US Army Corps of Engineers®
St. Paul District

Appendix M: Mitigation

CAP Section 205 Flood Risk Management Study

Arcadia, WI

Final Feasibility Study Report with Integrated Environmental Assessment

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1. Overview

Efforts have been made to avoid and minimize project impacts by modifying designs and additional efforts will be made during Plans and Specifications. However, the project would still result in the impacts identified in the main report for aquatic habitat and wetland resources. For these impacts, mitigation will be implemented to offset adverse effects to the greatest extent practicable.

Corps regulations (ER 1105-2-100) require assessment of environmental impacts and associated mitigation actions in a manner that addresses changes in ecological resource quality. Changes to habitat must be assessed as a function of improvement or degradation in habitat quality and/or quantity, as expressed quantitatively in physical units or indexes.

Corps regulations also require projects take an adaptive approach to implementing, monitoring and modifying mitigation actions to ensure they are offsetting significant project impacts (USACE Implementation Guidance for Section 2036a of WRDA 2007, Aug 2009).

This appendix provides information on habitat impacts quantification, mitigation and adaptive management, all of which are intended to ensure adverse effects from the project are offset.

2. Assessment of Impacts and Habitat Loss

2.1 Project Impacts: Stream

Past actions on Turton Creek include channelization and bank stabilization (riprap). The creek has a homogeneous sand bottom with little to no habitat structure. The project will result in rerouting approximately 1,100 linear feet in Reach 1 and 642 linear feet in Reach 2 (Figures 1 and 2). Current project design would result in the loss of 110 linear feet of largely channelized stream length in Turton Creek. Because rerouted sections of Turton Creek are being cut into new ground and soil borings will not be taken until Plans and Specifications, the current design includes riprap on the channel bottom. If results of the soil borings indicate riprap on the stream bottom is not necessary, then it will not be included in any design updates. If it is determined that riprap is necessary to stabilize the channel, then the stream bottom will shift from homogenous sand to homogenous rock in the rerouted sections.

Due to increased velocities in Turton Creek upstream of the Oak Street Bridge (Reach 1), approximately 470 linear feet of riprap will be placed to protect against erosion or degradation that could continue upstream if not controlled. Further analysis during the design phase may reduce the amount of riprap needed. The stream bottom in this section will shift from homogeneous sand to homogenous rock which will not result in a loss of habitat. No mitigation is proposed for this impact.

Approximately 0.3 acre of the Trempealeau River will be impacted by the project. Substrate in the impacted area will be converted from sand to riprap. Placement of the riprap could create habitat for some species. No loss of habitat is anticipated and no mitigation is proposed for this impact.

Figure 1. Turton Creek reroute in Reach 1. Existing channel is 1,100 linear feet and the new channel (yellow) would be 1,067 linear feet (loss of 33 linear feet).

Figure 2. Turton Creek reroute in Reach 2. Existing channel is 642 linear feet and the new channel (yellow) would be 564 linear feet (loss of 78 linear feet).

2.2 Project Impacts: Wetland

Approximately four acres of wetland would be impacted by the proposed project. Mitigation criteria and metrics will be to replace lost wetland quantity, as measured in units provided by the Minnesota Routine Assessment Method (MnRAM). MnRAM will be performed during the next phase of the project. MnRAM was modified and used to compute mitigation needs on the Fargo-Moorhead Metropolitan Area Flood Risk Management study and a similar approach would be used for this project.

3. Assessment of Mitigation Alternatives

3.1 Stream Mitigation

The Recommended Plan would impact approximately 1,756 linear feet (1.0 acre) of Turton Creek due to rerouting two segments of the stream. A section of Turton Creek, either within the rerouted stream segments or another stream segment, would include a meander to make up for any lost channel length. Habitat structures will be included to ensure the new stream segments provide the same or better habitat than the existing stream segments.

There are currently no stream credits within the bank service area and stream mitigation

banking is in the early stages of development within St. Paul District regulatory boundaries. It is possible that stream credits would be available in 2021 when the project is proposed to be constructed; however, on-site mitigation is currently the best option for mitigation. The PDT will design the stream mitigation during Plans and Specifications. Options currently being considered would be a stream meander and riffle/habitat structures. The estimated cost of on-site stream mitigation is $289,041.

3.2 Wetland Mitigation

The Recommended Plan would impact approximately 2.5 acres of emergent wetland and 1.5 acres of forested wetland.

There are currently no mitigation bank or advance In-Lieu Fee credits available in the BSA. Mitigation bank credits are available in the next closest BSA that is still within the Mississippi River basin. The current cost per credit is approximately $65,000. Given the low quality of the impacted wetlands (Section 4.2.3 of the Main Report), we are assuming no more than four credits would be required to offset proposed impacts. The total cost of credits would be approximately $260,000.

Opportunities to mitigate on-site are limited due to lack of available land to accommodate a large enough site to generate approximately four credits. Off-site mitigation would require land acquisition. The cost of the land, work needed to re-establish or rehabilitate a wetland and conduct monitoring and adaptive management would likely exceed $260,000. Purchasing mitigation bank credits is the most cost effective option to date.

4. Adaptive Management and Monitoring

Coordination with the Wisconsin Department of Natural Resources on the compensatory mitigation and monitoring needed to offset project impacts is ongoing and will continue through project implementation.

If wetland bank credits are purchased, then the wetland bank sponsor would conduct any monitoring and adaptive management. Monitoring objectives, monitoring methods/plans, entity responsible for monitoring, and real estate fall on the wetland bank sponsor and are approved by the St. Paul District regulatory office.

Methods for Assessing Habitat in Flowing Waters: Using the Qualitative Habitat Evaluation Index (QHEI) will be conducted before and after construction to determine success of any on-site stream mitigation. The ultimate goal would be to have stream habitat in the newly constructed channel sections have equal to or greater habitat quality and biotic integrity than the original sections of stream channel. If habitat quality or biotic integrity is less than expected after construction, the non-federal sponsor and USACE would work with Wisconsin Department of Natural Resources on any necessary improvements. Real estate for any on-site mitigation would be acquired as part of the project.