National Park Service
U.S. Department of the Interior

Grand Portage National Monument
Minnesota

STATEMENT OF FINDINGS
FOR
EXECUTIVE ORDER 11990 (PROTECTION OF WETLANDS)

MILE CREEK ROAD RE-ROUTE AND BRIDGE CONSTRUCTION
COOK COUNTY HIGHWAY DEPARTMENT &
GRAND PORTAGE BAND OF LAKE SUPERIOR CHIPPEWA
MILE CREEK ROAD/COUNTY STATE AID HIGHWAY 17 (CSAH 17)
GRAND PORTAGE NATIONAL MONUMENT
GRAND PORTAGE, MINNESOTA

Recommended:

Superintendent, Grand Portage National Monument Date

Certification of Technical Adequacy and Service-wide Consistency:

Chief, Water Resources Division Date

Approved:

Regional Director Date

Grand Portage Creek
Appendix H:
Statement of Findings for Wetlands

Grand Portage National Monument
February 2023

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Project No. 08256023

Grand Portage Creek
Cook County Highway Department

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1.0 INTRODUCTION

Executive Order (EO) 11990, Protection of Wetlands, and EO 11988, Floodplain Management, require the National Park Service (NPS) and other federal agencies to evaluate the likely impacts of actions in wetlands and floodplains, respectively. NPS Director's Order #77-1: Wetland Protection provides NPS policies and procedures for complying with EO 11990. NPS Director's Order #77-2 provides NPS policies and procedures for complying with EO 11988. The NPS adheres to a "no net loss" of wetlands policy, as well as other federal and agency policies. This statement of findings has been prepared in accordance with Executive Order 11990 (Protection of Wetlands) and NPS Director's Order #77-1.

Based on NPS Directors Order #77-1: Wetland Protection (2002) and NPS Procedural Manual #77-1: Wetland Protection (2016), a Statement of Findings (SOF) must be prepared if a preferred alternative would have adverse impacts on wetlands. This SOF has been prepared to comply with EO 11990 and 11988. A wetland delineation was completed in 2021, which identified 0.76 acres of Type 6 (Riverine and Palustrine scrub/shrub and forested) wetland in the vicinity of the project area. This wetland type is characterized by organic or mineral soil and a water table at or near the ground surface. Common sites for shrub swamp type wetlands include along sluggish streams, drainage depressions and occasionally floodplains (Minnesota Department of Natural Resources, 2022). Approximately 0.33 acres of these wetlands would be impacted by the proposed road realignment project.

Cook County, Minnesota and the Grand Portage Band (the Band) of Lake Superior Chippewa (Ojibwe), in partnership with the Grand Portage National Monument (the Park), propose to realign a segment of Mile Creek Road/County State Aid Highway 17 (CSAH 17) and construct a new bridge across Grand Portage Creek ***(Figure 1)***. An Environmental Assessment (EA) for the proposed Mile Creek Road Re-Route and Bridge Construction was prepared in compliance with the National Environmental Policy Act (NEPA). The EA identified two alternatives, Alternative A: No Action, and Alternative B: County Road 17 Re-Route (Preferred Alternative). Under the No Action Alternative, the road would not be realigned. Under the Preferred Alternative, an existing blind curve would be removed, and a portion of the original asphalt would be left in place as a walking path, and the road would be re-routed across a new bridge. The purpose of this SOF is to present the rationale for the proposed realignment and document anticipated effects on wetlands.

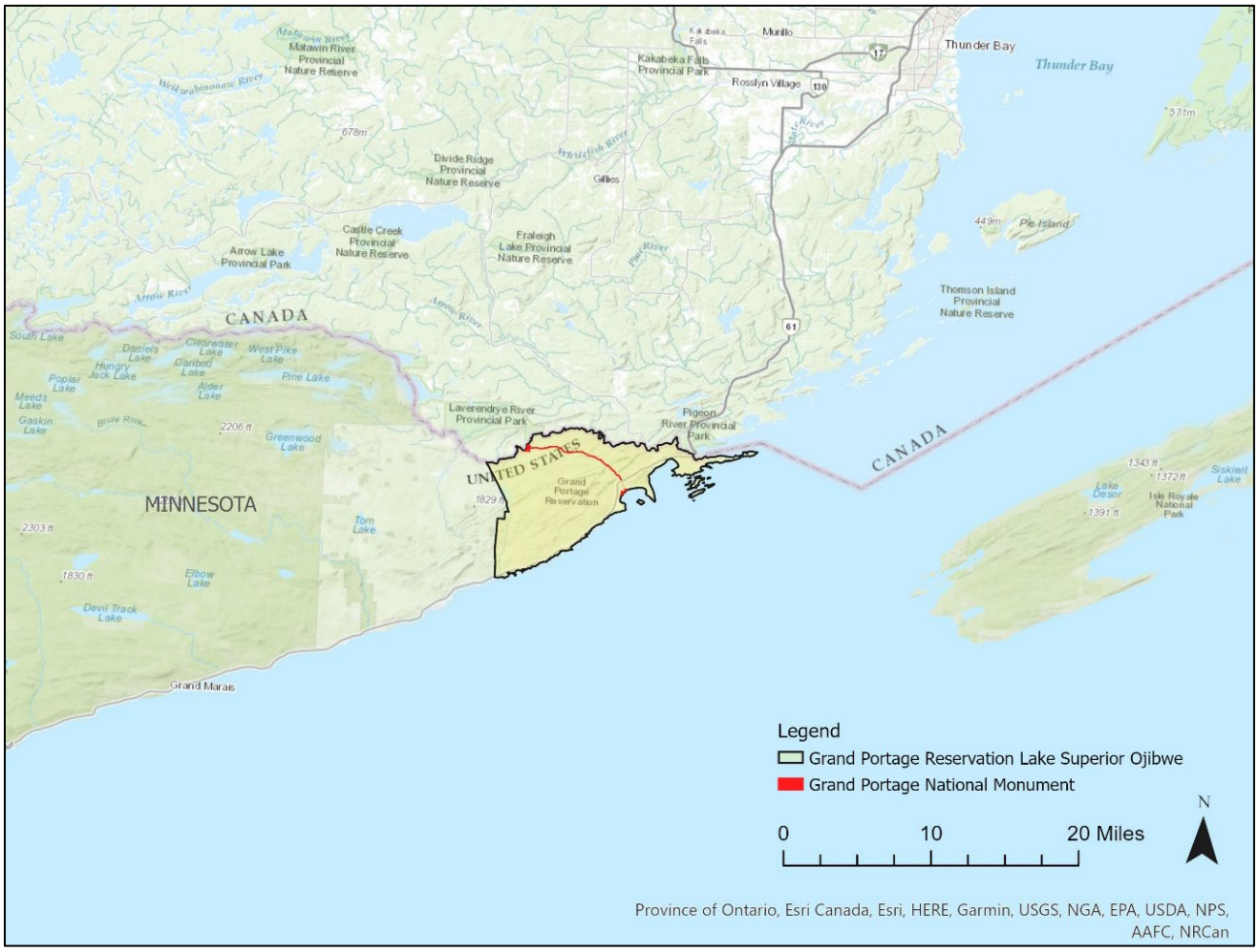

Figure 1. Site Location Map: Grand Portage National Monument and Grand Portage Indian Reservation.

2.0 PROPOSED ACTION

The purpose of this project is to reduce the hazard caused by the blind curve on CSAH 17, eliminate safety, traffic and plowing impacts on the historic bridge and increase pedestrian access. The project is needed to improve safety and protect park resources.

Alternative A: No-Action Alternative
The No-Action Alternative assumes that current management would be continued and no realignment construction would occur. It provides a benchmark for comparative purposes with the Proposed Action Alternative. The No Action Alternative would retain the existing roadway, including the portion that crosses Grand Portage Creek via the historic stone bridge and the existing blind curve. Repairs would continue to be made by the NPS to preserve the stone bridge.

Alternative B: Road Realignment (Proposed Action)
Under the Proposed Action, Mile Creek Road/CSAH 17 would be realigned to remove a blind, 90-degree turn and eliminate vehicular traffic across the historic stone bridge. The proposed realignment would require construction of a 450-foot straight segment that runs from the T-intersection of Mile Creek Road and Store Road, roughly north-northeast, and would connect with Mile Creek Road at the park's decommissioned maintenance shop ***(Figure 2)***.

The realignment would consist of an approximately 70-foot-wide raised roadbed that would cross Grand Portage Creek at a point approximately 220 feet north, or upstream, of the existing stone bridge. Where the new alignment crosses the creek, a new 20-foot-wide by 56-foot-long wooden bridge would be constructed ***(Figure 3)***. The bridge would be built with three spans; two 18-foot spans on the north and south sides of the creek, and one 20-foot span in the center. Two piers would be placed in the creek channel to a depth of 3 feet below the channel bottom. All construction would occur above the ordinary high water mark.

