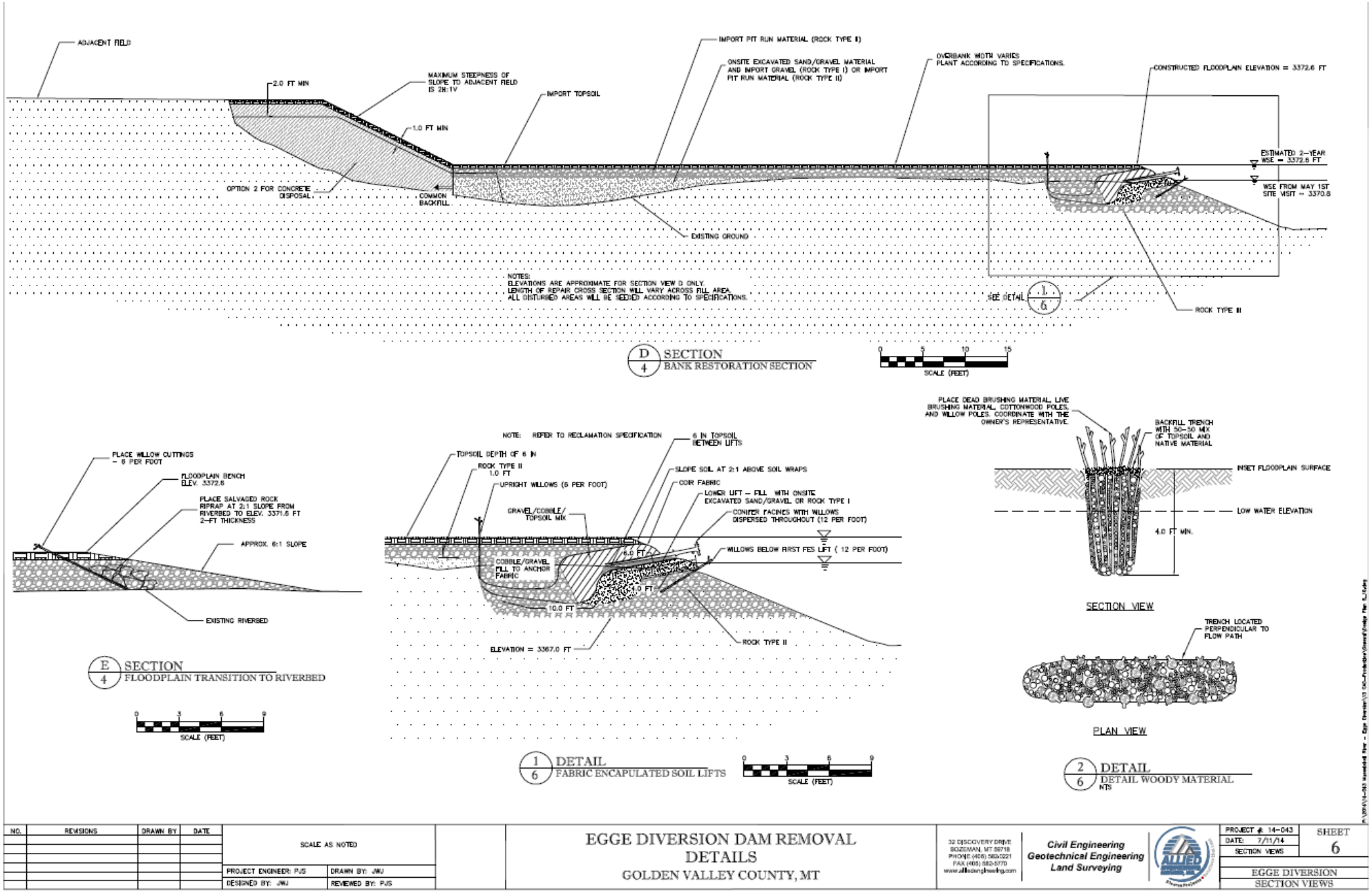
