



**US Army Corps
of Engineers**®
St. Paul District

Appendix K1: Environmental

Fargo Moorhead Metropolitan Area
Flood Risk Management Project
**Reach 5 Diversion Channel and Lower Rush
River Inlet/Drop Structure**

Engineering and Design Phase

P2# 370365

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Appendix K1: Environmental

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ATTACHMENTS

Attachment K-1. MFR Guidelines for Reach 5 Planting Plan of the Fargo Moorhead Diversion Channel

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Appendix K1: Environmental

K.1 SUMMARY OF IMPACTS

Impacts identified in the 2011 Fargo-Moorhead Metropolitan Area Flood Risk Management Feasibility Report and Environmental Impact Statement includes impacts to aquatic habitat, fish passage and connectivity, floodplain forest, wetland resources, and cultural resources.

K.1.1 Aquatic Habitat

Impacts to aquatic habitat includes riverine habitat directly affected by individual project features to include the Red River Control Structure, Red River Outlet Structure, Wild Rice River Control Structure, Sheyenne River Aqueduct, Maple River Aqueduct, and the abandonment of 5 miles of channel on the Rush and Lower Rush Rivers.

K.1.2 Fish Passage and Connectivity

Impacts to fish passage and connectivity result from staging water during operation of the flood control project, reducing connectivity.

K.1.3 Floodplain Forest

The project will result in a loss of 131 acres of forested land consisting of floodplain forest, shelterbelts and small pockets of trees around farmsteads.

K.1.4 Wetlands

Wetlands delineation has recently been completed.

Wetlands delineation has	Acres
Open Water	0.69
Seasonally Flooded Basin	1476.97
Shallow Marsh	106.38
Shrub-Carr	1.32
Wet Meadow	119.85
Total Acres	1705.20

In general, the majority of the wetlands impacted are low functioning farmed, seasonally flooded type.

K.1.5 Cultural Resources

Phase 1 cultural resource surveys have been ongoing for the entire project area. Areas where phase 2 testing and evaluation will be needed have been identified and will continue to be identified as the phase 1 surveys are completed.

K.2 OVERALL MITIGATION FEATURES

K.2.1 Aquatic Habitat Mitigation Features

Measures considered for aquatic habitat mitigation include performing full stream restoration, stream improvement via riparian corridor restoration, designing the low-flow channel to meander, and construction of fish passage.

K.2.2 Fish Passage and Connectivity

Fish Passage and connectivity impacts will be mitigated for by designing the outlet structure to be passable to fish, providing fish passage at the Rush River inlet, and providing fish passages at other existing dams in the region to include Drayton Dam and Wild Rice Dam.

Agencies have supported the idea that fish passage be provided across the widest range of conditions practicable. For example, fish passage during floods is important as fish often move in response to pulse events, particularly during spring floods. The Fargo-Moorhead project has strived to provide fish passage during all but the largest flood events.

K.2.3 Floodplain Forest

Mitigation to offset the impacts to floodplain forest includes converting 262 acres of floodplain farmland or pastured land into floodplain forest.

K.2.4 Wetlands

The channel will be planted with native wetland species on the bottom and the fringe of the side slopes of the channel, with the remainder of the side slopes being planted as a prairie swale type community. A buffer strip of several hundred feet on either side of the diversion channel up to the embankment top will help limit encroachment from agricultural activities and will provide filtering of surface runoff into the diversion channel wetlands. In consultation with several plant experts, planting guidelines and seed mixes for various zones of the channel cross section have been developed that ensure project objectives are met (Attachment K-1).

K.2.5 Cultural

Cultural resources mitigation for each Reach must be completed prior to the start of construction that Reach. In addition monitoring by a professional archeologist will be required during construction in select reaches of the project.

K.3 REACH 5 MITIGATION FEATURES

The environmental consideration for mitigation for this reach includes providing planting guidance to facilitate wetlands in the bottom of the diversion channel, and to ensure the low flow channel is designed to meander. These efforts are discussed in the Feasibility Report and Environmental Impact Statement (EIS).

