December 2022 version

Environmental Assessment Worksheet

This most recent Environmental Assessment Worksheet (EAW) form and guidance documents are available at the Environmental Quality Board's website at: https://www.eqb.state.mn.us/ The EAW form provides information about a project that may have the potential for significant environmental effects. Guidance documents provide additional detail and links to resources for completing the EAW form.

Cumulative potential effects can either be addressed under each applicable EAW Item or can be addressed collectively under EAW Item 21.

Note to reviewers: Comments must be submitted to the RGU during the 30-day comment period following notice of the EAW in the *EQB Monitor*. Comments should address the accuracy and completeness of information, potential impacts that warrant further investigation and the need for an EIS.

1. **Project title:** Maple Creek Habitat Enhancement Project (will be referred to as "the project" in the EAW)

2. **Proposer: Minnesota Trout Unlimited**

Contact person: John Lenczewski
Title: Executive Director
Address: PO Box 845
City, State, ZIP: Chanhassen, MN 55317
Phone: 612-670-1629
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3. **RGU: Department of Natural Resources**

Contact person: Becky Horton
Title: Project Manager
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4. **Reason for EAW Preparation:** (check one)

Required:
☐ EIS Scoping
☒ Mandatory EAW

Discretionary:
☐ Citizen petition
☐ RGU discretion
☐ Proposer initiated

If EAW or EIS is mandatory give EQB rule category subpart number(s) and name(s):

Minnesota Rules 4410.4300, Subpart 26. Stream diversion.

5. **Project Location:**

- County: Fillmore
- City/Township: Preble Township
- PLS Location (¼, ¼, Section, Township, Range):

Table 1. PLS Location

¼, ¼	Section	Township	Range
NE ¼ Section 4, NW ¼ Section 3	3 & 4	102 N	8 W

- Watershed (81 major watershed scale): Root River (43)

- GPS Coordinates: (Lat 43.6709303°, Long -91.790563°)
- Tax Parcel Number

Table 2. Tax Parcel Numbers

Parcel ID	Section	Township	Range	Owner
030026000	04	102 N	8W	State of MN
030024000	03	102 N	8W	State of MN
030017000	03	102 N	8W	State of MN

The project site is located approximately 0.75 miles north of Choice, Minnesota. Figure 1 shows the location of the project within the state and county. Figure 2 shows the project on a U.S. Geological Survey 7.5 minute, 1:24,000 scale map and Figure 3 shows the project site overlaid with 2-foot contours.

At a minimum attach each of the following to the EAW:

- County map showing the general location of the project;
- U.S. Geological Survey 7.5 minute, 1:24,000 scale map indicating project boundaries (photocopy acceptable);
- Site plans showing all significant project and natural features. Pre-construction site plan and post-construction site plan.

Figure 1: Project location map
Figure 2: USGS 7.5 Minute quadrangle map
Figure 3: Project location map with topography
Figure 4: Proposed project practices
Figure 5: Existing land cover
Figure 6: Proposed land cover after construction
Figure 7: Project area with FEMA FIRM overlay
Figure 8: Water resources

List of data sources, models, and other resources (from the Item-by-Item Guidance: *Climate Adaptation and Resilience* or other) used for information about current Minnesota climate trends and how climate change is anticipated to affect the general location of the project duringthe life of the project (as detailed below in item 7. Climate Adaptation and Resilience).

DNR, 2023a. Climate Trends. Available online at https://www.dnr.state.mn.us/climate/climate_change_info/climate-trends.html. Accessed on 8/21/23.DNR,

2023b. Minnesota Climate Explorer. Available online at https://arcgis.dnr.state.mn.us/ewr/climateexplorer/main/historical. Accessed on 8/21/23.

6. Project Description:

a. Provide the brief project summary to be published in the *EQB Monitor*, (approximately 50 words).
Minnesota Trout Unlimited (MNTU) proposes to conduct a stream habitat enhancement project at Maple Creek located approximately 0.75 miles north of Choice, Fillmore County, Minnesota to address floodplain abandonment, accelerated bank erosion, and degraded instream habitat to restore the ecological and hydrologic functions of the creek

and adjacent floodplain. The project will include reconnecting the creek with the floodplain, installing grade control riffles to limit channel incision, installing woody material and boulders for instream habitat, and restoring native riparian vegetation. The project area occurs within the Choice Wildlife Management Area (WMA) and the Choice Aquatic Management Area (AMA). The project will be entirely funded by the Lessard-Sams Outdoor Heritage Fund (OHF) program that was secured by MNTU.

b. Give a complete description of the proposed project and related new construction, including infrastructure needs. If the project is an expansion include a description of the existing facility. Emphasize: 1) construction, operation methods and features that will cause physical manipulation of the environment or will produce wastes, 2) modifications to existing equipment or industrial processes, 3) significant demolition, removal or remodeling of existing structures, and 4) timing and duration of construction activities.

MNTU proposes to enhance approximately 3,500 feet of stream along Maple Creek located approximately 0.75 miles north of Choice, Fillmore County, Minnesota and includes the reconnection of several cutoff oxbow channels. The project area begins immediately east of the public parking lot located 0.5 miles north of 216th street off State Highway 43 and extends approximately 3,300 feet downstream. The entire project occurs within the Choice WMA and Choice AMA. This habitat enhancement project was selected as a stream enhancement project based on input from DNR fisheries and MNTU staff. The project will include earthwork to reconnect the creek with the floodplain (approximately one to three feet of cut depending on existing creek bank heights), reconnection of several cutoff oxbow channels, tree harvest along eroding creek banks and oxbow channels, and installation of tree trunks and rock riffles for fish and macroinvertebrate habitat. Figure 4 shows the proposed project elements. The proposed reconnection of the two oxbow channels will add approximately 200 feet of stream length in the project area and will benefit the stream by reducing stream slope to minimize erosion potential through the project area and adding stream length and subsequent habitat for aquatic biota. Reconnecting the oxbows will also reduce flood energy through the project area. The existing cutoff oxbows are filled with sediment; therefore, soil excavation is needed along the existing oxbow alignments to achieve positive stream flow through the oxbows. The excavation within the oxbows will occur working downstream to upstream, and once grading and habitat inputs are completed within each oxbow channel, streamflow will be redirected into the oxbow and the existing straight stream channel will be abandoned. In addition, there are two other oxbow channels in the project area (pink lines in Figure 4) that will be preserved (no proposed grading or vegetation disturbance). DNR fisheries staff indicated the upstream oxbow should not be reconnected since the meander pattern (stream bend) is very tight (too curved) and could cut off again if a reconnection was attempted. Wetland Conservation Act Technical Evaluation Panel staff indicated a desire to preserve the downstream oxbow since the cutoff oxbow contains high quality wetland vegetation. Where the stream occurs adjacent to the steep bluff slopes, no work is proposed on the bluff slopes to preserve the existing soils and vegetation (yellow lines in Figure 4). The bluff slopes at these three locations are stable and contain exposed bedrock that protects the stream banks along the bluffs. Grade control structures will emulate natural rock riffles and will be installed in the creek to increase the baseflow water elevation to restore riparian hydrology that has been impacted by channel incision and a disconnected floodplain. The existing floodplain is up to six feet above the existing stream bed and flood flows rarely occur over the disconnected floodplain. To improve floodplain connectivity and reduce flood energy during flood events, bankfull benches will be created along the stream at an elevation where flood flows can occur over the floodplain approximately once every one and half years, also known as the bankfull discharge. In general, earthwork and selective tree harvest will occur within 50 feet of the creek. Many of the trees

proposed to be removed include boxelder that have been girdled by DNR staff for vegetation management purposes for the WMA, but some tree harvest will occur along oxbow channels where channel reconnections are proposed. Construction site access will occur off State Highway 43. No infrastructure is proposed to be built for this project, and no alterations to existing infrastructure are proposed. MNTU will select a stream contractor to conduct all proposed tree harvest and stream enhancement activities as described in this document.

Erosion control measures that will be implemented during project construction include installation of temporary sediment Best Management Practices (BMP's) such as biologs and soil berms to capture surface soil erosion, and installation of both hydromulch and crimped straw mulch on all disturbed soils. All disturbed soils will be seeded with a cover crop (oats and winter wheat) and native seed. Erosion control measures will be installed prior to construction, and hydromulch and native seeding will occur immediately after final grading per the project Stormwater Pollution Prevention Plan (SWPPP). Construction will include use of heavy equipment such as excavators, dozers, and dump trucks and will involve movement of soil within the project area to complete the project. Impacts to the environment (e.g. disturbed soil, removal of existing vegetation) will be addressed by reconnecting the stream with the floodplain and seeding native vegetation. No waste is expected to be produced during project construction or post construction. Project construction will require tree and brush removal and grading to reconnect the floodplain. Excess soil derived from the project will be spread outside the active floodplain at the three designated spoils areas that are located above the 100-year flood elevation. All spread soils will be seeded with native seed and covered with mulch. Woody debris will be repurposed for select instream habitat features or used as brush piles in the riparian corridor for non-game habitat. Tree harvest activities are proposed to be completed by March 31, 2024, and project construction is expected to occur over a four-week period between May 1 and September 1, 2024.