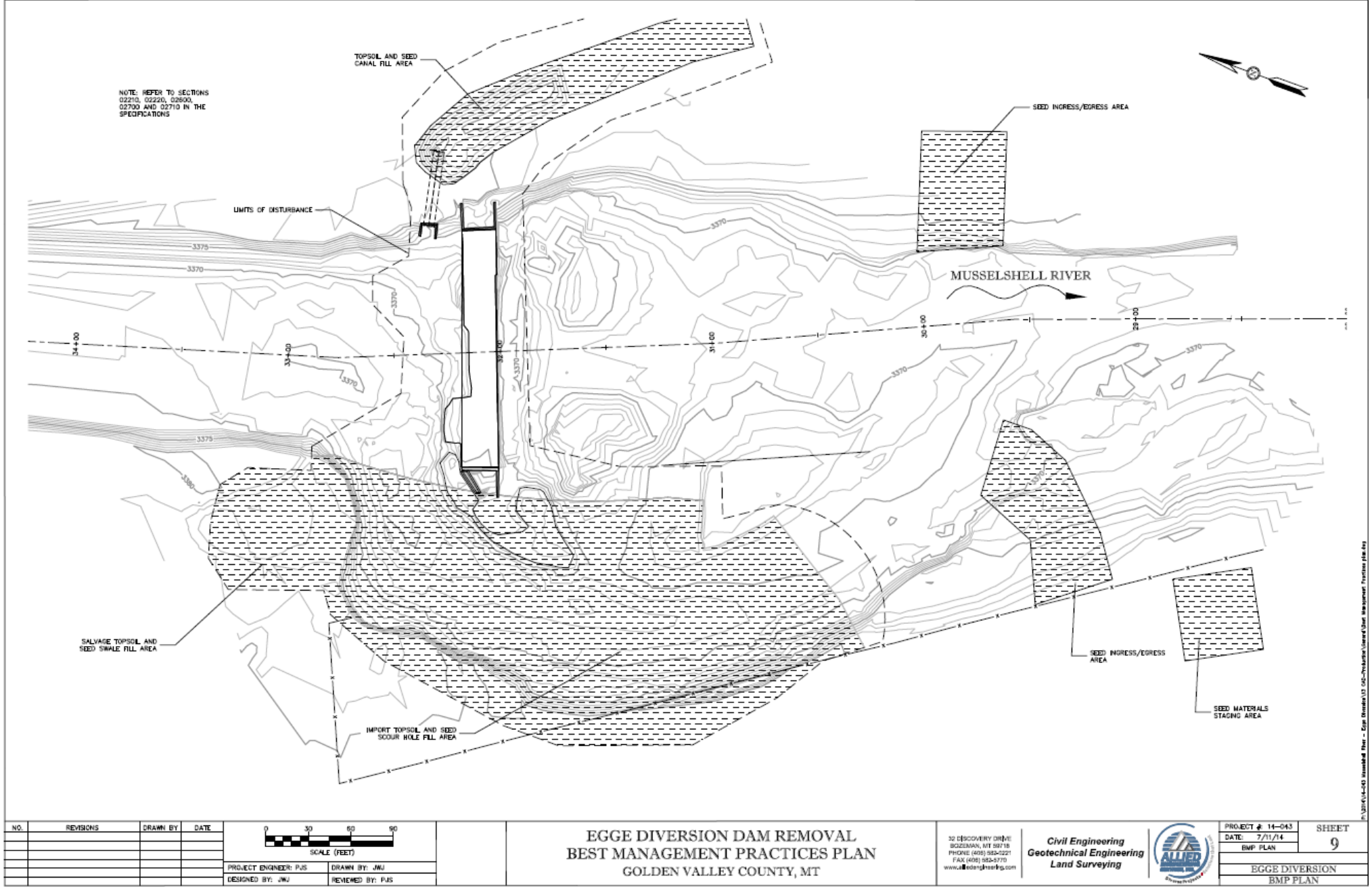