A corridor will be cleared and brushed prior to construction. This will include clearing brush and trees and removing stumps. Clearing will include approximately 48 individual black fruited hawthorn shrubs and other shrub species (such as willow). Approximately 40 mature jack pine and approximately 0.2 acres of young balsam will be removed in the area where the realignment will connect with Mile Creek Road at the far eastern end. Approximately 10 red pine will be cleared from the upland area where the realignment meets the junction of the Grand Portage Trail and Mile Creek Road.

The existing road between the Mile Creek Road and Store Road intersection and picnic area parking would be closed to all vehicular traffic and would be converted to a 10-foot-wide trail that would provide pedestrian access across the historic bridge. To protect the historic bridge, the path would not be plowed or otherwise maintained in the winter.

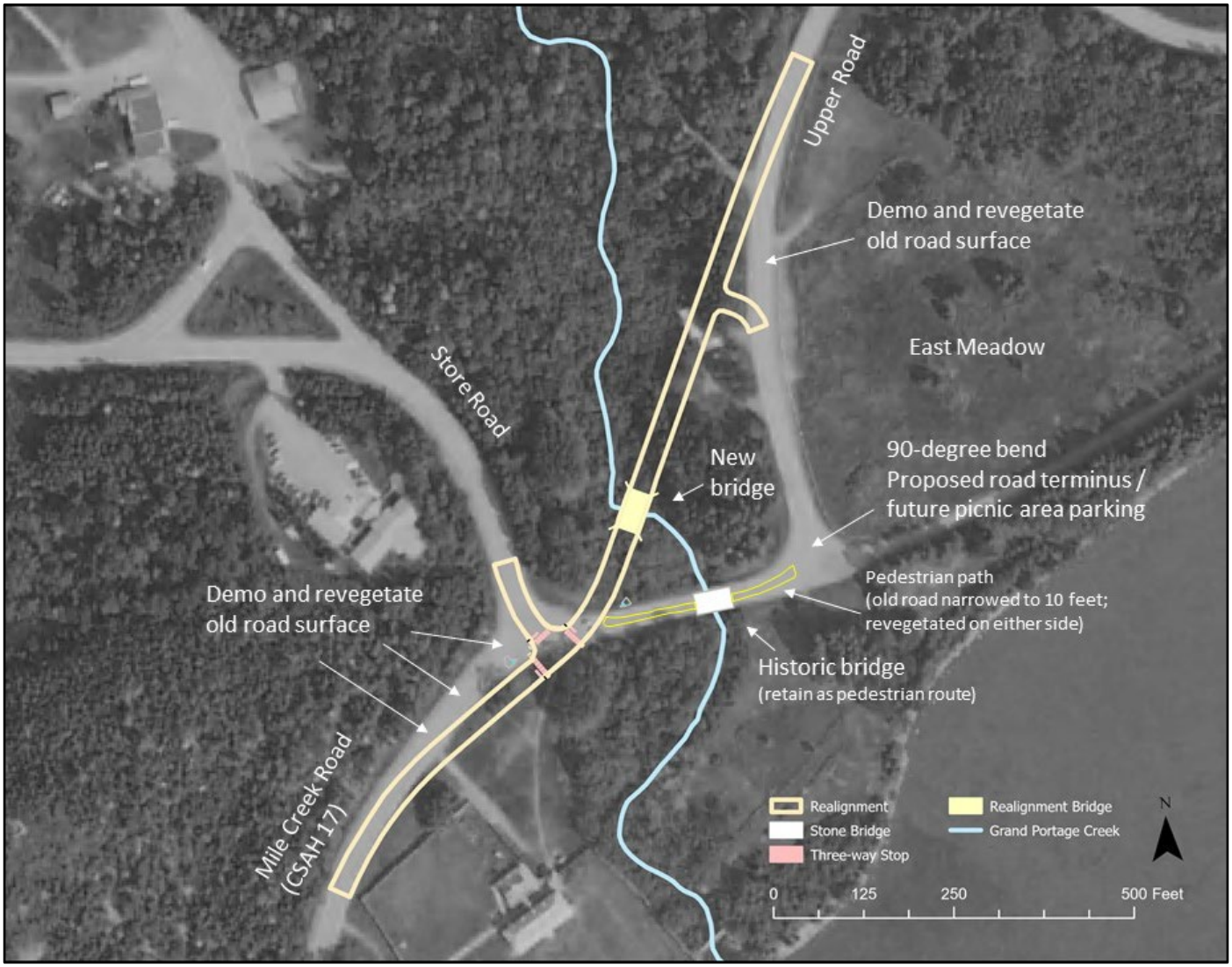

Figure 2. Project Map: Alternative B - Road Realignment.

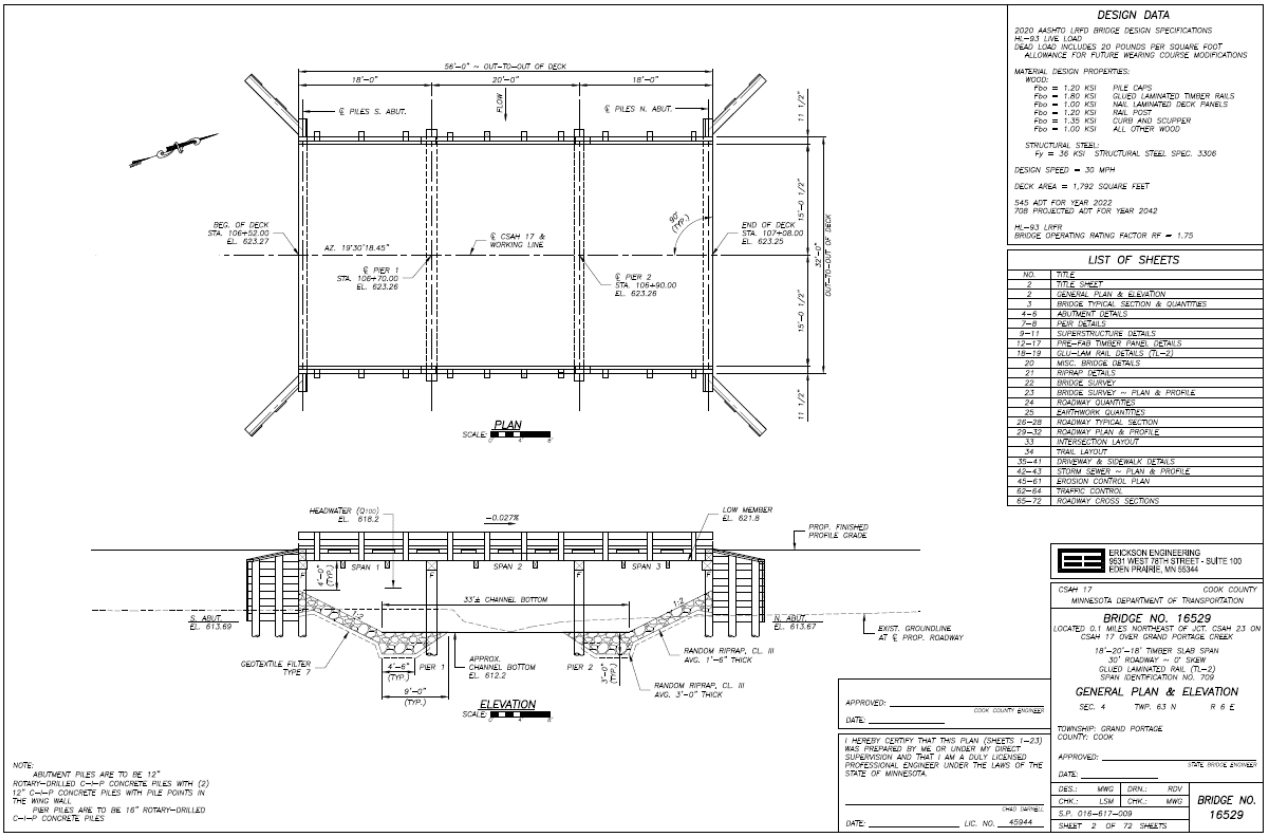

Figure 3. Proposed Bridge Design.