Construction Phasing:

1. Installation of erosion control BMP's
2. Initiate selective tree harvest and temporary stockpile of harvested wood
3. Bank grading and installation of grade control riffles and instream habitat
4. Installation of hydromulch and native seed to establish permanent vegetation
5. Removal of erosion control BMP's following establishment of native vegetation

c. Project magnitude:

Table 3. Project quantities

Description	Number
Total Project Acreage	16.57 acres
Linear project length (stream corridor)	3,500 feet
Number and type of residential units	N/A
Residential building area (in square feet)	N/A
Commercial building area (in square feet)	N/A
Industrial building area (in square feet)	N/A
Institutional building area (in square feet)	N/A
Other uses – specify (in square feet)	N/A
Structure height(s)	N/A

d. Explain the project purpose; if the project will be carried out by a governmental unit, explain the need for the project and identify its beneficiaries.

Floodplain abandonment (also known as a stream disconnected from its floodplain), channel incision, bank erosion, and degraded instream habitat have been identified in the project area. One of the primary goals for this project is to improve instream habitat for Minnesota native-strain brook trout that have been identified within the project area by DNR fisheries staff. Fish surveys conducted by DNR identified a significant shift in the population of trout, with a marked decline in native brook trout and a significant increase in non-native brown trout. Habitat elements that support native brook trout over non-native brown trout have been incorporated into the design based on input from DNR fisheries staff. Two site design walks have been completed with DNR and MNTU staff, and input from the design walks were incorporated in the project design, including limiting overhead cover generally preferred by brown trout and preserving and creating long pools that are more attractive to brook trout. The overarching goal of this project is to provide a stable creek channel and restore eroding banks to reduce internal sediment and nutrient loading within the creek, which will also help improve the water quality of downstream resources (South Fork Root River).

e. Are future stages of this development including development on any other property planned or likely to happen? ☐ Yes ☒ No
If yes, briefly describe future stages, relationship to present project, timeline and plans for environmental review.

f. Is this project a subsequent stage of an earlier project? ☐ Yes ☒ No
If yes, briefly describe the past development, timeline and any past environmental review.

7. Climate Adaptation and Resilience:

a. Describe the climate trends in the general location of the project (see guidance: *Climate Adaptation and Resilience*) and how climate change is anticipated to affect that location during the life of the project.
Climate change will cause Minnesota to become increasingly warmer and wetter, and there have been dramatic increases in the intensity and frequency of rainstorms within the state (DNR, 2023a). In the Root River Watershed where the project is located, the average annual precipitation has increased by 6.64 inches since 1895 (DNR, 2023b). The average annual temperature has increased by 1.86° F since 1895, with the most dramatic increases being in the average minimum temperature (increase of 3.24° F since 1895) and modest increases in the average maximum temperature (increase of 0.49° F since 1895). The predicted future increases in precipitation may affect the frequency and duration of flooding within the project area. However, the proposed project will reconnect the creek with the floodplain and help mitigate impacts from increased flooding by dissipating flood flows over the reconnected floodplain and through attenuation of flood water in the floodplain. Temperature increases as a result of climate change may increase stream temperature which could negatively impact cold-water dependent species such as trout and some species of macroinvertebrates that have a narrow temperature range. These anticipated temperature impacts will be mitigated in the project area by increasing native vegetation and subsequent stream shading provided by the restored riparian vegetation. Also, the post construction stream channel will be narrower than existing stream channel and will have less surface area exposed to solar radiation along the project reach.

b. For each Resource Category in the table below: Describe how the project's proposed activities and how the project's design will interact with those climate trends. Describe proposed adaptations to address the project effects identified.

Table 2. Climate Trends and Adaptations.

Resource Category	Climate Considerations	Project Information	Adaptations
Project Design	Increase in annual precipitation, increase in frequency and intensity of rainstorms	Increase in rainstorm intensity may increase the severity of flooding along the stream channel	The project is designed to allow dissipation of flood energy over the reconnected floodplain
Land Use	Increase in average annual temperature	Removal of some of the riparian canopy may increase ground and water temperatures	All disturbed soil will be revegetated with native species that will also provide near-stream shade of the creek Installation of rock riffles will maintain deep pools, and narrowing the stream channel in select areas will help counteract the increase in solar radiation
Water Resources	Addressed in section 12	Addressed in section 12	Addressed in section 12
Contamination/ Hazardous Materials/Wastes	Increase in annual precipitation, increase in frequency and intensity of rainstorms	Temporary increased risk of fuel contamination from construction vehicles working in the floodplain	Construction will not occur during storms and vehicles will not be parked or refueled in the floodplain
Fish, wildlife, plant communities, and sensitive ecological resources (rare features)	Addressed in section 14	Addressed in section 14	Addressed in section 14

8. **Cover types:** Estimate the acreage of the site with each of the following cover types before and after development:

Table 5 shows the existing and proposed land cover types. The existing land cover consists of planted prairie (formerly pasture) and both upland forest and floodplain forest with scattered living trees (most of the boxelder have been girdled by the DNR for management of the WMA). The post-project land cover will consist of an open canopy floodplain (dead boxelder removed) and a reconnected floodplain that will restore floodplain hydrology and riparian wetlands. The increase in stream acreage (proposed) will be the result of reconnecting cutoff oxbows that will increase stream length post-project. No

impervious surfaces occur within the project area and none are proposed. See Figure 5 and Figure 6 for existing and proposed land cover maps, respectively.

Table 3. Land Cover (existing and proposed).

Cover Types	Before (acres)	After (acres)
Wetlands and shallow lakes (<2 meters deep)	0	4.10
Deep lakes (>2 meters deep)	0	0
Wooded/forest	8.72	5.34
Rivers/streams	1.51	1.61
Brush/Grassland (upland/grassland/prairie)	6.34	5.52
Cropland	0	0
Livestock rangeland/pastureland	0	0
Lawn/landscaping	0	0
Green infrastructure TOTAL (from table below*)	0	0
Impervious surface	0	0
Stormwater Pond (wet sedimentation basin)	0	0
Other (describe)	0	0
TOTAL	16.57	16.57

Table 6. Green Infrastructure.

Green Infrastructure*	Before (acreage)	After (acreage)
Constructed infiltration systems (infiltration basins/infiltration trenches/ rainwater gardens/bioretention areas without underdrains/swales with impermeable check dams)	N/A	N/A
Constructed tree trenches and tree boxes	N/A	N/A
Constructed wetlands	N/A	N/A
Constructed green roofs	N/A	N/A
Constructed permeable pavements	N/A	N/A
Other (describe)	N/A	N/A
TOTAL*	N/A	N/A

Table 7. Tree Removals.

Trees	Percent	Number
Percent tree canopy removed or number of mature trees removed during development	N/A	94 (72 of these are previously girdled boxelder)
Number of new trees planted	N/A	TBD by DNR WMA management goals

9. Permits and approvals required: List all known local, state and federal permits, approvals, certifications and financial assistance for the project. Include modifications of any existing permits, governmental review of plans and all direct and indirect forms of public financial assistance including bond guarantees, Tax Increment Financing and infrastructure. *All of these final decisions are prohibiteduntil all appropriate environmental review has been completed. See Minnesota Rules, Chapter 4410.3100.*

Table 8. Permits and approvals.

Unit of Government	Type of Application	Status
Fillmore County	Floodplain Permit/No-Rise Certificate	To Be Applied For
U.S. Army Corps of Engineers	Joint Permit Application	To Be Applied For
Department of Natural Resources	Wetland Conservation Act (WCA) Permit	To Be Applied For
Department of Natural Resources	Water Appropriation Permit	To be applied for, if needed
Department of Natural Resources	Public Waters Work Permit	To Be Applied For
Minnesota Pollution Control Agency	National Pollution Discharge Elimination System (NPDES) Construction Stormwater (CSW) Permit	To Be Applied For
Minnesota Pollution Control Agency	401 Water Quality Certification	To Be Applied For
State Historic Preservation Office	Archeological or Historic Features/ Properties	Submitted

Cumulative potential effects may be considered and addressed in response to individual EAW Item Nos. 10-20, or the RGU can address all cumulative potential effects in response to EAW Item No.22. If addressing cumulative effect under individual items, make sure to include information requested in EAW Item No. 21

10. Land use:

a. Describe:

i. Existing land use of the site as well as areas adjacent to and near the site, including parks and open space, cemeteries, trails, prime or unique farmlands.