Figure 5 Soil Lift and Floodplain Restoration Plans



NO.	REVISIONS	DRAWN BY	DATE

0 30 60 90
SCALE (FEET)

PROJECT ENGINEER: PJS | DRAWN BY: JWJ
DESIGNED BY: JWJ | REVIEWED BY: PJS

EGGE DIVERSION DAM REMOVAL
BEST MANAGEMENT PRACTICES PLAN
GOLDEN VALLEY COUNTY, MT

32 DISCOVERY DRIVE
BOZEMAN, MT 59718
PHONE (406) 582-0221
FAX (406) 582-5770
www.alliedengineering.com

Civil Engineering
Geotechnical Engineering
Land Surveying

PROJECT #: 14-043
DATE: 7/11/14
BMP PLAN

SHEET 9

EGGE DIVERSION
BMP PLAN

Figure 6 Best Management Plan Reseeding areas.

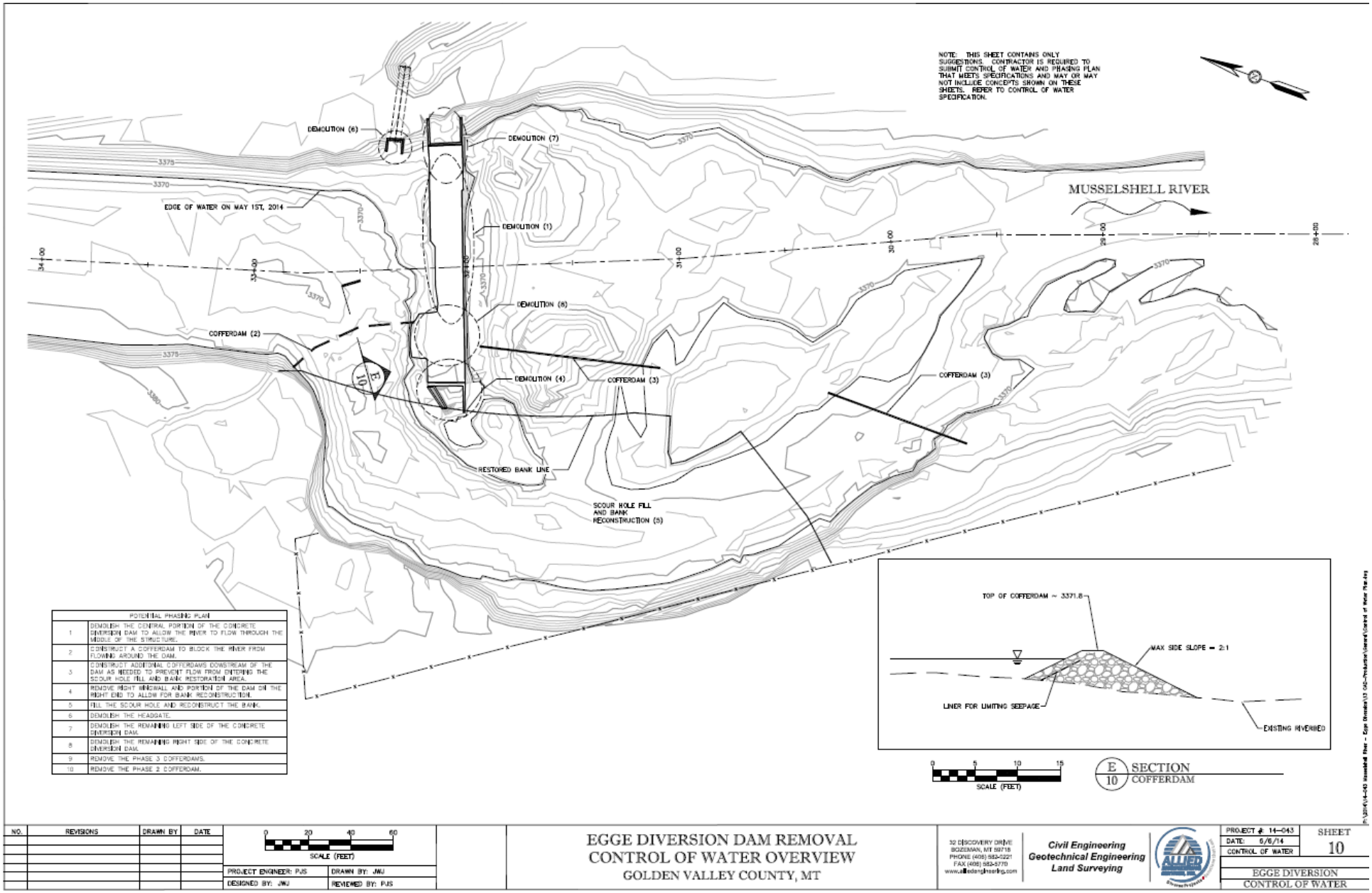


Figure 7 Control of Water Plan

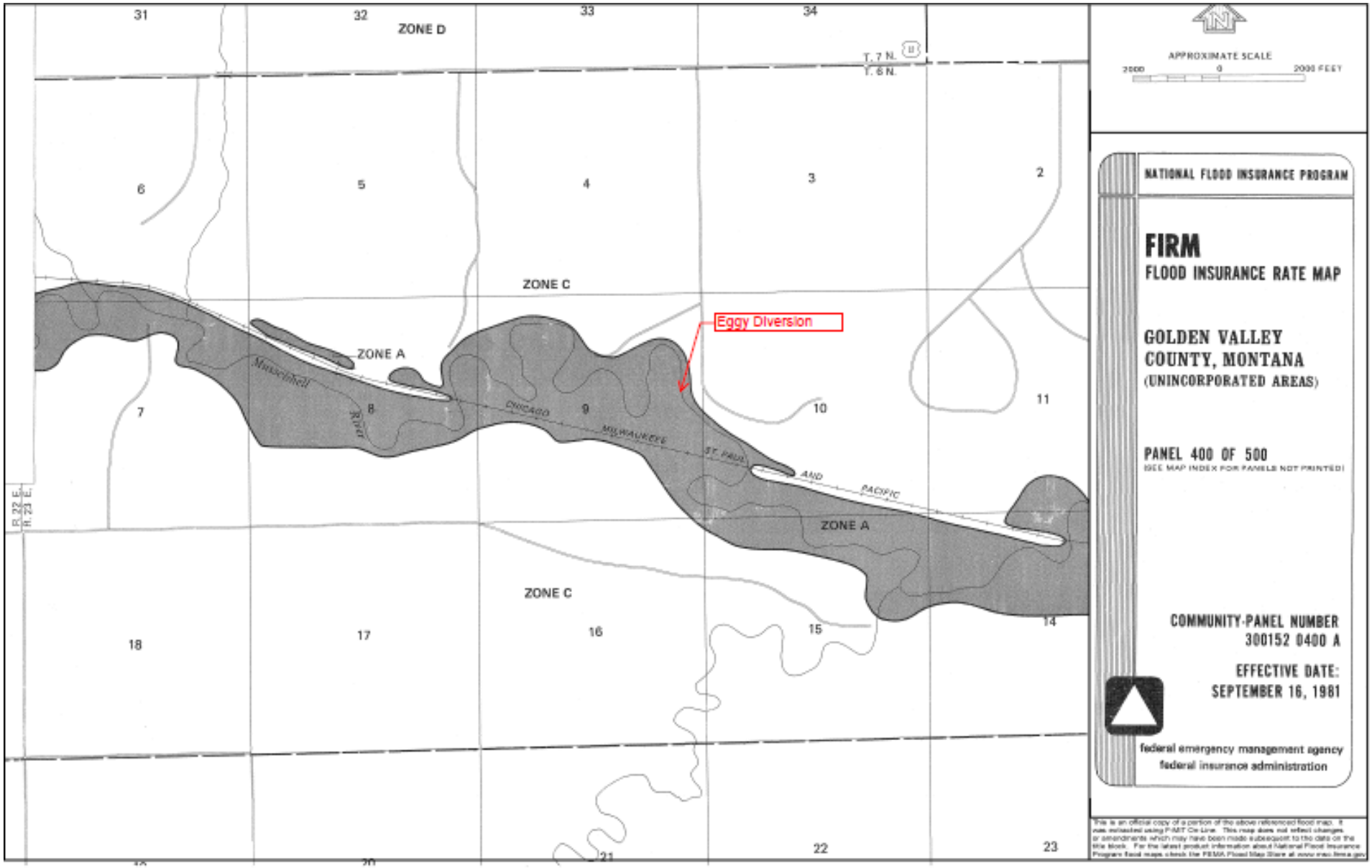


Figure 8 Flood Plain Map of Project Area

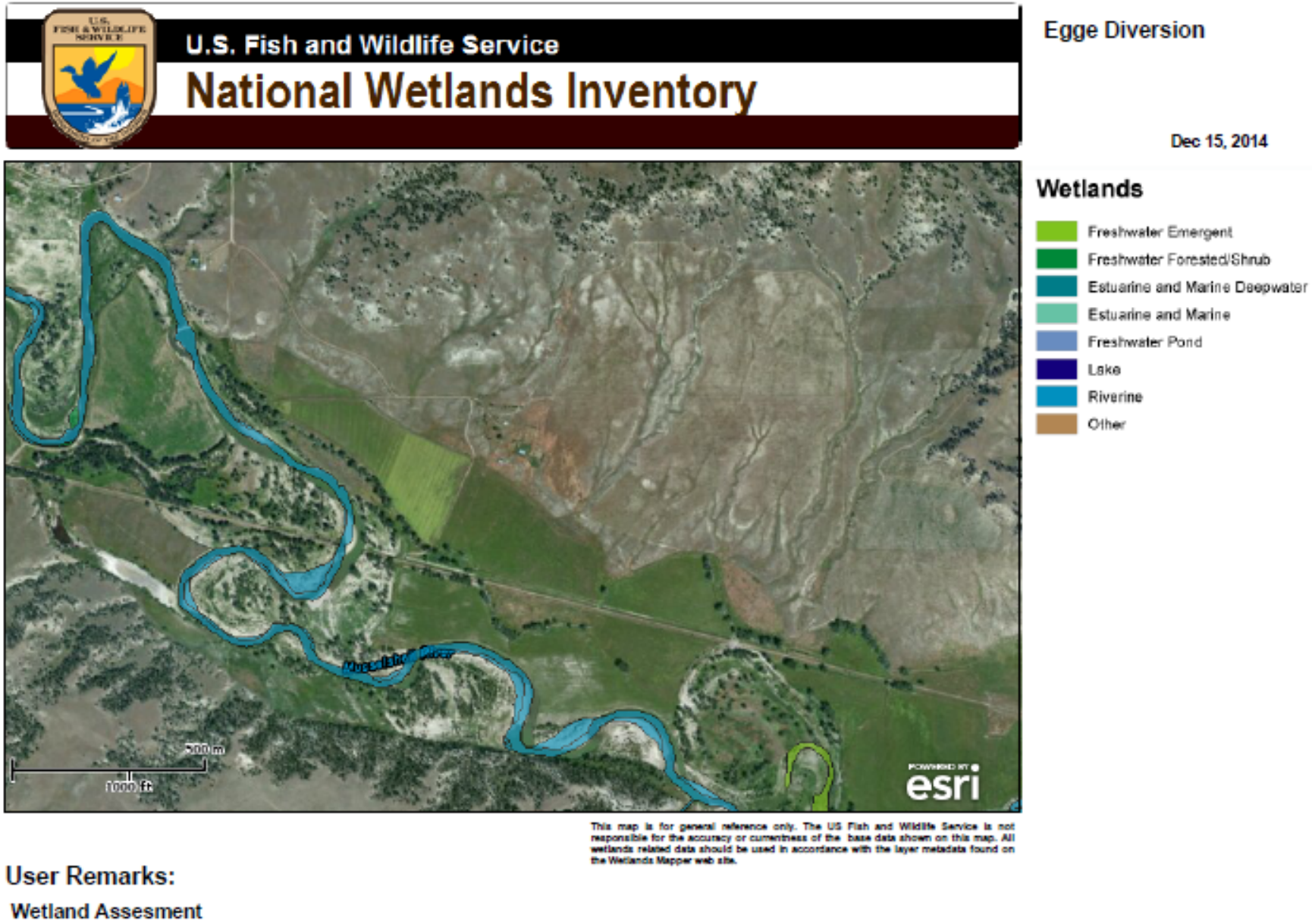


Figure 9 USFWS National Wetlands Inventory search Results.