Other Alternatives Considered

The following alternate road realignment bridge designs were considered but dismissed ***(Figure 4)***:

Cemetery Alternative

This alternative would include a raised road corridor and bridge located approximately 650 feet upstream from the stone bridge. The route would connect Store Road on the west side to Mile Creek Road on the east side, just below the historic Holy Rosary Catholic Church and associated cemetery. A small portion of the cemetery is inside the park boundary. The alternative would take advantage of a topographic narrowing of the stream valley on the west side, but would exit onto Mile Creek Road at the foot of the cemetery hill. In addition to the cemetery's known graves, historic photographs indicate there are likely many unmarked graves in the area. Ethnographic evidence also suggests some internments dating to the 1700-1800s may exist in the slopes below the current cemetery boundary. Historic records and pedestrian surveys also suggest the presence of archeological features in the slopes below Holy Rosary Cemetery that may date to the 18th century fur trade and 19th century Grand Portage Village periods. These features have not been evaluated for NRHP eligibility. This alternative would also add a traffic crossing on the Grand Portage Trail, which would break up the hiking experience for park visitors. Ground disturbance adjacent to the cemetery, the potential for inadvertent discoveries and impacts to

human remains or archeological resources, visual impacts, traffic noise, and impacts to visitor experience make this alternative unacceptable.

Powerline Corridor Alternative

This alternative would require a raised roadbed and bridge constructed within an existing powerline corridor, approximately 1,450 feet upstream and north of the historic stone bridge on Mile Creek Road. This option would intersect Store Road across the street from the Grand Portage community pow-wow grounds and cut across the edge of an allotment. This alternative would be constructed close to the home of a Band member and create a traffic hazard during the Grand Portage community's annual pow-wow celebration. Increased traffic in this area would also increase traffic noise and exhaust near the home and during the celebration. This alternative would also alter or relocate the community ball field, which is an area suspected to contain archeological deposits and possible burial sites. This alternative could have significant adverse impacts on unrecorded graves and archeological remains from the 18th and 19th centuries.

Alternate Bridge Designs

Alternative bridge designs were considered, including single-span and two-span options. These designs were dismissed due to engineering limitations on the length of each span and the overall length of the proposed stream crossing.

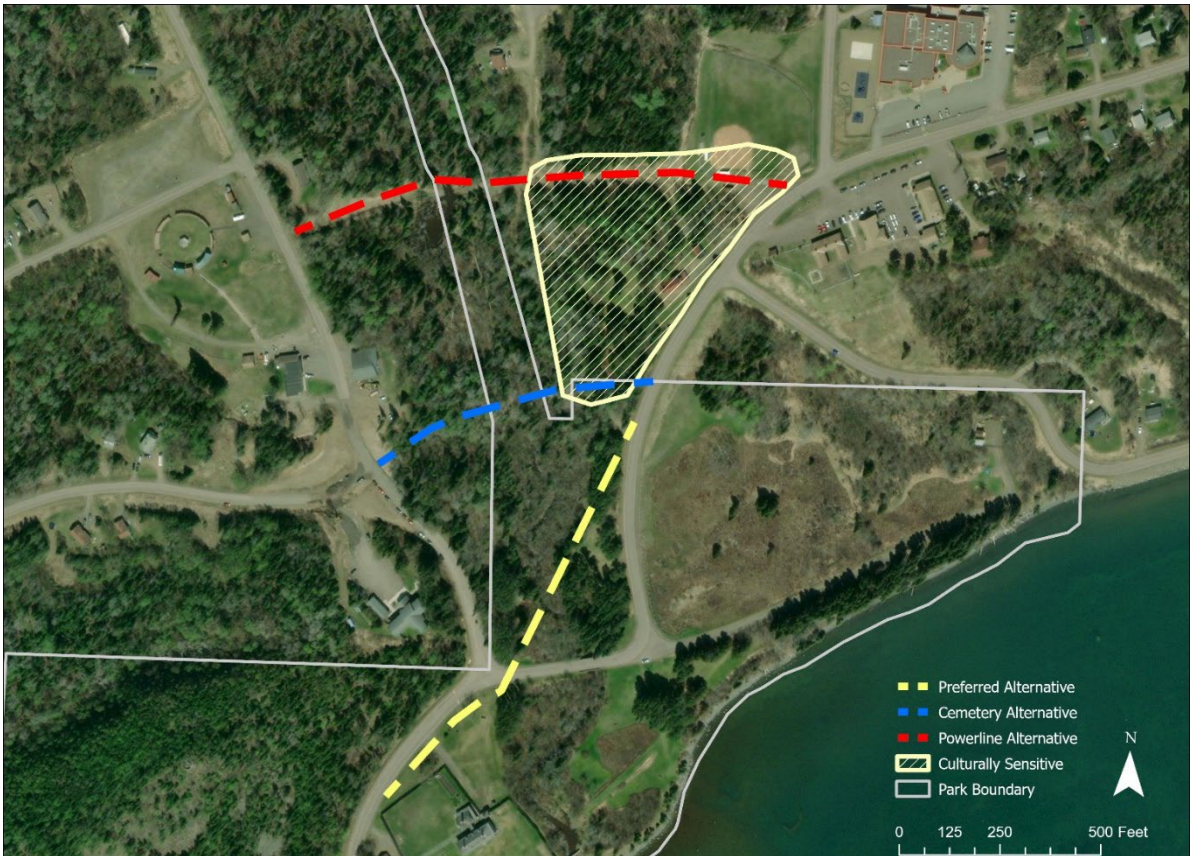

Figure 4. Preferred Alternative and Alternative Routes Considered but Dismissed.

3.0 SITE DESCRIPTION

MSA Professional Services, Inc. (MSA) staff conducted field delineation of wetlands and surface waters within the project area using available, offsite sources (including USGS topographic maps, National Wetland Inventory maps and LIDAR data) and field observations in July 2021. A Routine Onsite Determination was completed for this project. At each observations point (wetland and upland), a Wetland Determination Data Form – Northcentral and Northeast Region was completed. The following information was collected at each of the four observation points:

1. Determination of presence or absence of normal circumstances;
2. Observations of primary and secondary indicators of wetland hydrology;
3. An assessment of dominant hydrophytic and upland plant communities using current approved vegetation assessment methods;
4. The plant species indicator status, following categories outlined in Table 1 of the USACE 1987 Manual; and
5. Soil characteristics, such as color and texture and the presence or absence fo redoximorphic features.

The wetland delineation performed by MSA identified a palustrine scrub shrub and forested wetland area on either side of the Grand Portage Creek riverine wetland just to the north of Mile Creek Road (Wetland Area 1). Wetland Area 1 has primary characteristics of a palustrine scrub/shrub wetland which is associated with the Grand Portage Creek riverine and palustrine wetland flood plain ***(Figure 5)***.

Figure 5: Wetland Delineation Map.

Plant species identified at one or both of the two wetland data points included Speckled Alder (Alnus incana, FACW), Mountain Maple (Acer spicatum, FACU), Tatarian Dogwood (Cornus alba, FACW), Ostrich Fern (Matteuccia struthioptersis, FAC), Meadow Horsetail (Equisetum pratense, FACW) and Purple Meadow-Rue (Thalictrum dayscarpum, FACW).

Wetland hydrology indicators observed at data point DP-1 included: High Water table (A2), Saturation (A3), Sparsely Vegetated Concave Surface (B8) Geomorphic Position (D2) and FAC Neutral Test (D5). Wetland hydrology indicators observed at data point DP-3 included: Saturation (A3), Water marks (B1) Water-stained leaves (B9) and FAC Neutral Test (D5).

The soil in the area of data point DP-1 was classified as a muck with a matrix color of 7.5YR3/2 from 0-10 inches bgs. Hydric soil indicator status 2 cm Muck (A10) was observed at DP-1. The soil in the area of data point DP-2 was classified as a muck with a matrix color of 7.5YR3/2 from 0-16 inches bgs.

3.1 Evaluation of Wetland Functions and Values

As part of the technical review, a Minnesota Routine Assessment Method (MnRAM) evaluation of wetland was requested.

The MnRAM for Evaluating Wetland Functions was originally devised after the passage of the Wetland Conservation Act in 1991 as a practical assessment tool that would help local authorities make sound wetland management decisions as the assumed responsibility for regulating wetland impacts. The objective of a wetland management classification system and management standards is to achieve no net loss of wetland functions and values within the management area while providing flexibility for economic development that may require wetland impacts. Impacts to wetlands include not only direct impacts such as filling, draining, and excavating, but also indirect impacts from stormwater inputs, changes to local surface and ground water hydrology, and pollutant loading. The evaluation is conducted by applying field observations into a ranking spreadsheet to evaluate each of the twelve wetland function and value characteristics (ranging from: Low, Medium, High and Exceptional) to produce an overall value for the wetland. A MnRAM Assessment spreadsheet was completed for the evaluation of this wetland and is provided as **Appendix A**. Wetland Functional Values for the area proposed for impact fall within the Medium to High characterizations with no Low or Exceptional ratings. The following is a summary of the results of the MnRAM evaluation for the wetland on the property:

<u>Vegetative Diversity/Integrity</u>
The palustrine wetland vegetation characteristics are limited by a rocky substrate common to streams and watersheds of the North Shore area of Lake Superior. While vegetative diversity is limited by these area characteristics, vegetative quality is high in the area with limited invasive species within this wetland area. Nearby road features have introduced a manipulated setting toward the southern end of the wetland area, which does impact the overall functional rating for the wetland. The spreadsheet rating for vegetative diversity/integrity is considered Medium. The road realignment does not appear to pose a significant impact to the vegetative diversity/integrity of the area. A portion of the project area is already defined by moderate manipulation and bridge design will allow for maintaining the riverine regime.