The project area occurs in a rural setting. The closest town is Choice, Minnesota with a population less than 10 people and is located approximately 0.75 miles south of the project area. Highway 43 occurs within 100 feet of the upstream end of the project area and 2,150 feet from the downstream end of the project area. Only two houses occur within a half-mile of the project boundary. One house is located approximately 540 feet northwest of the upstream end of the project area, and the second house is located approximately 690 feet to the southwest of the project boundary. The project area is comprised of upland forest and open woodlands with one delineated wetland adjacent to the project boundary in the restored prairie. The entire project area occurs within the Choice WMA and Maple Creek AMA. Visitors to the site typically include anglers, hunters, and outdoor recreationists.

ii. Plans. Describe planned land use as identified in comprehensive plan (if available) and any other applicable plan for land use, water, or resources management by a local, regional, state, or federal agency.

The entire project area will be managed by the DNR as part of the Choice WMA and AMA programs. Management goals and activities completed by DNR resource managers for the site include supporting populations of trout, deer, pheasants, turkey, and small game animals primarily to support hunting and angling activities. Management activities conducted within the WMA include prescribed burns for prairie vegetation diversity and maintenance of open prairie habitat, direct seeding of hardwoods in forested areas, and timber sales. A large bluff prairie has been cleared of encroaching trees to maintain this rare and declining habitat in this part of the state. The valley floor where the project area is located was pastured for decades and has now been converted to native prairie. Tree management in the prairie has been completed through girdling of boxelder within the project site to support open prairie habitat. Management activities conducted by the AMA include fish population surveys and stocking, and riparian vegetation management.

iii. Zoning, including special districts or overlays such as shoreland, floodplain, wild and scenic rivers, critical area, agricultural preserves, etc.

The project area is zoned “Ag District” by Fillmore County and occurs within a Federal Emergency Management Agency (FEMA) Regulatory Floodway (Figure 7). No shoreland, wild and scenic or critical areas overlap the project area.

iv. If any critical facilities (i.e. facilities necessary for public health and safety, those storing hazardous materials, or those with housing occupants who may be insufficiently mobile) are proposed in floodplain areas and other areas identified as at risk for localized flooding, describe the risk potential considering changing precipitation and event intensity.

No critical facilities are proposed within the project area.

b. Discuss the project's compatibility with nearby land uses, zoning, and plans listed in Item 10a above, concentrating on implications for environmental effects.

The project is compatible with nearby land use, zoning, WMA, and AMA plans. The proposed project will help enhance the native vegetation within the stream corridor, improve water quality, and enhance fish and wildlife habitat which parallel goals established by the DNR for WMA and AMA lands. Specific management goals can be reviewed in Section 10 ii above.

Although the entire project area is within the FEMA floodplain, no structures or fill will be added that might change the flood elevations within or upstream of the project area.

c. Identify measures incorporated into the proposed project to mitigate any potential incompatibility as discussed in Item 10b above and any risk potential.

No mitigation measures are required for project compatibility with local land use code.

11. Geology, soils and topography/land forms:

a. Geology - Describe the geology underlying the project area and identify and map any susceptible geologic features such as sinkholes, shallow limestone formations, unconfined/shallow aquifers, or karst conditions. Discuss any limitations of these features for the project and any effects the project could have on these features. Identify any project designs or mitigation measures to address effects to geologic features.

Bedrock is exposed in river and stream valleys, and the depth of drift over bedrock varies from 0 to 50 feet. In general, sediment thickness varies by landscape position. Large exposures of bedrock occur in the steep ravines. These exposures are primarily Ordovician dolomite, limestone, and sandstone with Cambrian sandstone, shale, and dolomite exposed along the valley walls of the Mississippi River (DNR, 2023c). Devonian dolomite and limestone are more locally exposed along the western edge of the subsection.

The project area is in close proximity to mapped surface karst features including bedrock outcroppings along steep bluffs and springs that discharge to Maple Creek. The bedrock outcroppings occur at various elevations in the region, from near the bluff tops to along the base of the bluffs. Within the project area, rock outcroppings occur near the stream edge where the stream meanders adjacent to the bluff toe. No project inputs or construction activities are proposed along the rock outcrops within the project area to protect these unique features. Several small springs occur along the edge of the creek, and these features will be preserved within the project area (e.g. no filling or excavation proposed at or near the spring locations). These springs currently discharge directly into the creek and will continue to discharge directly into the creek post project. There are no mapped sinkholes within the project boundary, so groundwater impacts from surface water runoff are not anticipated from the proposed project. The proposed project includes reconnection of the creek with the floodplain and enhancement of deep-rooted native vegetation; these aspects will help attenuate flood water and allow for infiltration of flood water within the floodplain. The geology will not limit any aspect of the project, and the project will not have a significant effect on any geologic features.

b. Soils and topography - Describe the soils on the site, giving NRCS (SCS) classifications and descriptions, including limitations of soils. Describe topography, any special site conditions relating

to erosion potential, soil stability or other soils limitations, such as steep slopes, highlypermeable soils. Provide estimated volume and acreage of soil excavation and/or grading. Discuss impacts from project activities (distinguish between construction and operational activities) related to soils and topography. Identify measures during and after project construction to address soil limitations including stabilization, soil corrections or other measures. Erosion/sedimentation control related to stormwater runoff should be addressed inresponse to Item 12.b.ii.

- NOTE: For silica sand projects, the EAW must include a hydrogeologic investigation assessing the potential groundwater and surface water effects and geologic conditions that could create an increased risk of potentially significant effects on groundwater and surface water. Descriptions of water resources and potential effects from the project in EAW Item 12 must be consistent with the geology, soils and topography/land forms and potential effects described in EAW Item 11.

The Web Soil Survey mapped five unique soil units within the project area. The soils consist of a range of soil types and textures common to floodplains and uplands. The broader floodplain areas are considered prime farmland while the immediate stream corridor and adjacent bluffs are not considered prime farmland. Table 9 lists the soils identified in the project area.

Table 9. Soils Data from the Web Soil Survey.

Soil Unit	Parent Material	Farmland Class	Hydric Classification	Drainage Class
Ab – Alluvial land, medium textured, well drained	Loamy alluvium	Prime farmland	Not hydric	Well drained
Fk – Festina silt loam, 1 to 6 percent slopes, moderately eroded	Silty alluvium over stratified sandy & silty alluvium	Prime farmland	Not hydric	Moderately well drained
Md – Mixed alluvial land, 0 to 6 percent slopes	Sandy and silty alluvium	Not prime farmland	Predominantly hydric	Frequently flooded
N621B – Volney channery silt loam, 2 to 12 percent slopes, occasionally flooded	Loamy alluvium	Not prime farmland	Not hydric	Moderately well drained
N639G – Frontenac-Lacrescent complex, 30 to 70 percent slopes, rocky	Loamy sediments over loamy-skeletal colluvium	Not prime farmland	Not hydric	Moderately well drained

The mapped soils along the stream corridor are susceptible to erosion due to floodplain abandonment and channel incision that concentrate flood energy within the stream channel. Reconnecting the creek with the floodplain will allow flood flows to spread out and slow down which will reduce erosive stream bank scour. Increasing native herbaceous vegetation along the stream banks will promote further soil stabilization through deep rooting and surface protection provided by the plants. Additional measures to stabilize soils during project construction are listed in **#6 Project Description.**

Steep bluffs occur adjacent to the project area, but no construction activities are proposed along the steep bluffs to prevent disturbance and potential erosion of these delicate bluff soils and associated plant communities. The topography of the floodplain within the project area is relatively

flat and contains deep layer of silt loam as described in Table 9. These soils are highly susceptible to erosion considering the existing site conditions where channel incision has resulted in a disconnected floodplain and accelerated bank erosion. To limit further erosion within the project area, the proposed project includes removal of approximately 7,000 cubic yards of soil from the floodplain that will be derived from grading to reconnect the creek with the floodplain. This excavated soil is proposed to be hauled to three soil stockpile areas in upland areas within the project boundary that are above the 100-year flood elevation. These soils are to be thin spread and seeded with native vegetation, and erosion control measures are proposed around the perimeter and over the surface of the soil disposal areas to prevent soil erosion. Exposed soils from reconnecting the creek with the floodplain will also include erosion control measures which will meet requirements of the NPDES permit to limit soil erosion in the floodplain before perennial vegetation becomes established.

