2009 Hay Lake Parcel and McFarland Parcel Summer Wildlife and Wetland Assessment

Final Report

OCTOBER 2011

DOCUMENT NO. 05461-008-0400




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AECOM Environment
October 2011
Document No. 6013.7513.0400

AECOM

Executive Summary

PolyMet Mining Inc. (PolyMet) proposes to construct an open pit, low grade, polymetallic mineral mine in northern Minnesota. This project, called the NorthMet Mine and Ore Processing Facilities Project (mine project), is located in St. Louis County on the eastern end of the Mesabi Iron Range, about 60 miles north of Duluth, and 6 miles south of Babbitt, Minnesota (Mine Site). PolyMet plans to mine and process polymetallic ore from the northwest portion of the Duluth Complex. The ore contains copper, nickel, gold, platinum, palladium, and cobalt. PolyMet plans to operate a processing facility using the nearby and refurbished former LTV Steel Mining Company taconite processing facility near Hoyt Lakes, Minnesota, that would produce copper cathode, and separate platinum/palladium group metals sulfide and nickel/cobalt hydroxide concentrates, for off-site shipment and treatment.

The Mine Site encompasses about 2,801 acres of habitat used by wildlife, including species of concern to federal and state agencies. Habitats that would potentially be affected by the project include conifer forest (comprised primarily of black spruce, jack pine, tamarack, and balsam fir), deciduous forest (comprised primarily of trembling aspen and paper birch), mixed conifer/deciduous forest, riparian (dominated by speckled alder, red-osier dogwood, and willow), and wetland (dominated by sedges, cattail, bog Labrador-tea, leatherleaf, and sphagnum moss).

Of the approximately 2,801 acres, approximately 2,620 acres of the Mine Site are owned by the U.S. Government (Government) and administered by the U.S. Department of Agriculture Forest Service (Forest Service). In addition, about 3,898 acres adjacent to the Mine Site (Additional Parcel) are owned by the Government and administered by the Forest Service. The Forest Service is considering transferring these approximately 6,518 acres (Mine Site and Additional Parcel) to PolyMet in exchange for lands of similar value that have been offered for consideration by PolyMet. All lands potentially involved in the land exchange, including submerged lands, would be independently appraised according to the Uniform Appraisal Standards for Federal Land Acquisitions. The appraisals will determine the market value of the properties.

Wildlife and their habitats on the Mine Site were evaluated in 2000, 2004, and 2006 and this information was used to evaluate impacts to wildlife and their habitats for an Environmental Impact Statement for the mine project. Wildlife and their habitats on the Additional Parcel were evaluated in 2008 and 2009 and this information, along with information collected for the Mine Site, was used by the Forest Service in the preliminary land exchange appraisal, and will be used to evaluated impacts to wildlife and their habitats for an EIS for the proposed land exchange. The sites are in a region known to be used by several species that have been identified by state and federal agencies as species of concern, including bald eagle, northern goshawk, Canada lynx, and gray wolf.

PolyMet proposes to purchase and transfer 4,684 acres of nonfederal lands to the Government as part of the proposed land exchange.[1] These include 4,652 acres associated with the Hay Lake Parcel, and 32 acres associated with the McFarland Parcel. This study evaluated the wildlife and habitats these lands. The major components of this wildlife assessment include: 1) background research and collaboration with state and federal agencies to identify wildlife species and their habitats of interest; 2) field surveys to observe wildlife and their sign; 3) mapping of wildlife habitat using aerial photographic interpretation and field observations; 4) calling surveys for northern goshawk, owls, and gray wolf; and 5) echolocator surveys for bats.

Much of the Hay Lake Parcel is comprised of wetlands of high value. No wetlands are found on the McFarland Parcel. To better determine wetland acreage, functions and values, a wetland assessment was conducted for the Hay Lake Parcel and McFarland Parcel to assist with the land exchange appraisal.

[1] Acreage for the Hay Lake and McFarland parcels is based on Government Land Office (GLO) surveys.

Field surveys were conducted on the Hay Lake Parcel during June 22 to 27, and June 29 and 30, and on the McFarland Parcel on June 28, 2009. Evidence of 6 amphibian species, 3 reptile species, 49 bird species, and at least 12 mammal species was found on the Hay Lake Parcel, and evidence of 1 amphibian species, 19 bird species, and at least 8 mammal species was found on the McFarland Parcel. Species of interest identified at the sites during surveys included common loon, trumpeter swan, hooded merganser, broad-winged hawk, red-tailed hawk, ruffed grouse, American woodcock, belted kingfisher, pileated woodpecker, Swainson's thrush, bats, beaver, gray wolf, white-tailed deer, and moose. We mapped approximately 1,996 acres of upland and 2,930 acres of wetland habitat on the Hay Lake Parcel and 31 acres of upland habitat on the McFarland Parcel.[2] Thirty-three wetlands, or portions of wetlands, were evaluated for their functions and values on the Hay Lake Parcel; all wetlands were rated high value for most wetland functions and values.

Information collected during the wildlife and wetland assessments will support land exchange and environmental review and permitting efforts.

[2] The acreage surveyed during wildlife and wetland surveys on the parcels is based on Geographic Information System (GIS) mapping conducted by Barr Engineering, Inc. These acreages are greater than those based on GLO surveys.

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1.0 INTRODUCTION

1.1. Study Overview

PolyMet Mining Inc. (PolyMet) proposes to construct an open pit, low grade, polymetallic mineral mine in northern Minnesota. This project, called the NorthMet Mine and Ore Processing Facilities Project (mine project), is located in St. Louis County on the eastern end of the Mesabi Iron Range, about 60 miles north of Duluth, and 6 miles south of Babbitt, Minnesota (Mine Site). PolyMet plans to mine and process polymetallic ore from the northwest portion of the Duluth Complex. The ore contains copper, nickel, gold, platinum, palladium, and cobalt. PolyMet plans to operate a processing facility using the nearby and refurbished former LTV Steel Mining Company taconite processing facility near Hoyt Lakes, Minnesota, that would produce copper cathode, and separate platinum/palladium group metals sulfide and nickel/cobalt hydroxide concentrates, for off-site shipment and treatment.

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PolyMet proposes to purchase and transfer 4,684 acres of nonfederal lands to the Government as part of the proposed land exchange.[3] These include 4,652 acres associated with the Hay Lake Parcel, and 32 acres associated with the McFarland Parcel (Figures 1 and 2). This study evaluated the wildlife and habitats on nonfederal lands that PolyMet proposes to purchase and transfer to the Government as part of the proposed land exchange. The major components of this wildlife assessment include: 1) background research and collaboration with state and federal agencies to identify wildlife species and their habitats of interest; 2) field surveys to observe wildlife and their sign; 3) mapping of wildlife habitat using aerial photographic interpretation and field observations; 4) calling surveys for northern goshawk, owls, and gray wolf; and 5) echolocator surveys for bats. In addition, to better determine wetland acreage, functions and values, a wetland assessment was conducted for the Hay Lake Parcel to assist with the land exchange appraisal.

[3] Acreage for the Hay Lake and McFarland parcels is based on Government Land Office (GLO) surveys.

Wildlife species of concern (and federal/state status) that could occur on the parcels include gray wolf (federal threatened and state special concern), Canada lynx (federal threatened), bald eagle (state special concern), mountain lion (state special concern), least weasel (state special concern), northern goshawk (federal species of concern and Superior National Forest Regional Forester Sensitive Species), and boreal owl (federal species of concern and Superior National Forest Regional Forester Sensitive Species).

To provide information needed for the land exchange, AECOM Environment (AECOM; formerly ENSR) conducted surveys of wildlife and their habitats during June 2009 on the Hay Lake and McFarland parcels. The objectives of the study were to:

- Determine general wildlife use of the study area;
- Determine the presence of wildlife species of concern; and
- Identify important habitats used by wildlife; and

In addition to conducting an assessment of wildlife and their habitats, the Forest Service requested that a wetland assessment be conducted for the parcels. Information from the wetland assessment would also be used during the land exchange appraisal. Much of the Hay Lake Parcel is comprised of wetlands of high value. To better determine wetland acreage, functions and values on the parcels, AECOM conducted an assessment of wetland acreage and functions and values concurrently with the wildlife habitat assessment.

Information collected during the wildlife and wetland assessments would support land exchange and environmental review and permitting efforts, and help to identify additional data collection requirements.

1.2. Acknowledgements

AECOM appreciates the assistance of Kevin Pylka (PolyMet) in setting up the project and coordinating activities with other PolyMet personnel. Susan Catton and Daniel Ryan (Forest Service) provided wildlife and habitat information for the site. Lisa Joyal (Minnesota Department of Natural Resources; MnDNR) provided information on rare plant and animal species that could be found in the area. Dr. Cheryl Feigum provided assistance with wetland and floodplain and wild rice[4] assessments. Aaron Mielke and Amy Meulebroeck (Barr Engineering) prepared maps and provided Geographic Information System (GIS) analysis.

[4] Common and scientific names of plants and animals given in this report are provided in Appendix A.

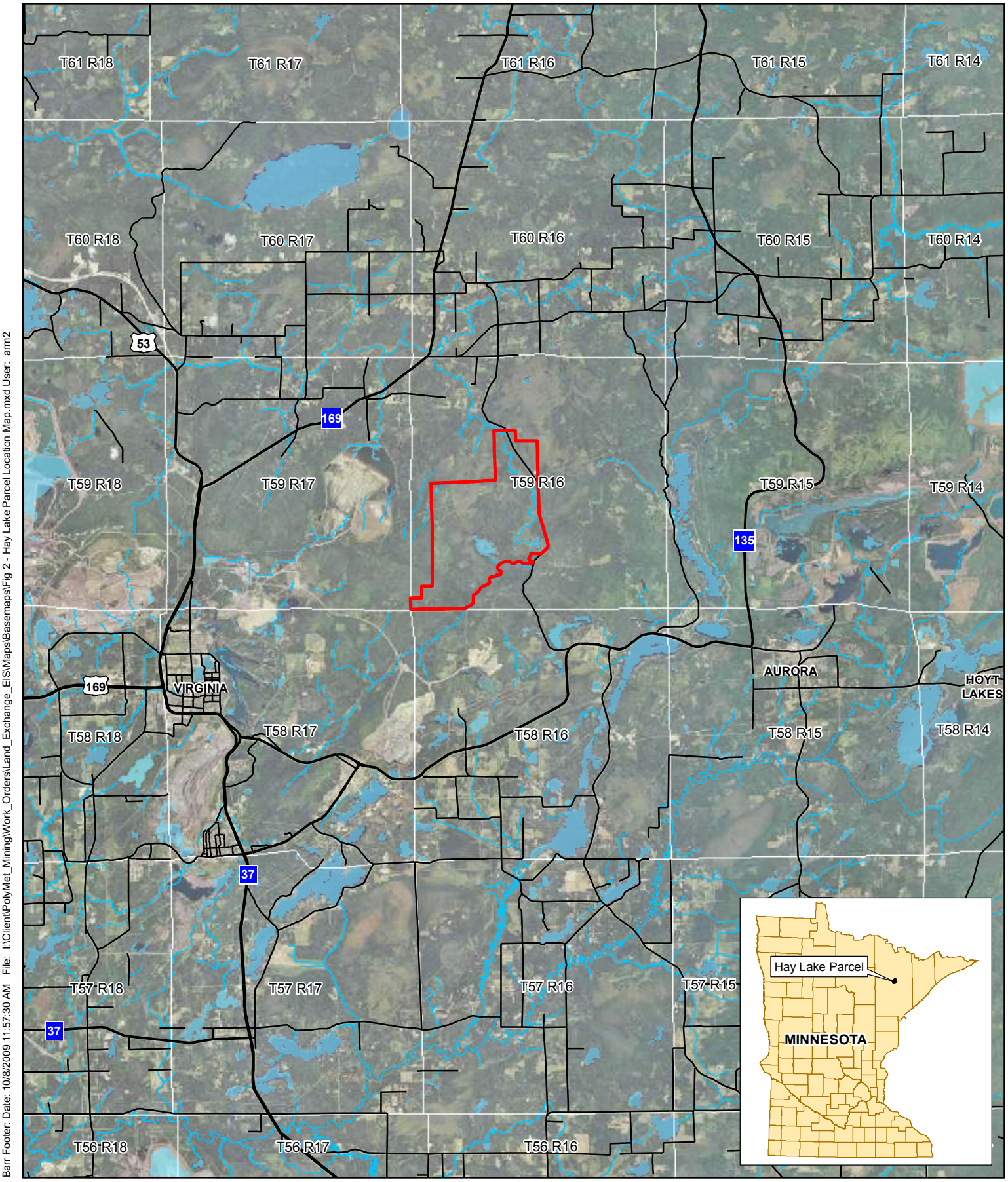
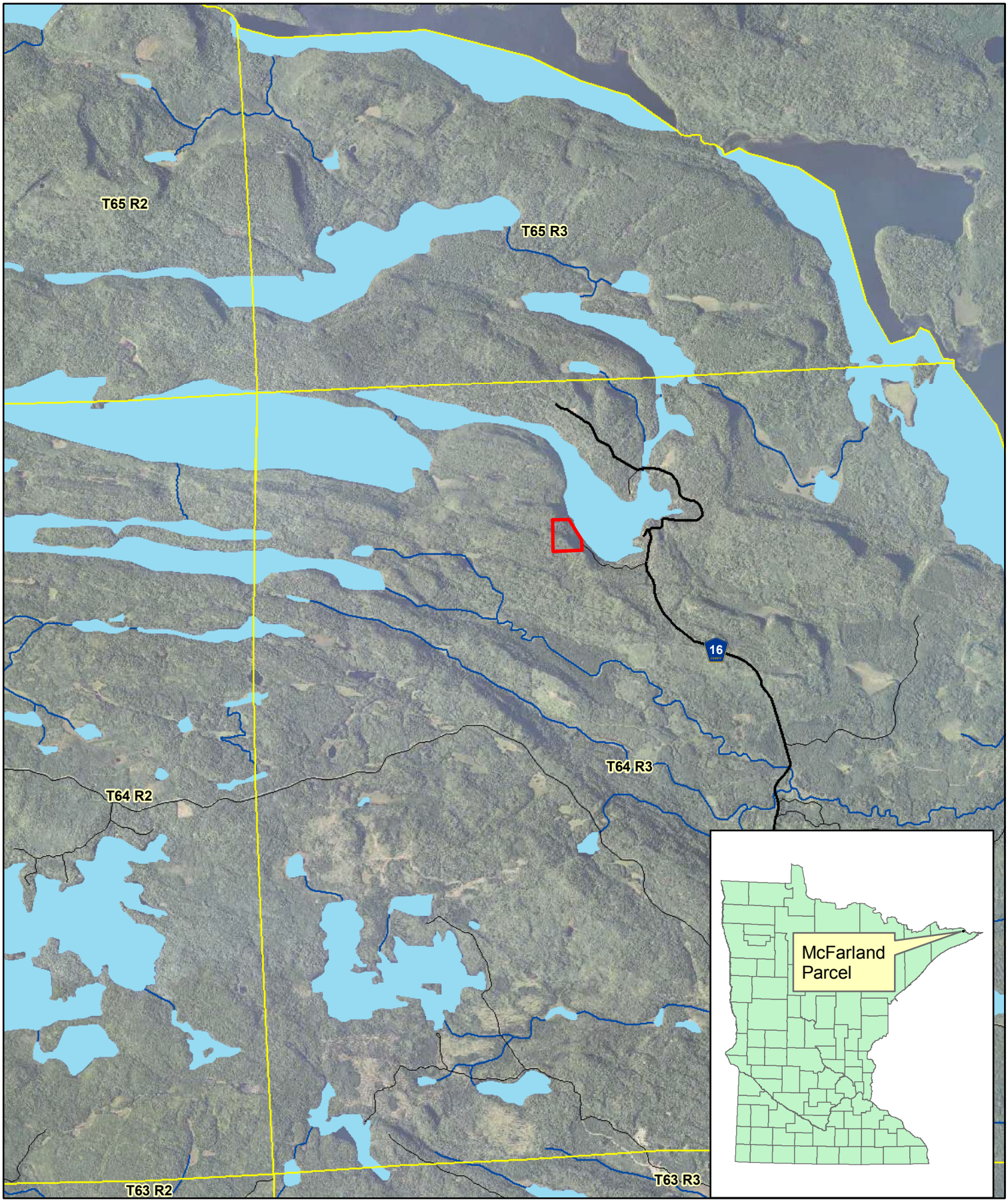


Figure 1

HAY LAKE PARCEL
LOCATION MAP
Hoyt Lakes, Minnesota

Barr Footer: Date: 10/8/2009 11:57:30 AM File: I:\Client\PolyMet_Mining\Work_Orders\Land_Exchange_EIS\Maps\Basemaps\Fig 2 - Hay Lake Parcel Location Map.mxd User: arm2



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McFarland Parcel

Townships

N

0 0.5 1 2

Miles

Figure 2

MCFARLAND PARCEL
LOCATION MAP
Hoyt Lakes, Minnesota

2.0 STUDY AREA

The Hay Lake parcel is in central St. Louis County, approximately 3 miles east of Biwabik, Minnesota. The parcel, located at the eastern end of the Mesabi Iron Range, includes approximately 4,926 acres in all or portions of Sections 9, 16, 19, 20, 21, 27, 28, 29, 30, 31, and 32 in Township 59 North, Range 16 West (Figure 1).[5] The site is moderately hilly and consists predominantly of second- or third growth deciduous and coniferous forest uplands and emergent, scrub-shrub, and forested wetlands. The parcel is adjacent to the Superior National Forest.

The McFarland parcel consists of approximately 31 acres in Section 9, Township 64 North, Range 3 East, in Cook County, Minnesota. It is approximately 3 miles west of the U.S.-Canada border (Figure 2). The site is mostly on a hillslope and consists of second- or third growth deciduous and coniferous forest upland. The parcel is surrounded by the Superior National Forest.

[5] The acreage surveyed during wildlife and wetland surveys on the parcels is based on GIS mapping conducted by Barr Engineering, Inc. These acreages are greater than those based on GLO surveys.

3.0 METHODS – WILDLIFE HABITAT ASSESSMENT

The evaluation of wildlife and their habitat use during early summer on the Hay Lake and McFarland parcels was based on a review of the literature, personal communications with biologists and wetland scientists familiar with wildlife and their habitats in the area, natural resource database queries, and from field studies.

3.1. Literature Review and Personal Communications

AECOM reviewed wildlife assessments conducted between 2000 and 2009 for the NorthMet Mine Project (ENSR 2000, 2005, 2006; AECOM 2008, 2009a). AECOM reviewed surveys of wildlife and their habitats on other lands near the parcels. These included the *Virginia Forest Management Project Final Environmental Impact Statement* (Forest Service 2004), which evaluated Forest Service lands near the Hay Lake Parcel, and the *Biological Evaluation South Fowl Lake Access Trail Gunflint Ranger District, Superior National Forest* (Forest Service 2006) for information on wetland habitat near the McFarland Parcel.

AECOM conducted telephone and in-person interviews with agency staff (MnDNR regional biologist, U.S. Fish and Wildlife Service regional biologist, Forest Service Superior National Forest biologist, and International Wolf Center wildlife biologist; Appendix B) for this project and other surveys within the region. The information received from these contacts was used to gain information on plants and animals likely to be found on the parcels and species of interest to state and federal agencies. Survey methods were selected to maximize our ability to characterize use of the site by wildlife and to detect the presence of potential species of interest. A list of contacts, which includes telephone numbers and addresses, is provided in Appendix B.

3.2. Database Queries

A database search request was made to the Minnesota Natural Heritage Program in May 2009. The results of that search showed that there are rare species within the McFarland parcel and within one mile of the Hay Lake parcel. Rocky mountain woodsia and encrusted saxifrage, both state-listed threatened plant species, have been documented within the McFarland parcel, and small white water-lily, a state-threatened species, and small-flowered woodrush, leafless water milfoil, and elegant groundsel, state species of concern, have been documented within 1 mile of the parcel boundary. Ternategrape-fern and triangle moonwort, state threatened species, and white baneberry, Dragon's-mouth, matricary grapefern, mingan moonwort, goblin fern, pale moonwort, necklace spike sedge, and clustered bur-reed, state plant species of concern, have been documented within 1 mile of the Hay Lake parcel. In addition, two wildlife species, northern goshawk and American bittern, were identified that have been or are found in the area and are tracked by the Program, but are not given special status by the State of Minnesota.

AECOM obtained a copy of the 2006 Superior National Forest Regional Forester Sensitive Species Conservation Assessments list of species of concern for the Superior National Forest (Appendix C). AECOM reviewed the Superior National Forest Land and Resource Management Plans (LRMP; Forest Service 1986, 2004) for Viability Indicator Species and Management Indicator Species. AECOM also reviewed the MnDNR species of concern list on the MnDNR website (http://www.dnr.state.mn.us/ets/index.html). AECOM reviewed the *Canada Lynx Sightings in Minnesota 2000-2007 Database* (MnDNR 2007a) for lynx sightings on or near the Hay Lake and McFarland parcels. AECOM also reviewed the *Wolf Telemetry Database* (International Wolf Center 2009) for wolf sightings on or near the parcels.

Based on the above discussions, database queries, and document reviews, the following were identified as species of interest for the 2008 survey on the Hay Lake Parcel and McFarland Parcel (wildlife with a * are identified as Management Indicator Species in the 2004 LRMP for the Superior National Forest [Forest Service 2004]):

Federally Listed Threatened and Endangered Species

- Canada lynx (threatened)
- Gray wolf* (threatened)

State-listed Threatened and Endangered Species

- Wood turtle (threatened)
- Trumpeter swan (threatened)
- Horned grebe (threatened)
- Wilson's phalarope (threatened)
- Common tern (threatened)

Federal Species of Concern

- Black tern
- Northern goshawk*
- Boreal owl
- Great gray owl
- Olive-sided flycatcher
- Black-throated blue warbler
- Bay-breasted warbler
- Connecticut warbler

State Species of Concern

- American white pelican
- Marbled godwit
- Yellow rail
- Bald eagle*
- Northern myotis
- Eastern pipistrelle
- Short-eared owl
- Smokey shrew
- Heather vole
- Least weasel
- Mountain lion

Other Species of Concern (identified as Viability and Management Indicator Species in the 1986 Superior National Forest LRMP)

- Northern leopard frog
- Common loon
- Hooded merganser
- Osprey
- Red-tailed hawk
- Ruffed grouse
- Spruce grouse
- American woodcock
- Killdeer
- Belted kingfisher

- Pileated woodpecker
- American three-toed woodpecker
- Black-backed woodpecker
- Brown creeper
- Golden-crowned kinglet
- Swainson's thrush
- Magnolia warbler
- Pine warbler
- Savannah sparrow
- Beaver
- Porcupine
- White-tailed deer
- Moose

3.3. Field Surveys

Field surveys were conducted on the Hay Lake Parcel on June 22 to 27, and June 29 and 30, and on June 28, 2009, on the McFarland Parcel. Studies were conducted by vehicle and on foot.

3.3.1 General Survey Methodology

Wildlife surveys were conducted along transects located on primary (site access roads, drill pad access roads, logging roads) and secondary (skid trails, stream corridors, wetlands, other natural corridors) access routes to maximize the amount of area covered during the survey period. Additional surveys were conducted off the primary and secondary access routes.

Wildlife, and their sign, observed during transect surveys were recorded and related to species and number of animals making the sign, habitat associated with the sign, and general activity of the animal (where possible). Most observations were of wildlife sightings, and tracks, scat, and foraging sign. The surveys were conducted during day and night to increase the number of species encountered.

Recognizable animal tracks observed during surveys were noted. Where feasible, all tracks observed during transect surveys were identified, and this information was used to determine habitat use. Tracks of interest included those of grouse, American marten, Canada lynx, gray wolf, white-tailed deer, and moose. The track surveys focused on locating fresh tracks in soft soil or mud, which were new enough that they were clearly identifiable. Generally, these tracks were less than 4 days old. The direction of travel, species and number of animals making the tracks, and habitat use was noted. Techniques used for identifying tracks are given in Rezendes (1992), Halfpenny et al. (1995), and Foresman and Pearson (1998). Recognizable animal calls and visual signs, and evidence of habitat use (foraging sign, bedding sites, etc.), were recorded.

Most wildlife observations were conducted near primary and secondary survey routes, but other sites of interest were also visited. Binoculars were used to locate and identify wildlife and their habitats. The locations of wildlife, their sign, and their habitats used were recorded using Global Positioning System (GPS) and aerial photographs. Time of day and weather conditions were also recorded during surveys.

3.3.2 Species of Concern Surveys

Special effort was made during surveys to locate and identify those species of concern listed in Section 3.2. Calling surveys for northern goshawk and American three-toed woodpecker were conducted during the day, and

during the night for owls and gray wolves, at calling stations (Figures 3 and 4). A 25-watt amplifier, with a range of up to 1 mile, was used to broadcast the calls. Professionally recorded northern goshawk, three-toed woodpecker, owl, and gray wolf calls were played into the amplifier. Visual and auditory observations of all wildlife that responded to calls during these surveys were recorded. Echolocators were used to detect the presence of bats in the vicinity of the parcels.

3.3.2.1 Northern Goshawk

Adult goshawk warning calls were broadcast at calling stations during the day. A biologist faced in a pre-determined direction, broadcast a series of calls for a minimum of 20 seconds, rotated 45 degrees, and played another 20-second series of calls. This call/rotate method was repeated every 45 degrees until the faced the original broadcast direction (after a total of eight series of calls). Before initiating another round of calls, the survey team waited several minutes, looking and listening for responses to the broadcasted calls. This procedure was repeated at each calling station.

If a hawk responded to the calls, the species was determined based on visual and auditory observations. Since several species of hawks in the area are likely to respond to northern goshawk warning calls if they have a nest nearby, we also tried to locate the nests of hawks that responded to broadcasted calls.

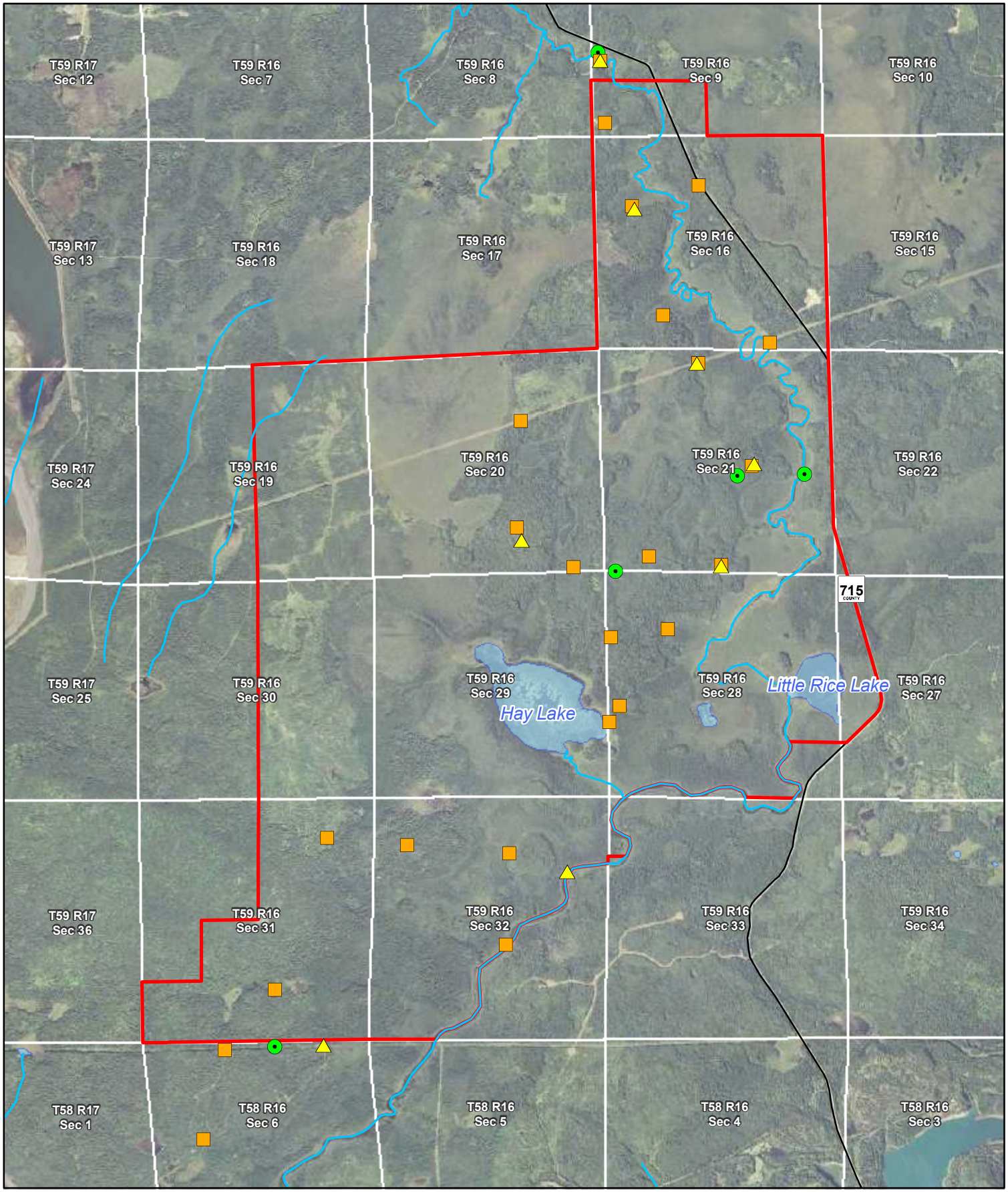
3.3.2.2 American Three-toed Woodpecker

Calls and drumming sounds of American three-toed woodpeckers were broadcast at calling stations during the day. A biologist faced in a pre-determined direction, broadcast a series of calls and drums for a minimum of 20 seconds, rotated 45 degrees, and played another 20-second series of calls. This call/rotate method was repeated every 45 degrees until the faced the original broadcast direction (after a total of eight series of calls/drums). Before initiating another round of calls/drums, the survey team waited several minutes, looking and listening for responses to the broadcasted calls/drums. This procedure was repeated at each calling/drumming station. If a woodpecker responded to the calls or drums, the species was determined based on visual and auditory observations.