Hydrology
The wetland is a palustrine system associated with the Grand Portage Creek watershed/flood plain. The wetland exists within a somewhat modified area with nearby impervious surfaces, but generally low-density development. The wetland is considered a discharge wetland based upon its topographic setting, surrounding soils, watershed land use and size. The spreadsheet rating for the hydrology is Medium. The limited footprint of wetland impacts created in the area of wetland immediately adjacent to Grand Portage Creek and already disturbed area near the existing road features lead to a conclusion that the proposed project will have minimal effect on area hydrology (project is a bridge span across the channelized feature).

Flood Attenuation
The wetland area is a flow through, riverine system with limited nearby features/characteristics affecting surface flow. Steep area/regional topography slopes to Lake Superior to the south, with water from adjacent uplands flowing towards the channelized flow within Grand Portage Creek. Because of its importance to providing a natural flow pattern for water within the watershed to enter Lake Superior, the flood attenuation rating for these riverine wetland features is characterized as High. A lower storage capacity, in its natural state, limits the characterization to High in comparison to Exceptional. The project design, including a bridge feature extending over the maintained stream bed have limited impacts to the flood attenuation capacity of the stream and associated wetlands.

Downstream Water Quality
The wetland is a riverine system associated with Grand Portage Creek. Grand Portage Creek is a Minnesota classified Public Water (S-087 and PWI_ID 16087) and it is listed as a trout stream by the Minnesota Department of Natural Resources.

The spreadsheet rating for downstream water quality is High. The project is designed to maintain the hydrologic regime of Grand Portage Creek by bridging the features and appropriate abutment cladding is proposed to prevent project area erosion and downstream sediment loading. Further, the road realignment provides for limited additional impervious surface contributions not already existing due to the current local road system.

Wetland Water Quality
The wetland is 100 percent vegetated with very low evidence of accelerated sediment delivery in the form of sediment fans. Within 50 feet of the wetland there is limited upland buffer; manicured, primarily vegetated adjacent areas; with areas of sparse adjacent vegetation and impervious surfaces; and moderate slopes. There is moderate evidence of disturbance to wetland soils with some degradation near area road features. Upland soils in the area consist mainly of bouldery glacial till. The spreadsheet rating for wetland water quality is High.

Shoreline Wetlands
The wetland is a riverine system associated with Grand Portage Creek. The vegetative and substrate characteristics (rocky) result in relatively small contributions of shoreline protection from the types of vegetation and flow regime of the stream. The spreadsheet rating for shoreline protection is Medium and the minimal footprint of shoreline disturbance and bridging of the actual stream channel both limit impacts to the shoreline protection aspect of he wetland functions.

Characteristic Wildlife Habitat Structure

The wetland has no recognized rare wildlife or plants and the immediate project area is defined by common wildlife characteristics. Wildlife common to the Park include: white-tailed deer; grey wolf; black bear; brown bat; American beaver; southern red-backed vole; North American deermouse; least chipmunk; red squirrel; mole shrew; Arctic shrew; and common shrew. There are also moderate barriers to wildlife in the area consisting of moderately traveled roads and low to moderate area development. The function is rated as Medium through MnRAM evaluation for the area, with low to moderate overall development.

Maintenance of Characteristic Fish Habitat

The wetland is a riverine system associated with Grand Portage Creek, a MNDNR Public Water and trout stream. The wetlands are not associated with direct tributary or spring feeding conditions for the stream in the area of the proposed project. This functional value is rated High through the spreadsheet evaluation.

Grand Portage Creek and its associated wetlands provide significant habitat to a variety of macroinvertebrates and herpetofauna and is one of several local stream systems integral to a resurgence in coaster brook trout populations in the Lake Superior watershed.

Coaster brook trout are native to Lake Superior and a significant part of the local heritage. The reintroduction and management of coaster brook trout in Grand Portage Creek is part of the overall rehabilitation plan for coaster brook trout in Lake Superior (Newman et al, 2003). Currently, Grand Portage Creek harbors a healthy coaster brook trout population that was successfully reintroduced by a joint effort between the Grand Portage Band and the U.S. Fish and Wildlife Service (USFWS) (Witand et al, 2006).

Macroinvertebrate data for Grand Portage Creek, as provided by the Grand Portage Natural Resources Department, indicate a stable and improving condition. Macroinvertebrate habitat is highly affected by both low and high flow conditions. As proposed work to construct the new bridge crossing will not impact any areas below the ordinary high-water mark (i.e. all work will stay outside the stream bed features) and the amount of new impervious surface generating additional stormwater contributions is considered low, the effect on macroinvertebrate populations in the project area will not be significant. Best management practices to be employed during and after construction activities are further described in a following section of this Report.

Maintenance of Amphibian Habitat

The rocky substrate and narrow band of floodplain wetland lead to limited amphibian related habitat in the wetlands adjacent to the actual stream bed. The open water (stream portion) of the wetland area would rate as High for maintenance of amphibian habitat, but will remain undisturbed as part of the road realignment and bridge construction over Grand Portage Creek. The actual shoreland wetland features are considered Low for amphibian habitat maintenance.

Project plans and associated Best Management Practices (BMPs) call for construction activities to completely avoid working within or moving equipment through the Grand Portage Creek stream bed. Equipment can be staged to accomplish this BMP and will prevent direct impacts to the stream and its inhabitants.

Aesthetics/Recreational/Educational/Cultural

The wetland itself does not provide a unique or rare educational, cultural or recreational opportunity. It will be visible form vantage points, but is not located near a population center and is not located on private property. The spreadsheet rating for aesthetics/recreation/educational/cultural function is Medium.

Commercial Use

The wetland has low potential for recreational use and has not been modified to sustain a commercial product (peat, wild rice harvest or similar commercial use). The spreadsheet rating for commercial use is Low.