12.Water resources:

a. Describe surface water and groundwater features on or near the site in a.i. and a.ii. below.

i. Surface water - lakes, streams, wetlands, intermittent channels, and county/judicial ditches. Include any special designations such as public waters, shoreland classification and floodway/floodplain, trout stream/lake, wildlife lakes, migratory waterfowl feeding/resting lake, and outstanding resource value water. Include the presence of aquatic invasive species and the water quality impairments or special designations listed on the current MPCA 303d Impaired Waters List that are within 1 mile of the project. Include DNR Public Waters Inventory number(s), if any.

Maple Creek is a mapped public watercourse (PIN 030026000 and 030017000) and a designated trout stream. From the downstream terminus of the project area, Maple Creek flows southeast for approximately 0.83 miles to the confluence with the South Fork Root River (PIN 030116000). Nearby public watercourses include the South Fork Root River (impaired for aquatic consumption and aquatic life) and Shattuck Creek (no impairment). Figure 8 shows the location of all mapped surface waters and impairments. Surface water drainage occurs during snowmelt and rain events, with significant increases in discharge and flooding occurring after large snowmelt and rain events.

ii. Groundwater – aquifers, springs, seeps. Include: 1) depth to groundwater; 2) if project is within a MDH wellhead protection area; 3) identification of any onsite and/or nearby wells, including unique numbers and well logs if available. If there are no wells known on site or nearby, explain the methodology used to determine this.

The project area is not within any mapped wellhead protection areas. The closest wellhead protection area is located approximately 8.5 north of the project boundary near the city of Rushford, Minnesota (MN Atlas, 2023). The surficial water table in the project area is generally less than five feet below the ground elevation of the floodplain and at the surface water elevation (baseflow elevation) of the creek. The baseflow of Maple Creek is supported by year-round groundwater discharge, including contributions from groundwater-fed tributaries located upstream of the project area. Well locations were identified using the Minnesota Well Index (MDH, 2023). No wells were located in the project area. The nearest well is located approximately 0.6 miles southeast of the downstream terminus of the project area (unique no. 1000004028) and occurs within the Tunnel City/Lone Rock FM aquifer. The well log is included in Appendix A. The well location has not been verified, but project activities are not expected to affect the well.

b. Describe effects from project activities on water resources and measures to minimize or mitigate the effects in Item b.i. through Item b.iv. below.

i. Wastewater - For each of the following, describe the sources, quantities and composition of all sanitary, municipal/domestic and industrial wastewater produced or treated at the site.

1) If the wastewater discharge is to a publicly owned treatment facility, identify any pretreatment measures and the ability of the facility to handle the added water and waste loadings, including any effects on, or required expansion of, municipal wastewater infrastructure. N/A

2) If the wastewater discharge is to a subsurface sewage treatment systems (SSTS), describe the system used, the design flow, and suitability of site conditions for such a system. If septic systems are part of the project, describe the availability of septage disposal options within the region to handle the ongoing amounts generated as a result of the project. Consider the effects of current Minnesota climate trends and anticipated changes in rainfall frequency, intensity and amount with this discussion. N/A

3) If the wastewater discharge is to surface water, identify the wastewater treatment methods and identify discharge points and proposed effluent limitations to mitigate impacts. Discuss any effects to surface or groundwater from wastewater discharges, taking into consideration how current Minnesota climate trends and anticipated climate change in the general location of the project may influence the effects. N/A

No wastewater will be stored onsite or produced during or after this project.

ii. Stormwater - Describe changes in surface hydrology resulting from change of land cover. Describe the routes and receiving water bodies for runoff from the project site (major downstream water bodies as well as the immediate receiving waters). Discuss environmental effects from stormwater discharges on receiving waters post construction including how the project will affect runoff volume, discharge rate and change in pollutants. Consider the effects of current Minnesota climate trends and anticipated changes in rainfall frequency, intensity and amount with this discussion. For projects requiring NPDES/SDS Construction Stormwater permit coverage, state the total number of acres that will be disturbed by the project and describe the stormwater pollution prevention plan (SWPPP), including specific best management practices to address soil erosion and sedimentation during and after project construction. Discuss permanent stormwater management plans, including methods of achieving volume reduction to restore or maintain the natural hydrology of the site using green infrastructure practices or other stormwater management practices. Identify any receiving waters that have construction-related water impairments or are classified as special as defined in the Construction Stormwater permit. Describe additional requirements for special and/or impaired waters.

Pre-Construction Site Runoff

The project area is entirely vegetated which helps filter and trap runoff during flood events. There are no stormwater outfalls that occur within the project area, but two road crossing culverts occur under Highway 43 just north of the project area that discharge to Maple Creek.

Post-Construction Site Runoff

One of the primary goals of this project is to reduce bank erosion and instream sedimentation by reconnecting the floodplain, reshaping stream banks to a stable slope, and

promoting the growth of native herbaceous vegetation to help stabilize floodplain soils. This will reduce sediment and nutrient loading to downstream resources. The filtering capacity of the floodplain will be enhanced through a reconnected floodplain and reestablishment of deep-rooted native riparian vegetation. Runoff from the surrounding land will not be altered.

Stormwater and Erosion Control BMP's

The project will disturb more than one acre of land; therefore, the construction contractor will apply for coverage under the National Pollutant Discharge Elimination System/State Disposal System (NPDES/SDS) General Permit with the MPCA prior to the start of construction. A SWPPP will be required and will include erosion prevention and sediment control Best Management Practices (BMP's) used to comply with the requirements of the permit. BMP's will be employed during construction, and inspection of BMP's will be required by the permittee after each rainfall event that exceeds one-half inch in 24 hours. Sediment BMP's will be installed to prevent runoff to the creek while earthwork is in progress. Immediately after the earthwork is complete, all disturbed areas will be seeded and stabilized with hydromulch and crimped straw mulch.

iii. Water appropriation - Describe if the project proposes to appropriate surface or groundwater (including dewatering). Describe the source, quantity, duration, use and purpose of the water use and if a DNR water appropriation permit is required. Describe any well abandonment. If connecting to an existing municipal water supply, identify the wells to be used as a water source and any effects on, or required expansion of, municipal water infrastructure. Discuss environmental effects from water appropriation, including an assessment of the water resources available for appropriation. Discuss how the proposed water use is resilient in the event of changes in total precipitation, large precipitation events, drought, increased temperatures, variable surface water flows and elevations, and longer growing seasons. Identify any measures to avoid, minimize, or mitigate environmental effects from the water appropriation. Describe contingency plans should the appropriation volume increase beyond infrastructure capacity or water supply for the project diminish in quantity or quality, such as reuse of water, connections with another water source, or emergency connections.

No water appropriations will be required during or after construction. No dewatering or well abandonment will occur for the project.

iv. Surface Waters

a) Wetlands - Describe any anticipated physical effects or alterations to wetland features such as draining, filling, permanent inundation, dredging and vegetative removal. Discuss direct and indirect environmental effects from physical modification of wetlands, including the anticipated effects that any proposed wetland alterations may have to the host watershed, taking into consideration how current Minnesota climate trends and anticipated climate change in the general location of the project may influence the effects. Identify measures to avoid (e.g., available alternatives that were considered), minimize, or mitigate environmental effects to wetlands. Discuss whether any required compensatory wetland mitigation for unavoidable wetland impacts will occur in the same minor or major watershed and identify those probable locations.

The National Wetlands Inventory (NWI) indicates that most of the project area is mapped as either PEMA1 (freshwater emergent wetland) and PFO1A (freshwater

forested wetland). However, a Level 2 wetland delineation completed for the project delineated only two wetlands above the ordinary high water level (OHWL) of Maple Creek. These two wetlands are located outside the proposed construction boundary of the project, as such are not summarized as existing wetlands within the project construction boundary as shown in Table 5. Below the OHWL, in-channel wetlands and small floodplain benches were documented adjacent to the creek and within disconnected oxbow channels and are considered riverine features. This project will change the type and extent of wetlands by reducing the tree canopy and increasing the inundation period in the immediate floodplain, but it will not convert wetlands to non-wetlands, so no loss of wetlands is anticipated from construction of the project. The land cover types shown in Table 5 indicate a net increase of 4.1 acres of wetland within the project boundary. This gain in wetland area is the result of reconnecting the creek with the floodplain; the wetland type of the reconnected floodplain is anticipated to be a type 1 wetland, seasonally flooded basin dominated by herbaceous vegetation (non forest).

b) Other surface waters- Describe any anticipated physical effects or alterations to surface water features (lakes, streams, ponds, intermittent channels, county/judicial ditches) such as draining, filling, permanent inundation, dredging, diking, stream diversion, impoundment, aquatic plant removal and riparian alteration. Discuss direct and indirect environmental effects from physical modification of water features, taking into consideration how current Minnesota climate trends and anticipated climate change in the general location of the project may influence the effects. Identify measures to avoid, minimize, or mitigate environmental effects to surface water features, including in-water Best Management Practices that are proposed to avoid or minimize turbidity/sedimentation while physically altering the water features. Discuss how the project will change the number or type of watercraft on any water body, including current and projected watercraft usage.