3.3.2.3 Owls

Recordings of owls that could be found in the area, including barred owl, boreal owl, eastern screech owl, great gray owl, great horned owl, long-eared owl, northern saw-whet owl, and short-eared owl, were broadcasted at night at calling stations.

Two call replications were conducted at each calling location, with each replication lasting approximately 2 minutes. The male owl territorial calls were broadcast in six directions during each replication. To start, the recording was played for a minimum of 20 seconds while facing a pre-determined direction, followed by a rotation of 60 degrees. The recording was then played for another 20 seconds in the new direction. This call/rotate method was repeated four more times, until the original broadcasting direction was reached. If an owl responded to the calls, the species was determined based on visual and auditory observations.



Calling Stations
- Bat
- Goshawk
- Owl
- Hay Lake Parcel
- Sections

N

3,000 1,500 0 3,000

Feet

Figure 3

CALLING STATIONS
Hay Lake Parcel
Saint Louis County, MN

Calling Stations
- Goshawk
- Owl
- McFarland Parcel
- Sections

N

400 200 0 400

Feet

Figure 4

CALLING STATIONS
McFarland Parcel
Cook County, MN

3.3.2.4 Gray Wolf

Calling surveys for gray wolves were conducted at night. Gray wolf calls are believed to play a role in maintaining wolf territories, and howling surveys in northern Minnesota's Voyageurs National Park have had a greater than 50 percent success rate at detecting gray wolves (Gogan et al. 2004). Human vocalizations that imitate wolf howls, and recorded wolf calls, were broadcast from calling stations. At each calling station, calls of a lone wolf and of several wolves in a pack were broadcast for approximately 3 minutes (Harrington and Mech 1979). If wolves responded, the number of animals involved was estimated.

3.3.2.5 Bats

Echolocators were used to detect the presence of bats on and near the Hay Lake Parcel. An echolocator picks up the inaudible, high frequency calls of bats and converts them to a frequency that is audible to humans. The echolocator transfers this signal, along with a calibration signal, to a delay switch. The delay switch transfers the bat call and calibration signal, along with information on the time of day, to a cassette recorder for tape storage. Once the information from an individual bat call is stored, the recorder turns off until a new bat call is received by the echolocator and transferred to the tape recorder. Cassette tapes used in this study had the capacity to store up to 45 minutes of bat calls per night.

Recordings were analyzed to determine the number and timing of calls given by bats during the night. This information provided a general indication of bat activity at the study site. However, since a single bat can give many calls, or many bats can give a few calls, it was not possible to determine absolute activity level.

Several factors influenced the number of calls recorded at each site. In some cases, multiple bats gave calls at nearly the same time, making it difficult to separate out and accurately count individual calls. In these situations, the number of bats making calls was estimated. The amount of bat activity recorded at a site was influenced by where the locator was placed (some portions of ponds had more bat activity than others), and weather (bat activity was usually less on cool than warm nights and less during periods of rain). In addition, other noises, in particular insect and amphibian calls and raindrops, triggered the bat recorder and caused it to record other sounds in addition to bat calls, potentially reducing the total number of bat calls recorded during a session.

3.3.3 Habitat Assessment

Aerial photographs were used to create large maps for use in the field. Infrared aerial photographs were reviewed to identify areas of similar vegetative cover (cover types; habitat types) based on the classification system discussed below. Photographs and field maps were then used in the field to verify cover types. Upon completion of field studies, cover types were mapped as habitat polygons, and polygons were digitized using GIS and overlaid onto habitat maps that were created using aerial photographs (see Maps 1 and 2 in the back pocket of this report). These maps and the associated GIS database were used to determine the approximate acreage of each habitat type.

Wildlife habitat features on the parcels, including plant species composition and structure and special features (snags, downed woody debris, rock outcrops, wetlands, and deer snow-intercept thermal [SIT] cover) were recorded during field surveys. In particular, we noted the species composition, density, and size (diameter at breast height [dbh]) of trees and shrubs near survey areas, and the use of snags and other special habitat features by wildlife. The location of special features was recorded using GPS units. This information was recorded on aerial photographs, and, in conjunction with information on shrubs and herbaceous vegetation collected during surveys, was used to prepare habitat maps of the project sites (see Maps 1 and 2 in the back pocket of this report).

Wildlife habitats were primarily characterized based on whether the area was wetland or upland (based on guidance provided in Cowardin et al. 1979), plant types (forbs/grassland, shrubland, forestland), and percent aerial plant coverage. Areas with >30 percent tree cover were coded as forested. Areas with <30 percent tree cover, but >30 percent shrub cover, were coded as shrubland. Areas with <30 percent shrub cover and <30 percent tree cover were coded as emergent/bog (for wetlands), or disturbed or grassland/forb (for uplands). Forest stands were further characterized based on the percent cover of deciduous and coniferous trees within the stand. Stands with >70 percent cover of deciduous or coniferous trees were coded as forest deciduous or forest coniferous, respectively. Stands with a mixture of coniferous and deciduous trees (30 to 70 percent cover of each tree type) were classified as mixed.

In addition, stands were characterized by predominant tree size. Stands with trees <4 inches dbh were classified as sapling. Sapling trees are generally less than 10 years old (Table 1; Forest Service 2004). Stands with trees mostly 5 to 11 inches dbh were classified as pole/young mature forest. Pole/young mature stands are usually from 10 to 60 years in age. Stands dominated by trees 12 inches or greater dbh were classified as mature. These stands are generally 60 years or older. This wildlife habitat classification system is similar to that developed by the MnDNR (1993) Natural Heritage Program, in that it separates plant communities into upland and wetland habitat types based on vegetation characteristics, but differs in that it further divides forest communities based on tree size and evaluates grassland/forb and shrub successional stages associated with recently-logged or disturbed forests.

Table 2 summarizes the habitat classification criteria used to identify habitat cover types found on the parcels and provides corresponding habitat types based on the key to natural communities developed by the MnDNR (1993) Natural Heritage Program. The table also provides the corresponding Management Indicator Habitats that were developed for the 2004 Superior National Forest LRMP (Forest Service 2004).

As noted above, information was gathered during field surveys to determine habitat quality and presence/absence of special habitat features used by wildlife. The MnDNR Natural Heritage Program has developed *Element Occurrence Ranking Guidelines* based on several natural community habitat features (MnDNR 1994). These guidelines primarily consider the presence or absence of human-induced disturbances such as logging and development, but also consider the presence or absence of special habitat features, such as a multi-layered forest structure and presence of large downed woody debris. Table 2 includes Element Occurrence Rankings for habitat types recorded during this study.

Table 1
Ages of Forest Stand Types (Years)

Forest Type	Young (seedling)	Sapling/Pole	Mature/Old	Old/Old Growth	Old Growth Multi-ages
Jack Pine	0-9	10-39	40-59	60-79	80+
Red Pine	0-9	10-49	50-119	120-149	150+
Eastern White Pine	0-9	10-49	50-119	120-149	150+
Lowland Spruce/Tamarack	0-19	20-59	60-119	120-149	150+
Spruce/Fir	0-9	10-49	50-89	90-149	150+
Aspen-Birch/Aspen-Birch-Conifer	0-9	10-49	50-79	80+	80+
Source: Forest Service (2004).					

3.3.4 Data Recording

Observations of wildlife, their sign, and habitats were recorded on tape recorder and field maps. Photographic records were taken as necessary to record wildlife, their sign, and habitats.

Table 2
Habitat Classification

Code	Habitat Type	Forest Service Management Indicator Habitat Number	Minnesota Natural Heritage Program Natural Community Key[1]	Minnesota Natural Heritage Program Element Occurrence Ranking[2]	Habitat Characteristics
Wetland					
P-0	Open water	14	Lake bed	Not applicable	>70 percent of area dominated by open water with no standing vegetation. Includes Hay Lake, Little Rice Lake, an unnamed lake, and the Pike River on the Hay Lake Parcel, and McFarland Lake. Wild rice, pondweeds, coontail, and bulhead water-lily were seen in these areas, but comprised <30 percent of surface of the water body, but up to 70% of the subsurface of the water body. Open water habitat was used by common loon, and several species of waterfowl including trumpeter swan, ringed-neck duck, and and river otter.
P-1	Bog/palustrine emergent	14	Black spruce bog; open sphagnum bog; mixed emergent marsh	AB, B, C	Bog wetlands were rare on the site. There were scattered (<5 percent) black spruce and smallish tamarack in bog wetlands. Bog Labrador-tea, bog birch, lowbush blueberry, small-fruited bog cranberry, speckled alder, and small willows covered up to 50 percent of the area. Other species encountered included cottongrass, bunchberry, and bog rosemary. Emergent wetlands were dominated by sedges, narrow-leaved cattail, woolly sedge, spikerush, wild iris, and horsetail (up to 95 percent cover). Willows, tamarack, and speckled alder were often found along the border of these wetlands. Bog/emergent wetlands provided habitat for several amphibians, birds including great-blue heron, and sparrows, and moose.
P-2	Palustrine scrub shrub	14	Alder swamp; willow swamp	B, C	Wetlands dominated by speckled alder, pussywillow, red-osier dogwood, and other shrubs. Scrub-shrub wetlands usually consisted of a dense (50 to 90 percent) cover of speckled alder, with alder often 4 feet or taller in height. These wetlands may also have scattered sapling balsam fir, black spruce, willow, and the occasional black ash (up to 10 percent cover). Dominant low shrubs were bog Labrador-tea, leatherleaf, lowbush blueberry, prickly rose, wild raspberry, and red-osier dogwood. Herbaceous layer species included club and sphagnum mosses, woolly sedge, Canada bluejoint, narrow-leaved cattail, horsetail, and bunchberry. Provided forage for deer and moose as well has habitat for numerous bird species.

Table 2 (Cont.)
Habitat Classification

Code	Habitat Type	Forest Service Management Indicator Habitat Number	Minnesota Natural Heritage Program Natural Community Key[1]	Minnesota Natural Heritage Program Element Occurrence Ranking[2]	Habitat Characteristics
Wetland (Cont.)					
P-3	Palustrine forest dead trees	Not applicable	Black spruce bog; black spruce swamp	C	Portions of flooded wetlands/bogs with a large number of dead black spruce (wetlands flooded by beavers or man-made structures). Some dead trees were used by cavity-nesting birds as nesting and foraging sites. Tree cover ranged from 10 to 40 percent.
P-4	Palustrine forest deciduous sapling (0-4 in dbh)	14	Mixed hardwood swamp	C	Wetlands dominated by sapling deciduous trees. Comprised of sapling paper birch, trembling aspen, and mountain maple. Specked alder dominates the dense shrub layer, while twining honeysuckle, interrupted fern, sedges, and mosses are close to the ground. This habitat is rare on the Hay Lake Parcel.
P-5	Palustrine forest deciduous pole/young mature (5-12 in dbh)	14	Mixed hardwood swamp	B	Wetlands dominated by pole and young mature-size deciduous trees. Comprised of paper birch, trembling aspen, and mountain maple, with occasional scattered black spruce and balsam fir. Specked alder dominated the shrub layer, but was generally not dense when found in sapling stands. Understory included bog Labrador-tea, leatherleaf, sphagnum moss, and club moss. Provided habitat for numerous species of birds, small mammals, deer, and moose.
P-6	Palustrine forest deciduous mature (12+ in dbh)	14	Mixed hardwood swamp	AB	Wetlands dominated by mature deciduous trees. Comprised of paper birch, trembling aspen, and black ash, with occasional scattered black spruce and balsam fir. Specked alder, mountain maple, black spruce, and balsam fir were found in the shrub layer. Understory include bog Labrador-tea, leatherleaf, sphagnum moss, and club moss. Tree coverage averaged about 40 percent, shrubs coverage was about 70 percent, and ground vegetation coverage was about 80 percent. Provides habitat for numerous species of birds, small mammals, deer, and moose. Moderate size woody debris.
P-7	Palustrine forest mixed sapling (0-4 in dbh)	14	Mixed hardwood swamp; black spruce swamp	C	Wetlands dominated by a mixed stand of sapling deciduous and conifer trees. In addition to species listed for palustrine deciduous forest, also includes sapling black spruce and tamarack and a dense shrub cover dominated by speckled alder. Provides important forage for moose and deer, yet limited cover, especially during winter.

Table 2 (Cont.)
Habitat Classification

Code	Habitat Type	Forest Service Management Indicator Habitat Number	Minnesota Natural Heritage Program Natural Community Key[1]	Minnesota Natural Heritage Program Element Occurrence Ranking[2]	Habitat Characteristics
Wetland (Cont.)					
P-8	Palustrine forest mixed pole/young mature (5-12 in dbh)	14	Mixed hardwood swamp; black spruce swamp	B	Wetlands dominated by mixed stand of pole- and young mature-size deciduous and coniferous trees, including black spruce, tamarack, trembling aspen, and paper birch (to 30 percent cover). Bog Labrador-tea, leatherleaf, and speckled alder are prevalent (to 80 percent cover), as is spruce regeneration. The herbaceous layer varies in vegetative cover. In some areas with dense stands of spruce, few shrubs are seen, but sphagnum and club mosses could cover nearly 100 percent of the ground. Common species include clintonia, Starry false Solomon's seal, horsetail, and creeping snowberry. Some areas also have cottongrass. Important wildlife species include ruffed grouse, numerous species of songbirds, pileated woodpecker, snowshoe hare, and red squirrel. This habitat was not found on the parcels.
P-9	Palustrine forest mixed mature (12+ in dbh)	14	Mixed hardwood swamp; black spruce swamp	AB	Wetlands dominated by a mixed stand of mature deciduous and conifer trees with well-developed midstory of pole-size trees. Wetlands forests dominated black spruce, with scattered other conifer species (e.g., tamarack) or deciduous trees. Bog Labrador-tea and lowbush blueberry are prevalent, as is spruce regeneration. Red squirrel and woodpeckers are common in these forests. This habitat is rare on the Hay Lake Parcel.
P-10	Palustrine forest conifer sapling (0-4 in dbh)	9, 14	Black spruce swamp	C	Wetlands dominated by sapling conifer trees, primarily black spruce and tamarack to 60 percent cover. Shrubs include leatherleaf and bog Labrador-tea to 70 percent cover, while cottongrass, forbs, grasses, and mosses are found in the understory and cover up to 95 percent of the ground. Sapling spruce forest was uncommon on the site and provided limited wildlife habitat due to the small trees, lack of downed woody material and snags, and wet soil conditions.

Table 2 (Cont.)
Habitat Classification

Code	Habitat Type	Forest Service Management Indicator Habitat Number	Minnesota Natural Heritage Program Natural Community Key[1]	Minnesota Natural Heritage Program Element Occurrence Ranking[2]	Habitat Characteristics
Wetland (Cont.)					
P-11	Palustrine forest conifer pole/young mature (5-12 in dbh)	9, 14	Black spruce swamp	B	Wetlands dominated by pole- and young mature-size conifer trees, primarily black spruce and tamarack. Tree cover ranged from 30 to 60 percent. Bog Labrador-tea, leatherleaf, willow, speckled alder, mountain maple, prickly rose, and lowbush blueberry were prevalent, as was spruce regeneration, and coverage ranged from 50 to 80 percent. Some tamarack could also be present. The herbaceous layer varied in vegetative cover from 50 to 90 percent. In some areas with dense stands of pole-sized spruce, few shrubs were seen, but sphagnum and club mosses could cover up to 90 percent of the ground. Common species include Canada bluejoint, sedges, bunchberry, ferns, prickly rose, horsetail, star flower, and creeping snowberry. Stands had good cover for wildlife. This is the most common wetland habitat on the parcels.
P-12	Palustrine forest conifer mature (12+ in dbh)	9, 14	Black spruce swamp	AB	Wetlands dominated by mature conifer trees, primarily black spruce, tamarack, and northern white cedar. Bog Labrador-tea is prevalent, as is spruce regeneration. Speckled alder may be present. Mature forests often contain numerous snags and downed woody debris. Pileated woodpecker, black-capped chickadee, and red squirrel are common. This habitat was found on the McFarland Parcel.
Upland					
U-1	Disturbed	Not applicable	Not applicable	Not applicable	Recently-disturbed sites or cleared for roads, landings, etc. These areas had little or no vegetation. Vegetation consisted of scattered forbs and grasses, including white clover, cow parsnip, ox-eye daisy, and thistles. Deer, moose, gray wolf, and red fox sign was also seen the Hay Lake Parcel. This habitat was not found on the McFarland Parcel.

Table 2 (Cont.)
Habitat Classification

Code	Habitat Type	Forest Service Management Indicator Habitat Number	Minnesota Natural Heritage Program Natural Community Key[1]	Minnesota Natural Heritage Program Element Occurrence Ranking[2]	Habitat Characteristics
Upland (Cont.)					
U-2	Grassland/ Forbs	Not applicable	Not applicable	Not applicable	Recently-disturbed sites that had revegetated and were dominated by grasses and forbs; <30 percent cover of trees and shrubs. Occur in areas recently logged, or rights-of-ways. Scattered shrubs and sapling trees, including trembling aspen, willow, beaked hazel, and bog Labrador tea, comprised up to 20 percent cover. Bluejoint, daisy fleabane, wild raspberry, wild strawberry, thistles, ox-eye daisy, cow parsnip, white clover, thistles, and asters covered up to 80 percent of the area. American robin, white-tailed deer, gray wolf, and red fox or their sign were seen in these areas.
U-3	Shrubland	Not applicable	Not applicable	Not applicable	Area dominated by shrubs; >30 percent cover of shrubs and <30 percent cover of trees. Occurred in areas where natural succession of logged/disturbed sites led to replacement of grassland/forb habitats with habitats dominated by shrubs. Scattered pole and sapling trees (trembling aspen, paper birch, jack pine, and black spruce) were occasionally found in these areas, but shrubs, including beaked hazel, lowbush blueberry, thimbleberry, and wild raspberry could cover up to 80 percent or more of the landscape. Provided forage for white-tailed deer and moose, and nesting and foraging habitats for a variety of birds, including red-winged blackbird.
U-4	Forest deciduous sapling (0-4 in dbh)	2	Aspen forest; aspen-birch forest	C	Forests dominated by sapling deciduous trees, primarily trembling aspen, with lesser amounts of paper birch, willow, and spruce from 60 to 80 percent cover. Mountain maple, beaked hazel, willow, lowbush blueberry, bog Labrador-tea, twining honeysuckle, and prickly rose were important shrubs. The ground cover included clintonia, bunchberry, large-leaved aster, bracken fern, twinflower, wild strawberry, wild raspberry, bunchberry, woodland anemone, and horsetail. Provided foraging habitat for birds and deer and moose. Shrub cover ranged from 40 to 80 percent while ground cover ranged from 60 to 90 percent.

Table 2 (Cont.)
Habitat Classification

Code	Habitat Type	Forest Service Management Indicator Habitat Number	Minnesota Natural Heritage Program Natural Community Key[1]	Minnesota Natural Heritage Program Element Occurrence Ranking[2]	Habitat Characteristics
Upland (Cont.)					
U-5	Forest deciduous pole/young mature (5-12 in dbh)	2	Aspen forest; aspen-birch forest	BC	Forests dominated by pole and young mature-size deciduous trees. Deciduous forests usually dominated by trembling aspen and paper birch. Percent tree cover in pole forests ranged from 60 to 90 percent. Forests usually had a moderately dense (50 to 80 percent cover) midstory of sapling balsam fir and paper birch, beaked hazel, lowbush blueberry, wild raspberry, twining honeysuckle, and prickly rose. The ground cover ranged from 60 to 90 percent and included clintonia, bunchberry, large-leaved aster, bracken fern, wild strawberry, and club moss. Provided foraging and nesting habitat for a variety of birds and small mammals, roosting habitat for American crown, and shade cover during summer for larger mammals. This was the most common upland habitat on the parcels.
U-6	Forest deciduous mature (12+ in dbh)	2	Aspen forest; aspen-birch forest	B	Forest dominated by mature deciduous trees, with well-developed midstory of pole- and young mature-size trees. Usually dominated by trembling aspen to 16 inches dbh, although some forests contained an important paper birch component. Well-developed midstory of sapling to pole-size balsam fir and paper birch, beaked hazel, lowbush blueberry, mountain maple, twining honeysuckle, and prickly rose. The ground cover included wild sarsaparilla, bunchberry, large-leaved aster, bracken fern, wild strawberry, clintonia, and horsetail. Trees and stumps used by cavity nesting birds and small mammals, and downed woody material provided habitat. Vegetation cover in the canopy, midstory, and near the ground ranged from 50 to 60 percent.
U-7	Forest mixed sapling (0-4 in dbh)	4	Mixed pine-hardwood forest; boreal hardwood-conifer forest	C	Forests dominated by a mixed stand of sapling conifer and deciduous trees. Mixed forests contain varying amounts of jack pine, spruce, trembling aspen, paper birch, and balsam fir saplings. Wild sarsaparilla, clintonia, twining honeysuckle, rose twisted stalk, large-leaved aster, and ferns are common herbs. Provides good foraging habitat, but limited cover for wildlife.

Table 2 (Cont.)
Habitat Classification

Code	Habitat Type	Forest Service Management Indicator Habitat Number	Minnesota Natural Heritage Program Natural Community Key[1]	Minnesota Natural Heritage Program Element Occurrence Ranking[2]	Habitat Characteristics
Upland (Cont.)					
U-8	Forest mixed pole/young mature (5-12 in dbh)	4	Mixed pine-hardwood forest; boreal hardwood-conifer forest	BC	Forests dominated by a mixed stand of pole and young mature-size conifer and deciduous trees. Mixed forests contained varying amounts of jack pine, spruce, trembling aspen, and paper birch. Northern white cedar was also common on the McFarland Parcel. Beaked hazel, mountain maple, and twining honeysuckle were common in the midstory. Common herbs were wild sarsaparilla, clintonia, twining honeysuckle, bunchberry, rose twisted stalk, and large-leaved aster. Wild columbine was found on rock cliffs. Numerous birds were seen gleaning insects in trees during surveys. Forests had scattered woody debris and few snags. Vegetation cover in the canopy, midstory, and near the ground ranged from 50 to 60 percent.
U-9	Forest mixed mature (12+ dbh)	4	Mixed pine-hardwood forest; boreal hardwood-conifer forest	B	Forests dominated by a mixed stand of mature coniferous and deciduous trees, with well-developed midstory of pole and young mature-size trees. Mixed forests contained varying amounts of black spruce, trembling aspen, and paper birch. Pole and young mature-size deciduous and coniferous trees were found in the midstory, including spruce, balsam fir, and mountain maple. Shrubs included beaked hazel and lowbush blueberry. Mature forests usually had a moderate shrub layer, but the ground was nearly covered with vegetation, including wild sarsaparilla, horsetail, bunchberry, ferns, lowbush blueberry, large-leaved aster, and rose twisted stalk. Large deciduous trees could be used by hawks for nests. Dead trees and stumps, especially those of conifers, used by cavity nesting birds and small mammals, and down woody material provided habitat for small mammals, snakes, and amphibians. Canopy and midstory cover ranged from 40 to 70 percent, while ground cover ranged from 30 to 90 percent.
U-10	Forest conifer sapling (0-4 in dbh)	5, 8	Jack pine forest; black spruce-feathermoss forest	C	Forests dominated by sapling conifer trees, primarily jack pine and balsam fir, and occasionally black spruce. The shrub layer is usually dense and includes beaked hazel. The herb layer includes ferns, shining clubmoss, bunchberry, and Starry false Solomon's seal. Provides limited foraging habitat and cover for wildlife. This habitat was not found on the parcels.

Table 2 (Cont.)
Habitat Classification

Code	Habitat Type	Forest Service Management Indicator Habitat Number	Minnesota Natural Heritage Program Natural Community Key[1]	Minnesota Natural Heritage Program Element Occurrence Ranking[2]	Habitat Characteristics
Upland (Cont.)					
U-11	Forest conifer pole/young mature (5-12 in dbh)	5, 8	Jack pine forest; black spruce-feathermoss forest	BC	Forests dominated by pole- and young mature-size conifer trees, primarily jack pine and red pine, with scattered balsam fir and black spruce. Tree cover ranged from 60 to 70 percent The shrub layer was sparse (to 30 percent), but well-developed in pole forests with openings in the canopy. The herb layer included bunchberry, wood ferns, twining honeysuckle, wild raspberry, white clover, tall buttercup, and Starry false Solomon's seal and coverage ranged from 60 to 80 percent. Pole conifer forests provided forage for conifer-dependent species (red squirrel, spruce grouse) and hiding cover, but poor snow-intercept thermal cover for deer and moose. These forests had few snags or downed woody material.
U-12	Forest mature conifer (12+ in dbh)	5, 8	Jack pine forest; black spruce-feathermoss forest	B	Forests dominated by mature conifer trees, primarily jack pine and balsam fir, with scattered black spruce. Stands usually consist of trees of nearly uniform age. The shrub layer is usually dense and includes beaked hazel, willow, paper birch, trembling aspen, and balsam fir. The herb layer includes interrupted fern, shining clubmoss, bunchberry, wood ferns, and Starry false Solomon's seal. Jack pine forests with interspersed wet areas often have black spruce and tamarack in the overstory, and a shrub layer is comprised of willow, prickly rose, lowbush blueberry, and bog Labrador-tea. Large-leaved aster, clintonia, and star flower are common herbs. These forests provide good foraging habitat for conifer-dependent species, and good snow-intercept thermal cover for deer and moose. Snags and downed woody material are common and provide habitat for amphibians, owls, woodpeckers, and squirrels. This habitat was not found on the parcels.

4.0 METHODS - WETLAND ASSESSMENT AND FUNCTIONS AND VALUES ANALYSIS

The evaluation of wetlands and their functions and values on the Hay Lake Parcel and McFarland Parcel was based on a review of studies conducted in the region and field studies.

4.1. Previous Surveys

AECOM reviewed the *Wetland Delineation and Wetland Functional Assessment Report* (Barr 2006) and *Supplemental Information to the Wetland Delineation Report* (Barr 2007a) for the Mine Site, and *Wetlands in the USFS Land Exchange Area* Memo (Barr 2007b) for the Additional Parcel. These reports provided information on wetland habitats likely to be found in the region and on the Hay Lake Parcel and McFarland Parcel. AECOM also reviewed the *Virginia Forest Management Project Final Environmental Impact Statement* (Forest Service 2004), which evaluated Forest Service lands near the Hay Lake Parcel, and the *Biological Evaluation South Fowl Lake Access Trail Gunflint Ranger District, Superior National Forest* (Forest Service 2006) for information on wetland habitat near the McFarland Parcel.

The initial assessment of the Hay Lake Parcel was based on a review of U.S. Fish and Wildlife Service's National Wetlands Inventory (NWI) mapping and aerial photographic interpretation using infrared color photographs. The NWI maps were generated by the U.S. Fish and Wildlife Service from interpretations of black-and-white aerial photographs taken in 1977. The NWI maps generally do not accurately represent wetland resources in the forested areas of northeastern Minnesota, so aerial photographic interpretation was also conducted to identify wetlands on the Hay Lake Parcel and McFarland Parcel.

4.2. Field Surveys

Wetlands on the parcels were identified, characterized, and mapped concurrently with the wildlife habitat assessment. Initially, potential wetland locations were determined by reviewing color infrared aerial photographs, U.S. Geological Survey topographic maps, and NWI maps. Aerial photographs were used to create large maps for use in the field. Infrared aerial photographs were reviewed to identify areas of similar vegetative cover based on the classification system shown in Table 2. Aerial photographs and field maps were then used in the field to verify cover types. Upon completion of field studies, cover types were mapped as habitat polygons, and polygons were digitized using GIS and overlaid onto habitat maps that were created using aerial photographs (see Maps 1 and 2 in the back pocket of this report). These maps and the associated GIS database were used to determine the approximate acreage of each wetland and upland habitat types.

Wetland surveys were conducted along transects located on primary (site access roads, drill pad access roads, logging roads) and secondary (skid trails, stream corridors, wetlands, other natural corridors) access routes to maximize the amount of area covered during the survey period. Additional surveys were conducted off of the primary and secondary access routes in an effort to better determine wetland boundaries and types.

4.3. Wetland Delineation and Classification Methods

We did not attempt to delineate the boundary of wetlands in the field using federal and state wetland delineation protocols (e.g., *1987 Corps of Engineers Wetland Delineation Manual* routine wetland delineation procedures; U.S. Army Corps of Engineers 1987). Instead, the boundaries of wetlands were determined based on aerial photograph interpretation, with some refining of wetland boundaries during field studies. Wetland boundaries were determined in the field based on hydrologic and vegetation characteristics and were more accurate where survey routes crossed or were near wetland boundaries. Wetland boundaries shown on Maps 1 and 2 and acreages given in this report are approximate. However, we did make special effort to have survey routes intercept many of the wetlands on the parcels to better determine their boundaries, characteristics, and functions and values. Surveys covered nearly all portions of the parcels, although not all wetlands were surveyed.

Wetlands were classified using the classification system given in Table 2. However, this classification system can be adapted to classify wetlands based on other classification systems, including the Circular 39 Classification System (Shaw and Fredine 1956), the Cowardin System (Cowardin et al. 1979), and the Eggers and Reed (1998) wetland classification systems, as shown in Table 3.