K.3.1 Fish Passage at Outlet Structure – *Not applicable to this reach.*

K.3.2 Wetland Planting Guidelines

To meet the mitigation requirements for planting the diversion channel with wetland species the vegetation establishment guidelines for the diversion channel are attached as attachment K-1. One goal of the planting plan is to limit the potential for the establishment of undesirable species (such as cattails, willow, etc.), compatible with Conveyance criteria (resulting in a Manning's roughness n value of .03 or less), and resilient to maintenance activities.

K.4 CULTURAL RESOURCES

The overlapping portion of the former and current Reach 5 diversion channel alignments was surveyed for cultural resources in June and October 2011, with the remainder of the current Reach 5 alignment surveyed in May 2012. The Lower Rush River inlet area of Reach 5 was surveyed for cultural resources in October 2011 and October 2012. Parcels along 105th Avenue SE and parts of the temporary Lower Rush River bypass channel and adjacent temporary work areas, as well as three excavated material pile (EMP) and construction staging areas, were surveyed for cultural resources in November 2013. Four archeological sites, one bridge, and one built-environment linear resource were recorded in the Reach 5 area.

Prehistoric isolated find spot sites 32CSX348 and 32CSX385 are each single projectile points found in the SE¼ and NW¼ of Section 2, Township 140 North, Range 50 West. Site 32CS5189 is a historic cultural material scatter also located in Section 2, Township 140 North, Range 50 West. These three sites were recommended as not eligible to the National Register of Historic Places (Tucker et al., 2012, *The Fargo- Moorhead Flood Risk Management Project, Cass County, North Dakota and Clay County, Minnesota: Results of Phase I Cultural Resources Investigations, 2010-2011*, URS Corporation, Denver, Colorado; Meier et al., 2013 draft, *The Fargo-Moorhead Flood Risk Management Project, Cass County, North Dakota, and Clay County, Minnesota: Results of Phase I Cultural Resources Investigations, 2012*, URS Corporation, Denver, Colorado). Historic isolated find spot site 32CSX397 and single-span concrete bridge 32CS5216, both along 105th Avenue SE, are in Sections 10 and 11, Township 140 North, Range 50 West, and are recommended as not eligible to the National Register (Meier, December 2013, *Fargo-Moorhead Metro Flood Risk Management Project: Phase I Cultural Resources Investigations, Progress Report for 2013 Archaeological Fieldwork*, URS Corporation, Denver, Colorado). Coordination with the North Dakota SHPO to confirm their non- eligibility is ongoing.

Finally, the channelized portion of the Lower Rush River in Sections 2 and 11, Township 140 North, Range 50 West, was recorded as Feature 3 (Harwood Drain No. 2) of linear resource 32CS5113, historic flood control ditch channels (Tucker et al. 2012:219, Table 136). This linear built-environment feature has been determined not eligible to the National Register with the concurrence of the North Dakota SHPO (letter dated May 20, 2014).

K.5 ENVIRONMENTAL SURVEYS AND MONITORING

Raptor surveys were conducted by the Corps and the USFWS during the spring of 2012 - 2014. Surveys will be conducted each spring prior to construction for Reach 5.

Construction monitoring for deeply buried archeological sites at the Lower Rush River, as stipulated in Paragraph I, Construction Monitoring, of the Project's cultural resources Programmatic Agreement, is not necessary because the Fargo, Nutley, and Ryan series soils at Reach 5 do not contain any deeply buried topsoil (A) horizons and therefore little to no chance for such sites.

K.6 NEPA COMPLIANCE

The proposed plan for the diversion channel was discussed in the 2011 Fargo-Moorhead Metropolitan Area Flood Risk Management Final Feasibility Report and Environmental Impact Statement. Changes to the original layout for the Rush River inlet consisted of a modified inlet structure and an optimization of the diversion alignment. A Supplemental Environmental Assessment, Design Modifications to the Fargo Moorhead Metropolitan Flood Risk Management Project, dated September 2013 was prepared to address changes in impacts caused by alignment changes, construction of levees in-town to provide the opportunity to allow more flow through town, and the construction of a levee around the communities of Hickson, Bakke, and Oxbow. The Finding of No Significant Impact (FONSI) was signed on 19 September 2013.