No other surface waters exist within or near the project area except for those described under “i. Surface Water” above.

12. Contamination/Hazardous Materials/Wastes:

a. Pre-project site conditions - Describe existing contamination or potential environmental hazards on or in close proximity to the project site such as soil or ground water contamination, abandoned dumps, closed landfills, existing or abandoned storage tanks, and hazardous liquid or gas pipelines. Discuss any potential environmental effects from pre-project site conditions that would be caused or exacerbated by project construction and operation. Identify measures to avoid, minimize or mitigate adverse effects from existing contamination or potential environmental hazards. Include development of a Contingency Plan or Response Action Plan.

According to historical aerial photos accessed through Minnesota Historical Aerial Photographs Online, the project area has been in mixed agricultural use since the 1960's. Hay fields and pastures occurred adjacent to the project area through the 1990's. In the 1964 aerial image, it appears there was a small building or shed located just east of State Highway 43 near the existing gravel parking lot at the upstream end of the project, but the building was no longer visible in the 1991 aerial image.

No existing site contamination is known within the project area. A desktop review of both the Minnesota Department of Agriculture (MDA) and MPCA's "What's In My Neighborhood" databases did not identify any known environmental contamination within the project area, but seven animal feed lots were located within one-mile of the project boundary. Five of the seven animal feedlots occur outside the watershed drainage area to the project area and are unlikely to be a contamination source to proposed project. However, it is unknown if runoff occurs from the two remaining animal feedlots within the watershed drainage area or if there is a karst feature that may connect potential animal feedlot runoff to the groundwater table.

b. Project related generation/storage of solid wastes - Describe solid wastes generated/stored during construction and/or operation of the project. Indicate method of disposal. Discuss potential environmental effects from solid waste handling, storage and disposal. Identify measures to avoid, minimize or mitigate adverse effects from the generation/storage of solid waste including source reduction and recycling.

Any non-biodegradable waste generated from the project such as waste materials from installation of temporary erosion control BMP's and food container refuse will be removed from the project site by the contractor once the project is completed.

c. Project related use/storage of hazardous materials - Describe chemicals/hazardous materials used/stored during construction and/or operation of the project including method of storage. Indicate the number, location and size of any new above or below ground tanks to store petroleum or other materials. Indicate the number, location, size and age of existing tanks on the property that the project will use. Discuss potential environmental effects from accidental spill or release of hazardous materials. Identify measures to avoid, minimize or mitigate adverse effects from the use/storage of chemicals/hazardous materials including source reduction and recycling. Include development of a spill prevention plan.

Construction of the project will not require long-term storage of hazardous materials. Portable tanks of diesel fuel and hydraulic fluid will be used to service heavy machinery but will not be stored onsite; these are typically contained inside construction vehicles (e.g., fuel and hydraulic tanks secured to the bed of a construction truck) that depart the construction site at the end of each workday. Small amounts of grease and petroleum for small engines will be stored in weatherproof

containers and stored inside a job box or a contractor trailer which are proposed to be temporarily located near the parking lot at the upstream end of the project. Construction equipment will be refueled outside of the immediate floodplain using portable tanks of fuel housed inside construction vehicles.

d. Project related generation/storage of hazardous wastes - Describe hazardous wastes generated/stored during construction and/or operation of the project. Indicate method of disposal. Discuss potential environmental effects from hazardous waste handling, storage, and disposal. Identify measures to avoid, minimize or mitigate adverse effects from the generation/storage of hazardous waste including source reduction and recycling.

The project is not anticipated to generate hazardous waste during construction. The only waste generated will be those discussed in Item 13.b: soils, woody debris, and scraps from BMP erosion control materials.

13. Fish, wildlife, plant communities, and sensitive ecological resources (rare features):

a. Describe fish and wildlife resources as well as habitats and vegetation on or in near the site.

Pre-settlement vegetation derived from the original public land survey records indicate the project area was comprised of bur oak and other timber with an undergrowth of oak bushes and hazel. Post-settlement, the riparian corridor has been impacted by a history of agriculture and large flood events. Much of the stream channel has been disconnected from its floodplain with exposed eroded banks common throughout the project area. A canopy of boxelder occurred within the floodplain but was girdled by DNR staff in 2020 for vegetation management of the WMA. All the girdled boxelder trees are dead, but many are still standing in place. Outside the project area boundary, the WMA is managed for both prairie and forest habitat. Several bluff prairies have been enhanced through seeding of native vegetation and removal of invasive species, and forest regeneration has been conducted through direct seeding of hardwood species in the woodlands. The pasture that occurred within the stream valley several decades ago has now been restored to a planted prairie by WMA staff.

Despite impacts from historic land use, the stream corridor provides habitat for a variety of wildlife. A detailed species list is not available for the WMA, but the project area likely supports a wide range of species such as mammals (e.g., deer, racoon, opossum, squirrel, chipmunk, beaver, mice, shrews, bats), reptiles and amphibians (e.g., snakes, turtles, toads, frogs), and insects (e.g., skippers, butterflies, moths, beetles, spiders, ants). The creek itself supports a diverse fish community including brook trout, brown trout, sculpin, longnose dace, blacknose dace, white sucker, central stoneroller, creek chub, black bullhead, Johnny darter, fantail darter, and common shiner (Hoxmeier et al, 2012, p. 27). Bird species observed within the project area by EOR staff in December 2022 include hairy woodpecker, downy woodpecker, northern flicker, blue jay, dark-eyed junco, northern cardinal, barred owl, bald eagle, red-tailed hawk, and swamp sparrow.

The restored prairie near the project area and adjacent bluff prairies in the WMA contains diverse native grasses and forbs that likely support a variety of pollinator species such as butterflies, bumblebees, moths, hummingbirds, and other species that utilize nectar.

b. Describe rare features such as state-listed (endangered, threatened or special concern) species, native plant communities, Minnesota Biological Survey Sites of Biodiversity Significance, andother sensitive ecological resources on or within close proximity to the site. Provide the license agreement number (LA-1068) and/or correspondence number (MCE 2023-00687, Appendix B) from

which the data were obtained and attach the Natural Heritage Review letter from the DNR. Indicate if any additional habitat or species survey work has been conducted within the site and describe the results.

A review of rare features for the project area was completed using the DNR Natural Heritage Information System (NHIS) database, which included a 1-mile search radius around the project boundary. EOR has a license agreement (LA-1068) to access the NHIS database. Five state-listed species were identified within 1-mile of the project boundary, including common five-lined skink (*Plestiodon fasciatus*), timber rattlesnake (*Crotalus horridus*), squirrel corn (*Dicentra canadensis*), great Indian plantain (*Arnoglossum reniforme*), and Short's aster (*Symphyotrichum shortii*).

The common five-lined skink is a species of special concern that occurs along forest edges, rocky bluffs, oak savannas, and near exposed limestone and sandstone outcroppings and bluff prairies (DNR, 2023d). The species prefers an abundance of cover provided by rocks, stumps, and other natural features. The presence of rock outcroppings is an important habitat feature for this species. The species is not known to occur in floodplains, but rock outcroppings do exist near the project area within the adjacent bluffs. Since no proposed work is to occur along the bluff edges or within the rock outcrops, the project is not expected to directly impact this species.

In Minnesota, timber rattlesnakes are a state-threatened species that prefer south-facing rock outcrops, bluff prairies, and forested bluffs. They have an affinity for south-facing bluff prairies adjacent to rocky outcrops that can provide critical habitat features such as overwintering dens (DNR, 2023e). During the summer months, timber rattlesnakes are known to utilize lowland areas for foraging and basking and can be found in floodplains and agricultural areas. It is possible the project area provides suitable foraging and basking opportunities during the summer months, and possible overwintering habitat exists within rock outcroppings in the WMA but no known overwintering dens are documented within the project area.

Squirrel corn is a species of special concern that occurs in closed-canopy mature mesic hardwood forest. This species is known to occur on north facing slopes, usually near the base of slopes, or in forested bottomlands of narrow valleys (DNR, 2023f). The project area contains marginal habitat for this species due to the disturbed nature of floodplain (open canopy) and lack of mature mesic hardwood forest within the project boundary. However, north-facing bluff slopes do occur in areas adjacent to the project area, but no work is proposed on the bluff edges or slopes adjacent to the creek.