Table 3
Comparison of Wetland Classification Systems

Wildlife Habitat[1]	Cowardin et al.[2]	Eggers and Reed[3]	Circular 39[4]	Definition[4]
P-4, P-5, P-6, P-7, P-8, and P-9	PFO1A (Palustrine Forested Broad-Leaved Deciduous Temporarily Flooded)	Floodplain forest; Seasonally flooded basin	Type 1 - Seasonally Flooded Basin or Flat	Soils are usually somewhat well-drained/poorly drained for much of the growing season. These shallow depressions typically have standing water for a few weeks, but dry up for the remainder of the year. Vegetation varies greatly according to season and duration of flooding from bottomland hardwoods (floodplain forests) to herbaceous plants.
P-1	PEMB (Palustrine Emergent Saturated)	Wet to Wet-mesic prairie; Fresh (wet) meadow; Sedge meadow; Calcareous Fen	Type 2 - Inland Fresh Meadow	Soil is usually saturated during most of the growing season. Soil may contain peat or muck. Vegetation includes grasses, sedges, rushes, forbs, and asters. Calcareous fens are the rarest wetland plant communities and can have a disproportionate number of rare, threatened, and endangered plant species compared to other plant communities.
P-1	PEMC (Palustrine Emergent Seasonally Flooded)	Shallow marsh	Type 3 - Inland Shallow Fresh Marsh	Soil is usually covered with less than 6 inches of water and may consist of enough to saturate the soil throughout the growing season. Vegetation consists of emergent plants, such as, narrow-leaved cattail, bulrush, and sedge. Emergent aquatic plants can become established when water levels are low.
P-0, P-1, and P-3	PUBF (Palustrine Unconsolidated Bottom Semi Permanently Flooded)	Deep marsh	Type 4 - Inland Deep Fresh Marsh	Soil is usually covered with 6 inches to 3 feet or more of water during growing season and can fluctuate throughout the year. This type is characterized by emergent, floating, and submergent vegetation including narrow-leaved cattail, bulrush, pondweed, water-lily, and wild rice.
P-0 and P-3	PEM1H/L1UBH (Palustrine Emergent Persistent Permanently Flooded/Lacustrine Limnetic Unconsolidated Bottom Permanently Flooded)	Shallow open water	Type 5 - Inland Open Fresh Water	Water depths are less than 6.6 feet and very rarely fluctuate; therefore, emergent aquatic vegetation cannot become established. This type is characterized by submergent, floating and floating leaved aquatic plants including pondweed, water-lily, watermilfoil, coontail, and duckweed. Size can vary from one-quarter acre pond to a long oxbow of a river or a shallow bay of a lake.

Table 3 (Cont.)
Comparison of Wetland Classification Systems

Wildlife Habitat[1]	Cowardin et al.[2]	Eggers and Reed[3]	Circular 39[4]	Definition[4]
P-2	PSS1, PSS1A/C (Palustrine Scrub-Shrub Broad-Leaved Deciduous, Temporarily Flooded / Seasonally Flooded)	Shrub-Carr Alder thicket	Type 6 - Shrub Swamp	Soil is usually saturated to seasonally flooded conditions during the growing season. Woody vegetation is typically less than 20 feet in height with a dbh of less than 6 inches. Willows and red-osier dogwood generally dominate the shrub layer with a ground layer of ferns, sedges, grasses and forbs. Speckled alder may occur as a monotype.
P-4, P-5, P-6, P-7, P-8, P-9, P-10, P-11, and P-12	PFO1A/B/C, PFO1C (Palustrine Forested Broad-Leaved Deciduous, Temporarily Flooded/Saturated / Seasonally Flooded)	Hardwood swamp Coniferous swamp	Type 7 - Wooded Swamp	Soil is saturated or inundated by as much as a foot of water during the growing season. Soils are usually organic. Forest vegetation includes tamarack and northern white cedar. Sphagnum moss is not usually present. Deciduous trees include black ash and red maple. The ground layer may also include ferns, sedges, grasses and forbs. Tamarack and northern white cedar can be present where calcareous peat soils are found.
P-1, P-10, P-11, and P-12	PFO7B (Palustrine Forested Evergreen Saturated)	Open bog Coniferous bog	Type 8 - Bogs	Soils consist of acid peats that are low in nutrients. Open bog vegetation is typically herbs with low shrubs with scattered immature or stunted black spruce or tamarack. Coniferous bogs consist of sedges, orchids, and purple pitcher plants.

[1] From: Table 2 in this report.
[2] From: Cowardin et al. (1979).
[3] From: Eggers and Reed (1997).
[4] From: Shaw and Fredine (1956).

4.4. Wetland Functional Assessment Methods

During the field surveys, data were collected related to the functions and values of representative wetlands within the parcels. Wetland functions and values were rated using the guidelines in the *Minnesota Routine Assessment Method for Evaluating Wetland Functions, Version 3.2* (MnRAM 3.2; Minnesota Board of Water and Soil Resources 2008).

Sixty-three questions given in MnRAM 3.2 were addressed, and all factors were evaluated for each wetland surveyed. The primary wetland functions rated by MnRAM 3.2 are:

- Special Features (unique vegetation, fish and wildlife, cultural, and other factors that would result in a functional rating of "exceptional")
- Vegetative Diversity/Integrity
- Hydrology
- Flood Attenuation
- Effect on Water Quality Downstream
- Water Quality in the Wetland
- Shoreline Protection
- Wildlife Habitat Characteristics
- Fish Habitat Characteristics
- Amphibian Habitat Characteristics

- Amphibian Habitat Characteristics
- Aesthetics/Recreation/Education/Cultural

The primary wetland functions were evaluated based on a review of the 1) wetland soil, hydrology, and vegetation; 2) outlet characteristics; 3) watershed and adjacent upland land uses and conditions; 4) erosion and sedimentation; and 5) human disturbances. The Eggers and Reed (1998) classification system was used to classify wetland communities for the wetland function and value evaluation. Landscape factors were typically evaluated on a larger scale. For instance, soil and vegetation conditions within the watershed were usually similar for large groups of wetlands. The human disturbance levels were also typically similar across broad areas. Based on the responses to questions posed by MnRAM 3.2 and the assessment of special features, a function value of high, medium, or low was given for each primary function.

5.0 SURVEY RESULTS – WILDLIFE ASSESSMENT

5.1. Introduction

Field surveys were conducted on the Hay Lake Parcel during June 22 to 27, and June 29 and 30, and on the McFarland Parcel on June 28, 2009. The weather was generally favorable during the study period. Temperatures ranged from the low 50s degree Fahrenheit (°F) in the morning to mid-80s °F during the afternoon. Light to moderate rain fell on and off during June 22 and 26 to 29. The survey was conducted mostly on foot, although the Pike River Road (County Road 715) was used to access portions of the site. Generally, a circular route was taken on foot each day, with the intent of surveying a variety of habitats each day.

5.2. Wildlife Species Survey

We observed or found evidence of 6 amphibian species, 3 reptile species, 49 bird species, and at least 11 mammal species on the Hay Lake Parcel, and evidence of 1 amphibian species, 19 bird species, and at least 8 mammal species on the McFarland Parcel. American toad, gray treefrog, green frog, spring peeper, western chorus frog, and wood frog were observed or heard on the Hay Lake Parcel, and spring peeper on the McFarland Parcel. Garter snake, painted turtle, and snapping turtle were observed on the Hay Lake Parcel; no reptiles were seen on the McFarland Parcel.

Birds observed on wetlands and lakes on the Hay Lake Parcel (birds seen on the McFarland Parcel indicated with a *) included (common loon*, trumpeter swan and cygnets, ring-necked duck, hooded merganser*, great blue heron, Virginia rail, American woodcock, eastern phoebe*, red-winged blackbird, and song sparrow. Northern flicker, Eastern kingird, American robin*, cedar waxwing, American goldfinch, dark-eyed junco*, chipping sparrow*, and white-throated sparrow were seen in disturbed areas and grassland/shrubland habitats. The remaining species were primarily associated with forests, including ruffed grouse*, ruby-throated hummingbird, yellow-bellied flycatcher, blue* and gray* jays, American crow, winter wren*, hermit thrush*, Swainson's thrush, ruby-crowned kinglet, pine grosbeak, Philadelphia vireo, red-eyed vireo, Canada warbler, chestnut-sided warbler, golden-winged warbler, yellow warbler, yellow-rumped warbler, and common yellowthroat*. Woodpecker cavities and foraging signs were common on larger snags (>6 in dbh) and on stumps. Cavity-nesting species seen or heard in forests included barred owl* and great-horned owl, four species of woodpeckers (downy*, hairy*, and pileated* woodpeckers, and yellow-bellied sapsuckers), black-capped chickadee*, and red-breasted nuthatch*. Broad-winged hawk*, red–tailed hawk, turkey vulture, common nighthawk, and common raven* were seen flying overhead.

Mammals seen or identified based on sign included rodents, snowshoe hare, bats*, black bear*, gray wolf, red fox*, American marten*, river otter, red squirrel*, beaver*, white-tailed deer*, and moose. Snowshoe hare and their sign were seen in shrub areas near roads and wetlands. Bats were seen flying over wetlands in the evening and were recorded at six sites on or adjacent to the Hay Lake Parcel. Black bear sign was seen in mixed forests, Gray wolf and red fox tracks were seen along roads on the parcels. American marten and red squirrel sign was common in spruce forests. River otter were seen in the Pike River. Beaver dams and cuttings were found at several sites on both parcels and beaver dams created several ponds on the Hay Lake Parcel. White-tailed deer or their sign were seen at numerous locations on both parcels, including at bedding sites along the Pike River and near several deer hunting stands. Moose sign was observed over much of the Hay Lake Parcel, but especially in forests near wetlands and in shrublands.

5.3 Northern Goshawk, American Three-Toed Woodpecker, Owl, and Gray Wolf Calling and Bat Echolocation Surveys

Calling surveys were conducted at 24 stations during the day and 8 stations at night (Figure 3) on the Hay Lake Parcel, and at 3 stations during the day and 1 station at night on the McFarland Parcel (Figure 4). Echolocation

surveys were conducted at six stations on the Hay Lake Parcel (Table 4; one station was located just south of the parcel and is not shown on Figure 3).

5.3.1 Northern Goshawk

Surveys were conducted for northern goshawk during the day. Calling surveys, using recorded calls, were conducted at 24 calling stations on the Hay Lake Parcel and 3 stations on the McFarland Parcel. No responses were obtained during the surveys.

5.3.2 American Three-toed Woodpecker

Daytime surveys were done for American three-toed woodpeckers in conjunction with northern goshawk surveys. Calling surveys, using recorded calls, were conducted at 24 calling stations on the Hay Lake Parcel and 3 stations on the McFarland Parcel. No American three-toed woodpecker responses were heard during calling surveys, but hairy and pileated woodpeckers and northern flicker were observed during the surveys.

5.3.3 Owls

Owl calling surveys were conducted at night at eight calling stations on the Hay Lake Parcel and one station on the McFarland Parcel. Two great-horned owls were seen and heard at the survey station on the northern end of the Hay Lake Parcel. Barred owls were heard in the central and southern portions of Section 21, Township 59, Range 16. A barred owl was also heard at the McFarland Lake calling station.

5.3.4 Gray Wolf

Wolf howling surveys were conducted at night at the Hay Lake Parcel and McFarland Parcel calling stations. No gray wolves were heard during howling surveys, but sign of gray wolf was seen on the Hay Lake Parcel.

5.4 Bat Echolocation Surveys

Echolocation surveys were conducted at six stations on the Hay Lake Parcel, although one station was located just south of the parcel (Figure 3 and Table 4). Recordings indicated the presence of bats at all sites, with the greatest number of calls occurring at an emergent wetland with open water (814 echolocations, mostly feeding activity). Moderate numbers of echolocations were recorded at the two sites along the Pike River (164 echolocations north Pike River site, 230 echolocations middle Pike River site; feeding activity was moderate), and at two small emergent wetland ponds with limited open water (64 and 181 echolocations). The echolocation site to the south of the parcel was located a small patch of open water associated with an old beaver pond; 72 echolocations were recorded at this site.

Seven bat species could occur in the study area. The little brown myotis is the most abundant bat in Minnesota. Along with the northern myotis, big brown bat, and eastern pipistrelle, it hibernates in caves and mines. In summer, they roost in caves, mines, hollow trees, under tree bark, and in buildings, often in large groups. The silver-haired bat is a forest dweller that usually lives near water. It feeds among the trees, much like the eastern red bat. Another woodland species is the hoary bat, the largest bat found in Minnesota. The silver-haired bat, eastern red bat, and hoary bats are all solitary, roost in trees, and migrate south for the winter (MnDNR 2008a).

5.5 Species of Concern

Several species of concern may be found on the Hay Lake Parcel and McFarland Parcel, although most species listed below are rare visitors to the area or migrate through the area during spring or fall. Background information on species of concern was obtained for reptiles and amphibians (Behler and King 1995, Tekiela 2003); birds

(Terres 1982; Robbins et al. 1983; Benyus 1989); and mammals (Burt and Grossenheider 1965, Chapman and Feldhamer 1982).

Table 4
Bat Echolocations at Survey Stations

Bat Echolocator Stations[1]	
E1	164 echolocations
E2	230 echolocations
E3	181 echolocations
E4	814 echolocations
E5	64 echolocations
E6 (just south of parcel boundary)	72 echolocations

[1] Station locations shown on Figure 3.

5.5.1. Federally Listed Threatened and Endangered Species

Canada lynx (threatened). No lynx or their sign were observed during 2009 surveys. Of 437 lynx recorded by the MnDNR between 2000 and 2006, 115 lynx were reported in St. Louis County, and 109 lynx in Cook County, (MnDNR 2007), including verified, probable, and unverified sightings. The vast majority of sightings are incidental encounters, and as such, tend to be clustered along roads and other places frequented by observant and interested people. Thus, while these reports tell us something (however incomplete) about where lynx are, they provide no information about where lynx do not occur. Similarly, we cannot know the relationship between the number of reports and the number of lynx in Minnesota at the time of the reports. A review of the Minnesota Lynx Database (MnDNR 2007a) revealed that lynx have been sighted in the townships of each parcel since 2000. A probable lynx sighting was made by a trained biologist in Section 13 of Township 59 North, Range 16 West, east of the Hay Lake parcel, in October 2003. Another lynx sighting was made 1 mile to the west of the Hay Lake parcel the same year. Unverified lynx sightings were made in December 2002 and January 2003 in Sections 22 and 27 of Township 64 North, 3 West, south of the McFarland parcel.

The Canada lynx originally ranged throughout the boreal forest of North America and the mixed coniferous-deciduous forests of the northeastern and Great Lakes states (Hazard 1982). Snowshoe hare and red squirrels are the primary prey item of lynx in northern Minnesota, but they also eat carrion, grouse, and small mammals (Aubry et al. 2000). Canada lynx numbers declined sharply in the U.S. and Canada in the mid-1900s due to overtrapping and ecological changes caused by settlement, logging, and agriculture (DeVos and Matel 1952, Todd 1985). Individuals move great distances when prey is scarce, and lynx were seen in many areas of Minnesota during 1962-1963 and 1972-1973, presumably years when snowshoe hares were scarce in Canada (Phillips 1999). Canada lynx numbers in Minnesota appear to be near a cyclic low in 2009 (AECOM 2009b).

On February 25, 2009, the U.S. Fish and Wildlife Service designated approximately 8,226 mi^2 in portions of Cook, Koochiching, Lake, and St. Louis counties in Minnesota as lynx critical habitat. (Federal Register 2009). Both parcels are located within the area designated as critical habitat.

Gray wolf (threatened; Superior National Forest Management Indicator Species). Gray wolf was recorded in the Hay Lake Parcel during the survey. Wolf scat was seen on several abandoned logging roads. No wolves or their sign were seen on the McFarland Parcel.

A review of the International Wolf Center (2009) Minnesota Wolf Telemetry Database revealed that radio-collared wolves have been recorded in the townships of the Hay Lake Parcel. A wolf was observed in Section 6 of Township 58 North, Range 16 West in September 1994, just south of Hay Lake. Wolves were observed in Sections 1, 19, 22, and 23 of Township 59 North, Range 16 West, in and around the Hay Lake parcel, between 1994 and 1997. There are no recorded observations of wolves in the township of the McFarland parcel (Township 64 North, Range 3 West).

Territory size for wolves in northern Minnesota ranges from 20 to 150 mi^2 and wolf packs tend to avoid areas used by other wolf packs. An estimated 2,900 wolves resided in Minnesota in 2008, similar to numbers recorded in 2004 (MnDNR 2008b). The average size of a wolf pack in Minnesota is 5.3 individuals, and average territory size is 40 mi^2 (Erb and Benson 2004).

The number of wolves in Minnesota has increased nearly five-fold since the early 1970s (Berg and Benson 1999, Erb and Benson 2004, MnDNR 2008b). Wolves typically prey on ungulates (hoofed animals), such as deer and moose in northeastern Minnesota (MnDNR 1999). Until recently, wolves have been primarily confined to areas with little human disturbance. During the past 20 years, they have been observed using areas with higher levels of human activity (Mech 1995; Thiel et al. 1998). Wolves also appear to avoid areas with a high density of roads, especially those accessible to two-wheeled (versus four-wheeled and ATV) vehicles, although more wolves have moved into areas with higher road densities in recent years (Mech 1998, MnDNR 1999).

In 1978, critical habitat was designated for the Eastern Distinct Population Segment of gray wolf (Federal Register 1978). That rule identified critical habitat at Isle Royale National Park, Michigan, and Minnesota wolf management zones 1, 2, and 3. Wolf management zones 1, 2, and 3 comprise approximately 9,800 $miles^2$ in northeastern and north central Minnesota and include all of the Superior National Forest and portions of the Chippewa National Forest. The Hay Lake Parcel is not located within the area of critical habitat, while the McFarland Parcel is in Zone 1.

5.5.2. State-listed Threatened and Endangered Species

Wood turtle. No wood turtles were found in the parcels. The wood turtle is on the western edge of its range in Minnesota. It occurs north into Ontario, east to Nova Scotia and south from northern Iowa to northern Virginia. There are no Minnesota Natural Heritage Program records of wood turtles near either site (MnDNR 2009). Because of its dependence on forested riverine systems and well-drained soils, the wood turtle was probably never uniformly distributed in the Upper Great Lakes Region, but was locally abundant in areas with optimal habitat. In Minnesota, factors contributing to its decline include the loss or fragmentation of riverine forests related to agriculture, timber harvest, road construction, and development; siltation of streams caused by excessive runoff; and flooding of nesting areas.

Trumpeter swan. A pair of trumpeter swans withy cygnets (young) were seen on Little Rice Lake on the Hay Lake Parcel. The trumpeter swan is primarily found on lakes and ponds in the Rocky Mountains during the breeding season and on the West Coast during winter. The trumpeter swan is a casual visitor to the Superior National Forest (Green 1993, Ryan 2009).

Horned grebe. No horned grebes were seen in the parcels during the surveys. The horned grebe nests on freshwater ponds and lakes throughout central and western Canada and into the Dakotas and Minnesota and winters on salt water and the Great Lakes. The horned grebe is a migrant in Superior National Forest (Green 2003) and could use pond and lake habitat in the study area during migration.

Wilson's phalarope. No Wilson's phalaropes were seen in the parcels during the surveys. The Wilson's phalarope nests on prairie sloughs and ponds found in the interior grasslands of western and central Canada and northern

U.S. and the Pacific Northwest (Terres 1982). The bird winters in southern South America and has been reported as a very rare migrant in Superior National Forest (Green 2003).

Common tern. No common terns were seen in the parcels during the surveys. The common tern is found over large inland lakes in Canada and the northern U.S. The bird nests in large colonies on beach sandspits and islands of sand and oyster shells, and winters along the Atlantic and Gulf coasts. The common tern is an occasional visitor to Superior National Forest (Green 2003).

5.5.3. Federal Species of Concern

Black tern. No black terns were seen in the parcels during the surveys. The black tern is a locally common breeder on prairie sloughs and marshes of the upper Midwest and Canadian Prairies. The black tern breeds in northern Minnesota and has been seen in Superior National Forest during summer and fall (Green 2003). Breeding habitats favored by black terns are uncommon on the parcels, and it is unlikely that black terns would nest or spend much time on the parcels.

Northern goshawk (Superior National Forest Management Indicator Species). No northern goshawks were seen or heard during the surveys. However, a northern goshawk territory was identified in 2002 about 1 mile southwest of the Hay Lake Parcel, Two young were produced in 2003 and 2005, but the territory has not been active since 2005 (MnDNR 2009a). The pair had three nests, and two were in birch trees.

Northern goshawks are widely distributed across the northern half of eastern North America and in many parts of western North America (Squires and Reynolds 1997), but are generally rare over most portions of their range. Population productivity and nesting densities are related to snowshoe hare and grouse populations. Goshawks in Minnesota favor forest stands with large canopy trees and a brushy understory (Phillips 1999). Territory sizes can range up to 6,000 acres, and logging and other human-related activities can discourage goshawks from using an area.

Goshawk breeding habitat in Superior National Forest is typically older forest with sufficient open space between the bottom live tree branches and the understory for the birds to easily fly (Phillips 1999). Aspen are favored as nest trees. Goshawk pairs observed on the NorthMet Mine site used large aspen trees as nest sites, and the midstory canopy was mostly open in the vicinity of the nest. The surrounding forest stand was a mixture of deciduous and coniferous trees, and it was near a recent clear-cut stand and scrub-shrub wetland (ENSR 2009a). There is little mature deciduous and mixed forest habitat on the Hay Lake Parcel, although there are scattered deciduous trees to 16 inches dbh. The McFarland Parcel had mature forest habitat with large (> 12 inches dbh) on the northern and southern portions of the parcel (Map 2), and scattered large eastern white pine, northern white cedar, and trembling aspen to 16 inches dbh were found in the central portion of the site.

Boreal owl. No boreal owls were seen or heard during the surveys. Boreal owls nest in mature conifer and mixed deciduous/conifer forests in northern Canada and are irregular visitors to the northern U.S., including northern Minnesota, during winter. Boreal owls breed in the Superior National Forest, although they are very rare and few boreal owls are expected to occur in or near the parcels (Forest Service 1999, Green 2003, Catton 2007).

Great gray owl. No great gray owls were seen or heard during the surveys. The great gray owl primarily nests at high elevations in the Sierra Nevada and Northern Rocky Mountains, and in pine and spruce forests of western and north central Canada. Great gray owls use stick nests built in tamarack and spruce trees. Great gray owls are very rare in the Superior National Forest (Green 2003). No great gray owl nests have been found within 6 miles of the parcels.

Olive-sided flycatcher. No olive-sided flycatchers were observed during the surveys. The olive-sided flycatcher is common in coniferous woods of the western U.S. and western and central portions of northern Canada. Flycatchers

nest in tamarack and other conifer trees. They are listed as rare migrants in the Superior National Forest (Green 2003).

Black-throated blue warbler. No black-throated blue warblers were seen or heard during the surveys. The black-throated blue warbler is common in conifer and mixed forests, primarily east of Minnesota. These warblers nest as far west as central Minnesota, but are listed as rare in the Superior National Forest (Green 2003).

Bay-breasted warbler. Bay-breasted warblers were not seen or heard during the surveys. The bay-breasted warbler is fairly common in the northern coniferous forests of Canada and has been reported nesting in northeastern Minnesota. It constructs nests in spruce, hemlock, and birch trees or in shrubs. The bay-breasted warbler is a very rare breeder and migrant in the Superior National Forest (Green 2003).

Connecticut warbler. The Connecticut warbler was not seen or heard during the surveys. The Connecticut warbler is an occasional migrant and breeding bird in the vicinity of the study area (Green 2003). This species prefers to nest in spruce-tamarack bogs and in poplar and aspen woods. These warblers winter in Central and South America.

5.5.4. State Species of Concern

American white pelican. No pelicans were seen in the parcels during the surveys, although pelicans could use Hay and Little Rice lakes and other nearby water bodies that support fish. The American white pelican nests on isolated islands in lakes of inland North America, primarily in the Prairie Provinces of Canada. The pelican winters along the Pacific and Gulf coasts. Northeastern Minnesota is on the eastern range of the pelican's migratory route, and the bird is an occasional visitor to the Superior National Forest during migration (Green 2003).

Marbled godwit. No godwits were seen in the parcels during the surveys. The marbled godwit is common in the western U.S. and Canada, nesting on prairies, meadows, and pastures. Godwits winter along the Pacific, Gulf, and Atlantic coasts. Godwits migrating between breeding areas and the Gulf and Atlantic coasts are occasionally seen in the Superior National Forest (Green 2003).

Yellow rail. No yellow rails were seen in the parcels. Yellow rails are a secretive, wetland species, breeding in the northern United States and Canada (MnDNR 2009b). Recent surveys have documented yellow rails in numerous counties in north-central and northwestern Minnesota, indicating that this species is somewhat more widespread in suitable habitat than previously believed. However, yellow rails have very narrow habitat requirements, and even slight changes in water levels in wetlands can render habitat unsuitable. Yellow rails breed in sedge- or grass-dominated wetlands, particularly wet prairie and rich fens with narrow-leaved sedges. The invasion of woody species into wetlands diminishes the habitat quality for yellow rails (Bookhout 1995). The bird is a casual visitor to the Superior National Forest during migration (Green 2003).

Bald eagle (Superior National Forest Management Indicator Species). No bald eagles were observed during the surveys. The nearest bald eagle nest to the Hay Lake Parcel is about 4 miles to the southeast on Cedar Island Lake (Ryan 2010). Eagle nests have been observed at John Lake and at North Fowl Lake (two nests), about 2 to 3 miles from the McFarland Parcel. The John Lake nest was active in 2007, and one nest at North Fowl Lake was active in 2005; the other nest was not active during surveys in 2006. No nest surveys were conducted for these nests during 2007 to 2009, and all three nests could belong to the same pair of eagles. Bald eagles forage on McFarland Lake (Russ 2010).

Bald eagles tend to be associated with larger lakes surrounded by mature forest, where eagles can perch while searching for fish, birds, and other prey items, and where large trees provide suitable structure for nests. Hay and Little Rice lakes, and McFarland Lake are found in the parcels and have large trees that could be used by eagles as perches or for nests. No bald eagle nests have been recorded on the parcels. Lindquist (1990 *in* Forest Service

2005a) found that 85 percent of nest trees selected by bald eagles in the Superior National Forest were large diameter eastern white pine. Roosting and foraging habitat for an eagle may include an area up to 1.5 miles from its nest (Forest Service 2005b).

Eastern pipistrelle. Bats were recorded at several sites in or near the parcels, but the species of bats echolocating at bat survey sites was not determined. The eastern pipistrelle is the smallest of Minnesota's seven bat species (MnDNR 2009c). The eastern pipistrelle, which ranges over most of the eastern United States and southeastern Canada, was first discovered in Minnesota at St. Peter in 1934 (Swanson and Evans 1936). It has never been found in large numbers, and no maternity colony has yet been found in the state. Eastern pipistrelles hibernate in caves, mines, and tunnels. This species is often found hibernating in the same sites as large populations of other bats. Since its designation in Minnesota as a species of special concern in 1984, the eastern pipistrelle has been found to occur regularly, although in low numbers, in caves and mines in the southeastern part of the state. A single hibernating individual was found in 1990 and two were found in 2003 in northeastern Minnesota, several hundred miles north of the previously documented northernmost locality in the state (MnDNR 2009c).

Northern myotis. Bats were recorded at several sites in or near the parcels, but the species of bats echolocating at bat survey sites was not determined. The northern myotis, also known as the northern long-eared myotis, is widely distributed in Canada and throughout the eastern half of the United States (MnDNR 2009d). It was designated a species of special concern in 1984. It can be found in the state in both summer and winter. A large hibernaculum was discovered in St. Louis County, and northern myotis have been found in most other caves and mines surveyed in Minnesota, although typically in low numbers. In summer, the species is often associated with forested habitats, especially around wetlands. Summer roosts are believed to include separate day and night roosts. Day roosts may be under loose tree bark, in buildings, or behind signs or shutters, and night roosts may include caves, mines, and quarry tunnels. This bat is frequently found hanging with or near groups of little brown bats.

Smokey shrew. No smokey shrews were found in the parcels. The smoky shrew is a mouse-sized animal with a pointy nose, small eyes, and a long tail (MnDNR 2009e). It is relatively large for a shrew. The presence of smoky shrews in extreme northeastern Minnesota was first documented in 1991 (Jannett and Oehlenschlager 1994) and subsequently further west in Lake County in 2003. Minnesota now represents the western edge of the species' distribution. Throughout its range, smoky shrews occur in deciduous and coniferous forests, bogs, and swamps. Moist habitats are important (McShea et al. 2003) and the preferred microhabitat includes a cool, damp forest floor with a thick litter layer, mossy covered rocks, and decaying debris (Owen 1984). In Minnesota, smoky shrews have been found in glacial boulder streams, second-growth black spruce, fir, paper birch forests (Jannett and Oehlenschlager 1994), talus slopes, and sphagnum bogs. They are active year-round.

Heather vole. No heather vole or their sign were seen in the parcels. The heather vole is extremely rare in northeastern Minnesota (MnDNR 2006a). The heather vole has limited distribution in coniferous forest habitats of northeastern Minnesota along the Canadian border. The project site is on the southern edge of its range, which lies primarily in Canada and the Rocky Mountains.

Least weasel. No weasels were seen during the surveys. Least weasels are found in Alaska, throughout Canada, and into the northern U.S. They prefer meadows, fields, and brushy areas (MnDNR 2009f). The least weasel has a sporadic distribution in northern Minnesota. However, most records of this species in Minnesota come from the northwestern portion of the state. Once considered secure in the state, only one least weasel has been recorded in Minnesota since 1967 despite extensive survey work in suitable habitats.

Mountain lion. No mountain lions or their sign were seen in the parcels during the surveys. The mountain lion is a habitat generalist that preys primarily on deer and prefers areas with little human disturbance. Mountain lion sightings are very rare in Minnesota; it is possible that mountain lions inhabit the study area, although no mountain lion have been seen in the study area (Cougar Network 2009). There is currently no estimate of population size in Minnesota, and the mountain lion was removed from the Forest Service Region 9 Threatened, Endangered, and

Sensitive Species list and the Regional Forester Sensitive Species list in 2000 because it is considered to be extirpated from Minnesota (Catton 2007).

5.5.5. Other Species of Concern

Several animal species were identified in the 1986 LRMP for the Superior National Forest as Superior National Forest Viability and Management Indicator Species (Forest Service 1986). In 2004, the plan was updated to include only three Viability/Management Indicator Species: bald eagle, gray wolf, and northern goshawk (Forest Service 2004). These three species are discussed above. In addition, this report includes information on those species listed in the 1986 LRMP.

Northern leopard frog. Northern leopard frogs were not seen or heard in the parcels. The northern leopard frog is found in the Rocky Mountains, upper Midwest U.S., and southern Canada. It breeds in freshwater and brackish marshes. In the Superior National Forest, it uses grass, forb, and low wet meadows near streams, ponds, and open water. Northern leopard frogs have been seen in the region (ENSR 2007).