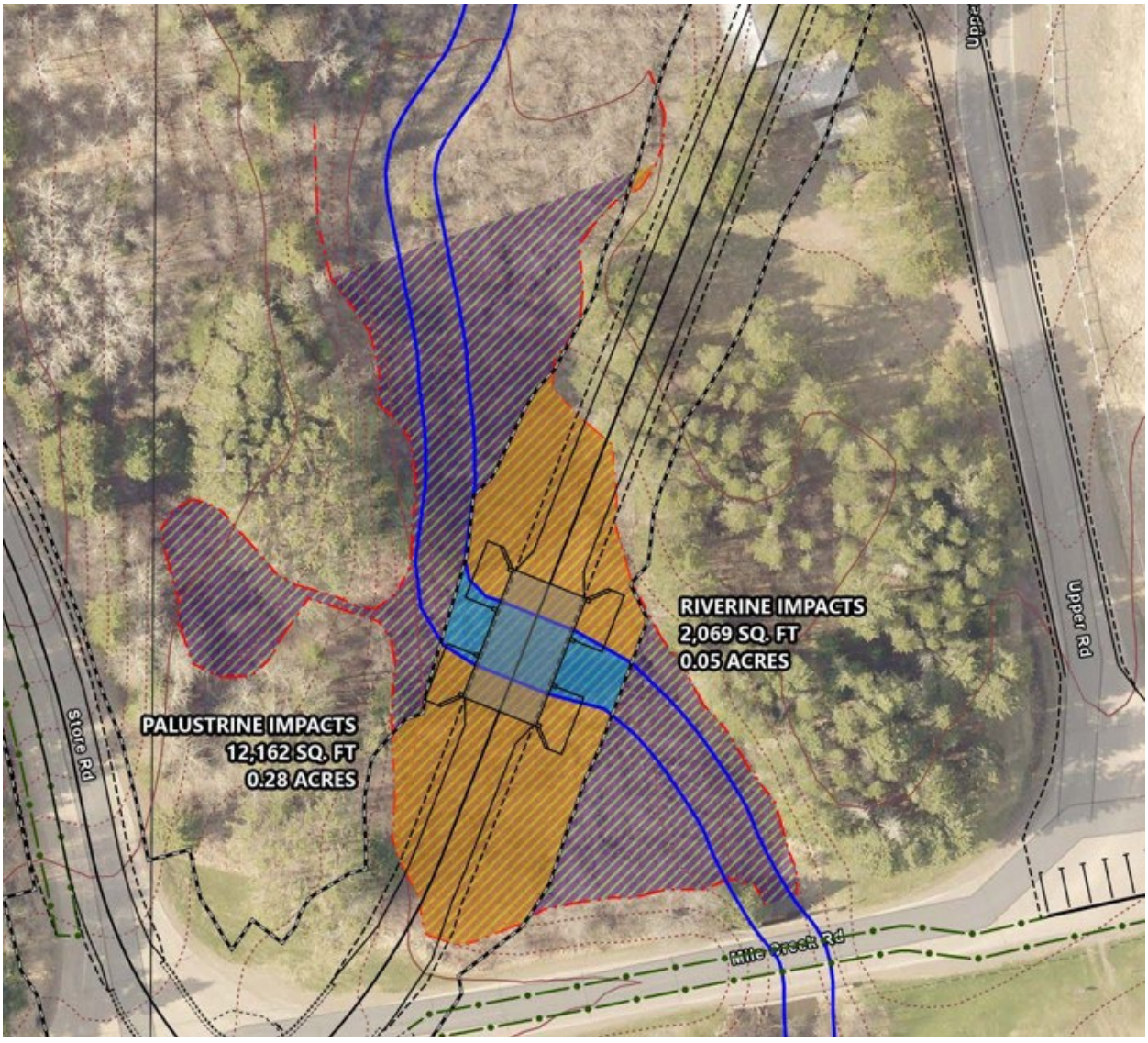

Figure 6: Areas of Wetland Impacts

3.2 Impacts to Palustine and Riverine Wetlands

The Proposed Action would result in unavoidable impacts to 0.33 acres of wetlands identified within the project area during the July 2021 wetland delineation (see Figure 6 above). Expected impacts would include the construction of the new roadway realignment and bridge crossing within the wetland area. The Proposed Action will result in a net increase of 0.30 acres of impervious surface, which is expected to cause a negligible increase in runoff.

3.3 Impacts to the Stream Ecology

The wetland area identified as part of this project is a riverine system existing within the flood plain for Grand Portage Creek. Flow is generally low to moderate with occasional flash conditions created by strong relief to the north and a broad watershed. The stream itself is rocky and provides limited environment for significant submerged aquatic vegetation.

The proposed project includes crossing the creek channel with a bridge span which limits impacts to the stream and its features (as compared to impacts which may be caused through the use of culverts or other closed features designed to allow water movement beneath surface features). The impacts to submerged aquatic vegetation from this proposed project are considered insignificant.

3.3 Floodplains within the Project Area

The project area is not currently mapped by the Federal Emergency Management Agency (FEMA), however, the project area appears to be located within the Grand Portage Creek flood plain based on observations made during wetland delineation activities. Based on the nature of the project (roadway relocation and bridge construction), complete avoidance of the flood plain is not possible with a build alternative. The Proposed Action will result in a net increase of 0.30 acres of impervious surface, which is expected to cause a negligible increase in runoff.

During review of the bridge design and a selected 3-span timber bridge, the backwater effect caused by the downstream, existing stone bridge was evaluated to determine its potential to affect the new bridge and possible consequences for the stream system during unusual storm events. Hydraulic modeling show stage increases of <0.1 feet for both the 100-year and 500-year events and the low member elevation for the bridge is 2.3 feet higher than the 100-year design stage. While backwater flooding may occur due to the restrictive downstream crossing, modelling shows that the effect on the new bridge would be negligible.

3.4 Mitigative Measures

In compliance with National Park Service Procedural Manual #77-1: Wetland Protection, Appendix 2: Best Management Practices and Conditions for Proposed Actions with the Potential to Have Adverse Impacts on Wetlands, the following practices will be implemented during the proposed bridge construction project over Grand Portage Creek.

3.4.1 Effects on Hydrology and Fluvial Processes

To limit effects on site hydrology and fluvial processes, the project is designed as a bridge crossing with abutments constructed and placed outside the banks of Grand Portage Creek. No work shall occur within the stream bed of the creek. Equipment will be staged on either side of the stream and no equipment will physically cross the creek during the construction activities.

3.4.2. Effects on Fauna

The bridge system will provide for unaltered movement, migration reproduction and health of coaster brook trout populations inhabiting the creek at the times of the year (fall) or other aquatic or terrestrial fauna.

3.4.3 Water Quality Protection and Certification

Water quality protection and certification shall comply with the requirements of the Grand Portage Band of Chippewa Water Resources Ordinance. Spill prevention and control measures will be employed to prevent or control spills of fuels, lubricants or contaminants from entering Grand Portage Creek or adjacent wetlands. Such actions will include on-site availability of spill containment and absorbents and appropriate management and training to implement response/clean-up actions via a spill response plan.

3.4.4 Erosion and Siltation Controls

Erosion and siltation controls will be maintained during construction, and all exposed soil or fill material will be permanently stabilized following Minnesota Department of Transportation (MnDOT) construction standards. Exposed soils with slopes of 1:3 or steeper will have temporary erosion control or permanent cover placed within seven days once the area is not actively being worked. To reduce sediment tracking during site work, the construction entrance will be stabilized with a vehicle tracking pad.

Following the completion of site work and spreading of topsoil, permanent vegetation will be established with either certified native seed mixes or with reused existing topsoil salvaged from the work site. after topsoil is spread. Any vehicle tracking pads installed to prevent sediment tracking from the site shall be removed and the area restored after site work has been completed.

3.4.5 Proper Maintenance

In accordance with MnDOT 2573 and 2575, all erosion and sediment control devices will be routinely inspected and logged at least once every seven days and within 24 hours of any 1/2-inch rain event. Upon inspection, all nonfunctional devices will be repaired, replaced or cleaned as necessary.

3.4.6 Heavy Equipment Use

Heavy equipment will be staged to complete work from either side of Grand Portage Creek. No heavy equipment will cross the stream bed as part of this project. Further, only wetland areas which will be filled and are proposed for impact and replacement will be impacted. Work areas

and erosion control BMPs will be placed to provide clear boundaries to the work zone and effectively protect the adjacent wetlands from sediment delivery or direct impacts from equipment.

3.4.7 Stockpiling Material

All excavated materials will be stockpiled in upland, rather than wetland, areas. If any stockpile is to remain in place for more than three days, sediment and erosion control devices/methods shall be used. Silt fence will be placed around any material stockpiles to prevent runoff to Grand Portage Creek and adjacent wetlands.

3.4.8 Removal of Stockpiles and Other Temporary Disturbances During Construction

Care will be taken to avoid impacts to wetland areas which are not proposed for impact and replacement. Any unintentional disturbances to soil, hydrology or native vegetation communities which occur during construction activities will be restored to pre-existing conditions as soon as practicable.

3.4.9 Topsoil Storage and Re-use

Existing topsoil will be salvaged, stored onsite and reused as practicable for restoration efforts. Storage and reuse will be completed as quickly as possible to prevent loss of seed and root viability, loss of organic matter and degradation of the soil microbial community.

3.4.10 Native Plants

Certified native seed mixes will be used to re-establish vegetation within the work area following completion of the bridge construction and stabilization of side slopes, ditches and shoulder areas. Seed mixes shall comply with NPS policies and guidance for use and be appropriate for the areas in which they are being used.

3.4.11 Boardwalk Elevations

No boardwalks are being constructed as part of this project. The bridge decking is a sufficient distance (elevation) to provide adequate clearance and daylighting to allow for vegetation growth in the underlying stream bed. Vegetation in the Grand Portage Creek stream bed is limited due to the rocky nature of the channel.

3.4.12 Wild and Scenic Rivers

Grand Portage Creek is not a State or Federally designated Wild and Scenic River.

3.4.13 Coastal Zone Management

This project exists within the Coastal Management Zone for Lake Superior. Project-related stormwater/erosion control measures are reflective of work being completed in this ecologically sensitive area.

3.4.14 Endangered Species

No threatened or endangered species were identified during wetland delineation activities. While not listed, the coaster brook trout and its spawning habitat are of special consideration for this project and no disturbance to the stream bed will occur.

3.4.15 Historic Properties

The bridge construction project is being completed to alleviate heavy vehicle traffic over the existing historic stone bridge. The project is designed to be consistent with the long-term goals and plans for Grand Portage National Monument.

4.0 JUSTIFICATION FOR USE OF WETLANDS

The purpose of the Proposed Action is to reduce the current hazard caused by a blind curve on CSAH 17, eliminate safety concerns and traffic and plowing impacts to an existing historic bridge, and enhance pedestrian access. The Proposed Action is required to improve safety and protect park cultural resources.

5.0 MITIGATIVE ACTIONS

Planned mitigative action for the project area includes invasive species prevention measures in and around the identified wetland areas.