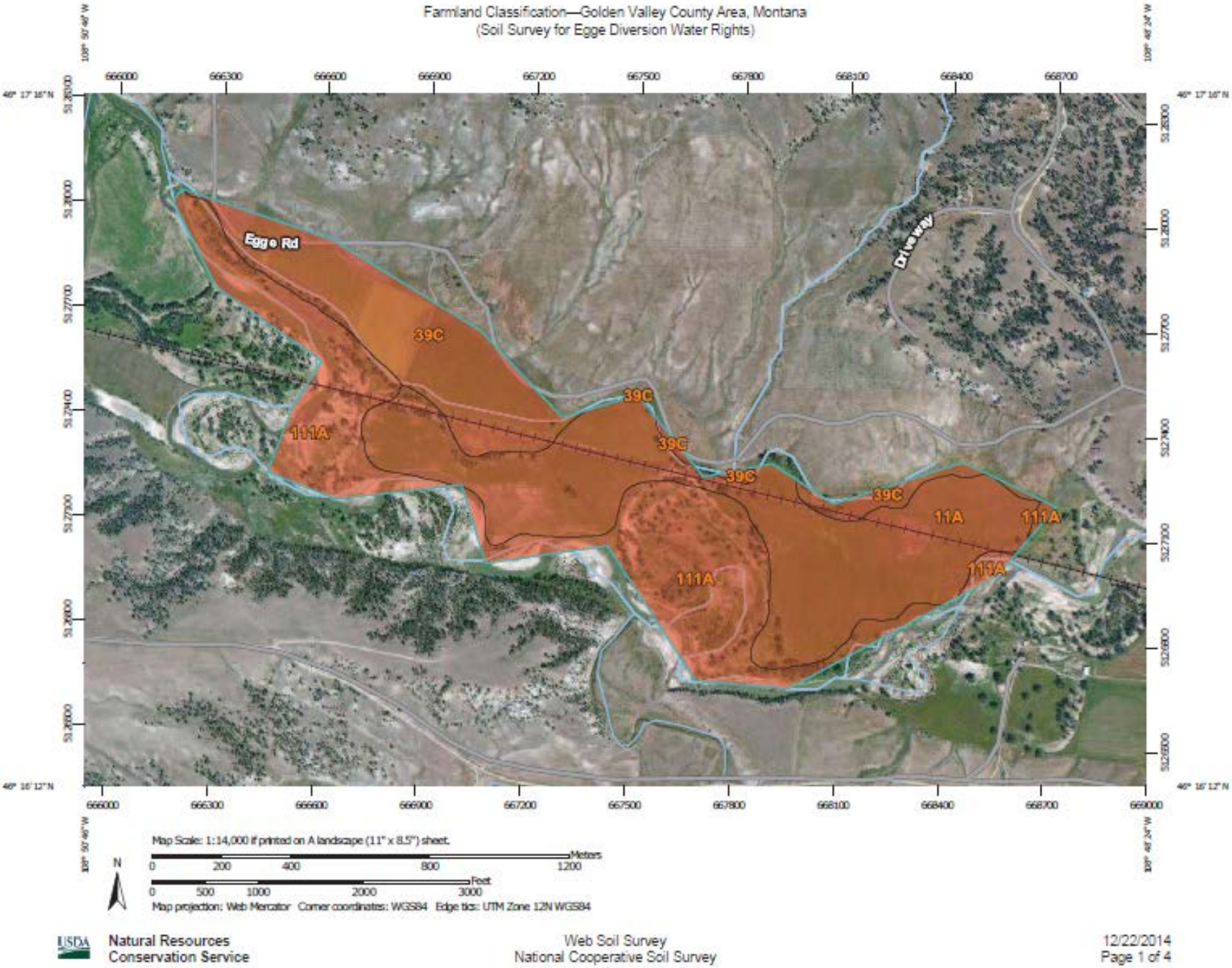


Figure 10 Prime and Unique Soil Survey Map NRCS

Farmland Classification

Farmland Classification— Summary by Map Unit — Golden Valley County Area, Montana (MT666)				
Map unit symbol	**Map unit name**	**Rating**	**Acres in AOI**	**Percent of AOI**
11A	Havre-Glendive complex, 0 to 2 percent slopes, rarely flooded	Not prime farmland	121.8	41.5%
39C	Delpoint, calcareous-Cabbart-Yamacall, calcareous, loams, 4 to 15 percent slopes	Not prime farmland	65.9	22.5%
111A	Havre-Glendive complex, 0 to 2 percent slopes, occasionally flooded	Not prime farmland	105.7	36.0%
Totals for Area of Interest			**293.4**	**100.0%**

Description

Farmland classification identifies map units as prime farmland, farmland of statewide importance, farmland of local importance, or unique farmland. It identifies the location and extent of the soils that are best suited to food, feed, fiber, forage, and oilseed crops. NRCS policy and procedures on prime and unique farmlands are published in the "Federal Register," Vol. 43, No. 21, January 31, 1978.

Rating Options

Aggregation Method: No Aggregation Necessary

Tie-break Rule: Lower

Table 1 Results of Prime and Unique Soil Survey NRCS.

Big Sky. Big Land. Big History.
Montana
Historical Society

RECEIVED
MAY 28 2015
DESIGN & CONSTRUCTION