Common loon. Loons are uncommon in the Superior National Forest (Green 2003), but were observed on Hay Lake and McFarland Lake. The common loon is a common breeder along lakes and rivers in northern Minnesota, west through the northern U.S, and throughout Canada. Loons winter along the Pacific, Atlantic, and Gulf coasts. Loons forage on small fish and crustaceans and tend to use deep water bodies where they can dive to escape predation.

Hooded merganser. Hooded mergansers were seen on Hay Lake and the Pike River, and on McFarland Lake, but are uncommon in the Superior National Forest (Green 2003). Hooded mergansers are found on wooded lakes and streams, primarily in the western U.S., and northern Minnesota and most of the eastern U.S. Hooded mergansers nest in tree cavities that are large enough to allow for entrance by the female.

Osprey. Ospreys were not seen during the survey. The osprey is a raptor that is found along the seacoast, lakes, and rivers. It ranges from Alaska, through western and southern Canada, into the northern U.S., and along U.S. and Canadian coastlines. Though uncommon in the Superior National Forest (Green 2003), ospreys can be found on large lakes and rivers where mature white and red pines are found within a quarter mile of fish-bearing streams and lakes.

Red-tailed hawk. A red-tailed hawk was observed during the Hay Lake Parcel survey. Red-tailed hawks are found throughout North America. They nest in woodlands and feed in open country on rabbits, rodents, and snakes. They are rare in the Superior National Forest (Green 2003).

Ruffed grouse. Ruffed grouse were seen and heard during the survey, especially in mixed and deciduous forest habitats near the edges of wetlands. Drumming counts indicate that ruffed grouse populations fluctuate cyclically over 10-year intervals in Minnesota, and northeast Minnesota has greater ruffed grouse density than other portions of the state (MnDNR 2007b). Ruffed grouse favor young aspen/birch forests less than 25 years in age. Most forest stands on the project site are more than 25 years old.

Spruce grouse. Spruce grouse were not seen during the survey, but spruce grouse occur throughout the region in conifer forests. Approximately half of the spruce grouse in Minnesota are found in the northeastern portion of the state. Spruce grouse primarily use mature jack pine and spruce forests, which were present but not common in the study area.

American woodcock. American woodcock was seen on the Hay Lake Parcel in several areas with scrub-shrub wetlands dominated by speckled alder. The American woodcock is a rare breeder in the Superior National Forest

(Green 2003). Woodcock are mostly found in the eastern and southern U.S. American woodcock live in moist woods and thickets.

Killdeer. Killdeer were not seen during the survey. Killdeer are common in meadows, pastures, fields, and dry uplands throughout North America. They are considered rare in the Superior National Forest (Green 2003) and would not likely use the study area to any great extent due to the lack of meadows, pastures, and fields they favor for nesting and foraging.

Belted kingfisher. Belted kingfisher were not seen during the survey. The belted kingfisher is uncommon in the Superior National Forest (Green 2003), but has been seen using open water habitat associated with streams and wetlands in the region. The belted kingfisher is the most common kingfisher in North America. It is commonly seen singly or in pairs along streams and ponds, often perching at the edge of the pond and then diving into the water for fish.

Pileated woodpecker. Pileated woodpecker and their sign were observed in the parcels in older pole and mature mixed forests with snags and stumps on both parcels. Pileated woodpeckers are found in the Pacific Northwest, throughout much of Canada, into Minnesota, and throughout much of the eastern U.S. Pileated woodpeckers favor large expanses of deciduous or mixed forests with mature trees and down woody material, snags, and large stumps.

American three-toed woodpecker. No American three-toed woodpeckers were observed during the surveys. American three-toed woodpeckers are very rare in the Superior National Forest (Green 2003) and prefer mature boreal forest habitats where snags are common.

Black-backed woodpecker. Black-backed woodpeckers were not observed during the surveys. Black-backed woodpeckers are very rare in the Superior National Forest (Green 2003) and prefer upland and wetland spruce/fir mixed forests and conifer stands with scattered snags.

Brown creeper. The brown creeper is uncommon in the Superior National Forest (Green 2003) and was not seen in the parcels during the survey. The brown creeper is a common woodland bird found throughout North American. Creepers favor both deciduous and coniferous mature forests, and have been seen in mature red and eastern white pine stands near the Mine Site.

Golden-crowned kinglet. Golden-crowned kinglets were not seen during the survey. They are common in the Superior National Forest (Green 2003). Golden-crowned kinglets are found throughout North America, primarily in mature lowland coniferous forests.

Swainson's thrush. Swainson's thrushes were heard on the Hay Lake Parcel. Swainson's thrushes summer in the spruce, cedar, and fir forests of Alaska, Canada, and the northern U.S. They are common breeders in the Superior National Forest (Green 2003).

Magnolia warbler. Magnolia warblers were not observed during the survey. Magnolia warblers breed in spruce, balsam fir, and hemlock forests of southern Canada and the northern U.S., and winter in Central America. Magnolia warblers are abundant residents of the Superior National Forest (Green 2003), selecting sparsely stocked spruce and fir sampling stands, and mature and immature pine stands.

Pine warbler. Pine warblers were not heard in the parcels during the surveys. The pine warbler nests in open groves of mature pine and is found nesting primarily to the east of Minnesota in the northeastern and eastern U.S. and southern Canada. Pine warblers also select mature aspen trees near lowland conifer foraging habitat. They are uncommon migrants and breeders in the Superior National Forest (Green 2003).

Savannah sparrow. The savannah sparrow is listed as rare in the Superior National Forest (Green 2003) and was not seen during the survey. The savannah sparrow is common throughout North America and prefers large fields with short or sparse grass or weeds, although savannah sparrows also use sedge marshes and wet meadows.

Beaver. Beaver dams were found in several ponds and wetlands, and along the Pike River, in the Hay Lake Parcel, with recent cuttings found at several locations. Several large open water bodies on the site were created by beaver dams, and beaver lodges were also seen on large water bodies. Beaver cuttings were also seen on the McFarland Parcel near McFarland Lake. Beavers are found near aquatic habitats in the Superior National Forest, including rivers, streams, lakes, ponds, and marshes.

Porcupine. No porcupines were observed in the parcels during the surveys. Porcupines are most often found in woody areas, but have adapted to a wide range of habitats, from tundra to desert chaparral and rangelands. They are found throughout Alaska, Canada, and the western U.S. In the Superior National Forest, porcupines are most closely identified with mature pine forests. They are considered scarce in the Boundary Waters Canoe Area Wilderness north and east of the study area.

White-tailed deer. White-tailed deer were common in the parcels. Deer tracks and droppings were commonly found in the study areas in virtually all habitat types, and several deer were seen along roads, in shrublands, and bedding along the Pike River on the Hay Lake Parcel. Deer were especially common in recently logged areas and shrublands near mixed and conifer pole/young mature and mature forest habitats. During winter, deer favor mature forest stands with large conifer trees or dense pole-size spruce and balsam fir stands for cover, and foraged in nearby wetlands and shrublands. Deer trails in forests often followed the edge of wetlands, about 20 feet from the wetland edge. An estimated 15 to 28 deer are found per square mile in the study area (MnDNR 2006a). Based on population surveys and hunter kill rates, deer population densities in Minnesota are lower in northeastern Minnesota than in central and southeastern Minnesota (MnDNR 2005, 2006b).

Moose. Moose sign (droppings, tracks, and evidence of browsing) were observed in the Hay Lake Parcel in areas with abundant shrubs and in speckled alder wetlands. Moose were more likely than deer to move through wetlands. Moose populations in the Superior National Forest have fluctuated considerably since the early 1900s and have shown their greatest increases during periods of intense timber harvest (Huempfner 1978a). A 2009 aerial survey by the MnDNR produced a population estimate of 7,593 moose in northeastern Minnesota. The moose population in the region has mostly trended upwards since the early 1990s (Lenarz 2009).

5.6 Wildlife Habitat Assessment

Habitat observed on the parcels is similar to habitat associated with much of the Iron Range and northeastern Minnesota. The Hay Lake Parcel has moderate topographic relief. The site consists of a mosaic of slightly elevated upland areas surrounded by wetlands, and slopes toward the east-northeast, in the direction of the Pike River. Elevations range from 1,464 feet above mean sea level along the northeastern boundary to 1,902 feet above mean sea level near the southwestern boundary of the parcel and along the Pike River The McFarland Parcel is on a hillslope that rises from 1,483 feet above mean sea level at McFarland Lake to 1,778 feet above mean sea level on the western boundary of the parcel. Rocky cliffs, about 150 feet in height, are found at the top of the hillslope,

During surveys, most (59 percent; 2,930 acres) of the Hay Lake Parcel was wetland habitat, although upland habitat (41 percent; 1,995 acres) was an important component in the central and western portion of the parcel (see Maps 1 and 2). The Pike River, Hay Lake, and Little Rice Lake were dominant features of the landscape. The Pike River flows along the eastern boundary of the parcel.

The McFarland Parcel consists of upland habitat, although a small (<0.5 acre) portion of the parcel is palustrine mature conifer wetland habitat. As noted above, the parcel is on a hillslope west of McFarland Lake. Large boulders were found on the hillslope and steep, rocky cliffs were at the top of the hillslope.

Forest vegetation dominates the Hay Lake Parcel (Table 5). Nearly all forest stands contained trees that were 11 inches dbh or less, and most of the upland trees were 8 inches dbh or less. The site can be divided into four general habitats. The eastern portion is dominated by the Pike River. Floodplain associated with river is dominated by wetland emergent habitat with sedges and grasses, and wetland scrub-shrub speckled alder habitat. Wetland areas to the west of the river are dominated by lowland black spruce forest, with scattered northern white cedar and tamarack, and scrub-shrub wetlands, especially in areas with evidence of past disturbance by logging activities. Higher elevations in the northern, central, and western portions of the parcel are dominated by upland deciduous and mixed deciduous and coniferous forest. Upland forest stands in the northern, central, and southwestern portions of the parcel are pole to young mature in size and age, while stands in the western portion of the parcel are sapling to young pole in size in age, having been harvested in recent years. Most trees are estimated to be 60 years or younger. Two transmission line right-of-ways (ROWs) were found on the parcel (see Maps 1 and 2). Emergent wetland and upland grassland/shrubland vegetation dominated the ROWs. Abandoned logging roads were also found on the parcel. Low areas along roads were dominated by emergent wetland vegetation consisting of sedges and grasses, while upland portions of roads were dominated by grasses and forbs.

Curing surveys, upland areas appeared to be used more by wildlife than wetlands, especially by passerine birds and large mammals such as white-tailed deer and moose, probably because uplands provided more cover and food. However, it was common to see game trails going around wetlands, suggesting that white-tailed deer and moose foraged in wetlands, but sought cover in nearby forests. White-tailed deer favor aspen and birch forests in northern Minnesota for foraging, while conifer-dominated stands are important in late winter (Mooty 1971, Wetzel 1972). Huempfner (1978b, c) suggested that mixed conifer-deciduous forest stands near recently disturbed areas containing large amounts of browse should be considered prime wintering areas for white-tailed deer and moose. This appeared to be true on the Hay Lake Parcel, as evidence of white-tailed deer and moose use was greatest on or near logged areas, ROWs, and wetlands/streams. Wetzel (1972) found that winter deer and moose beds were associated with conifer stands, primarily balsam fir, that provided areas with shallower snow depths and helped to decrease body heat loss.

Access to the site on all-terrain vehicle or snowmobile was available from the Pike River Road, near the northern boundary and at a second access point in the northcentral portion of the parcel. A boat launch to the Pike River was located in the southcentral portion of the parcel and adjacent to the Pike River Road. Several deer stands were observed on the parcel, and deer were often seen in the vicinity of deer stands.

The McFarland Parcel was dominated by deciduous and mixed deciduous and coniferous forest habitats (Table 6). Tree sizes and ages ranged from pole to young mature forest. Some logging had occurred recently on the top of the hillslope along the western boundary of the parcel. Steep rocky cliffs were found at the top of the hillslope. The site could be accessed by vehicle from private and Forest Service roads leading to McFarland Lake.

5.6.1 Wetlands

5.6.1.1 Hay Lake Parcel

Wetlands on the Hay Lake Parcel consisted predominantly of pole/young mature palustrine conifer forest (65.1 percent), palustrine scrub-shrub (19.7 percent), and open water (6.0 percent; Table 5). Hay Lake, Little Rice Lake, an unnamed lake, and the Pike River are the dominant water features on the parcel. The Pike River flows along the eastern boundary of the parcel. Floodplain habitat is associated with the river. Large bog wetlands dominated much of the east-central portion of the parcel. Several wetlands were created or enlarged due to damming of streams by beaver dams. Raised water levels resulted in stands of dead and dying spruce along portions of the river. These areas show up as dark blue areas (P-3) on Map 1.

Table 5
Habitat Classification and Acreage for the Hay Lake Parcel

Code	Habitat Type	Total Acreage for Hay Lake Parcel[1]
P-0	Open water	177
P-1	Bog/palustrine emergent wetland	86
P-2	Palustrine scrub-shrub	578
P-3	Palustrine forest dead trees	45
P-4	Palustrine forest deciduous sapling (0-4 in dbh)	2
P-5	Palustrine forest deciduous pole/young mature (5-12 in dbh)	0
P-6	Palustrine forest deciduous mature (12+ in dbh)	1
P-7	Palustrine forest mixed sapling (0-4 in dbh)	44
P-8	Palustrine forest mixed pole/young mature (5-12 in dbh)	0
P-9	Palustrine forest mixed mature (12+ in dbh)	6
P-10	Palustrine forest conifer sapling (0-4 in dbh)	83
P-11	Palustrine forest conifer pole/young mature (5-12 in dbh)	1,908
P-12	Palustrine forest conifer mature (12+ in dbh)	0
U-1	Disturbed	5
U-2	Grassland/Forbs	25
U-3	Shrubland	36
U-4	Forest deciduous sapling (0-4 in dbh)	423
U-5	Forest deciduous pole/young mature (5-12 in dbh)	820
U-6	Forest deciduous mature (12+ in dbh)	119
U-7	Forest mixed sapling (0-4 in dbh)	81
U-8	Forest mixed pole/young mature (5-12 in dbh)	117
U-9	Forest mixed mature (12+ dbh)	349
U-10	Forest conifer sapling (0-4 in dbh)	0
U-11	Forest conifer pole/young mature (5-12 in dbh)	21
U-12	Forest mature (12+ in dbh)	0
Total		4,926

[1] Acreage is based on GIS analysis and is not the same as acreage reported in Government Land Office records that are based on land surveys.

Hay Lake was an open freshwater body found in the central portion of the parcel. During surveys, yellow water-lily, pondweeds, wild rice, horsetail, and coontail were important submerged, emergent, and floating species. Sedges, narrow-leaved cattail, speckled alder, leatherleaf, horsetail, and moss ringed the lake. No waterfowl were seen on the lake at the time of the visit.

Little Rice Lake is adjacent to the Pike River Road and the Pike River. Yellow water-lily pondweeds, wild rice, and coontail were important aquatic plants. The lake was ringed by patches of phragmites, speckled alder, and narrow-leaved cattail. Painted turtle, green frog, Virginia rail, ring-necked duck, and trumpeter swan and their young, were seen on the lake.

Table 6
Habitat Classification and Acreage for the McFarland Parcel

Code	Habitat Type	Total Acreage for McFarland Parcel[1]
U-8	Forest mixed pole/young mature (5-12 in dbh)	19.5
U-9	Forest mixed mature (12+ dbh)	8.9
U-11	Forest conifer pole/young mature (5-12 in dbh)	0.9
U-12	Forest mature (12+ in dbh)	1.5
Total		30.8

[1] Acreage is based on GIS analysis and is not the same as acreage reported in Government Land Office records that are based on land surveys.

Yellow water-lily, pondweeds, wild rice, bladderwort, and coontail were important aquatic plants associated with the Pike River. Floodplain wetlands associated with the river were dominated by emergent wetland habitat dominated by sedges (P-1), and scrub-shrub habitat dominated by speckled alder, red-osier dogwood, meadowsweet, slender-leaved willow, and pussywillow (P-2). Western chorus and green frogs called from the rivers edge. A variety of birds were seen along the river, included ring-necked duck, hooded merganser, common loon, song sparrow, golden-winged warbler, common yellowthroat, chipping sparrow, blue jay, red-winged blackbird, thrushes, and cedar waxwing. White-tailed deer bedded in shrubs along the river, and several river otters were seen using the riverbank and swimming in the river.

Bogs were dominated by leatherleaf and bog Labrador-tea, with scattered young speckled alder, bog birch, tamarack, and in some areas, narrow-leaved cattail and sedges. Sphagnum and club moss often covered 80 to 90 percent of the bog. Scattered (<5 percent) black spruce (some dead) and smallish tamarack were found in the tree layer. Lowbush blueberry, small-fruited bog cranberry, bog rosemary, and small willows were also common. Other species encountered included cottongrass, wild iris, wild raspberry, bunchberry, and northern bog orchid. Moose and white-tailed deer scat and trails were seen in or near these wetlands.

Emergent wetlands were primarily limited to disturbed areas on the parcel: floodplains associated with the Pike River and wetlands associated with abandoned logging roads, transmission line ROWs, and beaver ponds. These wetlands were often dominated by Canada bluejoint, sedges, and narrow-leaved cattail (70 to 80 percent cover) and water depths were a foot or more in deeper areas. Spruce, tamarack, and northern white cedar associated with the wetland were often killed when flooded due to the rising water level behind beaver dams. Willows, tamarack, red-osier dogwood, and speckled alder were often found along the border of these wetlands, but comprised less than 30 percent of the cover. Wild iris was seen in some wetlands, as was horsetail, burreed, spikerush, water arum, broad-leaved arrowhead, and woolly sedge. Wildlife observed in these wetlands included American toad, Western chorus frog, gray treefrog, wood frog, snapping turtle, garter snake, great blue heron, red-winged blackbird, blue jay, and eastern phoebe. Beaver and bats were seen using these wetlands. White-tailed deer and moose trails and scat were often seen in or near these wetlands.

Shrub swamp/scrub-shrub wetlands usually consisted of a dense (60 to 90 percent) cover of speckled alder, meadowsweet, and bog birch, with alder often 6 feet or taller in height. Some of the wetlands had scattered sapling black spruce, tamarack, and willow, but tree cover never exceeded 25 percent. Dominant low shrubs were bog Labrador-tea, leatherleaf, lowbush blueberry, prickly rose, wild raspberry, and red-osier dogwood. Mountain maple saplings were also present in a few wetlands. Herbaceous layer species included club and sphagnum mosses, woolly sedge, Canada bluejoint, horsetail, bunchberry, and clintonia. American woodcock sought forage and shelter in alder stands; ruffed grouse and snowshoe hare also foraged on willow buds and twigs. Common yellowthroat and yellow warbler were other common species that were seen in these habitats.

Wetlands forests were dominated by black spruce and tamarack, with scattered northern white cedar, red pine, and black ash. Coniferous wetland forest was the most common habitat type on the parcel; deciduous and mixed forest wetlands were uncommon. In some areas with dense stands of spruce, few shrubs were seen, but sphagnum and club mosses often covered nearly 100 percent of the ground. Some open stands had an understory comprised of shrubs and scattered sapling northern white cedar, tamarack, and black spruce, along with speckled alder and willow. Other trees included mountain maple, primarily in deciduous and mixed forests. Common shrub species included specked alder, leatherleaf, bog Labrador-tea, lowbush blueberry, and bog birch. Species found near the ground included clintonia, bracken fern, horsetail, bunchberry, wild raspberry, cottongrass, wild sarsaparilla, wild strawberry, and false lily-of-the-valley. Forest and shrub cover typically ranged from 30 to 60 percent, while moss and other understory vegetation covered from 50 to 90 percent of the ground. Forest dwelling wildlife included western chorus frog, downy, hairy, and pileated woodpeckers, blue jay, gray jay, black-capped chickadee, and red-breasted nuthatch. White-tailed deer and moose used these forests for cover, while red squirrel fed upon spruce cones. American marten scat and holes were also seen in these forests.

Snags and woody debris were rarely encountered in wetlands. Most snags were the result of dead and dying spruce in wetlands that had been flooded by beavers or man-made activities. These snags, however, were little used by cavity-nesting bird species, but did provide perches for birds. Pole and young mature wetland forests had downed woody material to 6 inches in diameter.

5.6.1.2 McFarland Parcel

McFarland Lake borders the parcel and provides lake habitat. Horsetail was seen along the shoreline, but submerged and emergent aquatic vegetation were not seen in the lake near the shoreline. A small (<0.5 acres), shallow-water mature conifer forest wetland was found near the northeastern boundary of the parcel but off the property.

5.6.2 Uplands

5.6.2.1 Hay Lake Parcel

Uplands on the Hay Lake parcel were dominated by deciduous forests (68 percent of all upland habitat), including pole/young mature deciduous forest (41 percent), and sapling deciduous forest (21 percent; Table 5; Map 1). Over 27 percent of upland habitat consisted of mixed deciduous and coniferous forest habitat, while only 1 percent was coniferous forest habitat. Disturbed areas and grasslands were primarily associated with abandoned logging roads and landings and two powerline ROWs, but comprised only 2 percent of upland habitat. Shrubland was also scarce, comprising only 1 percent of upland habitat.

Disturbed areas and grasslands were dominated by forbs and grasses, including cow parsnip, white clover, ox-eye daisy, tall buttercup, common sow thistle, orange hawkweed, American vetch, wild strawberry, wild raspberry, and tansy. Ground cover was about 80 percent. Roads and trails provided important travel routes for mammals, including red fox, gray wolf, black bear, white-tailed deer, and moose.

Shrubland habitat was rare. These areas had scattered pole/young mature and sapling trees (trembling aspen, paper birch, jack pine, willow, and black spruce) and shrubs, primarily beaked hazel. Ground cover was comprised of wild raspberry, wild strawberry, asters, and prickly rose, and covered up to 80 percent of the landscape. Wildlife seen in these areas included red-tailed hawk, northern flicker, cedar waxwing, dark-eyed junco, common yellowthroat, American goldfinch, chipping sparrow, white-throated sparrow, snowshoe hare, and white-tailed deer.

Deciduous forests were dominated by trembling aspen and to a lesser extent paper birch, although some forests contained a willow, mountain maple and black spruce component. Percent cover in sapling forests ranged from 60 to 80 percent, while percent cover generally ranged from 60 to 90 percent in pole and young, young mature, and mature forests The midstory was comprised of sapling mountain maple, trembling aspen, paper birch, balsam fir, and black spruce, and ranged from 40 to 80 percent cover. Shrub species included beaked hazel, with scattered speckled alder, twining honeysuckle, and prickly rose. The ground cover ranged from 40 to 90 percent, but generally was 80 to 90 percent, and included sedges, wild strawberry, bunchberry, wild raspberry, prickly rose, horsetail, clintonia, twinflower, large-leaved aster, rose twisted stalk, skunk currant, spotted coralroot, wood anemone, tall buttercup, bracken fern, and interrupted fern. Wildlife seen in deciduous forests included broad-winged hawk, ruffed grouse, American woodcock, barred owl, blue jay, gray jay, American robin, hermit thrush, Swainson's thrush, winter wren, American crow (including a roost site), common yellowthroat, song sparrow, small rodents, black bear, and white-tailed deer.

Mixed forests contained varying amounts trembling aspen, paper birch, jack pine, and black spruce. Beaked hazel, mountain maple, and sapling balsam fir trees were common in the midstory. Wild sarsaparilla, lowbush blueberry, horsetail, bunchberry, and large-leaved aster were common herbs. Mature forests usually had a sparse shrub layer (about 30 percent cover), but the ground was nearly covered with vegetation, including wild sarsaparilla, bunchberry, wild raspberry, clintonia, tall buttercup, large-leaved aster, and rose twisted stalk. Forest cover ranged from 60 to 80 percent. The midstory ranged from 40 to 70 percent, while ground cover ranged from 40 to 90 percent. Wildlife or their sign seen in mixed forests during the study included ruffed grouse, barred owl, blue jay, gray jay, yellow-bellied sapsucker, black-capped chickadee, red-breasted nuthatch, winter wren, American robin, thrushes, small rodents, red squirrel, American marten, black bear, and white-tailed deer.

Conifer forests were rare on the Hay Lake Parcel. Forest cover was 60 to 70 percent and was comprised of red pine and jack pine. The shrub layer was dominated by beaked hazel (30 percent cover). The herbaceous layer included interrupted fern, bunchberry, wild raspberry, and tall buttercup. Wildlife seen in these forests included great-horned owl, downy, hairy, and pileated woodpeckers, black-capped chickadee, red-breasted nuthatch, American marten, red squirrel, and white-tailed deer.

The largest trees were up to approximately 16 inches dbh for deciduous trees and 10 inches dbh for coniferous trees. Snags and large downed woody debris were uncommon in disturbed areas, shrublands, and sapling and pole/young mature forests. Large snags (up to 12 inches dbh), stumps, and woody debris were seen in more mature forest stands. Snags and stumps were used by pileated, hairy, and downy woodpeckers, yellow-bellied sapsucker, black-capped chickadees, red-breasted nuthatches, and other cavity-nesting birds.

5.6.2.2 McFarland Parcel

The McFarland Parcel consisted of mixed forest (27.9 acres) and coniferous forest (2.4 acres). Mixed forest consisted of trembling aspen, paper birch, mountain maple, northern white cedar, black spruce, and balsam fir. Mountain maple and northern white cedar were especially common on the upper hillslopes, while red pine and trembling aspen dominated the top of the hillslope.

Midstory species included mountain maple and balsam fir. Shrubs included smooth sumac and beaked hazel. Forbs included bunchberry, twining honeysuckle, clintonia, large-leaved aster, twinflower, false lily-of-the-valley, ox-eye daisy, thimbleberry, wild raspberry, wild strawberry, bog rosemary, bog cranberry, wild sarsaparilla, bracken fern and other ferns, and club moss. Enchanter's nightshade and wild columbine were seen on the rocky cliffs. Spring peeper, wood frog, broad-winged hawk, black-capped chickadee, pileated woodpecker, ruffed grouse, American robin, hermit thrush, eastern phoebe, gray jay, blue jay, winter wren, common yellowthroat, chipping sparrow, red squirrel, beaver, white-tailed deer, and moose were seen or heard in forests. A barred owl was heard to the northeast of the parcel. Plant cover averaged about 60 percent in all layers for pole and young mature forests, mature forest canopy was 30 percent cover, and the midstory and understory were about 60 to 80 percent

cover. Conifer forests were primarily located on the north end of the parcel, and were dominated by eastern white pine and trembling aspen to 16 inches dbh.

The largest trees on the parcel were up to approximately 24 inches dbh for paper birch and northern white cedar; 18 inches for trembling aspen, red pine, and eastern white pine; 16 inches for balsam fir; and 12 inches for paper birch. Snags and large downed woody debris, stumps, and woody debris were common in the forests and were to 16 inches in diameter. Snags and stumps were used by pileated, hairy, and downy woodpeckers, black-capped chickadees, red-breasted nuthatches, and other cavity-nesting birds.

6.0 SURVEY RESULTS – WETLAND ASSESSMENT

6.1. Introduction

Field surveys were conducted on the Hay Lake Parcel during June 22 to 27, and June 29 and 30, and on the McFarland Parcel on June 28, 2009. The weather was generally favorable during the study period. Temperatures ranged from the low 50s degree Fahrenheit (°F) at in the morning to mid-80s °F during the afternoon. Light to moderate rain fell on and off during June 22 and 26 to 29. The survey was conducted mostly on foot, although the Pike River Road was used to access portions of the site. Generally, a circular route was taken on foot each day, with the intent of surveying a variety of habitats each day.

6.2. Wetland Assessment

Wetlands on the Hay Lake Parcel consisted predominantly of pole/young mature palustrine conifer forest (65.1 percent), palustrine scrub-shrub (19.7 percent), and open water (6.0 percent). Hay Lake, Little Rice Lake, and unnamed lake, and the Pike River are the dominant water features on the parcel. The Pike River flows along the eastern boundary of the parcel. Floodplain habitat is associated with the river. Large bog wetlands dominated much of the east-central portion of the parcel. Several wetlands were created or enlarged due to damming of streams by beaver dams. Raised water levels resulted in stands of dead and dying spruce along portions of the river. These areas show up as dark blue areas (P-3) on Map 1.

McFarland Lake borders the parcel and provides lake habitat. Horsetail was seen along the shoreline, but submerged and emergent aquatic vegetation were not seen in the lake near the shoreline. A small (<0.5 acres), shallow-water mature conifer forest wetland was found near the northeastern boundary of the parcel, but just off the parcel.

The approximate boundaries of wetlands were determined based on aerial photographic, topographic, and NWI mapping, and field truthing, as discussed in Section 4.0. Approximate wetland boundaries and wetland types based on habitat mapping are shown on Maps 1, 2 and 3.

Wetlands were classified using the classification system given in Table 2. However, this classification system can be adapted to classify wetlands based on other classification systems, including the Circular 39 Classification System (Shaw and Fredine 1956), the Cowardin System (Cowardin et al. 1979), and the Eggers and Reed (1998) wetland classification systems, as shown in Table 3.

6.3. Wetland Function and Values Assessment

During the field surveys, data were collected related to the functions and values of 33 representative wetland locations within the Hay Lake Parcel and 2 locations just off the parcel (Figure 5). Some survey locations were for individual wetlands, while for larger wetland complexes several locations were surveyed. An attempt was made to survey a variety of wetland types across the entire parcel. Survey locations for the wetland functions and values assessment are shown on Figure 5.

Wetland functions and values were rated using the guidelines in the *Minnesota Routine Assessment Method for Evaluating Wetland Functions, Version 3.2* (MnRAM 3.2; Minnesota Board of Water and Soil Resources 2008). As discussed in Section 4.4, MnRAM considers numerous factors in determining the rating, or value, of a wetland. Sixty-three questions given in MnRAM 3.2 were addressed, and all factors were evaluated for each wetland surveyed. As discussed in Section 4.4, the Eggers and Reed (1998) classification system was used to classify wetland communities for the wetland function and value evaluation.

Table 7 summarizes the functional value ratings for the primary wetland functions rated by MnRAM 3.2. Wetlands were rated high for nearly all wetland functional values. Vegetation diversity/integrity was rated high for all wetlands. The overall rating for vegetation diversity/integrity was based on the highest rated community for vegetation diversity and integrity, rather than the average or weighted value for community vegetation diversity and integrity. MnRAM 3.2 guidance states that this is the appropriate measure for assessing wetland quality for regulatory purposes (Minnesota Board of Water and Soil Resources 2008).