Great Indian plantain is a state-threatened species that occurs along stream banks, terrace forests, and floodplain forests but has also been documented in wet prairies and wet meadows (DNR, 2023g). This species is known to occur in both partial shade and direct sun as well as in forests with patchy canopy cover. The project area contains suitable habitat for this species (streambanks and presence of patchy floodplain forest canopy); therefore, a rare plant survey was conducted by Midwest Natural Resources (MNR) in September 2023 to search for this species and other rare plants. The survey did not locate any rare plants within the project boundary (MNR, 2023). DNR staff reviewed the survey report, and no additional surveys are required.

Short's aster is a species of special concern that occurs in mesic to dry-mesic forests on both slopes and level terrain, typically dominated by white oak, northern red oak, basswood, and sugar maple (DNR, 2023h). The species usually occurs in mostly closed canopy forests and within forest gaps where partial sunlight can reach the ground surface. The project area contains marginal habitat for this species due to the disturbed nature of floodplain (open canopy) and lack of dry-mesic forest and associated tree species in the project boundary. It is possible the adjacent forest bluffs provide

suitable habitat, but no work is proposed on the bluff slopes.

A review of Native Plant Communities and Sites of Biodiversity Significance was completed for the project, and no mapped Native Plant Communities or Sites of Biodiversity Significance occur within the project boundary. However, the bluffs located adjacent to the project site are mapped as a Site of Moderate Biodiversity Significance by the Minnesota Biological Survey. The nearest native plant community is a White Pine - Sugar Maple - Basswood Forest (Cold Slope) (MHc38a) located approximately 400 feet northeast of the project area. No proposed work is planned near this native plant community.

In addition, the USFWS Information for Planning and Consultation (IPaC) Resources List was reviewed for information on endangered species, critical habitats, migratory birds, refuges and hatcheries, and wetlands that may occur within the same county as the project area. The IPaC report identified four species that may occur within the project area (Table 10**, Appendix C)**. The IPaC report did not identify any critical habitats, refuges, or hatcheries within the project area.

Table 10. IPaC Federally Listed Wildlife.

Common Name	Scientific Name	Federal Status
Northern Long-Eared Bat	*Myotis septentrionalis*	Endangered
Tricolored Bat	*Perimyotis subflavus*	Proposed Endangered
Whooping Crane	*Grus americana*	Experimental Population, Non-Essential (EXPN)
Monarch Butterfly	*Danaus plexippus*	Candidate

The WMA where the project is located contains suitable habitat for the species listed in Table 10, though habitat would be considered marginal for whooping crane within the project boundary. The WMA as a whole includes a wide variety of habitats including small streams and a mosaic of grassland, wetland, and forest habitats. As part of the WMA, the project area contains primarily open canopy floodplain forest and grassland habitat that may support foraging and roosting habitat for the monarch butterfly, northern long-eared bat, and tricolored bat. Northern long-eared bats and tricolored bats have the potential to roost in the trees and forage along the stream corridor, and as such, it is proposed that all tree harvest activities for the project will be conducted by March 31 before bats emerge from hibernation.

The project may temporarily impact the monarch butterfly through direct mortality and disturbance to their host plants (milkweed species). Construction of the project is likely to occur when eggs, caterpillars, and adults are present. However, over the long-term, the project area will provide suitable habitat for this species following establishment of native vegetation since the seed mixes selected for the proposed project will include milkweed species (common milkweed and swamp milkweed).

c. Discuss how the identified fish, wildlife, plant communities, rare features and ecosystems may be affected by the project including how current Minnesota climate trends and anticipated climate change in the general location of the project may influence the effects. Include a discussion on introduction and spread of invasive species from the project construction and operation. Separately discuss effects to known threatened and endangered species.

The project will impact floodplain forest and upland grassland areas through removal of trees and grading near the creek, but it will also increase open habitats such as prairies and wet meadows

within the floodplain. Although the natural habitats in the project area have been historically degraded by grazing, invasive species, and stream channel erosion, the species that currently exist within the construction limits will also be temporarily impacted by construction. Select tree removal will occur within 50 feet of the stream banks and will have an impact on any species using the trees for nesting or roosting. Earthwork will also occur within 50 feet of the stream edge which will temporarily disrupt terrestrial and fossorial species that occur in this area. Likewise, the establishment of rock riffles and instream habitat will temporarily disrupt the streambed and the species that live there such as small fishes and macroinvertebrates.

Project construction will impact habitat that could potentially be used by rare and protected species. Removing trees from the project area could impact migratory and breeding birds as well as the northern long-eared bat and tricolored bat if these species roost within the project boundary. The northern long-eared bat hibernates in caves in the winter and roosts in tree cavities and under exfoliating tree bark during the spring and summer. The tricolored bat also hibernates in caves during the winter and typically roosts in forested areas among tree leaves in the spring, summer, and fall (USFWS, 2023). To limit impacts to these species and other migratory wildlife, tree harvest is proposed to occur in the winter months.

Grading and clearing will have the potential to temporarily impact floral resources for bumblebees, butterflies, and other insects; however, nearby restored prairie areas occur adjacent to the northern project boundary and along the bluff top located approximately 500 feet south of the project site that will provide habitat for pollinators during project construction. All areas of disturbed soil from construction of the project will be reseeded with native grasses, sedges, and forbs, and all seed mixes proposed for the project will be reviewed and approved by the DNR staff, (including the WMA manager and the Regional Plant Ecologist) prior to seed installation to ensure pollinator habitat is reestablished within the project area.

A MBS Site of Biodiversity Significance with a moderate ranking is located along the southwestern fringe of the project area (site name NORWAY TWP 28). This MBS site is associated with the bluff that occurs adjacent to the stream along the southwest project boundary, and the MBS boundary partially extents onto the floodplain where the project is proposed. No work is proposed along the bluff slope and associated forest community of the MBS site, but grading for floodplain reconnection is proposed on the floodplain where the MBS boundary overlaps the project site. The proposed work will minimally impact the MBS site during project construction, and all disturbed soil from project construction will be reseeded with native riparian vegetation. Invasive species such as common buckthorn and wild parsnip will be managed within all soil disturbance areas per the three-year vegetation maintenance plan developed for the project. The area of the MBS site that overlaps the proposed project area will benefit from removal of invasive species from this area.

Climate change threatens to exacerbate some of the impacts to fish and wildlife. Hotter summers and warmer winters combined with canopy removal have the potential to increase stream temperatures within the project area. However, creation of deep pools and shading of the stream with overhanging native herbaceous vegetation will help mitigate impacts from solar radiation post-construction.

The project will have a net-positive impact on fish, wildlife, and the plant communities within the stream area. While project construction has the potential to spread weedy and invasive species through soil disturbance, the net effect will be a reduction of invasive species over the long-term through removal of invasive species from the project area and establishment of a diverse community of native grasses and forbs. The project will include a three-year vegetation management plan that will be conducted by the project contractor with input from the DNR WMA

manager. Management will include occasional mowing and spot herbicide treatments for both woody and herbaceous invasive species. Mowing is only proposed during the first two years of vegetation establishment to limit impacts to developing native vegetation.

Overall, the proposed project will have a long-term positive benefit to the natural resources in the project area through the following:

- Creation of rock riffles will improve and increase macroinvertebrate habitat and fish spawning opportunities and will also maintain deep-pool habitat.
- The project will increase the number and depth of pools for thermal refugia during the summer months and provide overwintering habitat for fish and other aquatic biota.
- The reconnected floodplain will improve riparian hydrology, benefit native hydrophytic vegetation, and reestablish wetland habitat adjacent to the stream.
- Reducing sediment and nutrient loading within the project area will help improve the water quality of downstream impaired resources (South Fork Root River).
- Native seeding will increase the diversity and extent of native vegetation within the project site, and invasive species documented in the project area will be managed, including common buckthorn, Siberian elm, exotic bush honeysuckles, dame's rocket, wild parsnip, reed canary grass, chickweed, creeping charlie, Queen Anne's lace, common burdock, cocklebur, and garlic mustard.
- Seeding native forbs will improve habitat for pollinators including the federally listed rusty patched bumblebee and monarch butterfly.
- Establishment of brush piles will provide refugia for terrestrial fauna, particularly small mammals and herpetiles.

d. Identify measures that will be taken to avoid, minimize, or mitigate the adverse effects to fish, wildlife, plant communities, ecosystems, and sensitive ecological resources.