The following mitigative measures will be taken to reduce the potential impacts of invasive species during construction work within the project area:

- Revegetation of all disturbed areas will occur in accordance with the revegetation plan in Appendix A of the EA, using native seed or mature transplants.
- A black fruited hawthorn inventory was conducted to document the number and location of these plants in the project area and determine their suitability for transplanting. No individuals young enough to be transplanted were found (B. Seitz, personal communication, December 12, 2022). Live, nursery grown plants will be installed post-construction in suitable habitat. Care will be taken to ensure the population is stable and the plants can continue to regenerate (see Revegetation Plan, Appendix A of the EA).
- All imported material including topsoil, gabions, rivet mattresses, or rip rap will be weed free.

The following revegetation goals were listed in Appendix A of the EA:

- Reestablish all ethnobotanically significant plant communities/species that occurred in the Limit of Disturbance
- Control invasive plant introduction and movement through the salvage of topsoil, exposed mineral soil, and contaminated heavy equipment used in construction.
- Mitigate the impacts to rare plant species.
- Maintain the natural landscape.
- Maintain the park vegetation diversity by using locally sourced seed of native species and outplanting nursery-grown shrubs started from locally sourced seed.
- Contain point-source pollution by properly storing topsoil.
- Minimize soil erosion using native vegetation.

Non-native and invasive Species Control will be executed by the NPS Great Lakes Invasive Plant Management Team, based out of St. Croix Falls, MN. Focus will be placed on pre-construction kill of all undesired species and post-construction kill of reed canary grass.

The compensation for wetland impacts will be completed following two mechanisms consistent with State and Federal requirements. To meet National Park Service requirements for on-site mitigation, approximately 5.4 acres of wetland-dominated land will be restored to native conditions through invasive species removal (***Figure 6***). The invasive species removal plan mitigation strategy results in a nearly 20:1 ratio for the restoration of the nearby wetland area. In order to meet State and Federal (USACE) replacement requirements which include in-place and in-kind stipulations, State Roadbank Wetland credits will be acquired through the Joint Application Permit process at a 1:1 ratio.

Figure 7: Wetland Mitigation Area

6.0 CONCLUSION

The proposed roadway realignment along Mile Creek Road/County State Aid Highway 17 (CSAH 17) and construction of a new bridge across Grand Portage Creek would improve park safety and visitor access. Based on review of alternatives, there does not appear to be a practicable alternative that would result in zero wetland impacts.

The Proposed Action would impact approximately 0.33 acres of wetlands. These wetland impacts will be mitigated through two mechanisms consistent with State of Minnesota and United States (National Park Service and Corps of Engineers) policies. To meet National Park Service requirements for on-site mitigation, approximately 5.4 acres of wetland-dominated land will be restored to native conditions through invasive species removal (Figure 6). The invasive species removal plan mitigation strategy results in a nearly 17:1 ratio for the restoration of the nearby wetland area. In order to meet State and Federal (USACE) replacement requirements which include in-place and in-kind stipulations, State Roadbank Wetland credits will be acquired through the Joint Application Permit process at a 1:1 ratio.

Mitigation and compliance with regulations and policies to prevent additional wetland or water quality impacts will be observed during and after the completion of construction activities. Based on proposed wetland restoration and compensation, no net loss of wetlands will occur, therefore, MSA finds this project to be consistent with the policies and procedures of NPS Director's Order #77-1 (Protection of Wetlands) and Executive Order 11990.

7.0 REFERENCES

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APPENDIX A

MnRAM Site Assessment Report

MnRAM Site Assessment Report

Portage Creek **Cook County, MN**

Wetland ID: 1, Township 4, Section 63, Range 6 East.

Cook County, Minnesota Corps Bank Service Area #1

Assessment Purpose: Planning

A site visit was made to this wetland on 6/10/2022 by Jeff Anderson. Site conditions were Normal. This wetland is estimated to cover 0.76 acres.

This report reflects conditions on the ground at the date of the assessment and, unless noted or implicit in the standard questions, does not reflect speculation on the future or past conditions.

This wetland is located in or near the city of Grand Portage, Minnesota.

General Features

Hydrogeomorphology

The maximum water depth at this site is variable due to seasonal changes with spring runoff and high precipitation events which is controlled from Grand Portage Creek..

As a Floodplain wetland, this site is outside waterbody banks. As such, it likely receives water on an irregular basis depending on water flows.

This wetland has been drained or altered 0% from its original size of 0 acres.

Soils

No soils were observed on the NRCS Soil Survey Database.

Soils onsite observed were sandy soils.

Vegetation and Upland Buffer

The extent of vegetation in this wetland is about 75 percent and the naturalized buffer width averages 50 feet. Vegetated buffers around wetlands provide multiple benefits including wildlife habitat, erosion protection, and a reduction in surface water runoff.

This buffer not only provides an excellent buffer for wetland water quality, it also serves as an important resources for wildlife habitat.

As a shoreline wetland, this site has the potential to protect from erosion and provide spawning and nursery habitat for fish and wildlife. Wetlands located in areas with strong currents and wave action have the greatest potential for protecting shoreline. Shorelines composed of sandy or erodible soils will benefit the most from shoreline wetland protection.

Special Features

There were no special features observed at the site at the time of this assessment

Vegetative Communities

The following plant communities were observed:

(See Appendix A for details on the Dominant Species per plant community)

Shrub-carr Type 6, PSS1. This community had a vegetative index of moderate and comprised 100 percent of the entire area.

Functional Ratings

Function	*Rating*	*Comment*
Vegetative Diversity	High	High-functioning vegetative communities reflect the presence of diverse, native wetland species and a lack of non-native or invasive species.
Additional stormwater treatment needs	Moderate	Sediment removal would improve the ability of this site to maintain water quality.
Maintenance of Hydrologic Regime	Moderate	There has been some degree of human alteration of the wetland hydrology, either by outlet control or by altering immediate watershed conditions. However, the wetland retains some of the hydrologic regime similar to the original wetland type, either in part of the wetland or overall to some extent. Because of the interference (whether active or inadvertant), some characteristic vegetative communities have likely been affected, as also have the functions of flood attenuation, water quality and groundwater interaction.
Flood/Stormwater/Attenuation	Moderate	The wetland provides some flood storage and/or flood wave attenuation. It may have either an altered or unrestricted outlet, disturbed wetland soils, thin or little emergent vegetation (with channels) or it may be situated high in a watershed with a low proportion of impervious surfaces, moderate runoff volumes, loamy upland soils, and one or more other wetlands present within the subwatershed.

Downstream Water Quality	High	Portage Creek drains directly into Lake Superior with a high water quality.
Maintenance of Wetland Water Quality	Moderate	Wetland water quality is average. Sediment removal from incoming water would benefit the site. Also consider reducing the amount of stormwater directed at the site. Sustaining a diverse wetland may require additional control over upland land use and the buffer.
Shoreline Protection	Moderate	This fringe site provides some protection against erosive action. Reducing the amount of buffer that is manicured would further protect the adjacent water resource, as would increasing the buffer width.
Maintenance of Characteristic Wildlife Habitat Structure	Moderate	The site provides good habitat and is relatively accessible to wildlife.
Maintenance of Characteristic Fish Habitat	Moderate	Permanently flooded but isolated wetlands can support native populations of minnows and some isolated deep marshes have intermittent populations of sunfish and northern pike after flood events. Poor water quality, due to runoff and insufficient buffer and vegetation, can affect the sustainability of fish populations.
Maintenance of Characteristic Amphibian Habitat	Moderate	Predatory fish are always present and winter habitat unsuitable as site often freezes to the bottom. High inputs of untreated stormwater or unfiltered runoff contribute to poor water quality and reproductive conditions.
Aesthetics/Recreation /Education/Cultural	Moderate	Wetlands is visible from roadway and stream is used as a recreation destination such as hiking. .
Wetland restoration potential	Not Applicable	Because restoration would affect the overall stream.
Wetland Sensitivity to Stormwater and Urban Development	Moderate	This wetland is moderately sensitive to stormwater from spring runoff and high precipitation events.