Wetland hydrology and water quality were rated high for all wetlands, and high for all wetlands but two for downstream water quality. Wetlands provided moderate to high flood attenuation value.

Wildlife habitat was rated high for all but one wetland, as natural wildlife corridors and upland communities were relatively untouched by recent human disturbances or impacts. There were also no barriers to wildlife movement. Wildlife habitat was rated moderate in an area where there were few plant communities and large amounts of water.

Fish habitat was rated high for wetlands that received a rating. Fish habitat was rated as not applicable for some wetlands. This indicates that the wetland does not have enough standing water throughout the year to support fish. Some other characteristics that might limit wetland value for fish would include isolated wetlands that are not permanently flooded, or forested wetlands where the water table was below the surface for all or part of the year.

Amphibian habitat was rated high for most wetlands. This indicated that the wetland stayed inundated long enough in most years to allow amphibians to successfully breed. Amphibian habitat was rated medium for some wetlands if ideal conditions needed to support amphibian breeding did not occur at the site. Forested wetlands with little or no standing water or not enough woody vegetation during the breeding season would likely not support amphibians. Wetlands with predatory fish may also not support amphibians.

Aesthetics, recreation, education, and cultural values were rated medium. All wetlands were aesthetically pleasing, and could be used for recreation, education, and cultural purposes. However, access by the general public access was limited to overland by foot or on snowmobile/all-terrain vehicle from Pike River Road. A few wetlands had human influences on the viewshed due to close proximity to Pike River Road.

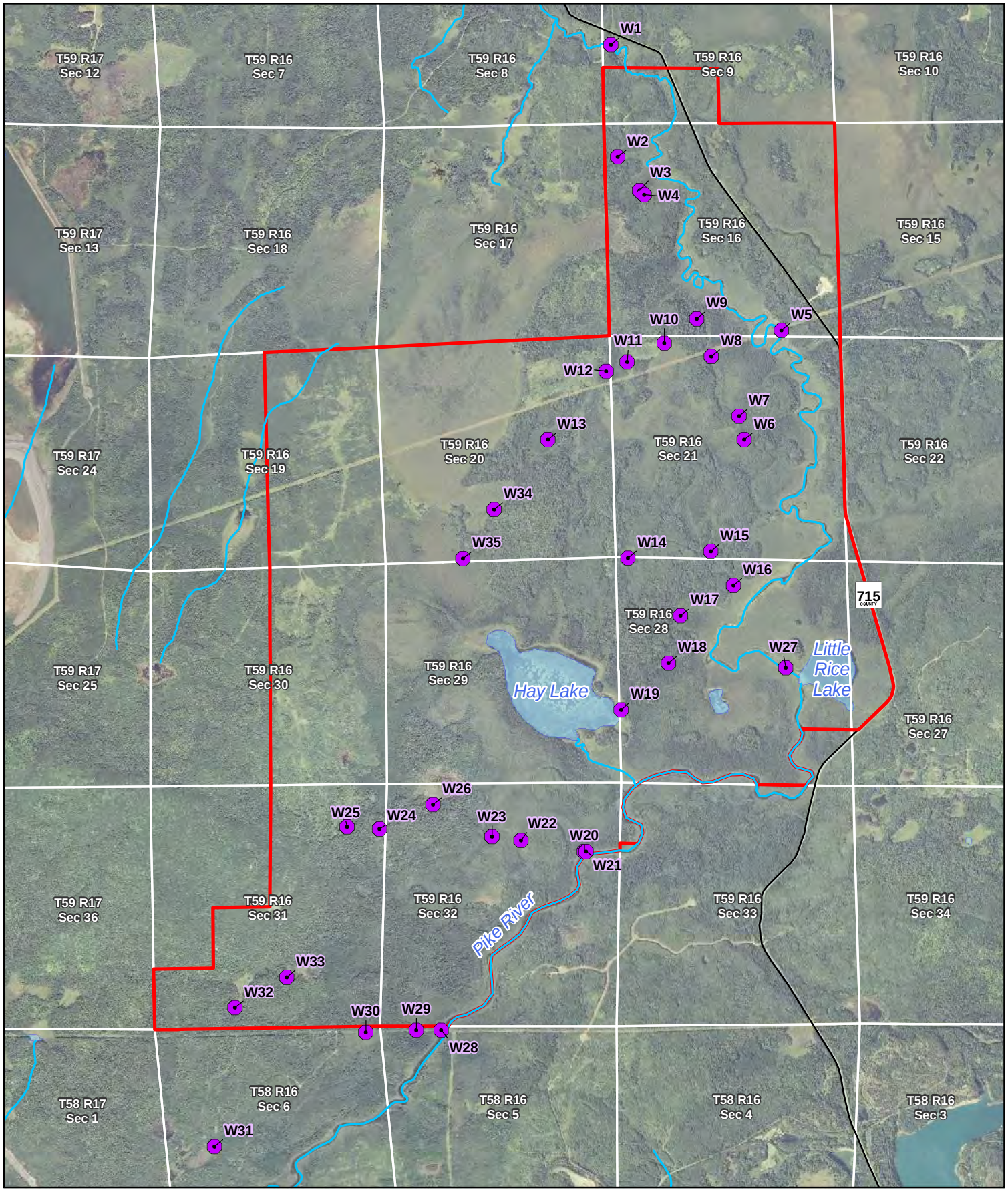


Figure 5

WETLAND FUNCTIONS AND VALUES ASSESSMENT SITES
Hay Lake Parcel
Saint Louis County, MN

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Wetland Functions and Values Assessment Sites
McFarland Parcel
Sections

N

400 200 0 400

Feet

Figure 6

WETLAND FUNCTIONS AND VALUES ASSESSMENT SITES
McFarland Parcel
Cook County, MN

Table 7
Wetland Functional Value Assessment

HAY LAKE PARCEL

Wetland Number	Primary Community Type	Functional Value Ratings								
		Vegetation Diversity / Integrity	Hydrology	Flood Attenuation	Downstream Water Quality	Wetland Water Quality	Wildlife Habitat	Fish Habitat	Amphibian Habitat	Aesthetics / Education / Cultural
1	Alder Thicket	High	High	Medium	High	High	High	High	Medium	Medium
2	Alder Thicket	High	High	Medium	High	High	High	High	High	Medium
3	Coniferous Swamp	High	High	Medium	High	High	High	High	High	Medium
4	Sedge Meadow	High	High	Medium	High	High	High	High	High	Medium
5	Shrub-Carr	High	High	Medium	High	High	High	High	Medium	Medium
6	Coniferous Bog	High	High	Medium	High	High	High	High	High	Medium
7	Coniferous Bog	High	High	Medium	High	High	High	N/A	High	Medium
8	Alder Thicket	High	High	Medium	High	High	High	N/A	High	Medium
9	Coniferous Swamp	High	High	Medium	High	High	High	N/A	High	Medium
10	Coniferous Swamp	High	High	Medium	High	High	High	N/A	High	Medium
11	Shrub-Carr	High	High	Medium	High	High	High	N/A	High	Medium
12	Coniferous Swamp	High	High	Medium	High	High	High	N/A	High	Medium
13	Coniferous Swamp	High	High	High	High	High	High	N/A	High	Medium
14	Shallow Marsh	High	High	High	High	High	High	High	High	Medium
15	Alder Thicket	High	High	High	High	High	High	N/A	High	Medium
16	Alder Thicket	High	High	Medium	High	High	High	High	High	Medium
17	Sedge Meadow	High	High	Medium	High	High	High	N/A	High	Medium

Table 7 (Cont.)
Wetland Functional Value Assessment for Hay Lake Parcel and McFarland Parcel

HAY LAKE PARCEL										
Wetland Number	**Primary Community Type**	**Functional Value Ratings**								
		Vegetation Diversity / Integrity	**Hydrology**	**Flood Attenuation**	**Downstream Water Quality**	**Wetland Water Quality**	**Wildlife Habitat**	**Fish Habitat**	**Amphibian Habitat**	**Aesthetics / Education / Cultural**
18	Coniferous Bog	High	High	Medium	High	High	High	N/A	High	Medium
19	Deep Marsh	High	High	Medium	High	High	High	High	Low	Medium
20	Alder Thicket	High	High	Medium	High	High	High	High	High	Medium
21	Shallow Open Water	High	High	Medium	Medium	High	High	High	Low	Medium
22	Coniferous Swamp	High	High	Medium	High	High	High	N/A	High	Medium
23	Coniferous Swamp	High	High	Medium	High	High	High	N/A	High	Medium
24	Coniferous Swamp	High	High	Medium	High	High	High	N/A	High	Medium
25	Hardwood Swamp	High	High	Medium	High	High	High	N/A	High	Medium
26	Shallow Marsh	High	High	Medium	High	High	High	High	High	Medium
27	Shallow Open Water	High	High	Medium	Medium	High	Medium	High	Low	Medium
28	Sedge Meadow	High	High	Medium	High	High	High	High	Medium	Medium
29	Alder Thicket	High	High	Medium	High	High	High	High	High	Medium
30	Coniferous Bog	High	High	Medium	High	High	High	High	High	Medium
31	Shallow Marsh	High	High	Medium	High	High	High	High	High	Medium
32	Sedge Meadow	High	High	High	High	High	High	High	High	Medium

Table 7 (Cont.)
Wetland Functional Value Assessment for Hay Lake Parcel and McFarland Parcel

HAY LAKE PARCEL										
Wetland Number	**Primary Community Type**	**Functional Value Ratings**								
		Vegetation Diversity / Integrity	**Hydrology**	**Flood Attenuation**	**Downstream Water Quality**	**Wetland Water Quality**	**Wildlife Habitat**	**Fish Habitat**	**Amphibian Habitat**	**Aesthetics / Education / Cultural**
33	Sedge Meadow	High	High	Medium	High	High	High	High	High	Medium
34	Coniferous Swamp	High	High	Medium	High	High	High	High	High	Medium
35	Alder Thicket	High	High	Medium	High	High	High	High	High	Medium

7.0 REFERENCES

AECOM Environment (AECOM) 2008. 2008 NorthMet Mine/Forest Service Additional Parcel Summer Wildlife and Wetland Assessment – Final Report. Prepared for PolyMet Mining Corporation. Hoyt Lakes, Minnesota.

AECOM Environment (AECOM) 2009a. 2009 NorthMet Mine/Forest Additional Parcel Northern Goshawk and Owl Survey – Final Report. Prepared for PolyMet Mining Corporation. Hoyt Lakes, Minnesota.

_____. 2009b. 2009 Keetac Iron Ore Expansion Project Canada Lynx Assessment Final Report. Report Prepared for United States Steel, Inc., Keewatin, Minnesota. Redmond, Washington

Aubry, K.B., G.M. Koehler, and J.R. Squires. 2000. Ecology of Canada Lynx in Southern Boreal Forests. Pages 373-396 *in* L.F. Ruggiero, K.B. Aubry, S.W. Buskirk, G.M. Koehler, C.J. Krebs, K.S. McKelvey, and J.R. Squires (eds.). Ecology and Conservation of Lynx in the United States. University Press of Colorado, Denver, Colorado.

AECOM Environment (AECOM) 2008. 2008 NorthMet Mine/Forest Service Additional Parcel Summer Wildlife and Wetland Assessment – Final Report. Prepared for PolyMet Mining Corporation. Hoyt Lakes, Minnesota.

Barr Engineering. 2006. Wetland Delineation and Wetland Functional Assessment Report. Report Prepared for PolyMet Mining Inc., Hoyt Lakes, Minnesota. Minneapolis, Minnesota.

_____. 2007a. Supplemental Information to the Wetland Delineation Report. Report Prepared for PolyMet Mining Inc., Hoyt Lakes, Minnesota. Minneapolis, Minnesota.

_____. 2007b. Wetlands in the USFS Land Exchange Area. Report Prepared for PolyMet Mining Inc., Hoyt Lakes, Minnesota. Minneapolis, Minnesota.

Behler, J.L., and F.W. King. 1995. National Audubon Society Field Guide to North American Reptiles and Amphibians. Alfred A. Knopf, New York, New York.

Benyus, J.M. 1989. Northwoods Wildlife: A Watcher's Guide to Habitats. NorthWood Press, Inc., Minocqua, Wisconsin.

Berg, W., and S. Benson. 1999. Summary Report to 1997-1998 Wolf Survey Cooperators. Minnesota Department of Natural Resources, Grand Rapids, Minnesota.

Bookhout, T.A. 1995. Yellow Rail (*Coturnicops noveboracensis*). Number 139 *in* A. Poole and F. Gill (eds.). The Birds of North America. The Birds of North America, Inc., Philadelphia, Pennsylvania.

Burt, W.H., and R.P. Grossenheider. 1965. A Field Guide to the Mammals. Houghton Mifflin Company, Boston, Massachusetts.

Catton, S. 2007. Electronic Transmission on July 19, 2007. Mountain Lion and Goshawk Questions. Kawishiwi Ranger District, Superior National Forest. Ely, Minnesota.

Chapman, J.A., and G. A. Feldhamer (eds.). 1982. Wild Mammals of North America. Johns Hopkins University Press, Baltimore, Maryland.

Cougar Network. 2009. Upper Midwest Cougar Confirmations. Available at: http://www.cougarnet.org/uppermidwest.html.

Cowardin, L.M., V. Carter, F.C. Golet, and E.T. LaRoe. 1979. Classification of Wetlands and Deepwater Habitats of the United States. U.S. Fish and Wildlife Service FWS/OBS-79-31. Washington, D.C.

DeVos, A., and S.E. Matel. 1952. The Status of the Lynx in Canada, 1920-1952. Journal of Forestry 50:742-745.

Eggers, S.D., and D.M. Reed. 1997. Wetland Plants and Communities of Minnesota and Wisconsin. U.S. Army Corps of Engineers, St. Paul District. Jamestown, North Dakota: Northern Prairie Wildlife Research Center Online. Available at: http://www.npwrc.usgs.gov/resource/plants/mnplant/index.htm.

ENSR. 2000. Winter 2000 Wildlife Survey Plan for the Proposed NorthMet Mine Site, St. Louis County, Minnesota. Prepared for PolyMet Mining Inc., Hoyt Lakes, Minnesota. Redmond, Washington.

_____. 2005. NorthMet Mine Summer Fish and Wildlife Study. Report Prepared for Barr Engineering, Inc., Minneapolis, Minnesota. Redmond, Washington.

_____. 2006. 2006 Canada Lynx Assessment Final Report. Report Prepared for Barr Engineering, Inc., Minneapolis, Minnesota. Redmond, Washington.

_____. 2007. 2007 Maturi Project Wildlife Assessment. Report Prepared for Franconia Minerals Corporation, Babbitt, Minnesota, and Barr Engineering, Inc., Minneapolis, Minnesota. Redmond, Washington.

Erb, J. and S. Benson. 2004. Distribution and Abundance of Wolves in Minnesota, 2003-04. Unpublished Report by Minnesota Department of Natural Resources, Grand Rapids, Minnesota.

Federal Register. 1978. Reclassification of the Gray Wolf in the United States and Mexico, with Determination of Critical Habitat in Michigan and Minnesota. March 9, 1978. Volume 43, Number 47, Pages 9607-9615. Washington, D.C.

_____. 2009. Endangered and Threatened Wildlife and Plants; Revised Critical Habitat for the Contiguous United States Distinct Population Segment of the Canada Lynx (*Lynx canadensis*); Final Rule. February 25, 2009. 50 Code of Federal Regulation Part 17, Volume 74, Number 36, Pages 8616-8702. Washington, D.C.

Foresman, K.R., and D.E. Pearson. 1998. Comparison of Proposed Survey Procedures for Detection of Forest Carnivores. Journal of Wildlife Management 62:1217-1226.

Green, J.C. 2003. Birds of the Superior National Forest: An Annotated Checklist. Boundary Waters Wilderness Foundation. Minneapolis, Minnesota.

Halfpenny, J.C., R.W. Thompson, S.C. Morse, T. Holden, and P. Rezendes. 1995. Snow tracking. Pages 91-163 *in* W.J. Zielinski and T.E. Kucera (eds.). American Marten, Fisher, Lynx, and Wolverine: Survey Methods for their Detection. U.S. Department of Agriculture, Forest Service, Pacific Southwest Research Station, General Technical Report PSW-GTR-157. Berkeley, California.

Harrington, F.H., and L.D. Mech. 1979. Wolf Howling and its Role in Territory Maintenance. Behaviour: 48: 207-249.

Hazard, E.B. 1982. The Mammals of Minnesota. University of Minnesota Press, Minneapolis, Minnesota.

Huempfner, D. 1978a. Regional Copper-Nickel Study: Moose (*Alces alces*). Minnesota Environmental Quality Board, Minneapolis, Minnesota.

_____. 1978b. Regional Copper-Nickel Study: Ruffed Grouse (*Bonasa umbellus*). Minnesota Environmental Quality Board, Minneapolis, Minnesota.

_____. 1978c. Regional Copper-Nickel Study White-tailed Deer (*Odocoileus virginianus*). Minnesota Environmental Quality Board, Minneapolis, Minnesota.

International Wolf Center. 2009. Wolf Telemetry Database. Available at: http://www.wolf.org/wolves/experience/telemsearch/vtelem/telem_main.asp. Ely, Minnesota.

Jannett, F. J., Jr., and R. J. Oehlenschlager. 1994. Range Extension and First Minnesota Records of the Smokey Shrew *Sorex fumeus*. American Midland Naturalist 131:364-365.

Lenarz, M.S. 2009. 2009 Aerial Moose Survey. Minnesota Department of Natural Resources, Forest Wildlife Populations and Research Group. Grand Rapids, Minnesota.

Lindquist, E. 1990. Trees used by Eagles and Osprey. Unpublished memo; Superior National Forest. Duluth, Minnesota.

McShea, W. J., J. P. Pagels, J. Orrock, E. Harper, and K. Koy. 2003. Mesic Deciduous Forest as Patches of Small-mammal Richness within an Appalachian Mountain Forest. Journal of Mammalogy 84:627-643.

Mech, L.D. 1995. The Challenge and Opportunity of Recovering Wolf Populations. Conservation Biology.

_____. 1998. Estimated Costs of Maintaining a Recovered Wolf Population in Agricultural Regions of Minnesota. Wildlife Society Bulletin 26: 817-822.

Minnesota Board of Water and Soil Resources. 2008. MnRam v. 3.2 Wetland Assessment Data Form. Available at: http://www.bwsr.state.mn.us/wetlands/mnram/index.html. St. Paul Minnesota.

Minnesota Department of Natural Resources (MnDNR). 1993. Minnesota's Native Vegetation: A Key to Natural Communities. Biological Report No. 20. Natural Heritage Program Section of Wildlife, St. Paul, Minnesota.

_____. 1994. Natural Community: Element Occurrence Ranking Guidelines. Natural Heritage Program, St Paul, Minnesota.

_____. 1999. Minnesota Wolf Management Plan. Division of Wildlife. St. Paul, Minnesota.

_____. 2005. Total 2005 Deer Harvest Map. St. Paul, Minnesota. Available at: http://www.dnr.state.mn.us/hunting/deer/mapit2005.html.

_____. 2006a. Tomorrow's Habitat for the Wild and Rare An Action Plan for Minnesota Wildlife: Laurentian Uplands Subsection Profile. Comprehensive Wildlife Conservation Strategy, Division of Ecological Services. St. Paul, Minnesota.

_____. 2006b. Deer Density from Deer Population Model 2006 Pre-Harvest. St. Paul, Minnesota. Available at: http://files.dnr.state.mn.us/outdoor_activities/hunting/deer/2006_deer_density.pdf.

_____. 2007a. Canada Lynx Sightings in Minnesota 2000-2007. St. Paul, Minnesota. Available at: http://www.dnr.state.mn.us/eco/nhnrp/research/lynx_sightings.html.

_____. 2007b. Ruffed Grouse Survey Results. St. Paul, Minnesota. Available at: http://files.dnr.state.mn.us/outdoor_activities/hunting/grouse/grouse_survey_report_07.pdf.

_____. 2008a. Bats. St. Paul, Minnesota. Available at: http://www.dnr.mn.us/mammals/bats/index.html.

_____. 2008b. DNR Survey Indicates Wolf Range, Population Similar to 2004. August 1, 2008 News Release. St. Paul, Minnesota.

_____. 2009a. Information in the Vicinity of the PolyMet Mining/USFS Land Exchange, St. Louis and Cook Counties. Correspondence # ERDB 20080641-0004, July 21, 2009. Division of Ecological Services. St. Paul, Minnesota.

_____. 2009b. Yellow Rail. Available at: http://www.dnr.state.mn.us/rsg/profile.html?action=elementDetail&selectedElement=ABNME01010. St. Paul, Minnesota.

_____. 2009c. Eastern Pipistrelle. Available at: http://www.dnr.state.mn.us/rsg/profile.html?action=elementDetail&selectedElement=AMACC03020. St. Paul, Minnesota.

_____. 2009d. Northern Myotis. Available at: http://www.dnr.state.mn.us/rsg/profile.html?action=elementDetail&selectedElement=AMACC01150. St. Paul, Minnesota.

_____. 2009e. Smokey Shrew. Available at: http://www.dnr.state.mn.us/rsg/profile.html?action=elementDetail&selectedElement=AMABA01180. St. Paul, Minnesota.

_____. 2009f. Least Weasel. Available at: http://www.dnr.state.mn.us/rsg/profile.html?action=elementDetail&selectedElement=AMAJF02020. St. Paul, Minnesota.

Mooty, J.J. 1971. The Changing Habitat Scene. Pages 27-33 *in* M.M. Nelson (ed.). The White-tailed Deer in Minnesota. Minnesota Department of Natural Resources, St. Paul, Minnesota.

Owen, J.G. 1984. *Sorex fumeus*. Mammalian Species 215:1-8

Phillips, S. 1999. Draft Biological Evaluation Reservoir Analysis Area Laurentian Ranger District Superior National Forest. USDA Forest Service, Aurora, Minnesota.

Rezendes, P. 1992. Tracking & the Art of Seeing: How to Read Animal Tracks & Sign. Camden House Publishing, Inc., Charlotte, Vermont.

Robbins, C.S., B. Bruun, and H.S. Zim.1983. A Guide to the Field Identification Birds of North America. Golden Press, New York, New York.

Ryan, D. 2009. Electronic Transmission on July 13, 2009, to Stuart Paulus, AECOM Regarding Swan Sightings Near the Hay Lake Parcel. Wildlife Biologist, Laurentian Ranger District, Superior National Forest, Aurora, Minnesota.

_____. 2010. Electronic Transmission on January 14, 2010 to Stuart Paulus, AECOM Regarding Bald Eagle Sightings Near the Hay Lake Parcel. Wildlife Biologist, Superior National Forest,, Minnesota.

Russ, W.P. 2009. Electronic Transmission on January 21, 2010 to Stuart Paulus, AECOM Regarding Status of Species of Concern Near McFarland Lake, Cook County, Minnesota. Wildlife Biologist, Laurentian Ranger District, Superior National Forest, Aurora, Minnesota.

Shaw, S.P., and C.G. Fredine. 1956. Wetlands of the United States - Their Extent and Their Value to Waterfowl and Other Wildlife. U.S. Department of the Interior, Washington, D.C. Circular 39. Northern Prairie Wildlife Research Center Online. Available at: http://www.npwrc.usgs.gov/resource/wetlands/uswetlan/index.htm.

Squires, J.R., and R.T. Reynolds. 1997. Northern Goshawk (*Accipiter gentilis*). *In* A. Poole and F. Gill (eds.). The Birds of North America. The Academy of Natural Sciences, Philadelphia, Pennsylvania.

Swanson, G.A., and C. Evans. 1936. The Hibernation of Certain Bats in Southern Minnesota. Journal of Mammalogy 17:39-43.

Tekiela, S. 2003. Reptiles and Amphibians of Minnesota Field Guide. Adventure Publications, Inc. Cambridge, Minnesota.

Terres, J.K. 1982. The Audubon Society Encyclopedia of North American Birds. Alfred A. Knopf, New York, New York.

Thiel, R.P., S. Merril, and L.D. Mech. 1998. Tolerance by Denning Wolves, *Canis lupus*, to Human Disturbance. Canadian Field-Naturalist. 122:340-342

Todd, A.W. 1985. The Canada Lynx: Ecology and Management. Canadian Trapper 13:15-20.

U.S. Army Corps of Engineers. 1987. Interim Regional Supplement to the Corps of Engineers Wetland Delineation Manual: Western Mountains, Valleys, and Coast Region. ERDC/EL TR-08-13. Environmental Laboratory. Washington, D.C.

U.S. Department of Agriculture Forest Service (Forest Service). 1986. Land and Resource Management Plan. Alternative 6 Final Environmental Impact Statement. Eastern Region USDA Forest Service, Duluth, Minnesota.

_____. 1999. Environmental Assessment for the Reservoir Analysis Area. Superior National Forest Laurentian Ranger District, Aurora, Minnesota.

_____. 2004. Land and Resource Management Plan Superior National Forest Eastern Region. Milwaukee, Wisconsin.

_____. 2005a. Wallbridge Mining Exploratory Drilling and Special Use Access Biological Assessment. Superior National Forest Kawishiwi Ranger District, Ely, Minnesota.

_____. 2005b. Dunka Project Biological Evaluation. Superior National Forest Kawishiwi Ranger District, Ely, Minnesota.

Wetzel, J.F. 1972. Winter Food Habits and Habitat Preferences of Deer in Northeastern Minnesota. M.S. Thesis, University of Minnesota, St. Paul.

APPENDIX A

Common and Scientific Names of Plants and Animals Given in the Report

Common Name	Scientific Name
Plants	
American Vetch	*Vicia americana*
Balsam Fir	*Abies balsamea*
Beaked Hazel	*Corylus cornuta*
Black Ash	*Fraxinus nigra*
Black Spruce	*Picea mariana*
Bladderwort	*Utricularia vulgaris*
Bog Birch	*Betula pumila*
Bog Cranberry	*Vaccinium oxycoccus*
Bog Labrador-tea	*Ledum groenlandicum*
Bog Rosemary	*Andromeda glaucophylla*
Bracken Fern	*Pteridium aquilinum*
Broad-leaved Arrowhead	*Sagittaria latifolia*
Bunchberry	*Cornus canadensis*
Burreed	*Sparganium* spp.
Canada Bluejoint	*Calamagrostis canadensis*
Cattail	*Typha* spp.
Clintonia	*Clintonia borealis*
Club Moss	*Lycopodium* spp.
Clustered Bur-reed	*Sparganium glomeratum*
Common Sow Thistle	*Sonchus uliginosus*
Coontail	*Ceratophyllum demersum*
Cottongrass	*Eriophorum* sp.
Cow Parsnip	*Heracleium lanatum*
Creeping Snowberry	*Gaultheria hispidula*
Daisy Fleabane	*Erigeron philadelphicus*
Dragon's Mouth	*Arethusa bulbosa*
Duckweed	*Lemma minor*
Eastern White Pine	*Pinus strobus*
Elegant Groundsel	*Senecio indecorus*
Enchanters Nightshade	*Circaie quadrisulcata*
Encrusted Saxifrage	*Saxifraga paniculata*
False Lily-of-the-valley	*Maianthemum canadense*
Goblin Fern	*Botrychium mormo*
Horsetail	*Equisetum* spp.
Interrupted Fern	*Osmunda claytoniana*
Jack Pine	*Pinus banksiana*

APPENDIX A (Cont.)

Common and Scientific Names of Plants and Animals Given in the Report

Common Name	Scientific Name
Plants (Cont.)	
Large-leaved Aster	*Aster macrophyllus*
Leafless Watermilfoil	*Myriophyllum tenellum*
Leatherleaf	*Chamaedaphne calyculata*
Lowbush Blueberry	*Vaccinium angustifolium*
Matricary Grapefern	*Bortychium matricariifolium*
Meadowsweet	*Spiraea alba*
Michigan Moonwort	*Botrychium michiganense*
Mountain Maple	*Acer spicatum*
Narrow-leaved Cattail	*Typha angustifolia*
Necklace Spikesedge	*Carex ormostachya*
Northern Bog Orchid	*Platanthera hyperborea*
Northern White Cedar	*Thuja occidentalis*
Orange Hawkweed	*Hieracium aurantiacum*
Ox-eye Daisy	*Heliopsis helianthoides*
Pale Moonwort	*Botrychium pallidum*
Paper Birch	*Betula papyrifera*
Phragmites	*Phragmites* sp.
Pondweed	*Potamogeton* spp.
Prickly Rose	*Rosa acicularis*
Pussywillow	*Salix discolor*
Red Maple	*Acer rubrum*
Red-osier Dogwood	*Cornus stolinifera*
Red Pine	*Pinus resinosa*
Rocky Mountain Woodsia	*Woodsia scopulina*
Rose Twisted Stalk	*Streptopus roseus*
Sedge	*Carex* spp.
Shining Clubmoss	*Lycopodium lucidulum*
Skunk Currant	*Ribes glandulosum*
Slender-leaved Willow	*Salix petiolaris*
Small Flowered Woodrush	*Luzula parviflora*
Small-fruited Bog Cranberry	*Vaccinium oxycoccus*
Small White Water-lily	*Nymphaea leibergi*
Smooth Sumac	*Rhus glabra*
Speckled Alder	*Alnus rugosa*
Spikerush	*Eleocharis* spp.
Spotted Coralroot	*Corallorhiza maculata*

APPENDIX A (Cont.)