The project will have a net positive impact on fish and wildlife habitat as mentioned above in **Item 14.c.** The temporary negative impacts from project construction will be mitigated by the following measures:

- No instream work will occur between October 15 to April 15 per DNR work exclusion dates to allow for fish spawning and migration.
- Project precautions to avoid impacts to timber rattlesnake will include the recommendations provided in the natural heritage review letter and will include: checking the project work area for snakes each day before starting work, especially around metal objects, rock piles, culverts, and rock outcrops, avoidance of stockpiling rock or metal objects in adjacent tall grass, avoiding stockpiling of material that will sit for weeks before they are used, erosion and sediment control measures will be limited to wildlife friendly products to prevent incidental take of timber rattlesnakes and other animals, and avoidance of hydromulch products that may contain synthetic fiber additives.
- Tree harvest will occur by March 31, 2024 to minimize impacts to migratory species and tree-nesting/roosting species such as the northern long-eared bat and tricolored bat.
- Work is only proposed on degraded stream banks and will bypass stream banks that are stable or that are currently providing quality near stream/ instream habitat.
- Wooded bluffs adjacent to the stream will be preserved including no disturbance of the creek edge at the base of the bluffs.

- Significant native trees and stable root masses adjacent to the creek will be preserved for bank stability and habitat diversity.
- Implementation of appropriate sediment BMP's, including rapid soil stabilization, to minimize soil erosion during project construction.
- Upon completion of earthwork, all disturbed soils will be seeded with native species and stabilized with hydromulch and crimped straw.

14. Historic properties:

Describe any historic structures, archeological sites, and/or traditional cultural properties on or in close proximity to the site. Include: 1) historic designations, 2) known artifact areas, and 3) architectural features. Attach letter received from the State Historic Preservation Office (SHPO). Discuss any anticipated effects to historic properties during project construction and operation. Identify measures that will be taken to avoid, minimize, or mitigate adverse effects to historic properties

A Phase I Archaeological and Cultural Resources field survey was completed by Mississippi Valley Archeology Center (MVAC) in May 2023 (Appendix D). This study showed: 1) No properties currently listed on the National Register of Historic Places (National Register) are located within or proximate to the project area; 2) Five previously inventoried cultural sites were located within 1-mile of the project area, but no cultural sites occurred within the project area; and 3) Soils are classified as deep post-settlement alluvium (PSA) with limited potential for intact archaeological deposits due to significant stream migration and floodplain erosion as interpreted from historic aerial imagery.

The Phase I Archaeological and Cultural Resources report was submitted to the Minnesota State Historic Preservation Office (SHPO) for their review and comment. A copy of the SHPO letter response is included in Appendix E.

As part of the Section 404 permitting process, the U.S. Army Corps of Engineers (USACE) will conduct their own internal review of the project to fulfill their responsibilities under Section 106 of the National Historic Preservation Act to identify and consider impacts the project may have on known historic resources. A copy of the MVAC report will be included in the permit application submitted to the USACE.

15. Visual:

Describe any scenic views or vistas on or near the project site. Describe any project related visual effects such as vapor plumes or glare from intense lights. Discuss the potential visual effects from the project. Identify any measures to avoid, minimize, or mitigate visual effects.

Visitors to the WMA and AMA where the project is proposed may observe disturbance to the stream corridor during project construction such as disturbed soil, temporary piles of harvested logs, and presence of construction equipment. These impacts are considered temporary since active construction is to be completed over a four-week period, including final soil stabilization, hydromulching, and native seeding. The proposed seeding of native herbaceous vegetation is expected to mature within three years following completion of the project.

16. Air:

a. Stationary source emissions - Describe the type, sources, quantities and compositions of any

emissions from stationary sources such as boilers or exhaust stacks. Include any hazardous air pollutants, criteria pollutants. Discuss effects to air quality including any sensitive receptors, human health or applicable regulatory criteria. Include a discussion of any methods used assess the project's effect on air quality and the results of that assessment. Identify pollution control equipment and other measures that will be taken to avoid, minimize, or mitigate adverse effects from stationary source emissions.

No stationary source of emissions will be employed during the construction of the project or in its completed state.

b. Vehicle emissions - Describe the effect of the project's traffic generation on air emissions. Discuss the project's vehicle-related emissions effect on air quality. Identify measures (e.g. traffic operational improvements, diesel idling minimization plan) that will be taken to minimize or mitigate vehicle-related emissions.

Heavy equipment such as dump trucks, excavators, bulldozers, and tractors will be used during construction. Engine emissions including particle pollution, carbon monoxide, hydrocarbons, and nitrogen oxides will increase at the project site during construction, but the release of these pollutants will be minimized to periods of active construction during the day (generally between 8 am to 5 pm) and will occur over a four-week period of active construction. Emissions from construction are considered temporary and are not anticipated to cause or contribute to a violation of ambient air quality standards for any pollutants. Emissions are not anticipated to be noticeable to nearby landowners due to the distance from the project area (closest home is 540 feet to the northwest), nor are emissions likely to be problematic to visitors, since few machines will be operating at a given time. With the few machines operating at any given point in time, the emissions are not anticipated to be problematic to visitors. After construction, there will not be any project-related air emissions.

c. Dust and odors - Describe sources, characteristics, duration, quantities, and intensity of dust and odors generated during project construction and operation. (Fugitive dust may be discussed under item 17a). Discuss the effect of dust and odors in the vicinity of the project including nearby sensitive receptors and quality of life. Identify measures that will be taken to minimize or mitigate the effects of dust and odors.

The project will generate dust during construction from grading activities and from importing materials over dirt access trails. The effects on air quality from fugitive dust generated during construction will be temporary (between the hours of 8 am and 5 pm during a four-week active construction period) and localized. Dust minimization and prevention efforts are expected to be consistent with state standards contained in Minnesota Rules, chapter 7011 which provide limitations on the amount of dust released from a project or facility. There are no businesses or houses located adjacent to the project site, but two houses occur within 600 feet of the project boundary. Rapid soil stabilization is proposed for the project which will mitigate the release of dust from the work area. After construction is complete and vegetation becomes established, the project area will not create any dust.

Odors generated by the project during construction will be temporary and are expected to be odors typical of construction equipment, primarily dust and diesel exhaust. There will be no man-made odors emanating from the project area after construction.

17. Greenhouse Gas (GHG) Emissions/Carbon Footprint

a. GHG Quantification: For all proposed projects, provide quantification and discussion of project GHG emissions. Include additional rows in the tables as necessary to provide project-specific emission sources. Describe the methods used to quantify emissions. If calculation methods are not readily available to quantify GHG emissions for a source, describe the process used to come to that conclusion and any GHG emission sources not included in the total calculation.

GHG emissions from the project will result from two sources: the operation of construction equipment, and tree and brush removal during the conversion of forest to prairie/wetland. Emissions from construction equipment emissions were calculated by using methods identified in the EQB guidance document and standard metrics from the EPA's Greenhouse Gas Emission Factors Hub (https://www.epa.gov/climateleadership/ghg-emission-factors-hub). Project construction is estimated to take 18 days to complete and require the use of 5 diesel construction vehicles per day (two excavators, one skidsteer, one bulldozer, and one tractor). Fuel consumption at an average of four gallons per hour and eight-hour working days was used to calculate total fuel use of 2,880 gallons:

Fuel use = days * hours * fuel use per hour * number of vehicles

Emissions were calculated using this equation from the EQB EAW guidance document:

Tons CO2 = fuel use in physical units *CO2 Emission Factor (kg CO2/physical unit of fuel use) * conversion of kg to short tons

Emissions rates in Table 11 were retrieved from the Emissions Factors for Greenhouse Gas Inventory (EPA, 2023) for diesel nonroad construction vehicles.

Table 11. Rates of GHG Emissions for Nonroad Construction Equipment).

CO2 (kg/gal)	CH4 (grams/gal)	N2O (grams/gallon)
10.21	1.01	0.94

Totals emissions from construction equipment equate to 33.38 short tons of carbon dioxide equivalents (CO_2e) which were calculated using the appropriate global warming potential (GWP) for each GHG and the appropriate unit conversion factor.

Land use conversion from forest to grassland is the second category of emissions from the project. However, 72 of the 94 trees proposed for harvest are already dead, so emissions from conversion of "living" forest to prairie is significantly less for this project. The remaining 22 living trees proposed for harvest are estimated to be the equivalent of 0.2 acres of forest converted to grassland. Using the EPA's Inventory of Greenhouse Gas Emissions and Sinks to estimate an average carbon loss per acre for conversion from forest to grassland, there would be an estimated loss of 14.81 short tons of CO_2e per acre converted, which equates to 2.96 short tons of CO_2e for the proposed land conversion. However, most of the harvested trees would be reincorporated into the project for habitat enhancements, which is assumed to be a carbon sink. As a result, the total potential project-related emissions are estimated at 34.34 short tons of CO_2e (Table 12).

Table 12. Construction Emissions.