Appendix A: Dominant Species By Plant Community

	Wetland Type	Plant Community	Dominant Species	Percent Cover
PSS1	**Type 6**	**Shrub-carr**		
			Speckled Alder	>25-50%
			Ostridge Fern	>10-<40%
			Meadow Horsetail	>10-<20%
			White Dogwood	>10-<20%
			Purple Meadow Rue	>10-20%

	Date	Wetland name / ID _____1_____	Wetland name / ID _____	Wetland name / ID _____	Wetland name / ID _____
	Special Features (from list, p.2--enter letter/s)	- ____	- ____	- ____	- ____
#1	Community Number (circle each community which represents at least 10% of the wetland)	(Type 6); (PSS;1, 6; B, C)	3A, 3B, 4A, 4B, 7A, 7B, 8A, 8B, 10A, 13A, 13B, 12B, 14A, 15A, 15B, 16A, 16B	3A, 3B, 4A, 4B, 7A, 7B, 8A, 8B, 10A, 13A, 13B, 12B, 14A, 15A, 15B, 16A, 16B	3A, 3B, 4A, 4B, 7A, 7B, 8A, 8B, 10A, 13A, 13B, 12B, 14A, 15A, 15B, 16A, 16B
#2 & #3	~ Describe each community type individually below ~			~ Describe each community type individually below ~	
Plant Community #1	Community Type (Shrub Swamp)	8A Alder Thicket	- -	- -	- -
	Community Proportion (% of total)	40%			
	Dominant Vegetation / Cover Class	*Alnus incana*			
	Invasive/exotic Vegetation / Cover Class	0			
	Community Quality (E, H, M, L)	H 3	0	0	0
Plant Community #2	Community Type (wet meadow, marsh)	8A Alder Thicket	- -	- -	- -
	Community Proportion (% of total)	20%			
	Dominant Vegetation / Cover Class	Cornus alba			
	Invasive/exotic Vegetation / Cover Class	0			
	Community Quality (E, H, M, L)	H 3	0	0	0
Plant Community #3	Community Type (wet meadow, marsh)	8A Alder Thicket	- -	- -	- -
	Community Proportion (% of total)	10%	D6		
	Dominant Vegetation / Cover Class	Matteuccia struthioptersis			
	Invasive/exotic Vegetation / Cover Class	0			
	Community Quality (E, H, M, L)	H 3	0	0	0
Plant Community #4*	Community Type (wet meadow, marsh)	8A Alder Thicket	- -	- -	- -
	Community Proportion (% of total)	30%			
	Dominant Vegetation / Cover Class	Equisetum pratense thalictrum dayscarpum			
	Invasive/exotic Vegetation / Cover Class				
	Community Quality (E, H, M, L)	H 3	0	0	0
	Circular 39 Types (primary <TAB> others)				
	Cowardin Types				
	Photo ID				
Highest rated community veg. div./integ:		3.0	0 -	0 -	0 -
Average vegetative diversity/integrity:		3.00	- -	- -	- -
Weighted Average veg. diversity/integrity:			### #VALUE!	0.00 -	0.00 -
#4	Listed, rare, special plant species?	n N	Y N	Y N	Y N
#5	**Rare community or habitat?**	**n N**	**Y N**	**Y N**	**Y N**
#6	Pre-European-settlement conditions?	n N	Y N	Y N	Y N

Floodplain Forest [1A, 2A, 3A] * Hardwood Swamp [3B] * Coniferous Bog [2A, 4B] * Coniferous Swamp [4B] * Open Bog [1B, 5A, 5B, 6A, 7A, 9A, 10A] * Calcareous Fen [7B, 11B, 14A] * Shrub Swamp [6B] * Alder Thicket [8A] * Shrub-carr [8B] * Sedge Meadow [10B, 11A, 12A, 13A] * Shallow Marsh [13B] * Deep Marsh [12B] * Wet to Wet-Mesic Prairie [14B, 15A] * Fresh (Wet) Meadow [15B] * Shallow, Open Water [9B, 16A] * Seasonally Flooded Basin [16B]

*If there are more than four plant community types, use the next column over to enter the rest and do not rely on the automatic average calculations.

Cover Class	Class Range
1	0 - 3%
2	3 - 10%
3	10 - 25%
4	25 - 50%
5	50 - 75%
6	75 - 100%

Italic questions are answered via GIS analyses or other methods in-office

MnRAM #	Question Description	Wet ID _____1___ Rating	Wet ID _____ Rating	Wet ID _____ Rating	Wet ID _____ Rating
7	Hydrogeomorphology and Topography (circle one)	Riverine, Palustrine	Depressional/Isolated, Depress'l/Flow-through, Depress'l/Tributary, Riverine, Lacustrine, Peatland, Floodplain, Slope, Other	Depressional/Isolated, Depress'l/Flow-through, Depress'l/Tributary, Riverine, Lacustrine, Peatland, Floodplain, Slope, Other	Depressional/Isolated, Depress'l/Flow-through, Depress'l/Tributary, Riverine, Lacustrine, Peatland, Floodplain, Slope, Other
8	**Maximum Water Depth** (inches) : **% inundation**	2:75%	:	:	:
9	*Local Watershed Area--immediate drainage (acres)*				
10	***Estimated size of existing wetland (acres)***	**0.76**			
11	*SOILS:* Upland/Wetland (survey classification + site)	N/A			
12	**Outlet characteristics for flood retention**	**A**	**A B C N/A**	**A B C N/A**	**A B C N/A**
13	Outlet characteristics for hydrologic regime	A	A B C N/A	A B C N/A	A B C N/A
14	***Dominant upland land use (within 500 ft)***	***A***	***A B C***	***A B C***	***A B C***
15	Soil condition (wetland)	A	A B C	A B C	A B C
16	**Vegetation (% cover)**	**_75___ %**	**____ %**	**____ %**	**____ %**
17	Emerg. veg. flood resistance	C	A B C N/A	A B C N/A	A B C N/A
18	**Sediment delivery**	**C**	**A B C**	**A B C**	**A B C**
19	*Upland soils (based on soil group)*	*B*	*A B C*	*A B C*	*A B C*
20	**Stormwater runoff pretreatment & detention**	**B**	**A B C**	**A B C**	**A B C**
21	*Subwatershed wetland density*	*B*	*A B C*	*A B C*	*A B C*
22	**Channels/sheet flow**	**B**	**A B C**	**A B C**	**A B C**
23	Adjacent naturalized buffer, average width (feet)	_10___ feet	____ feet	____ feet	____ feet
24	**Adjacent area management** (to 50 ft.) (% of each, minimum 20%)	**Full 80%**	**Full Manicured Bare . % % %**	**Full Manicured Bare . % % %**	**Full Manicured Bare . % % %**
25	Adjacent area diversity and structure (to 50 ft.) (% percent of each)	Native 100%	Native Mixed Sparse . % % %	Native Mixed Sparse . % % %	Native Mixed Sparse . % % %
26	**Upland area slope** (to 50 ft.) (% in each category)	**Moderate 5%**	**Gentle Moderate Steep . % % %**	**Gentle Moderate Steep . % % %**	**Gentle Moderate Steep . % % %**
27	*Downstream sensitivity/WQ protection*	*B*	*A B C*	*A B C*	*A B C*
28	**Nutrient loading**	**C**	**A B C**	**A B C**	**A B C**
29	Shoreline wetland	N	Y N	Y N	Y N
30	**Shoreline - rooted vegetation (% cover)**	**_____ %**	**_____ %**	**_____ %**	**_____ %**
31	Shoreline - wetland in-water width (in feet, average)	_____ ft	_____ ft	_____ ft	_____ ft
32	**Shoreline - emergent veg. erosion resistance**	**C**	**A B C**	**A B C**	**A B C**
33	Shoreline - erosion potential	C	A B C	A B C	A B C
34	**Shoreline - bank protection/upslope veg.**	**C**	**A B C**	**A B C**	**A B C**
35	*Rare Wildlife*	*N*	*Y N*	*Y N*	*Y N*
36	***Scare/Rare/S1/S2 local community***	***N***	***Y N***	***Y N***	***Y N***
37	Vegetation interspersion cover (see diagram 1)	6	1 2 3 4 5 6 7 8 N/A	1 2 3 4 5 6 7 8 N/A	1 2 3 4 5 6 7 8 N/A
38	**Veg. community interspersion (see diagram 2)**	**2**	**1 2 3 N/A**	**1 2 3 N/A**	**1 2 3 N/A**
39	Wetland detritus	B	A B C N/A	A B C N/A	A B C N/A
40	***Wetland interspersion on landscape***	***B***	***A B C***	***A B C***	***A B C***
41	Wildlife barriers	B	A B C	A B C	A B C
42	**Amph. breeding potential - hydroperiod**	Adequate	Adequate / Inadequate	Adequate / Inadequate	Adequate / Inadequate
43	Amphibian breeding potential - fish presence	C	A B C	A B C	A B C
44	**Amphibian & reptile overwintering habitat**	**B**	**A B C N/A**	**A B C N/A**	**A B C N/A**
45	Wildlife species (list)				
46	**Fish habitat quality**	**N/A**	**E A B C N/A**	**E A B C N/A**	**E A B C N/A**
47	Fish species (list)				
48	**Unique/rare educ./cultural/rec. opportunity**	**N**	**Y N**	**Y N**	**Y N**
49	Wetland visibility	B	A B C	A B C	A B C
50	**Proximity to population**	**Y**	**Y N**	**Y N**	**Y N**
51	*Public ownership*	B	A B C	A B C	A B C
52	**Public access**	**A**	**A B C**	**A B C**	**A B C**
53	Human influence on wetland	B	A B C	A B C	A B C
54	**Human influence on viewshed**	**B**	**A B C**	**A B C**	**A B C**
55	Spatial buffer	B	A B C	A B C	A B C
56	**Recreational activity potential**	**B**	**A B C**	**A B C**	**A B C**
57	Commercial crop--hydrologic impact	**N/A**	**A B C N/A**	**A B C N/A**	**A B C N/A**
58	***GW - Wetland soils***	***D***	***R D***	***R D***	***R D***
59	*GW - Subwatershed land use*	*D*	*R D*	*R D*	*R D*
60	***GW - Wetland size and soil group***	***D***	***R D***	***R D***	***R D***
61	GW - Wetland hydroperiod	D	R D	R D	R D
62	**GW - Inlet/Outlet configuration**	**D**	**R D**	**R D**	**R D**
63	*GW - Surrounding upland topographic relief*	D	R D	R D	R D
64	**Restoration potential w/o flooding**	**N**	**Y N**	**Y N**	**Y N**
65	*Landowners affected by restoration*	*all public*	*all public 1 2 3+*	*all public 1 2 3+*	*all public 1 2 3+*
66 A	***Existing wetland size (acres) [same as #10]***	**0.76**	_____ acres	_____ acres	_____ acres
66 B	Total wetland restoration size (acres)	0	_____ acres	_____ acres	_____ acres
66 C	**Potential new wetland area (acres)=B-A**	0	_____ acres	_____ acres	_____ acres
67	Average width of naturalized upland buffer (potential)	5	_____ feet	_____ feet	_____ feet
68	**Ease of potential restoration**	**C**	**A B C**	**A B C**	**A B C**
69	Hydrologic alteration type	N/A	Outlet, Tile, Ditch, GW pump, Wtrshd div., Filling	Outlet, Tile, Ditch, GW pump, Wtrshd div., Filling	Outlet, Tile, Ditch, GW pump, Wtrshd div., Filling
70	**Potential wetland type (Circ. 39)**	**6**	**1, 2, 3, 4, 5, 6, 7, 8**	**1, 2, 3, 4, 5, 6, 7, 8**	**1, 2, 3, 4, 5, 6, 7, 8**
71	Wetland sensitivity to stormwater	B	E A B C	E A B C	E A B C
72	**Additional stormwater treatment needs**	**B**	**A B C**	**A B C**	**A B C**