Common and Scientific Names of Plants and Animals Given in the Report

Common Name	Scientific Name
Plants (Cont.)	
Star Flower	*Trientalis borealis*
Starry False Solomon's Seal	*Maianthemum stellatum*
Tall Buttercup	*Ranunculus acris*
Tamarack	*Larix laricina*
Tansy	*Tanacetum vulgare*
Terrategrape Fern	*Botrychium rugulosum*
Thimbleberry	*Rubus parviflorus*
Trembling Aspen	*Populus tremuloides*
Triangle Moonwort	*Botrychium lanceolatum*
Twining Honeysuckle	*Lonicera dioica*
Twinflower	*Linnaea borealis*
Water Arum	*Calla palustris*
White Clover	*Trifolium repnes*
White Pine	*Pinus strobus*
Wild Columbine	*Aquilegia canadensis*
Wild Iris	*Iris versicolor*
Wild Raspberry	*Rubus* spp.
Wild Rice	*Zizania palustris*
Wild Sarsaparilla	*Aralia nudicaulis*
Wild Strawberry	*Fragaria virginiana*
Willow	*Salix* spp.
Wood Anenome	*Anenome quinquefolia*
Woolly Sedge	*Carex pellita*
Wood Fern	*Dryopteris* spp.
Yellow Water-lily	*Nuphar variegatum*
Yellow Sweetclover	*Melilotus officinalis*
Amphibians and Reptiles	
American Toad	*Bufo americanus*
Garter Snake	*Thamnophis* sp.
Gray Treefrog	*Hyla versicolor*
Green Frog	*Rana clamitans*
Northern Leopard Frog	*Rana pipiens*
Painted Turtle	*Chrysemys picta*
Snapping Turtle	*Chelydra serpentina*
Spring Peeper	*Pseudacris crucier*
Western Chorus Frog	*Pseudacris triseriata*

APPENDIX A (Cont.)

Common and Scientific Names of Plants and Animals Given in the Report

Common Name	Scientific Name
Amphibians and Reptiles (Cont.)	
Wood Frog	*Rana sylvatica*
Wood Turtle	*Glyptemys insculpta*
Birds	
American Bittern	*Botaurus lentiginosus*
American Crow	*Corvus branchyrhynchos*
American Goldfinch	*Carduelis tristis*
American Robin	*Turdus americanus*
American Three-toed Woodpecker	*Picoides dorsalis*
American White Pelican	*Pelecanus erythrorhynchos*
American Woodcock	*Scolopax minor*
Bald Eagle	*Haliaeetus leucocephalus*
Barred Owl	*Strix varia*
Bay-breasted Warbler	*Dendroica castanea*
Belted Kingfisher	*Megaceryle alcyon*
Black-backed Woodpecker	*Picoides arcticus*
Black-capped Chickadee	*Poecile atricapillus*
Black Tern	*Chlidonias niger*
Black-throated Blue Warbler	*Dendroica caerulescens*
Blue Jay	*Cyanocitta cristata*
Boreal Owl	*Aegolius funereus*
Broad-winged Hawk	*Buteo platypterus*
Brown Creeper	*Certhia americana*
Canada Warbler	*Wilsonia canadensis*
Cedar Waxwing	*Bombycilla cedrorum*
Chestnut-sided Warbler	*Dendroica pensylvanica*
Chipping Sparrow	*Spizella passerina*
Common Nighthawk	*Chordeiles minor*
Common Loon	*Gavia immer*
Common Raven	*Corvus corax*
Common Tern	*Sterna hirundo*
Common Yellowthroat	*Geothlypis trichas*
Connecticut Warbler	*Oporornis agilis*
Dark-eyed Junco	*Junco hyemalis*
Downy Woodpecker	*Picoides pubescens*
Eastern Kingbird	*Tyrannus tyrannus*
Eastern Phoebe	*Sayornis phoebe*
Eastern Screech-owl	*Megascops asio*

APPENDIX A (Cont.)

Common and Scientific Names of Plants and Animals Given in the Report

Common Name	Scientific Name
Birds (Cont.)	
Golden-crowned Kinglet	*Regulus satrapa*
Golden-winged Warbler	*Vermivora chrysoptera*
Gray Jay	*Perisoreus canadensis*
Great Blue Heron	*Ardea herodias*
Great Gray Owl	*Strix nebulosa*
Great Horned Owl	*Bubo virginianus*
Hairy Woodpecker	*Picoides villosus*
Hermit Thrush	*Catharus guttatus*
Hooded Merganser	*Lophodytes cucullatus*
Horned Grebe	*Podiceps auritus*
Killdeer	*Charadrius vociferus*
Long-eared Owl	*Asio otus*
Magnolia Warbler	*Dendroica magnolia*
Marbled Godwit	*Limos fedoa*
Northern Flicker	*Colaptes auratus*
Northern Goshawk	*Accipiter gentilis*
Northern Saw-whet Owl	*Aegolius acadicus*
Olive-sided Flycatcher	*Contopus cooperi*
Osprey	*Pandion haliaetus*
Philadelphia Vireo	*Vireo philadelphicus*
Pileated Woodpecker	*Dryocopus pileatus*
Pine Grosbeak	*Pinicola enucleator*
Pine Warbler	*Dendroica pinus*
Red-breasted Merganser	*Megus serrator*
Red-breasted Nuthatch	*Sitta canadensis*
Red-eyed Vireo	*Vireo olivaceus*
Red-tailed Hawk	*Buteo jamaicensis*
Red-winged Blackbird	*Sturnella agelaius*
Ring-necked Duck	*Aythya collaris*
Ruby-crowned Kinglet	*Regulus calendula*
Ruby-throated Hummingbird	*Archilochus colubris*
Ruffed Grouse	*Bonasa umbellus*
Savannah Sparrow	*Passerculus sandwichensis*
Short-eared Owl	*Asio flammeus*
Song Sparrow	*Melospiza melodia*
Spruce Grouse	*Falcipennis canadensis*

APPENDIX A (Cont.)

Common and Scientific Names of Plants and Animals Given in the Report

Common Name	Scientific Name
Birds (Cont.)	
Swainson's Thrush	*Catharus ustulatus*
Trumpeter Swan	*Cygnus buccinator*
Turkey Vulture	*Cathartes aura*
Virginia Rail	*Rallus limicola*
White-throated Sparrow	*Zonotrichia albicollis*
Wilson's Phalarope	*Phalaropus tricolor*
Winter Wren	*Troglodytes troglodytes*
Yellow-bellied Flycatcher	*Empidonax flaviventris*
Yellow-bellied Sapsucker	*Sphyrapicus varius*
Yellow Rail	*Coturnicops noveboracensis*
Yellow-rumped Warbler	*Dendroica coronata*
Yellow Warbler	*Dendroica petechia*
Mammals	
American Marten	*Martes americana*
Beaver	*Castor canadensis*
Big Brown Bat	*Eptesicus fuscus*
Black Bear	*Ursus americanus*
Canada Lynx	*Lynx canadensis*
Eastern Pipistrelle	*Pipistrellus subflavus*
Eastern Red Bat	*Lasiurus borealis*
Gray Wolf	*Canis lupus*
Heather Vole	*Phenacomys ungava*
Hoary Bat	*Lasiurus cinereus*
Eastern Pipistrelle	*Perimyotis subflavus*
Least Weasel	*Mustela nivalis*
Little Brown Myotis	*Myotis lucifugus*
Moose	*Alces alces*
Mountain Lion	*Puma concolor*
Northern Myotis	*Myotis septentrionalis*
Porcupine	*Erethizon dorsatum*
Red Fox	*Vulpes vulpes*
Red Squirrel	*Tamiasciurus hudsonicus*
River Otter	*Lutra canadensis*
Silver-haired Bat	*Lasionycteris noctivagans*
Smokey Shrew	*Sorex fumeus*
Snowshoe Hare	*Lepus canadensis*
White-tailed Deer	*Odocoileus virginianus*

APPENDIX B
Agency and Organization Contacts (2000-2008 Surveys)

Linda Aylsworth	Information Resources Coordinator, International Wolf Center, 1396 Highway 169, Ely 55731 (218-365-4695)
Susan Catton	Wildlife Biologist, Superior National Forest, 1393 Highway 169, Ely, MN 55731 (218) 365-7572
Lisa Joyal	Endangered Species Environmental Review Coordinator. Minnesota Department of Natural Resources Division of Ecological Resources, St. Paul 55155 (651-259-5109)
Kim Lappako	Mining Reclamation, Minnesota Department of Natural Resources, 1525 Third Avenue East, Hibbing, 55746 (218-262-6767)
Yvette Monstad	Division of Ecological Services, Minnesota Department of Natural Resources, 500 Lafayette Rd., Box 25, St. Paul, MN 55155
Wayne Russ	Wildlife Biologist, Superior National Forest.
Daniel Ryan	Wildlife Biologist, Forest Service Laurentian Ranger District, 318 Forestry Drive, Aurora, MN 55705 (218-229-8809)

APPENDIX C
Superior National Forest
Regional Forester Sensitive Species

Tuesday, October 5, 2006

Scientific Name	Common Name
MAMMALS	
Phenacomys intermedius	Heather Vole
BIRDS	
Accipiter gentilis	Northern Goshawk
Aegolius funereus	Boreal Owl
Ammodramus leconteii	Le Conte's Sparrow
Contopus cooperi	Olive-sided Flycatcher
Coturnicops noveboracensis	Yellow Rail
Dendroica caerulescens	Black-throated Blue Warbler
Dendroica castanea	Bay-breasted Warbler
Falco peregrinus anatum	American Peregrine Falcon
Oporornis agilis	Connecticut Warbler
Picoides tridactylus	Three-toed Woodpecker
Strix nebulosa	Great Gray Owl
Tympanuchus phasianellus	Sharp-tailed Grouse
REPTILES	
Clemmys insculpta (Glyptemys)	Wood Turtle
FISH	
Acipenser fulvescens	Lake Sturgeon
Coregonus zenithicus	Cisco or Lake Herring
Ichthyomyzon fossor	Northern Brook Lamprey
MOLLUSKS	
Lasmigona compressa	Creek Heelsplitter
Ligumia recta	Black Sandshell

APPENDIX D

WETLAND ASSESSMENT DATA FORMS

		Wetland ID HW1 UTM Coordinates 545749 5272963	Wetland ID HW2 UTM Coordinates 545799 5272164	Wetland name ID HW3 UTM Coordinates 545954 5271925	Wetland ID HW4 UTM Coordinates 545989 5271895
	Date	**22-Jun-09**	**22-Jun-09**	**22-Jun-09**	**22-Jun-09**
	Special Features (from list, p.2--enter letter/s)	- PHOTOS 72-73	- 74-75	- 76-77	- NONE
#1	Community Number (circle each community which represents at least 10% of the wetland)	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	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 (wet meadow, marsh)	8A Alder Thicket	8A Alder Thicket	4B Coniferous Swamp	13A Sedge Meadow
	Community Proportion (% of total)	60%	50%	57%	33%
	Dominant Vegetation / Cover Class	PUSSY WILLOW/4 SPECKLED ALDER/2 CANADA BLUEJOINT/4 RED-OSIER DOGWOOD2 SLENDER-LEAVED WILLOW/4	BLACK ASH/2 SPECKLED ALDER/5 WOOLLY SEDGE/5 WILLOW/3 CANADA BLUEJOINT/2 NARROW-LEAF CATTAIL/2	SEDGE/2 RUSH/2 LABRADOR TEA/3 NARROW-LEAF CATTAIL/2 SPECKLED ALDER/5 PUSSY WILLOW/3 TAMARACK/4	SEDGE/5 RUSH/2 NARROW-LEAF CATTAIL/4 SPECKLED ALDER/2 LABRADOR TEA/2 PUSSY WILLOW/2
	Invasive/exotic Vegetation / Cover Class				
	Community Quality (E, H, M, L)	H 1	H 1	H 1	H 1
Plant Community #2	Community Type (wet meadow, marsh)	- -		- -	
	Community Proportion (% of total)				
	Dominant Vegetation / Cover Class				
	Invasive/exotic Vegetation / Cover Class				
	Community Quality (E, H, M, L)	0	0	0	0
Plant Community #3	Community Type (wet meadow, marsh)	- -	- -	- -	- -
	Community Proportion (% of total)				
	Dominant Vegetation / Cover Class				
	Invasive/exotic Vegetation / Cover Class				
	Community Quality (E, H, M, L)	0	0	0	0
Plant Community #4*	Community Type (wet meadow, marsh)	- -	- -	- -	- -
	Community Proportion (% of total)				
	Dominant Vegetation / Cover Class				
	Invasive/exotic Vegetation / Cover Class				
	Community Quality (E, H, M, L)	- 0	0	0	0
	Circular 39 Types (primary <TAB> others)				2
	Cowardin Types				
	Photo ID				
Highest rated community veg. div./integ:		1.0 High	1 High	1 High	1 High
Average vegetative diversity/integrity:		1.00 High	1.00 High	1.00 High	1.00 High
Weighted Average veg. diversity/integrity:		0.60 Medium	0.50 Medium	0.57 Medium	0.33 Medium
#4	Listed, rare, special plant species?	n N	N N	N N	N N
#5	**Rare community or habitat?**	**n N**	**N N**	**N N**	**N N**
#6	Pre-European-settlement conditions?	n N	N N	N N	N 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]

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

*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.

MnRAM 3.2 Digital Worksheet, Side 2

WTL 1

		Question Description	User entry	Rating									
	1	Veg. Table 2, Option 4		0.60									Highest-rated: 1
		TOTAL VEG Rating	0.6	Medium									
Digital worksheet, section I	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	Flood	Floodplain									
	8	Water depth (inches)	24										
		Water depth (% inundation)											
	9	Local watershed/immedita drainage (acres)											
	10	Existing wetland size	1										
	11	SOILS: Up/Wetland (survey classification + site)											
	12	Outlet characteristics for flood retention	N/A	N/A									
	13	Outlet characteristics for hydrologic regime	A	1									
	14	Dominant upland land use (within 500 ft)	A	1	0.1								
	15	Soil condition (wetland)	A	1									
	16	Vegetation (% cover)	90%	H	1								
	17	Emerg. veg. flood resistance	A	1									
	18	Sediment delivery	A	1									
	19	Upland soils (based on soil group)	B	0.5									
	20	Stormwater runoff pretreatment & detention	C	0.1	1								
	21	Subwatershed wetland density	C	0.1									
	22	Channels/sheet flow	C	0.1									
	23	Adjacent naturalized buffer average width (feet)	500	H	WQ	1	H		1				
	24	Adjacent Area Management: % Full	100%	1	1	**1**							
		adjacent area mgmt: % Manicured		0									
		adjacent area mgmt: % Bare		0									
	25	Adjacent Area Diversity & Structure: % Native	100%	1	1	**1**							
		adjacent area diversity: % Mixed		0									
		adjacent area diversity: % Sparse/Inv./Exotic		0									
	26	Adjacent Area Slope: % Gentle	5%	0.05	1	**0.05**							
		adjacent area slope: % Moderate		0									
		adjacent area slope: % Steep		0									
Digital worksheet, section II	27	Downstream sensitivity/WQ protection	A	1									
	28	Nutrient loading	A	1									
	29	Shoreline wetland?	Y	Y									
	30	Rooted shoreline vegetation (%cover)	90%	1									
	31	Wetland in-water width (in feet, average)	100	1									
	32	Emergent vegetation erosion resistance	A	1									
	33	Shoreline erosion potential	C	0.1	1								
	34	Bank protection/upslope veg.	C	0.1									
	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	A	1									
	40	Wetland interspersion on landscape	A	1	1								
	41	Wildlife barriers	A	1									
	42	Amphibian breeding potential-hydroperiod	A	1									
	43	Amphibian breeding potential--fish presence	B	0.5									
	44	Amphibian & reptile overwintering habitat	C	0.1									
	45	Wildlife species (list)											
	46	Fish habitat quality	A	1									
	47	Fish species (list)											
	48	Unique/rare educ./cultural/rec.opportunity	N	N									
	49	Wetland visibility	B	0.5									
	50	Proximity to population	N	0.1									
	51	Public ownership	C	0.1									
	52	Public access	B	0.5									
	53	Human influence on wetland	A	1									
	54	Human influence on viewshed	A	1									
	55	Spatial buffer	C	0.1									
	56	Recreational activity potential	B	0.5									
	57	Commercial crop--hydrologic impact	N/A	N/A									

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.

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

Functional Rating Summaries

Function Name	Raw score	Final Rating	Rating Category
Vegetative Diversity/Integrity		0.60	Med
Hydrology - Characteristic		1.00	High
Flood Attenuation		0.53	Med
Water Quality--Downstream		0.80	High
Water Quality--Wetland		0.84	High
Shoreline Protection		0.64	Med
Characteristic Wildlife Habitat Structure	0.86	0.86	High
Maintenance of Characteristic Fish Habitat	1.00	1.00	High
Maintenance of Characteristic Amphibian Habitat		0.43	Med
Aesthetics/Recreation/Education/Cultural	0.48	0.48	Med
Commercial use		N/A	N/A

Formula shown to the right.

0

Special Features listing: - PHOTOS 72-73

Groundwater Interaction: discharge

Groundwater Functional Index: no special indicators

Restoration Potential (draft formula): #VALUE! #####

Stormwater Sensitivity (not active)

MnRAM 3.2 Digital Worksheet, Side 2

WTL2

		Question Description	User entry	Rating			
	1	Veg. Table 2, Option 4					Highest-rated: 1
		TOTAL VEG Rating	0.5	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	FT	Depress'l/Flow-through			
	8	Water depth (inches)	8				
		Water depth (% inundation)					
	9	Local watershed/immedita drainage (acres)					
	10	Existing wetland size	3				
	11	SOILS: Up/Wetland (survey classification + site)					
Digital worksheet, section I	12	Outlet characteristics for flood retention	N/A	N/A			
	13	Outlet characteristics for hydrologic regime	A	1			
	14	Dominant upland land use (within 500 ft)	A	1	0.1		
	15	Soil condition (wetland)	A	1			
	16	Vegetation (% cover)	90%	H	1		
	17	Emerg. veg. flood resistance	A	1			
	18	Sediment delivery	A	1			
	19	Upland soils (based on soil group)	B	0.5			
	20	Stormwater runoff pretreatment & detention	C	0.1	1		
	21	Subwatershed wetland density	C	0.1			
	22	Channels/sheet flow	A	1			
	23	Adjacent naturalized buffer average width (feet)	500	H	WQ	1 H	1
	24	Adjacent Area Management: % Full	100%	1	1	**1**	
		adjacent area mgmt: % Manicured		0			
		adjacent area mgmt: % Bare		0			
	25	Adjacent Area Diversity & Structure: % Native	100%	1	1	**1**	
		adjacent area diversity: % Mixed		0			
		adjacent area diversity: % Sparse/Inv./Exotic		0			
	26	Adjacent Area Slope: % Gentle	5%	0.05	1	**0.05**	
		adjacent area slope: % Moderate		0			
		adjacent area slope: % Steep		0			
Digital worksheet, section II	27	Downstream sensitivity/WQ protection	A	1			
	28	Nutrient loading	A	1			
	29	Shoreline wetland?	N	N			
	30	Rooted shoreline vegetation (%cover)		Enter a percentage			
	31	Wetland in-water width (in feet, average)		Enter a percentage			
	32	Emergent vegetation erosion resistance		Enter valid choice			
	33	Shoreline erosion potential		Enter valid cho			
	34	Bank protection/upslope veg.		Enter valid choice			
	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	A	1			
	40	Wetland interspersion on landscape	A	1	1		
	41	Wildlife barriers	A	1			
	42	Amphibian breeding potential-hydroperiod	A	1			
	43	Amphibian breeding potential--fish presence	A	1			
	44	Amphibian & reptile overwintering habitat	C	0.1			
	45	Wildlife species (list)					
	46	Fish habitat quality	B	0.5			
	47	Fish species (list)					
	48	Unique/rare educ./cultural/rec.opportunity	N	N			
	49	Wetland visibility	C	0.1			
	50	Proximity to population	N	0.1			
	51	Public ownership	C	0.1			
	52	Public access	C	0.1			
	53	Human influence on wetland	A	1			
	54	Human influence on viewshed	A	1			
	55	Spatial buffer	C	0.1			
	56	Recreational activity potential	C	0.1			
	57	Commercial crop--hydrologic impact	N/A	N/A			

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.

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

Functional Rating Summaries

Function Name	Raw score	Final Rating	Rating Category	Formula shown to the right.
Vegetative Diversity/Integrity		0.50	Med	
Hydrology - Characteristic		1.00	High	
Flood Attenuation		0.60	Med	
Water Quality--Downstream		0.80	High	
Water Quality--Wetland		0.81	High	
Shoreline Protection		N/A	N/A	
Characteristic Wildlife Habitat Structure	0.83	0.83	High	
Maintenance of Characteristic Fish Habitat	0.83	0.83	High	
Maintenance of Characteristic Amphibian Habitat		0.85	High	
Aesthetics/Recreation/Education/Cultural	0.33	0.33	Med	
Commercial use		N/A	N/A	0

Special Features listing: - PHOTOS 72-73

Groundwater Interaction	discharge	
Groundwater Functional Index		no special indicators
Restoration Potential (draft formula)	#VALUE!	#####
Stormwater Sensitivity (not active)		

MnRAM 3.2 Digital Worksheet, Side 2

WTL3

		Question Description	User entry	Rating			
	1	Veg. Table 2, Option 4		0.57			
		TOTAL VEG Rating	0.57	Medium			
Digital worksheet, section I	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	FT	Depress'l/Flow-through			
	8	Water depth (inches)	8"				
		Water depth (% inundation)					
	9	Local watershed/immedita drainage (acres)					
	10	Existing wetland size	9				
	11	SOILS: Up/Wetland (survey classification + site)					
	12	Outlet characteristics for flood retention	N/A	N/A			
	13	Outlet characteristics for hydrologic regime	A	1			
	14	Dominant upland land use (within 500 ft)	A	1	0.1		
	15	Soil condition (wetland)	A	1			
	16	Vegetation (% cover)	90%	H	1		
	17	Emerg. veg. flood resistance	A	1			
	18	Sediment delivery	A	1			
	19	Upland soils (based on soil group)	B	0.5			
	20	Stormwater runoff pretreatment & detention	C	0.1	1		
	21	Subwatershed wetland density	C	0.1			
	22	Channels/sheet flow	A	1			
	23	Adjacent naturalized buffer average width (feet)	500	H	WQ	1 H	1
	24	Adjacent Area Management: % Full	100%	1	1	**1**	
		adjacent area mgmt: % Manicured		0			
		adjacent area mgmt: % Bare		0			
	25	Adjacent Area Diversity & Structure: % Native	100%	1	1	**1**	
		adjacent area diversity: % Mixed		0			
		adjacent area diversity: % Sparse/Inv./Exotic		0			
	26	Adjacent Area Slope: % Gentle	5%	0.05	1	**0.05**	
		adjacent area slope: % Moderate		0			
		adjacent area slope: % Steep		0			
Digital worksheet, section II	27	Downstream sensitivity/WQ protection	A	1			
	28	Nutrient loading	A	1			
	29	Shoreline wetland?	N	N			
	30	Rooted shoreline vegetation (%cover)		Enter a percentage			
	31	Wetland in-water width (in feet, average)		Enter a percentage			
	32	Emergent vegetation erosion resistance		Enter valid choice			
	33	Shoreline erosion potential		Enter valid cho			
	34	Bank protection/upslope veg.		Enter valid choice			
	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	A	1			
	40	Wetland interspersion on landscape	A	1	1		
	41	Wildlife barriers	A	1			
	42	Amphibian breeding potential-hydroperiod	A	1			
	43	Amphibian breeding potential--fish presence	A	1			
	44	Amphibian & reptile overwintering habitat	C	0.1			
	45	Wildlife species (list)					
	46	Fish habitat quality	B	0.5			
	47	Fish species (list)					
	48	Unique/rare educ./cultural/rec.opportunity	N	N			
	49	Wetland visibility	C	0.1			
	50	Proximity to population	N	0.1			
	51	Public ownership	C	0.1			
	52	Public access	C	0.1			
	53	Human influence on wetland	A	1			
	54	Human influence on viewshed	A	1			
	55	Spatial buffer	C	0.1			
	56	Recreational activity potential	C	0.1			
	57	Commercial crop--hydrologic impact	N/A	N/A			

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: 1

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*	D	R or D	1
59	*GW - Subwatershed land use*	D	R or D	1
60	*GW - Wetland size and soil group*	D	R or D	1
61	GW - Wetland hydroperiod	D	R or D	1
62	GW - Inlet/Outlet configuration	D	R or D	1
63	GW - Surrounding upland topographic relief	D	R or D	1
64	Restoration potential w/o flooding		Y or N	6
65	*Landowners affected by restoration*		*E a b c*	Enter valid choice
66A	*Existing wetland size (acres) [from #10]*	9	__ acres	
66B	Total wetland restoration size (acres)		__ acres	0.1
66C	(Calculated) Potential New Wetland Area [B-A]	-9	__ acres	% effectively drained: ####
67	Average width of naturalized upland buffer (poten	0	__ feet	0.1 value: ####
68	Likelihood of restoration success		a b c	Enter valid choice
69	Hydrologic alteration type		Outlet, Tile, Ditch, GW pump, Wtrshd div., Filling	
70	Potential wetland type (Circ. 39)		1, 2, 3, 4, 5, 6, 7, 8	
71	Wetland sensitivity to stormwater		E a b c	
72	Additional stormwater treatment needs		a b c	

Functional Rating Summaries

Function Name	Raw score	Final Rating	Rating Category	Formula shown to the right.
Vegetative Diversity/Integrity		0.57	Med	
Hydrology - Characteristic		1.00	High	
Flood Attenuation		0.60	Med	
Water Quality--Downstream		0.80	High	
Water Quality--Wetland		0.83	High	
Shoreline Protection		N/A	N/A	
Characteristic Wildlife Habitat Structure	0.85	0.85	High	
Maintenance of Characteristic Fish Habitat	0.83	0.83	High	
Maintenance of Characteristic Amphibian Habitat		0.85	High	
Aesthetics/Recreation/Education/Cultural	0.33	0.33	Med	
Commercial use		N/A	N/A	0

Special Features listing: - PHOTOS 72-73

Groundwater Interaction	discharge	
Groundwater Functional Index		no special indicators
Restoration Potential (draft formula)	#VALUE!	#####
Stormwater Sensitivity (not active)		

MnRAM 3.2 Digital Worksheet, Side 2

WTL4

		Question Description	User entry	Rating			
	1	Veg. Table 2, Option 4		0.33			
		TOTAL VEG Rating	0.33	Medium			
Digital worksheet, section I	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	FT	Depress'l/Flow-through			
	8	Water depth (inches)	12				
		Water depth (% inundation)					
	9	Local watershed/immedita drainage (acres)					
	10	Existing wetland size	1				
	11	SOILS: Up/Wetland (survey classification + site)					
	12	Outlet characteristics for flood retention	N/A	N/A			
	13	Outlet characteristics for hydrologic regime	A	1			
	14	Dominant upland land use (within 500 ft)	A	1	0.1		
	15	Soil condition (wetland)	A	1			
	16	Vegetation (% cover)	95%	H	1		
	17	Emerg. veg. flood resistance	A	1			
	18	Sediment delivery	A	1			
	19	Upland soils (based on soil group)	B	0.5			
	20	Stormwater runoff pretreatment & detention	C	0.1	1		
	21	Subwatershed wetland density	C	0.1			
	22	Channels/sheet flow	A	1			
	23	Adjacent naturalized buffer average width (feet)	500	H	WQ	1 H	1
	24	Adjacent Area Management: % Full	100%	1	1	**1**	
		adjacent area mgmt: % Manicured		0			
		adjacent area mgmt: % Bare		0			
	25	Adjacent Area Diversity & Structure: % Native	100%	1	1	**1**	
		adjacent area diversity: % Mixed		0			
		adjacent area diversity: % Sparse/Inv./Exotic		0			
	26	Adjacent Area Slope: % Gentle	5%	0.05	1	**0.05**	
		adjacent area slope: % Moderate		0			
		adjacent area slope: % Steep		0			
Digital worksheet, section II	27	Downstream sensitivity/WQ protection	A	1			
	28	Nutrient loading	A	1			
	29	Shoreline wetland?	N	N			
	30	Rooted shoreline vegetation (%cover)		Enter a percentage			
	31	Wetland in-water width (in feet, average)		Enter a percentage			
	32	Emergent vegetation erosion resistance		Enter valid choice			
	33	Shoreline erosion potential		Enter valid cho			
	34	Bank protection/upslope veg.		Enter valid choice			
	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)	1	L	0.1		0
	39	Wetland detritus	A	1			
	40	Wetland interspersion on landscape	A	1	1		
	41	Wildlife barriers	A	1			
	42	Amphibian breeding potential-hydroperiod	A	1			
	43	Amphibian breeding potential--fish presence	A	1			
	44	Amphibian & reptile overwintering habitat	C	0.1			
	45	Wildlife species (list)					
	46	Fish habitat quality	B	0.5			
	47	Fish species (list)					
	48	Unique/rare educ./cultural/rec.opportunity	N	N			
	49	Wetland visibility	C	0.1			
	50	Proximity to population	N	0.1			
	51	Public ownership	C	0.1			
	52	Public access	C	0.1			
	53	Human influence on wetland	A	1			
	54	Human influence on viewshed	A	1			
	55	Spatial buffer	C	0.1			
	56	Recreational activity potential	C	0.1			
	57	Commercial crop--hydrologic impact	N/A	N/A			

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: 1

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

Scroll down to answer more questions and see formula calculations

72																
73		58	*GW - Wetland soils*	D	R or D	1										
74		59	*GW - Subwatershed land use*	D	R or D	1										
75		60	*GW - Wetland size and soil group*	D	R or D	1										
76	Additional questions	61	GW - Wetland hydroperiod	D	R or D	1										
77		62	GW - Inlet/Outlet configuration	D	R or D	1										
78		63	GW - Surrounding upland topographic relief	D	R or D	1										
79		64	Restoration potential w/o flooding		Y or N	6										
80		65	*Landowners affected by restoration*		*E a b c*	Enter valid choice										
81		66A	*Existing wetland size (acres) [from #10]*	1	__ acres											
82		66B	Total wetland restoration size (acres)		__ acres	0.1										
83		66C	(Calculated) Potential New Wetland Area [B-A]	-1	__ acres	% effectively drained: ####										
84		67	Average width of naturalized upland buffer (poten	0	__ feet	0.1	value: ####									
85		68	Likelihood of restoration success		a b c	Enter valid choice										
86		69	Hydrologic alteration type		Outlet, Tile, Ditch, GW pump, Wtrshd div., Filling											
87		70	Potential wetland type (Circ. 39)		1, 2, 3, 4, 5, 6, 7, 8											
88		71	Wetland sensitivity to stormwater		E a b c											
89		72	Additional stormwater treatment needs		a b c											
90																
92																
93																
94																

95		Function Name	Raw score	Final Rating	Rating Category	Formula shown to the right.
96	Functional Rating Summaries	Vegetative Diversity/Integrity		0.33	Med	
98		Hydrology - Characteristic		1.00	High	
100		Flood Attenuation		0.60	Med	
102		Water Quality--Downstream		0.80	High	
104		Water Quality--Wetland		0.76	High	
106		Shoreline Protection		N/A	N/A	
108		Characteristic Wildlife Habitat Structure	0.75	0.75	High	
110		Maintenance of Characteristic Fish Habitat	0.83	0.83	High	
112		Maintenance of Characteristic Amphibian Habitat		0.85	High	
114		Aesthetics/Recreation/Education/Cultural	0.33	0.33	Med	
115						
116		Commercial use		N/A	N/A	0
117						
118		Special Features listing:		-	PHOTOS 72-73	
119						
120		Groundwater Interaction		discharge		
121		Groundwater Functional Index			no special indicators	
122						
123		Restoration Potential (draft formula)		#VALUE!	#####	
124		Stormwater Sensitivity (not active)				
125						
126						
127						
128						
129						
130						
131						
132						
133						
134						
135						
136						
137						
138						
139						
140						
141						

		Wetland ID HW5 UTM Coordinates 546967 5270928	Wetland ID HW6 UTM Coordinates 546702 5270147	Wetland name ID HW7 UTM Coordinates 546665 5270315	Wetland ID HW8 UTM Coordinates 546466 5270741
	Date	**22-Jun-09**	**23-Jun-09**	**23-Jun-09**	**23-Jun-09**
	Special Features (from list, p.2--enter letter/s)	- PHOTOS 79-82	- 87-88	- 89-90	- 91-92
#1	Community Number (circle each community which represents at least 10% of the wetland)	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	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 (wet meadow, marsh)	8B Shrub-Carr	4A Coniferous Bog	4A Coniferous Bog	8A Alder Thicket
	Community Proportion (% of total)	60%	63%	63%	57%
	Dominant Vegetation / Cover Class	SLENDER-LEAVED WILLOW/4 MEADOWSWEET/3 BALSAM WILLOW/2 SPECKLED ALDER/1 CANADA BLUEJOINT/6	BLACK SPRUCE/2 LARCH/3 LABRADOR TEA/3 LEATHERLEAF/4 CLINTONIA/2 SPECKLED ALDER/3 BOG BIRCH/2 SPAGNUM MOSS/6	BLACK SPRUCE/4 LARCH/2 SPECKLED ALDER/4 LABRADOR TEA/4 BOG BIRCH/2 CLINTONIA/2 LEATHERLEAF/4 SPAGNUM MOSS/6	LARCH/2 SPECKLED ALDER/6 NARROW-LEAF CATTAIL/2 LEATHERLEAF/3 CANADA BLUEJOINT/4 FORBS/2 SPAGNUM MOSS/6
	Invasive/exotic Vegetation / Cover Class				
	Community Quality (E, H, M, L)	H 1	H 1	H 1	H 1
Plant Community #2	Community Type (wet meadow, marsh)	H	H	H	H
	Community Proportion (% of total)				
	Dominant Vegetation / Cover Class				
	Invasive/exotic Vegetation / Cover Class				
	Community Quality (E, H, M, L)	0	0	0	0
Plant Community #3	Community Type (wet meadow, marsh)	- -	- -	- -	- -
	Community Proportion (% of total)				
	Dominant Vegetation / Cover Class				
	Invasive/exotic Vegetation / Cover Class				
	Community Quality (E, H, M, L)	0	0	0	0
Plant Community #4*	Community Type (wet meadow, marsh)	- -	- -	- -	- -
	Community Proportion (% of total)				
	Dominant Vegetation / Cover Class				
	Invasive/exotic Vegetation / Cover Class				
	Community Quality (E, H, M, L)	- 0	0	0	0
	Circular 39 Types (primary <TAB> others)				2
	Cowardin Types				
	Photo ID				
Highest rated community veg. div./integ:		1.0 High	1 High	1 High	1 High
Average vegetative diversity/integrity:		1.00 High	1.00 High	1.00 High	1.00 High
Weighted Average veg. diversity/integrity:		0.60 Medium	0.63 Medium	0.63 Medium	0.57 Medium
#4	Listed, rare, special plant species?	N	N	N	N
#5	**Rare community or habitat?**	**N**	**N**	**N**	**N**
#6	Pre-European-settlement conditions?	N	N	N	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]

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

*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.