Scope	Type of Emission	Emission Sub-type	Project-related CO_2e Emissions (short tons)	Calculation Method(s)
Scope 1	Combustion	Mobile Equipment	33.38	Linear rate of diesel non-road construction vehicle emissions
Scope 1	Land Use	Conversion from Forest to Grassland	2.96	Estimated from nationwide averages for conversion from forest to grassland
Scope 1	Land Use	Carbon Sink	(2.0)	Woody material reused for habitat enhancements
TOTAL			**34.34**	

b. GHG Assessment

i. Describe any mitigation considered to reduce the project's GHG emissions.

ii. Describe and quantify reductions from selected mitigation, if proposed to reduce the project's GHG emissions. Explain why the selected mitigation was preferred.

iii. Quantify the proposed projects predicted net lifetime GHG emissions (total tons/#of years) and how those predicted emissions may affect achievement of the Minnesota Next Generation Energy Act goals and/or other more stringent state or local GHG reduction goals.

The project will require the use of Tier 4 Emissions level vehicles, which are construction vehicles that meet requirements established by the EPA to reduce particulate matter, nitrogen oxides, and air toxins from emissions from non-road diesel engines. All the reduction methods considered have already been incorporated into the project.

It is not anticipated the project will require other inputs during its life. The project will reduce the potential for bank erosion through bank reshaping and reconnection of the floodplain. Establishment of diverse, native vegetation will increase sequestration of carbon through the dense growth of plants and subsequent storage of carbon in the soil through the root systems which will mitigate the release of greenhouse gases released from construction of the project.

18. Noise

Describe sources, characteristics, duration, quantities, and intensity of noise generated during project construction and operation. Discuss the effect of noise in the vicinity of the project including 1) existing noise levels/sources in the area, 2) nearby sensitive receptors, 3) conformance to state noise standards, and 4) quality of life. Identify measures that will be taken to minimize or mitigate the effects of noise.

Existing Noise Levels and Sources

The project is located in a remote, rural area. Sources of noise are mainly from State Highway 43 located approximately 100 feet west of the upstream end of the project area and 2,150 feet west from the downstream end of the project area.

Noise Generated During Construction

The project is expected to generate noise during active construction and will result from operation of heavy equipment to complete the project. Noise impacts will occur only during periods of active construction during the day (generally between 8:00 am to 5:00 pm) and will occur over a four-week period of active construction. Noise will be generated by construction equipment during import of materials, earthwork, and tree removal activities. During project construction, it is anticipated up to three machines will be operating at the same time. For example, one excavator and one dozer to conduct soil grading, and one tractor to haul excess soil to a soil disposal area. Noise levels will vary depending on equipment in use and the distance between construction equipment and receptors. All construction equipment will contain mufflers to reduce engine noise.

Noise Generated After Construction

After construction, the project is not expected to generate any noise. All noise after construction will be from pre-project sources (State Highway 43).

Nearby Sensitive Receptors

Sensitive nearby receptors include the two houses located approximately 600 feet from the creek and any WMA/ AMA visitors/users when active construction is occurring.

Conformance to State Noise Standards

State noise standards are contained in Minnesota Rules, chapter 7030. The noise standards are based on the land use at the location of the person that hears the noise and the sound level in weighted decibels (dBA) over ten percent (L10) or fifty percent (L50) of an hour.

The land around the project area is residential/rural. Noise limits for residential locations are L10=65 dBA and L50=60 dBA during the daytime, and L10=55 dBA and L50=50 dBA during the nighttime. Noise generated from construction equipment will be limited to the hours between 8:00 am to 5:00 pm Monday through Friday to mitigate impacts of noise to nearby receptors and WMA/ AMA visitors. In addition, all construction equipment will contain mufflers to reduce noise impacts generated during active construction.

19. Transportation

a. Describe traffic-related aspects of project construction and operation. Include: 1) existing and proposed additional parking spaces, 2) estimated total average daily traffic generated, 3) estimated maximum peak hour traffic generated and time of occurrence, 4) indicate source of trip generation rates used in the estimates, and 5) availability of transit and/or other alternative transportation modes.

The project will utilize the existing public parking area located at the upstream end of the project area and immediately east of Highway 43. The existing parking area provides parking for approximately six vehicles. It is anticipated that one to three construction-related vehicles will be parked in the parking area during the active construction period between the hours of 8:00 am and 5:00 pm over a four-week construction period. Traffic related to construction vehicles will include the use of one to two transport trucks for construction workers and one to two trucks for importing materials to the project area. It is anticipated the construction vehicles will utilize Highway 43 for one to three hours each day during active construction depending on the construction schedule and need for import of materials.

b. Discuss the effect on traffic congestion on affected roads and describe any traffic improvements necessary. The analysis must discuss the project's impact on the regional transportation system.

If the peak hour traffic generated exceeds 250 vehicles or the total daily trips exceeds 2,500, a traffic impact study must be prepared as part of the EAW. Use the format and procedures described in the Minnesota Department of Transportation's Access Management Manual, Chapter 5 *(available at: http://www.dot.state.mn.us/accessmanagement/resources.html)* or a similar local guidance.

It is not anticipated that there will be a significant impact to traffic operations on any of the nearby roads. The contractor will be required to place signage on Highway 43 when trucks are hauling materials to the project area.

c. Identify measures that will be taken to minimize or mitigate project related transportation effects.

No traffic mitigation measures will be necessary.

20. Cumulative potential effects: (Preparers can leave this item blank if cumulative potential effects are addressed under the applicable EAW Items)

a. Describe the geographic scales and timeframes of the project related environmental effects that could combine with other environmental effects resulting in cumulative potential effects.

The proposed project impact area includes the area immediately surrounding the proposed project, along with areas immediately downstream. The project proposes to start early in 2024 with tree clearing; project construction is expected to occur over a four-week period between May 1 and September 1, 2024.

Geographic scale and timeframes of project related environmental effects that could combine with other effects are described below.

Climate change: The project will build resiliency in the stream channel to buffer potential effects of climate change such as increased rain events. Rain events are considered seasonal and sporadic and have been gaining in intensity for several decades. Average annual temperatures have also been increasing which may have cumulative potential effects with partial removal of the tree canopy. Climate change effects are anticipated to increase for the foreseeable future.

Cover types: The geographic scale for cover types includes impacts to cover types within the project impact area. The project will result in a decrease of wooded forest (3.38 acres) and grassland (.82 acres), and an increase of streams (.1 acre), and wetlands (4.1 acres)

Water resources: Impacts to water resources include the gain of 4.1 acres of wetlands due to reconnecting the creek with the floodplain. Temporary water quality impacts may result during the construction phase of the project.

Rare species: Project construction could impact habitat that could potentially be used by rare and protected species. Removing trees from the project area could impact the northern long-eared bat and tricolored bat if these species roost within the project boundary. Grading and clearing will have the potential to temporarily impact floral resources for bumblebees, butterflies, and other insects; however, nearby restored prairie areas occur adjacent to the northern project boundary and along the bluff top located approximately 500 feet south of the project site that will provide habitat for pollinators during project construction.

b. Describe any reasonably foreseeable future projects (for which a basis of expectation has been laid) that may interact with environmental effects of the proposed project within the geographic scales and timeframes identified above.

Staff from units of government were contacted to inquire about current or planned projects in the area that might have impacts that could contribute to cumulative potential effects from the proposed project. These include: DNR Division of Wildlife, DNR Division of Ecological and Water Resources, and the Fillmore Soil and Water Conservation District. Based on information obtained, reasonably foreseeable future projects do not exist within the geographic scope and timeframe in which project-related environmental effects are expected.

c. Discuss the nature of the cumulative potential effects and summarize any other available information relevant to determining whether there is potential for significant environmental effects due to these cumulative effects.

There are no reasonably foreseeable future projects identified that could combine with environmental effects from the proposed project to create potential effects greater than those from the proposed project. The effects from the project are not significant when viewed in conjunction with past, present, or future projects that would have overlapping environmental effects and the mitigation measures proposed.

21. Other potential environmental effects: If the project may cause any additional environmental effects not addressed by items 1 to 19, describe the effects here, discuss the how the environmentwill be affected, and identify measures that will be taken to minimize and mitigate these effects.

No other additional environmental effects are anticipated from this project. Potential environmental effects have been addressed in Items 1 through 19.

RGU CERTIFICATION. *(The Environmental Quality Board will only accept **SIGNED** Environmental Assessment Worksheets for public notice in the EQB Monitor.)*

I hereby certify that:

a. The information contained in this document is accurate and complete to the best of myknowledge.
b. The EAW describes the complete project; there are no other projects, stages or components other than those described in this document, which are related to the project as connected actions or phased actions, as defined at Minnesota Rules, parts 4410.0200, subparts 9c and 60,respectively.
c. Copies of this EAW are being sent to the entire EQB distribution list.

Signature: Becky Horton Digitally signed by Becky Horton Date: 2024.01.17 11:32:45 -06'00' Date: January 17,2024

Title: EAW Project Manager

EAW References

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