MnRAM 3.2 Digital Worksheet, Side 2

	Question Description	User entry	Rating				
1	Veg. Table 2, Option 4		0.00				
	TOTAL VEG Rating	0.6	Medium				
4	Listed, rare, special plant species?	N	next				
5	Rare community or habitat?	N	next				
6	Pre-European-settlement conditions?	N	next				
7	hydrogeo & topo		#N/A				
8	Water depth (inches)						
	Water depth (% inundation)						
9	Local watershed/immedita drainage (acres)						
10	Existing wetland size	0.76					
11	SOILS: Up/Wetland (survey classification + site)						
12	Outlet characteristics for flood retention	A	1				
13	Outlet characteristics for hydrologic regime	B	0.5				
14	Dominant upland land use (within 500 ft)	B	0.5	0.5			
15	Soil condition (wetland)	A	1				
16	Vegetation (% cover)	75%	M	0.5			
17	Emerg. veg. flood resistance	B	0.5				
18	Sediment delivery	A	1				
19	Upland soils (based on soil group)	A	0.1				
20	Stormwater runoff pretreatment & detention	B	0.5	0.5			
21	Subwatershed wetland density	B	0.5				
22	Channels/sheet flow	A	1				
23	Adjacent naturalized buffer average width (feet)	Medium	H	WQ	1	H	1
24	Adjacent Area Management: % Full	25%	0.25	3	**0.525**		
	adjacent area mgmt: % Manicured	50%	0.25				
	adjacent area mgmt: % Bare	25%	0.025				
25	Adjacent Area Diversity & Structure: % Native	75%	0.75	3	**0.855**		
	adjacent area diversity: % Mixed	20%	0.1				
	adjacent area diversity: % Sparse/Inv./Exotic	5%	0.005				
26	Adjacent Area Slope: % Gentle	20%	0.2	3	**0.58**		
	adjacent area slope: % Moderate	75%	0.375				
	adjacent area slope: % Steep	5%	0.005				
27	Downstream sensitivity/WQ protection	B	0.5				
28	Nutrient loading	A	1				
29	Shoreline wetland?	Y	Y				
30	Rooted shoreline vegetation (%cover)	25%	0.5				
31	Wetland in-water width (in feet, average)	20	0.5				
32	Emergent vegetation erosion resistance	C	0.1				
33	Shoreline erosion potential	C	0.1	1			
34	Bank protection/upslope veg.	B	0.5				
35	Rare Wildlife	N	N				
36	Scarce/Rare/S1/S2 local community	N	N				
37	Vegetation interspersion cover (see diagram 1)	N/A	N/A	N/A			
38	Community interspersion (see diagram 2)	2	M	0.5			0
39	Wetland detritus	B	0.5				
40	Wetland interspersion on landscape	B	0.5	0.5			
41	Wildlife barriers	B	0.5				
42	Amphibian breeding potential-hydroperiod	A	1				
43	Amphibian breeding potential--fish presence	A	1				
44	Amphibian & reptile overwintering habitat	A	1				
45	Wildlife species (list)						
46	Fish habitat quality	B	0.5				
47	Fish species (list)	Trout, salmon					
48	Unique/rare educ./cultural/rec.opportunity	N	N				
49	Wetland visibility	A	1				
50	Proximity to population	Y	1				
51	Public ownership	A	1				
52	Public access	B	0.5				
53	Human influence on wetland	C	0.1				
54	Human influence on viewshed	B	0.5				
55	Spatial buffer	B	0.5				
56	Recreational activity potential	B	0.5				
57	Commercial crop--hydrologic impact	N/A	N/A				

Digital worksheet, section I

Digital worksheet, section II

This comes in from Side 1 automatically using the weighted average. To use the highest rated veg. Community rating, please manually overwrite that value (shown to the right) into the field at E5.

Highest-rated: 3

Enter data starting here. Yellow boxes are used in calculations.

Scroll down to answer more questions and see formula calculations

Additional questions

58	*GW - Wetland soils*	R	R or D	0.1
59	*GW - Subwatershed land use*	D	R or D	1
60	*GW - Wetland size and soil group*	R	R or D	0.1
61	GW - Wetland hydroperiod	D	R or D	1
62	GW - Inlet/Outlet configuration	R	R or D	0.1
63	GW - Surrounding upland topographic relief	R	R or D	0.1
64	Restoration potential w/o flooding	Y	Y or N	2.4
65	*Landowners affected by restoration*	A	*E a b c*	1
66A	*Existing wetland size (acres) [from #10]*	0.76	__ acres	
66B	Total wetland restoration size (acres)	0.76	__ acres	0.1
66C	(Calculated) Potential New Wetland Area [B-A]	0	__ acres	% effectively drained: 0%
67	Average width of naturalized upland buffer (poten	50	__ feet	1 value: 0.1
68	Likelihood of restoration success	C	a b c	0.1
69	Hydrologic alteration type	Diversion	Outlet, Tile, Ditch, GW pump, Wtrshd div., Filling	
70	Potential wetland type (Circ. 39)	7	1, 2, 3, 4, 5, 6, 7, 8	
71	Wetland sensitivity to stormwater	A	E a b c	
72	Additional stormwater treatment needs	A	a b c	

Functional Rating Summaries

Function Name	Raw score	Final Rating	Rating Category	Formula shown to the right.
Vegetative Diversity/Integrity		0.60	Med	
Hydrology - Characteristic		0.63	Med	
Flood Attenuation		0.69	High	
Water Quality--Downstream		0.67	High	
Water Quality--Wetland		0.70	High	
Shoreline Protection		0.34	Med	
Characteristic Wildlife Habitat Structure	0.55	0.55	Med	
Maintenance of Characteristic Fish Habitat	0.67	0.67	High	
Maintenance of Characteristic Amphibian Habitat		0.75	High	
Aesthetics/Recreation/Education/Cultural	0.53	0.53	Med	
Commercial use		N/A	N/A	0
Special Features listing:			-	

Groundwater Interaction		indeterminate GW source
Groundwater Functional Index		no special indicators
Restoration Potential (draft formula)	0.47	Med
Stormwater Sensitivity (not active)		