MnRAM 3.2 Digital Worksheet, Side 2

WTL5

		Question Description	User entry	Rating									
	1	Veg. Table 2, Option 4		0.60									
		TOTAL VEG Rating	0.6	Medium									
Digital worksheet, section I	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	FLOOD	Floodplain									
	8	Water depth (inches)	12										
		Water depth (% inundation)											
	9	Local watershed/immedita drainage (acres)											
	10	Existing wetland size	5										
	11	SOILS: Up/Wetland (survey classification + site)											
	12	Outlet characteristics for flood retention	N/A	N/A									
	13	Outlet characteristics for hydrologic regime	A	1									
	14	Dominant upland land use (within 500 ft)	A	1	0.1								
	15	Soil condition (wetland)	A	1									
	16	Vegetation (% cover)	95%	H	1								
	17	Emerg. veg. flood resistance	A	1									
	18	Sediment delivery	A	1									
	19	Upland soils (based on soil group)	B	0.5									
	20	Stormwater runoff pretreatment & detention	C	0.1	1								
	21	Subwatershed wetland density	C	0.1									
	22	Channels/sheet flow	A	1									
	23	Adjacent naturalized buffer average width (feet)	500	H	WQ	1	H		1				
	24	Adjacent Area Management: % Full	100%	1	1	**1**							
		adjacent area mgmt: % Manicured		0									
		adjacent area mgmt: % Bare		0									
	25	Adjacent Area Diversity & Structure: % Native	100%	1	1	**1**							
		adjacent area diversity: % Mixed		0									
		adjacent area diversity: % Sparse/Inv./Exotic		0									
	26	Adjacent Area Slope: % Gentle	5%	0.05	1	**0.05**							
		adjacent area slope: % Moderate		0									
		adjacent area slope: % Steep		0									
Digital worksheet, section II	27	Downstream sensitivity/WQ protection	A	1									
	28	Nutrient loading	A	1									
	29	Shoreline wetland?	Y	Y									
	30	Rooted shoreline vegetation (%cover)	95%	1									
	31	Wetland in-water width (in feet, average)	200	1									
	32	Emergent vegetation erosion resistance	A	1									
	33	Shoreline erosion potential	C	0.1	1								
	34	Bank protection/upslope veg.	C	0.1									
	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	A	1									
	40	Wetland interspersion on landscape	A	1	1								
	41	Wildlife barriers	A	1									
	42	Amphibian breeding potential-hydroperiod	A	1									
	43	Amphibian breeding potential--fish presence	B	0.5									
	44	Amphibian & reptile overwintering habitat	C	0.1									
	45	Wildlife species (list)											
	46	Fish habitat quality	B	0.5									
	47	Fish species (list)											
	48	Unique/rare educ./cultural/rec.opportunity	N	N									
	49	Wetland visibility	B	0.5									
	50	Proximity to population	N	0.1									
	51	Public ownership	C	0.1									
	52	Public access	C	0.1									
	53	Human influence on wetland	A	1									
	54	Human influence on viewshed	A	1									
	55	Spatial buffer	C	0.1									
	56	Recreational activity potential	C	0.1									
	57	Commercial crop--hydrologic impact	N/A	N/A									

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:
#REF!

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*	D	R or D	1
59	*GW - Subwatershed land use*	D	R or D	1
60	*GW - Wetland size and soil group*	D	R or D	1
61	GW - Wetland hydroperiod	R	R or D	0.1
62	GW - Inlet/Outlet configuration	D	R or D	1
63	GW - Surrounding upland topographic relief	D	R or D	1
64	Restoration potential w/o flooding		Y or N	5.1
65	*Landowners affected by restoration*		*E a b c*	Enter valid choice
66A	*Existing wetland size (acres) [from #10]*	5	__ acres	
66B	Total wetland restoration size (acres)		__ acres	0.1
66C	(Calculated) Potential New Wetland Area [B-A]	-5	__ acres	% effectively drained: ####
67	Average width of naturalized upland buffer (poten	0	__ feet	0.1 value: ####
68	Likelihood of restoration success		a b c	Enter valid choice
69	Hydrologic alteration type		Outlet, Tile, Ditch, GW pump, Wtrshd div., Filling	
70	Potential wetland type (Circ. 39)		1, 2, 3, 4, 5, 6, 7, 8	
71	Wetland sensitivity to stormwater		E a b c	
72	Additional stormwater treatment needs		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		1.00	High	####
				####
Flood Attenuation		0.60	Med	####
Water Quality--Downstream		0.80	High	
Water Quality--Wetland		0.84	High	
Shoreline Protection		0.64	Med	
Characteristic Wildlife Habitat Structure	0.86	0.86	High	#REF!
				#REF!
Maintenance of Characteristic Fish Habitat	0.89	0.89	High	#REF!
				#REF!
Maintenance of Characteristic Amphibian Habitat		0.43	Med	
				#REF!
Aesthetics/Recreation/Education/Cultural	0.38	0.38	Med	#REF!
				#REF!
Commercial use		N/A	N/A	0
Special Features listing:			#REF!	####

Groundwater Interaction	discharge	#REF!
Groundwater Functional Index	#REF!	#REF!
Restoration Potential (draft formula)	#VALUE!	#####
Stormwater Sensitivity (not active)		

MnRAM 3.2 Digital Worksheet, Side 2

WTL6

		Question Description	User entry	Rating			
	1	Veg. Table 2, Option 4		0.63			
		TOTAL VEG Rating	0.63	Medium			
Digital worksheet, section I	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	FT	Depress'l/Flow-through			
	8	Water depth (inches)	12				
		Water depth (% inundation)					
	9	Local watershed/immedita drainage (acres)					
	10	Existing wetland size	15				
	11	SOILS: Up/Wetland (survey classification + site)					
	12	Outlet characteristics for flood retention	N/A	N/A			
	13	Outlet characteristics for hydrologic regime	A	1			
	14	Dominant upland land use (within 500 ft)	A	1	0.1		
	15	Soil condition (wetland)	A	1			
	16	Vegetation (% cover)	100%	H	1		
	17	Emerg. veg. flood resistance	A	1			
	18	Sediment delivery	A	1			
	19	Upland soils (based on soil group)	B	0.5			
	20	Stormwater runoff pretreatment & detention	C	0.1	1		
	21	Subwatershed wetland density	C	0.1			
	22	Channels/sheet flow	A	1			
	23	Adjacent naturalized buffer average width (feet)	500	H	WQ	1 H	1
	24	Adjacent Area Management: % Full	100%	1	1	**1**	
		adjacent area mgmt: % Manicured		0			
		adjacent area mgmt: % Bare		0			
	25	Adjacent Area Diversity & Structure: % Native	100%	1	1	**1**	
		adjacent area diversity: % Mixed		0			
		adjacent area diversity: % Sparse/Inv./Exotic		0			
	26	Adjacent Area Slope: % Gentle	5%	0.05	1	**0.05**	
		adjacent area slope: % Moderate		0			
		adjacent area slope: % Steep		0			
Digital worksheet, section II	27	Downstream sensitivity/WQ protection	A	1			
	28	Nutrient loading	A	1			
	29	Shoreline wetland?	N	N			
	30	Rooted shoreline vegetation (%cover)		Enter a percentage			
	31	Wetland in-water width (in feet, average)		Enter a percentage			
	32	Emergent vegetation erosion resistance		Enter valid choice			
	33	Shoreline erosion potential		Enter valid cho			
	34	Bank protection/upslope veg.		Enter valid choice			
	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)	3	H	1		0
	39	Wetland detritus	A	1			
	40	Wetland interspersion on landscape	A	1	1		
	41	Wildlife barriers	A	1			
	42	Amphibian breeding potential-hydroperiod	A	1			
	43	Amphibian breeding potential--fish presence	A	1			
	44	Amphibian & reptile overwintering habitat	C	0.1			
	45	Wildlife species (list)					
	46	Fish habitat quality	C	0.1			
	47	Fish species (list)					
	48	Unique/rare educ./cultural/rec.opportunity	N	N			
	49	Wetland visibility	C	0.1			
	50	Proximity to population	N	0.1			
	51	Public ownership	C	0.1			
	52	Public access	C	0.1			
	53	Human influence on wetland	A	1			
	54	Human influence on viewshed	A	1			
	55	Spatial buffer	C	0.1			
	56	Recreational activity potential	C	0.1			
	57	Commercial crop--hydrologic impact	N/A	N/A			

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:
#REF!

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*	D	R or D	1
59	*GW - Subwatershed land use*	D	R or D	1
60	*GW - Wetland size and soil group*	D	R or D	1
61	GW - Wetland hydroperiod	R	R or D	0.1
62	GW - Inlet/Outlet configuration	D	R or D	1
63	GW - Surrounding upland topographic relief	D	R or D	1
64	Restoration potential w/o flooding		Y or N	5.1
65	*Landowners affected by restoration*		*E a b c*	Enter valid choice
66A	*Existing wetland size (acres) [from #10]*	15	__ acres	
66B	Total wetland restoration size (acres)		__ acres	0.1
66C	(Calculated) Potential New Wetland Area [B-A]	-15	__ acres	% effectively drained: ####
67	Average width of naturalized upland buffer (poten	0	__ feet	0.1 value: ####
68	Likelihood of restoration success		a b c	Enter valid choice
69	Hydrologic alteration type		Outlet, Tile, Ditch, GW pump, Wtrshd div., Filling	
70	Potential wetland type (Circ. 39)		1, 2, 3, 4, 5, 6, 7, 8	
71	Wetland sensitivity to stormwater		E a b c	
72	Additional stormwater treatment needs		a b c	

Functional Rating Summaries

Function Name	Raw score	Final Rating	Rating Category	Formula shown to the right.
Vegetative Diversity/Integrity		0.63	Med	####
				####
Hydrology - Characteristic		1.00	High	####
				####
Flood Attenuation		0.60	Med	####
Water Quality--Downstream		0.80	High	
Water Quality--Wetland		0.85	High	
Shoreline Protection		N/A	N/A	
Characteristic Wildlife Habitat Structure	0.92	0.92	High	#REF!
				#REF!
Maintenance of Characteristic Fish Habitat	0.70	0.70	High	#REF!
				#REF!
Maintenance of Characteristic Amphibian Habitat		0.85	High	
				#REF!
Aesthetics/Recreation/Education/Cultural	0.33	0.33	Med	#REF!
				#REF!
Commercial use		N/A	N/A	0
Special Features listing:			#REF!	####

Groundwater Interaction	discharge	#REF!
Groundwater Functional Index	#REF!	#REF!
Restoration Potential (draft formula)	#VALUE!	#####
Stormwater Sensitivity (not active)		

MnRAM 3.2 Digital Worksheet, Side 2

WTL7

		Question Description	User entry	Rating			
	1	Veg. Table 2, Option 4		0.63			
		TOTAL VEG Rating	0.63	Medium			
Digital worksheet, section I	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	FT	Depress'l/Flow-through			
	8	Water depth (inches)	12				
		Water depth (% inundation)					
	9	Local watershed/immedita drainage (acres)					
	10	Existing wetland size	1				
	11	SOILS: Up/Wetland (survey classification + site)					
	12	Outlet characteristics for flood retention	N/A	N/A			
	13	Outlet characteristics for hydrologic regime	A	1			
	14	Dominant upland land use (within 500 ft)	A	1	0.1		
	15	Soil condition (wetland)	A	1			
	16	Vegetation (% cover)	100%	H	1		
	17	Emerg. veg. flood resistance	A	1			
	18	Sediment delivery	A	1			
	19	Upland soils (based on soil group)	B	0.5			
	20	Stormwater runoff pretreatment & detention	C	0.1	1		
	21	Subwatershed wetland density	C	0.1			
	22	Channels/sheet flow	A	1			
	23	Adjacent naturalized buffer average width (feet)	500	H	WQ	1 H	1
	24	Adjacent Area Management: % Full	100%	1	1	**1**	
		adjacent area mgmt: % Manicured		0			
		adjacent area mgmt: % Bare		0			
	25	Adjacent Area Diversity & Structure: % Native	100%	1	1	**1**	
		adjacent area diversity: % Mixed		0			
		adjacent area diversity: % Sparse/Inv./Exotic		0			
	26	Adjacent Area Slope: % Gentle	5%	0.05	1	**0.05**	
		adjacent area slope: % Moderate		0			
		adjacent area slope: % Steep		0			
Digital worksheet, section II	27	Downstream sensitivity/WQ protection	B	0.5			
	28	Nutrient loading	A	1			
	29	Shoreline wetland?	N	N			
	30	Rooted shoreline vegetation (%cover)		Enter a percentage			
	31	Wetland in-water width (in feet, average)		Enter a percentage			
	32	Emergent vegetation erosion resistance		Enter valid choice			
	33	Shoreline erosion potential		Enter valid cho			
	34	Bank protection/upslope veg.		Enter valid choice			
	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)	3	H	1		0
	39	Wetland detritus	A	1			
	40	Wetland interspersion on landscape	A	1	1		
	41	Wildlife barriers	A	1			
	42	Amphibian breeding potential-hydroperiod	A	1			
	43	Amphibian breeding potential--fish presence	A	1			
	44	Amphibian & reptile overwintering habitat	C	0.1			
	45	Wildlife species (list)					
	46	Fish habitat quality	N/A	N/A			
	47	Fish species (list)					
	48	Unique/rare educ./cultural/rec.opportunity	N	N			
	49	Wetland visibility	C	0.1			
	50	Proximity to population	N	0.1			
	51	Public ownership	C	0.1			
	52	Public access	C	0.1			
	53	Human influence on wetland	A	1			
	54	Human influence on viewshed	A	1			
	55	Spatial buffer	C	0.1			
	56	Recreational activity potential	C	0.1			
	57	Commercial crop--hydrologic impact	N/A	N/A			

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:
#REF!

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*	D	R or D	1
59	*GW - Subwatershed land use*	D	R or D	1
60	*GW - Wetland size and soil group*	D	R or D	1
61	GW - Wetland hydroperiod	R	R or D	0.1
62	GW - Inlet/Outlet configuration	D	R or D	1
63	GW - Surrounding upland topographic relief	D	R or D	1
64	Restoration potential w/o flooding		Y or N	5.1
65	*Landowners affected by restoration*		*E a b c*	Enter valid choice
66A	*Existing wetland size (acres) [from #10]*	1	__ acres	
66B	Total wetland restoration size (acres)		__ acres	0.1
66C	(Calculated) Potential New Wetland Area [B-A]	-1	__ acres	% effectively drained: ####
67	Average width of naturalized upland buffer (poten	0	__ feet	0.1 value: ####
68	Likelihood of restoration success		a b c	Enter valid choice
69	Hydrologic alteration type		Outlet, Tile, Ditch, GW pump, Wtrshd div., Filling	
70	Potential wetland type (Circ. 39)		1, 2, 3, 4, 5, 6, 7, 8	
71	Wetland sensitivity to stormwater		E a b c	
72	Additional stormwater treatment needs		a b c	

Functional Rating Summaries

Function Name	Raw score	Final Rating	Rating Category	Formula shown to the right.
Vegetative Diversity/Integrity		0.63	Med	####
				####
Hydrology - Characteristic		1.00	High	####
				####
Flood Attenuation		0.60	Med	####
Water Quality--Downstream		0.71	High	
Water Quality--Wetland		0.85	High	
Shoreline Protection		N/A	N/A	
Characteristic Wildlife Habitat Structure	0.92	0.92	High	#REF!
				#REF!
Maintenance of Characteristic Fish Habitat	######	0.70	High	#REF!
				#REF!
Maintenance of Characteristic Amphibian Habitat		0.85	High	
				#REF!
Aesthetics/Recreation/Education/Cultural	0.33	0.33	Med	#REF!
				#REF!
Commercial use		N/A	N/A	0
Special Features listing:			#REF!	####

Groundwater Interaction	discharge	#REF!
Groundwater Functional Index	#REF!	#REF!
Restoration Potential (draft formula)	#VALUE!	#####
Stormwater Sensitivity (not active)		

MnRAM 3.2 Digital Worksheet, Side 2

WTL8

		Question Description	User entry	Rating			
	1	Veg. Table 2, Option 4		0.57			
		TOTAL VEG Rating	0.57	Medium			
Digital worksheet, section I	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	FT	Depress'l/Flow-through			
	8	Water depth (inches)	12				
		Water depth (% inundation)					
	9	Local watershed/immedita drainage (acres)					
	10	Existing wetland size	46				
	11	SOILS: Up/Wetland (survey classification + site)					
	12	Outlet characteristics for flood retention	N/A	N/A			
	13	Outlet characteristics for hydrologic regime	A	1			
	14	Dominant upland land use (within 500 ft)	A	1	0.1		
	15	Soil condition (wetland)	A	1			
	16	Vegetation (% cover)	100%	H	1		
	17	Emerg. veg. flood resistance	A	1			
	18	Sediment delivery	A	1			
	19	Upland soils (based on soil group)	B	0.5			
	20	Stormwater runoff pretreatment & detention	C	0.1	1		
	21	Subwatershed wetland density	C	0.1			
	22	Channels/sheet flow	A	1			
	23	Adjacent naturalized buffer average width (feet)	500	H	WQ	1 H	1
	24	Adjacent Area Management: % Full	100%	1	1	**1**	
		adjacent area mgmt: % Manicured		0			
		adjacent area mgmt: % Bare		0			
	25	Adjacent Area Diversity & Structure: % Native	100%	1	1	**1**	
		adjacent area diversity: % Mixed		0			
		adjacent area diversity: % Sparse/Inv./Exotic		0			
	26	Adjacent Area Slope: % Gentle	5%	0.05	1	**0.05**	
		adjacent area slope: % Moderate		0			
		adjacent area slope: % Steep		0			
Digital worksheet, section II	27	Downstream sensitivity/WQ protection	B	0.5			
	28	Nutrient loading	A	1			
	29	Shoreline wetland?	N	N			
	30	Rooted shoreline vegetation (%cover)		Enter a percentage			
	31	Wetland in-water width (in feet, average)		Enter a percentage			
	32	Emergent vegetation erosion resistance		Enter valid choice			
	33	Shoreline erosion potential		Enter valid cho			
	34	Bank protection/upslope veg.		Enter valid choice			
	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)	3	H	1		0
	39	Wetland detritus	A	1			
	40	Wetland interspersion on landscape	A	1	1		
	41	Wildlife barriers	A	1			
	42	Amphibian breeding potential-hydroperiod	A	1			
	43	Amphibian breeding potential--fish presence	A	1			
	44	Amphibian & reptile overwintering habitat	C	0.1			
	45	Wildlife species (list)					
	46	Fish habitat quality	N/A	N/A			
	47	Fish species (list)					
	48	Unique/rare educ./cultural/rec.opportunity	N	N			
	49	Wetland visibility	C	0.1			
	50	Proximity to population	N	0.1			
	51	Public ownership	C	0.1			
	52	Public access	C	0.1			
	53	Human influence on wetland	A	1			
	54	Human influence on viewshed	A	1			
	55	Spatial buffer	C	0.1			
	56	Recreational activity potential	C	0.1			
	57	Commercial crop--hydrologic impact	N/A	N/A			

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:
#REF!

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*	D	R or D	1
59	*GW - Subwatershed land use*	D	R or D	1
60	*GW - Wetland size and soil group*	D	R or D	1
61	GW - Wetland hydroperiod	R	R or D	0.1
62	GW - Inlet/Outlet configuration	D	R or D	1
63	GW - Surrounding upland topographic relief	D	R or D	1
64	Restoration potential w/o flooding		Y or N	5.1
65	*Landowners affected by restoration*		*E a b c*	Enter valid choice
66A	*Existing wetland size (acres) [from #10]*	46	__ acres	
66B	Total wetland restoration size (acres)		__ acres	0.1
66C	(Calculated) Potential New Wetland Area [B-A]	-46	__ acres	% effectively drained: ####
67	Average width of naturalized upland buffer (poten	0	__ feet	0.1 value: ####
68	Likelihood of restoration success		a b c	Enter valid choice
69	Hydrologic alteration type		Outlet, Tile, Ditch, GW pump, Wtrshd div., Filling	
70	Potential wetland type (Circ. 39)		1, 2, 3, 4, 5, 6, 7, 8	
71	Wetland sensitivity to stormwater		E a b c	
72	Additional stormwater treatment needs		a b c	

Functional Rating Summaries

Function Name	Raw score	Final Rating	Rating Category	Formula shown to the right.
Vegetative Diversity/Integrity		0.57	Med	####
				####
Hydrology - Characteristic		1.00	High	####
				####
Flood Attenuation		0.60	Med	####
Water Quality--Downstream		0.71	High	
Water Quality--Wetland		0.83	High	
Shoreline Protection		N/A	N/A	
Characteristic Wildlife Habitat Structure	0.90	0.90	High	#REF!
				#REF!
Maintenance of Characteristic Fish Habitat	######	0.70	High	#REF!
				#REF!
Maintenance of Characteristic Amphibian Habitat		0.85	High	
				#REF!
Aesthetics/Recreation/Education/Cultural	0.33	0.33	Med	#REF!
				#REF!
Commercial use		N/A	N/A	0
Special Features listing:			#REF!	####

Groundwater Interaction	discharge	#REF!
Groundwater Functional Index	#REF!	#REF!
Restoration Potential (draft formula)	#VALUE!	#####
Stormwater Sensitivity (not active)		

		Wetland ID HW9 UTM Coordinates 546363 5271010	Wetland ID HW10 UTM Coordinates 546132 5270836	Wetland name ID HW11 UTM Coordinates 545866 5270703	Wetland ID HW12 UTM Coordinates 545717 5270634
	Date	**23-Jun-09**	**23-Jun-09**	**23-Jun-09**	**23-Jun-09**
	Special Features (from list, p.2--enter letter/s)	- PHOTOS 93-94	- 95-96	- 97-98	- 99-100
#1	Community Number (circle each community which represents at least 10% of the wetland)	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	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 (wet meadow, marsh)	4B Coniferous Swamp	4B Coniferous Swamp	8B Shrub-Carr	4B Coniferous Swamp
	Community Proportion (% of total)	88%	50%	50%	63%
	Dominant Vegetation / Cover Class	BLACK SPRUCE/5 SPECKLED ALDER/3 MOUNTAIN MAPLE/3 HORSETAIL/1 FORBS/3 BUNCHBERRY/3 BRACKEN FERN/3 SPAGNUM MOSS/5	SAPLING BLACK SPRUCE/2 SAPLING LARCH/3 LABRADOR TEA/2 LEATHERLEAF/5 FORBS/2 SPAGNUM MOSS/6	BOG BIRCH/5 CANADA BLUEJOINT/3 TAMARACK/2 LEATHERLEAF/4 SEDGE/2 SPECKLED ALDER/2	BLACK SPRUCE/5 LARCH/4 BOG BIRCH/2 LABRADOR TEA/5 FORBS/2 SEDGE/2 SPECKLED ALDER/4 SPAGNUM MOSS/6
	Invasive/exotic Vegetation / Cover Class				
	Community Quality (E, H, M, L)	H H	H H	H	H H
Plant Community #2	Community Type (wet meadow, marsh)	- -		- -	
	Community Proportion (% of total)				
	Dominant Vegetation / Cover Class				
	Invasive/exotic Vegetation / Cover Class				
	Community Quality (E, H, M, L)	0	0	0	0
Plant Community #3	Community Type (wet meadow, marsh)	- -	- -	- -	- -
	Community Proportion (% of total)				
	Dominant Vegetation / Cover Class				
	Invasive/exotic Vegetation / Cover Class				
	Community Quality (E, H, M, L)	0	0	0	0
Plant Community #4*	Community Type (wet meadow, marsh)	- -	- -	- -	- -
	Community Proportion (% of total)				
	Dominant Vegetation / Cover Class				
	Invasive/exotic Vegetation / Cover Class				
	Community Quality (E, H, M, L)	- 0	0	0	0
	Circular 39 Types (primary <TAB> others)				
	Cowardin Types				
	Photo ID				
Highest rated community veg. div./integ:		1.0 High	1 High	1 High	1 High
Average vegetative diversity/integrity:		1.00 High	1.00 High	1.00 High	1.00 High
Weighted Average veg. diversity/integrity:		0.88 High	0.50 Medium	0.50 Medium	0.63 Medium
#4	Listed, rare, special plant species?				
#5	**Rare community or habitat?**				
#6	Pre-European-settlement conditions?				