DEPT. OF FISH, WILDLIFE & PARKS

Historic Preservation
Museum
Outreach & Interpretation
Publications
Research Center

May 26, 2015

Bardell Mangum
Montana Fish, Wildlife & Parks
1522 9th Ave
P.O. Box 200701
Helena, MT 59620-0701

Re: Egge Diversion Structure Removal
Golden County, Montana

Dear Mr. Mangum:

Thank you for the letter and cultural report, received May 22, 2015, regarding the proposed Egge Diversion Structure Removal project in Golden County, Montana. We concur that cultural resource 24GV0313 (Egge Ditch) is Not Eligible for the National Register of Historic Places.

We also concur that this undertaking will have No Effect on Historic Properties.

Please note that our concurrence does not substitute for a good faith effort to consult with interested parties, local government authorities, and American Indian tribes. If you have any questions or concerns, do not hesitate to contact me at (406)444-0388 or JBush2@mt.gov. Thank you for consulting with us.

Sincerely,

Jessica Bush

Jessica Bush, M.A.
Review and Compliance Officer
Montana State Historic Preservation Office

225 North Roberts Street
P.O. Box 201201
Helena, MT 59620-1201
(406) 444-2694
(406) 444-2696 FAX
montanahistoricalsociety.org

File: FWP/Fish – 2015 – 2015052205

Figure 11 Concurrence Letter from SHPO to MTFWP for EGGE Diversion Dam