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%

MnRAM 3.2 Digital Worksheet, Side 2

WTL9

		Question Description	User entry	Rating			
	1	Veg. Table 2, Option 4		0.88			
		TOTAL VEG Rating	0.88	High			
Digital worksheet, section I	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	FT	Depress'l/Flow-through			
	8	Water depth (inches)	6				
		Water depth (% inundation)					
	9	Local watershed/immedita drainage (acres)					
	10	Existing wetland size	1				
	11	SOILS: Up/Wetland (survey classification + site)					
	12	Outlet characteristics for flood retention	N/A	N/A			
	13	Outlet characteristics for hydrologic regime	A	1			
	14	Dominant upland land use (within 500 ft)	A	1	0.1		
	15	Soil condition (wetland)	A	1			
	16	Vegetation (% cover)	95%	H	1		
	17	Emerg. veg. flood resistance	A	1			
	18	Sediment delivery	A	1			
	19	Upland soils (based on soil group)	B	0.5			
	20	Stormwater runoff pretreatment & detention	C	0.1	1		
	21	Subwatershed wetland density	C	0.1			
	22	Channels/sheet flow	A	1			
	23	Adjacent naturalized buffer average width (feet)	500	H	WQ	1 H	1
	24	Adjacent Area Management: % Full	100%	1	1	**1**	
		adjacent area mgmt: % Manicured		0			
		adjacent area mgmt: % Bare		0			
	25	Adjacent Area Diversity & Structure: % Native	100%	1	1	**1**	
		adjacent area diversity: % Mixed		0			
		adjacent area diversity: % Sparse/Inv./Exotic		0			
	26	Adjacent Area Slope: % Gentle	5%	0.05	1	**0.05**	
		adjacent area slope: % Moderate		0			
		adjacent area slope: % Steep		0			
Digital worksheet, section II	27	Downstream sensitivity/WQ protection	A	1			
	28	Nutrient loading	A	1			
	29	Shoreline wetland?	N	N			
	30	Rooted shoreline vegetation (%cover)		Enter a percentage			
	31	Wetland in-water width (in feet, average)		Enter a percentage			
	32	Emergent vegetation erosion resistance		Enter valid choice			
	33	Shoreline erosion potential		Enter valid cho			
	34	Bank protection/upslope veg.		Enter valid choice			
	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)	3	H	1		0
	39	Wetland detritus	A	1			
	40	Wetland interspersion on landscape	A	1	1		
	41	Wildlife barriers	A	1			
	42	Amphibian breeding potential-hydroperiod	A	1			
	43	Amphibian breeding potential--fish presence	A	1			
	44	Amphibian & reptile overwintering habitat	C	0.1			
	45	Wildlife species (list)					
	46	Fish habitat quality	N/A	N/A			
	47	Fish species (list)					
	48	Unique/rare educ./cultural/rec.opportunity	N	N			
	49	Wetland visibility	C	0.1			
	50	Proximity to population	N	0.1			
	51	Public ownership	C	0.1			
	52	Public access	C	0.1			
	53	Human influence on wetland	A	1			
	54	Human influence on viewshed	A	1			
	55	Spatial buffer	C	0.1			
	56	Recreational activity potential	C	0.1			
	57	Commercial crop--hydrologic impact	N/A	N/A			

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:
#REF!

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*	D	R or D	1
59	*GW - Subwatershed land use*	D	R or D	1
60	*GW - Wetland size and soil group*	D	R or D	1
61	GW - Wetland hydroperiod	R	R or D	0.1
62	GW - Inlet/Outlet configuration	D	R or D	1
63	GW - Surrounding upland topographic relief	D	R or D	1
64	Restoration potential w/o flooding		Y or N	5.1
65	*Landowners affected by restoration*		*E a b c*	Enter valid choice
66A	*Existing wetland size (acres) [from #10]*	1	__ acres	
66B	Total wetland restoration size (acres)		__ acres	0.1
66C	(Calculated) Potential New Wetland Area [B-A]	-1	__ acres	% effectively drained: ####
67	Average width of naturalized upland buffer (poten	0	__ feet	0.1 value: ####
68	Likelihood of restoration success		a b c	Enter valid choice
69	Hydrologic alteration type		Outlet, Tile, Ditch, GW pump, Wtrshd div., Filling	
70	Potential wetland type (Circ. 39)		1, 2, 3, 4, 5, 6, 7, 8	
71	Wetland sensitivity to stormwater		E a b c	
72	Additional stormwater treatment needs		a b c	

Functional Rating Summaries

Function Name	Raw score	Final Rating	Rating Category	Formula shown to the right.
Vegetative Diversity/Integrity		0.88	High	####
				####
Hydrology - Characteristic		1.00	High	####
				####
Flood Attenuation		0.60	Med	####
Water Quality--Downstream		0.80	High	
Water Quality--Wetland		0.92	High	
Shoreline Protection		N/A	N/A	
Characteristic Wildlife Habitat Structure	0.97	0.97	High	#REF!
				#REF!
Maintenance of Characteristic Fish Habitat	######	N/A	N/A	#REF!
				#REF!
Maintenance of Characteristic Amphibian Habitat		0.85	High	
				#REF!
Aesthetics/Recreation/Education/Cultural	0.33	0.33	Med	#REF!
				#REF!
Commercial use		N/A	N/A	0
Special Features listing:			#REF!	####

Groundwater Interaction	discharge	#REF!
Groundwater Functional Index	#REF!	#REF!
Restoration Potential (draft formula)	#VALUE!	#####
Stormwater Sensitivity (not active)		

MnRAM 3.2 Digital Worksheet, Side 2

WTL10

		Question Description	User entry	Rating			
	1	Veg. Table 2, Option 4		0.50			
		TOTAL VEG Rating	0.5	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	FT	Depress'l/Flow-through			
	8	Water depth (inches)	12				
		Water depth (% inundation)					
	9	Local watershed/immedita drainage (acres)					
	10	Existing wetland size	111				
	11	SOILS: Up/Wetland (survey classification + site)					
Digital worksheet, section I	12	Outlet characteristics for flood retention	N/A	N/A			
	13	Outlet characteristics for hydrologic regime	A	1			
	14	Dominant upland land use (within 500 ft)	A	1	0.1		
	15	Soil condition (wetland)	A	1			
	16	Vegetation (% cover)	90%	H	1		
	17	Emerg. veg. flood resistance	A	1			
	18	Sediment delivery	A	1			
	19	Upland soils (based on soil group)	B	0.5			
	20	Stormwater runoff pretreatment & detention	C	0.1	1		
	21	Subwatershed wetland density	C	0.1			
	22	Channels/sheet flow	A	1			
	23	Adjacent naturalized buffer average width (feet)	500	H	WQ	1 H	1
	24	Adjacent Area Management: % Full	100%	1	1	**1**	
		adjacent area mgmt: % Manicured		0			
		adjacent area mgmt: % Bare		0			
	25	Adjacent Area Diversity & Structure: % Native	100%	1	1	**1**	
		adjacent area diversity: % Mixed		0			
		adjacent area diversity: % Sparse/Inv./Exotic		0			
	26	Adjacent Area Slope: % Gentle	5%	0.05	1	**0.05**	
		adjacent area slope: % Moderate		0			
		adjacent area slope: % Steep		0			
Digital worksheet, section II	27	Downstream sensitivity/WQ protection	A	1			
	28	Nutrient loading	A	1			
	29	Shoreline wetland?	N	N			
	30	Rooted shoreline vegetation (%cover)		Enter a percentage			
	31	Wetland in-water width (in feet, average)		Enter a percentage			
	32	Emergent vegetation erosion resistance		Enter valid choice			
	33	Shoreline erosion potential		Enter valid cho			
	34	Bank protection/upslope veg.		Enter valid choice			
	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)	3	H	1		0
	39	Wetland detritus	A	1			
	40	Wetland interspersion on landscape	A	1	1		
	41	Wildlife barriers	A	1			
	42	Amphibian breeding potential-hydroperiod	A	1			
	43	Amphibian breeding potential--fish presence	A	1			
	44	Amphibian & reptile overwintering habitat	C	0.1			
	45	Wildlife species (list)					
	46	Fish habitat quality	N/A	N/A			
	47	Fish species (list)					
	48	Unique/rare educ./cultural/rec.opportunity	N	N			
	49	Wetland visibility	C	0.1			
	50	Proximity to population	N	0.1			
	51	Public ownership	C	0.1			
	52	Public access	C	0.1			
	53	Human influence on wetland	A	1			
	54	Human influence on viewshed	A	1			
	55	Spatial buffer	C	0.1			
	56	Recreational activity potential	C	0.1			
	57	Commercial crop--hydrologic impact	N/A	N/A			

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:
#REF!

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*	D	R or D	1
59	*GW - Subwatershed land use*	D	R or D	1
60	*GW - Wetland size and soil group*	D	R or D	1
61	GW - Wetland hydroperiod	R	R or D	0.1
62	GW - Inlet/Outlet configuration	D	R or D	1
63	GW - Surrounding upland topographic relief	D	R or D	1
64	Restoration potential w/o flooding		Y or N	5.1
65	*Landowners affected by restoration*		*E a b c*	Enter valid choice
66A	*Existing wetland size (acres) [from #10]*	111	__ acres	
66B	Total wetland restoration size (acres)		__ acres	0.1
66C	(Calculated) Potential New Wetland Area [B-A]	-111	__ acres	% effectively drained: ####
67	Average width of naturalized upland buffer (poten	0	__ feet	0.1 value: ####
68	Likelihood of restoration success		a b c	Enter valid choice
69	Hydrologic alteration type		Outlet, Tile, Ditch, GW pump, Wtrshd div., Filling	
70	Potential wetland type (Circ. 39)		1, 2, 3, 4, 5, 6, 7, 8	
71	Wetland sensitivity to stormwater		E a b c	
72	Additional stormwater treatment needs		a b c	

Functional Rating Summaries

Function Name	Raw score	Final Rating	Rating Category	Formula shown to the right.
Vegetative Diversity/Integrity		0.50	Med	####
				####
Hydrology - Characteristic		1.00	High	####
				####
Flood Attenuation		0.60	Med	####
Water Quality--Downstream		0.80	High	
Water Quality--Wetland		0.81	High	
Shoreline Protection		N/A	N/A	
Characteristic Wildlife Habitat Structure	0.89	0.89	High	#REF!
				#REF!
Maintenance of Characteristic Fish Habitat	######	N/A	N/A	#REF!
				#REF!
Maintenance of Characteristic Amphibian Habitat		0.85	High	
				#REF!
Aesthetics/Recreation/Education/Cultural	0.33	0.33	Med	#REF!
				#REF!
Commercial use		N/A	N/A	0
Special Features listing:			#REF!	####

Groundwater Interaction	discharge	#REF!
Groundwater Functional Index	#REF!	#REF!
Restoration Potential (draft formula)	#VALUE!	#####
Stormwater Sensitivity (not active)		

MnRAM 3.2 Digital Worksheet, Side 2

WTL11

		Question Description	User entry	Rating			
	1	Veg. Table 2, Option 4		0.50			
		TOTAL VEG Rating	0.5	Medium			
Digital worksheet, section I	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	FT	Depress'l/Flow-through			
	8	Water depth (inches)	12				
		Water depth (% inundation)					
	9	Local watershed/immedita drainage (acres)					
	10	Existing wetland size	1				
	11	SOILS: Up/Wetland (survey classification + site)					
	12	Outlet characteristics for flood retention	N/A	N/A			
	13	Outlet characteristics for hydrologic regime	A	1			
	14	Dominant upland land use (within 500 ft)	A	1	0.1		
	15	Soil condition (wetland)	A	1			
	16	Vegetation (% cover)	90%	H	1		
	17	Emerg. veg. flood resistance	A	1			
	18	Sediment delivery	A	1			
	19	Upland soils (based on soil group)	B	0.5			
	20	Stormwater runoff pretreatment & detention	C	0.1	1		
	21	Subwatershed wetland density	C	0.1			
	22	Channels/sheet flow	A	1			
	23	Adjacent naturalized buffer average width (feet)	500	H	WQ	1 H	1
	24	Adjacent Area Management: % Full	100%	1	1	**1**	
		adjacent area mgmt: % Manicured		0			
		adjacent area mgmt: % Bare		0			
	25	Adjacent Area Diversity & Structure: % Native	100%	1	1	**1**	
		adjacent area diversity: % Mixed		0			
		adjacent area diversity: % Sparse/Inv./Exotic		0			
	26	Adjacent Area Slope: % Gentle	5%	0.05	1	**0.05**	
		adjacent area slope: % Moderate		0			
		adjacent area slope: % Steep		0			
Digital worksheet, section II	27	Downstream sensitivity/WQ protection	B	0.5			
	28	Nutrient loading	A	1			
	29	Shoreline wetland?	N	N			
	30	Rooted shoreline vegetation (%cover)		Enter a percentage			
	31	Wetland in-water width (in feet, average)		Enter a percentage			
	32	Emergent vegetation erosion resistance		Enter valid choice			
	33	Shoreline erosion potential		Enter valid cho			
	34	Bank protection/upslope veg.		Enter valid choice			
	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	A	1			
	40	Wetland interspersion on landscape	A	1	1		
	41	Wildlife barriers	A	1			
	42	Amphibian breeding potential-hydroperiod	A	1			
	43	Amphibian breeding potential--fish presence	A	1			
	44	Amphibian & reptile overwintering habitat	C	0.1			
	45	Wildlife species (list)					
	46	Fish habitat quality	N/A	N/A			
	47	Fish species (list)					
	48	Unique/rare educ./cultural/rec.opportunity	N	N			
	49	Wetland visibility	C	0.1			
	50	Proximity to population	N	0.1			
	51	Public ownership	C	0.1			
	52	Public access	C	0.1			
	53	Human influence on wetland	A	1			
	54	Human influence on viewshed	A	1			
	55	Spatial buffer	C	0.1			
	56	Recreational activity potential	C	0.1			
	57	Commercial crop--hydrologic impact	N/A	N/A			

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:
#REF!

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*	D	R or D	1
59	*GW - Subwatershed land use*	D	R or D	1
60	*GW - Wetland size and soil group*	D	R or D	1
61	GW - Wetland hydroperiod	D	R or D	1
62	GW - Inlet/Outlet configuration	D	R or D	1
63	GW - Surrounding upland topographic relief	R	R or D	0.1
64	Restoration potential w/o flooding		Y or N	5.1
65	*Landowners affected by restoration*		*E a b c*	Enter valid choice
66A	*Existing wetland size (acres) [from #10]*	1	__ acres	
66B	Total wetland restoration size (acres)		__ acres	0.1
66C	(Calculated) Potential New Wetland Area [B-A]	-1	__ acres	% effectively drained: ####
67	Average width of naturalized upland buffer (poten	0	__ feet	0.1 value: ####
68	Likelihood of restoration success		a b c	Enter valid choice
69	Hydrologic alteration type		Outlet, Tile, Ditch, GW pump, Wtrshd div., Filling	
70	Potential wetland type (Circ. 39)		1, 2, 3, 4, 5, 6, 7, 8	
71	Wetland sensitivity to stormwater		E a b c	
72	Additional stormwater treatment needs		a b c	

Functional Rating Summaries

Function Name	Raw score	Final Rating	Rating Category	Formula shown to the right.
Vegetative Diversity/Integrity		0.50	Med	####
				####
Hydrology - Characteristic		1.00	High	####
				####
Flood Attenuation		0.60	Med	####
Water Quality--Downstream		0.71	High	
Water Quality--Wetland		0.81	High	
Shoreline Protection		N/A	N/A	
Characteristic Wildlife Habitat Structure	0.83	0.83	High	#REF!
				#REF!
Maintenance of Characteristic Fish Habitat	######	N/A	N/A	#REF!
				#REF!
Maintenance of Characteristic Amphibian Habitat		0.85	High	
				#REF!
Aesthetics/Recreation/Education/Cultural	0.33	0.44	Med	#REF!
				#REF!
Commercial use		N/A	N/A	0
Special Features listing:			#REF!	####

Groundwater Interaction	discharge	#REF!
Groundwater Functional Index	#REF!	#REF!
Restoration Potential (draft formula)	#VALUE!	#####
Stormwater Sensitivity (not active)		

MnRAM 3.2 Digital Worksheet, Side 2

WTL12

		Question Description	User entry	Rating			
	1	Veg. Table 2, Option 4		0.63			
		TOTAL VEG Rating	0.63	Medium			
Digital worksheet, section I	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	FT	Depress'l/Flow-through			
	8	Water depth (inches)	6				
		Water depth (% inundation)					
	9	Local watershed/immedita drainage (acres)					
	10	Existing wetland size	36				
	11	SOILS: Up/Wetland (survey classification + site)					
	12	Outlet characteristics for flood retention	N/A	N/A			
	13	Outlet characteristics for hydrologic regime	A	1			
	14	Dominant upland land use (within 500 ft)	A	1	0.1		
	15	Soil condition (wetland)	A	1			
	16	Vegetation (% cover)	80%	H	1		
	17	Emerg. veg. flood resistance	A	1			
	18	Sediment delivery	A	1			
	19	Upland soils (based on soil group)	B	0.5			
	20	Stormwater runoff pretreatment & detention	C	0.1	1		
	21	Subwatershed wetland density	C	0.1			
	22	Channels/sheet flow	A	1			
	23	Adjacent naturalized buffer average width (feet)	500	H	WQ	1 H	1
	24	Adjacent Area Management: % Full	100%	1	1	**1**	
		adjacent area mgmt: % Manicured		0			
		adjacent area mgmt: % Bare		0			
	25	Adjacent Area Diversity & Structure: % Native	100%	1	1	**1**	
		adjacent area diversity: % Mixed		0			
		adjacent area diversity: % Sparse/Inv./Exotic		0			
	26	Adjacent Area Slope: % Gentle		0	0	**0**	
		adjacent area slope: % Moderate		0			
		adjacent area slope: % Steep		0			
Digital worksheet, section II	27	Downstream sensitivity/WQ protection	B	0.5			
	28	Nutrient loading	A	1			
	29	Shoreline wetland?	N	N			
	30	Rooted shoreline vegetation (%cover)		Enter a percentage			
	31	Wetland in-water width (in feet, average)		Enter a percentage			
	32	Emergent vegetation erosion resistance		Enter valid choice			
	33	Shoreline erosion potential		Enter valid cho			
	34	Bank protection/upslope veg.		Enter valid choice			
	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	A	1			
	40	Wetland interspersion on landscape	A	1	1		
	41	Wildlife barriers	A	1			
	42	Amphibian breeding potential-hydroperiod	A	1			
	43	Amphibian breeding potential--fish presence	A	1			
	44	Amphibian & reptile overwintering habitat	C	0.1			
	45	Wildlife species (list)					
	46	Fish habitat quality	N/A	N/A			
	47	Fish species (list)					
	48	Unique/rare educ./cultural/rec.opportunity	N	N			
	49	Wetland visibility	C	0.1			
	50	Proximity to population	N	0.1			
	51	Public ownership	C	0.1			
	52	Public access	C	0.1			
	53	Human influence on wetland	A	1			
	54	Human influence on viewshed	A	1			
	55	Spatial buffer	C	0.1			
	56	Recreational activity potential	C	0.1			
	57	Commercial crop--hydrologic impact	N/A	N/A			

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:
#REF!

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*	D	R or D	1
59	*GW - Subwatershed land use*	D	R or D	1
60	*GW - Wetland size and soil group*	D	R or D	1
61	GW - Wetland hydroperiod	R	R or D	0.1
62	GW - Inlet/Outlet configuration	D	R or D	1
63	GW - Surrounding upland topographic relief	D	R or D	1
64	Restoration potential w/o flooding		Y or N	5.1
65	*Landowners affected by restoration*		*E a b c*	Enter valid choice
66A	*Existing wetland size (acres) [from #10]*	36	__ acres	
66B	Total wetland restoration size (acres)		__ acres	0.1
66C	(Calculated) Potential New Wetland Area [B-A]	-36	__ acres	% effectively drained: ####
67	Average width of naturalized upland buffer (poten	0	__ feet	0.1 value: ####
68	Likelihood of restoration success		a b c	Enter valid choice
69	Hydrologic alteration type		Outlet, Tile, Ditch, GW pump, Wtrshd div., Filling	
70	Potential wetland type (Circ. 39)		1, 2, 3, 4, 5, 6, 7, 8	
71	Wetland sensitivity to stormwater		E a b c	
72	Additional stormwater treatment needs		a b c	

Functional Rating Summaries

Function Name	Raw score	Final Rating	Rating Category	Formula shown to the right.
Vegetative Diversity/Integrity		0.63	Med	####
				####
Hydrology - Characteristic		1.00	High	####
				####
Flood Attenuation		0.60	Med	####
Water Quality--Downstream		0.71	High	
Water Quality--Wetland		0.85	High	
Shoreline Protection		N/A	N/A	
Characteristic Wildlife Habitat Structure	0.86	0.86	High	#REF!
				#REF!
Maintenance of Characteristic Fish Habitat	######	N/A	N/A	#REF!
				#REF!
Maintenance of Characteristic Amphibian Habitat		0.85	High	
				#REF!
Aesthetics/Recreation/Education/Cultural	0.33	0.33	Med	#REF!
				#REF!
Commercial use		N/A	N/A	0
Special Features listing:			#REF!	####

Groundwater Interaction	discharge	#REF!
Groundwater Functional Index	#REF!	#REF!
Restoration Potential (draft formula)	#VALUE!	#####
Stormwater Sensitivity (not active)		

		Wetland ID HW13 UTM Coordinates 545297 5270150	Wetland ID HW14 UTM Coordinates 545870 5269302	Wetland name ID HW15 UTM Coordinates 546463 5269353	Wetland ID HW16 UTM Coordinates 546624 5269108
	Date	**23-Jun-09**	**24-Jun-09**	**24-Jun-09**	**24-Jun-09**
	Special Features (from list, p.2--enter letter/s)	- PHOTOS 104-105	- 106	- 107-108	- 109-110
#1	Community Number (circle each community which represents at least 10% of the wetland)	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	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 (wet meadow, marsh)	4B Coniferous Swamp	13B Shallow Marsh	8A Alder Thicket	8A Alder Thicket
	Community Proportion (% of total)	67%	33%	33%	40%
	Dominant Vegetation / Cover Class	BLACK SPRUCE/4	NARROW LEAF CATTAIL/5	SPECKLED ALDER/4	SPECKLED ALDER/5
		LABRADOR TEA/4	SEDGE/3	SEDGE/6	PUSSY WILLOW/2
		LEATHERLEAF/3	SPECKLED ALDER/2	NARROW LEAF WILLOW/2	SEDGE/5
		TAMARACK/2	GRASS/2	BLACK SPRUCE/2	CANADA BLUEJOINT/2
		COTTONGRASS/1	PUSSY WILLOW/2	WHITE PINE/1	RUSH/2
		SPAGNUM MOSS/6	MEADOWSWEET/2	RASPBERRY/2	
	Invasive/exotic Vegetation / Cover Class				
	Community Quality (E, H, M, L)	H 1	H 1	H 1	H 1
Plant Community #2	Community Type (wet meadow, marsh)	- -	4B Coniferous Swamp	- -	
	Community Proportion (% of total)		67%		
	Dominant Vegetation / Cover Class		BLACK SPRUCE/4		
			TAMARACK/2		
			SPECKLED ALDER/2		
			LABRADOR TEA/4		
			LEATHERLEAF/6		
			MOSS/6		
	Invasive/exotic Vegetation / Cover Class				
	Community Quality (E, H, M, L)	0	H 1	0	0
Plant Community #3	Community Type (wet meadow, marsh)	- -	- -	- -	- -
	Community Proportion (% of total)				
	Dominant Vegetation / Cover Class				
	Invasive/exotic Vegetation / Cover Class				
	Community Quality (E, H, M, L)	0	0	0	0
Plant Community #4*	Community Type (wet meadow, marsh)	- -	- -	- -	- -
	Community Proportion (% of total)				
	Dominant Vegetation / Cover Class				
	Invasive/exotic Vegetation / Cover Class				
	Community Quality (E, H, M, L)	- 0	0	0	0
	Circular 39 Types (primary <TAB> others)				
	Cowardin Types				
	Photo ID				
Highest rated community veg. div./integ:		1.0 High	1 High	1 High	1 High
Average vegetative diversity/integrity:		1.00 High	1.00 High	1.00 High	1.00 High
Weighted Average veg. diversity/integrity:		0.67 High	0.50 Medium	0.33 Medium	0.40 Medium
#4	Listed, rare, special plant species?	N	N	N	N
#5	**Rare community or habitat?**	**N**	**N**	**N**	**N**
#6	Pre-European-settlement conditions?	N	N	N	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]

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

*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.

MnRAM 3.2 Digital Worksheet, Side 2

WTL13

		Question Description	User entry	Rating										
	1	Veg. Table 2, Option 4		0.67										
		TOTAL VEG Rating	0.67	High										
	4	Listed, rare, special plant species?	N	next										
	5	Rare community or habitat?	N	next										
	6	Pre-European-settlement conditions?	N	next										
Digital worksheet, section I	7	hydrogeo & topo	I	Depressional/Isolated										
	8	Water depth (inches)	6											
		Water depth (% inundation)												
	9	Local watershed/immedita drainage (acres)												
	10	Existing wetland size	5											
	11	SOILS: Up/Wetland (survey classification + site)												
	12	Outlet characteristics for flood retention	A	1										
	13	Outlet characteristics for hydrologic regime	A	1										
	14	Dominant upland land use (within 500 ft)	A	1	0.1									
	15	Soil condition (wetland)	A	1										
	16	Vegetation (% cover)	80%	H	1									
	17	Emerg. veg. flood resistance	A	1										
	18	Sediment delivery	A	1										
	19	Upland soils (based on soil group)	B	0.5										
	20	Stormwater runoff pretreatment & detention	C	0.1	1									
	21	Subwatershed wetland density	C	0.1										
	22	Channels/sheet flow	A	1										
	23	Adjacent naturalized buffer average width (feet)	500	H	WQ	1	H		1					
	24	Adjacent Area Management: % Full	100%	1	1	**1**								
		adjacent area mgmt: % Manicured		0										
		adjacent area mgmt: % Bare		0										
	25	Adjacent Area Diversity & Structure: % Native	100%	1	1	**1**								
		adjacent area diversity: % Mixed		0										
		adjacent area diversity: % Sparse/Inv./Exotic		0										
	26	Adjacent Area Slope: % Gentle	5%	0.05	1	**0.05**								
		adjacent area slope: % Moderate		0										
		adjacent area slope: % Steep		0										
Digital worksheet, section II	27	Downstream sensitivity/WQ protection	B	0.5										
	28	Nutrient loading	A	1										
	29	Shoreline wetland?	N	N										
	30	Rooted shoreline vegetation (%cover)		Enter a percentage										
	31	Wetland in-water width (in feet, average)		Enter a percentage										
	32	Emergent vegetation erosion resistance		Enter valid choice										
	33	Shoreline erosion potential		Enter valid cho										
	34	Bank protection/upslope veg.		Enter valid choice										
	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	A	1										
	40	Wetland interspersion on landscape	A	1	1									
	41	Wildlife barriers	A	1										
	42	Amphibian breeding potential-hydroperiod	A	1										
	43	Amphibian breeding potential--fish presence	A	1										
	44	Amphibian & reptile overwintering habitat	C	0.1										
	45	Wildlife species (list)												
	46	Fish habitat quality	N/A	N/A										
	47	Fish species (list)												
	48	Unique/rare educ./cultural/rec.opportunity	N	N										
	49	Wetland visibility	C	0.1										
	50	Proximity to population	N	0.1										
	51	Public ownership	C	0.1										
	52	Public access	C	0.1										
	53	Human influence on wetland	A	1										
	54	Human influence on viewshed	A	1										
	55	Spatial buffer	C	0.1										
	56	Recreational activity potential	C	0.1										
	57	Commercial crop--hydrologic impact	N/A	N/A										

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:
#REF!

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*	D	R or D	1
59	*GW - Subwatershed land use*	D	R or D	1
60	*GW - Wetland size and soil group*	D	R or D	1
61	GW - Wetland hydroperiod	R	R or D	0.1
62	GW - Inlet/Outlet configuration	D	R or D	1
63	GW - Surrounding upland topographic relief	D	R or D	1
64	Restoration potential w/o flooding		Y or N	5.1
65	*Landowners affected by restoration*		*E a b c*	Enter valid choice
66A	*Existing wetland size (acres) [from #10]*	5	__ acres	
66B	Total wetland restoration size (acres)		__ acres	0.1
66C	(Calculated) Potential New Wetland Area [B-A]	-5	__ acres	% effectively drained: ####
67	Average width of naturalized upland buffer (poten	0	__ feet	0.1 value: ####
68	Likelihood of restoration success		a b c	Enter valid choice
69	Hydrologic alteration type		Outlet, Tile, Ditch, GW pump, Wtrshd div., Filling	
70	Potential wetland type (Circ. 39)		1, 2, 3, 4, 5, 6, 7, 8	
71	Wetland sensitivity to stormwater		E a b c	
72	Additional stormwater treatment needs		a b c	

Functional Rating Summaries

Function Name	Raw score	Final Rating	Rating Category	Formula shown to the right.
Vegetative Diversity/Integrity		0.67	High	####
				####
Hydrology - Characteristic		1.00	High	####
				####
Flood Attenuation		0.68	High	####
Water Quality--Downstream		0.75	High	
Water Quality--Wetland		0.86	High	
Shoreline Protection		N/A	N/A	
Characteristic Wildlife Habitat Structure	0.87	0.87	High	#REF!
				#REF!
Maintenance of Characteristic Fish Habitat	######	N/A	N/A	#REF!
				#REF!
Maintenance of Characteristic Amphibian Habitat		0.85	High	
				#REF!
Aesthetics/Recreation/Education/Cultural	0.33	0.33	Med	#REF!
				#REF!
Commercial use		N/A	N/A	0
Special Features listing:			#REF!	####

Groundwater Interaction	discharge	#REF!
Groundwater Functional Index	#REF!	#REF!
Restoration Potential (draft formula)	#VALUE!	#####
Stormwater Sensitivity (not active)		

MnRAM 3.2 Digital Worksheet, Side 2

WTL14

		Question Description	User entry	Rating							
1		Veg. Table 2, Option 4		0.50							
		TOTAL VEG Rating	0.5	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	I	Depressional/Isolated							
	8	Water depth (inches)	24								
		Water depth (% inundation)									
	9	Local watershed/immedita drainage (acres)									
	10	Existing wetland size	1								
	11	SOILS: Up/Wetland (survey classification + site)									
Digital worksheet, section I	12	Outlet characteristics for flood retention	A	1							
	13	Outlet characteristics for hydrologic regime	A	1							
	14	Dominant upland land use (within 500 ft)	A	1	0.1						
	15	Soil condition (wetland)	A	1							
	16	Vegetation (% cover)	85%	H	1						
	17	Emerg. veg. flood resistance	A	1							
	18	Sediment delivery	A	1							
	19	Upland soils (based on soil group)	B	0.5							
	20	Stormwater runoff pretreatment & detention	C	0.1	1						
	21	Subwatershed wetland density	C	0.1							
	22	Channels/sheet flow	A	1							
	23	Adjacent naturalized buffer average width (feet)	500	H	WQ	1	H		1		
	24	Adjacent Area Management: % Full	100%	1	1	**1**					
		adjacent area mgmt: % Manicured		0							
		adjacent area mgmt: % Bare		0							
	25	Adjacent Area Diversity & Structure: % Native	100%	1	1	**1**					
		adjacent area diversity: % Mixed		0							
		adjacent area diversity: % Sparse/Inv./Exotic		0							
	26	Adjacent Area Slope: % Gentle	5%	0.05	1	**0.05**					
		adjacent area slope: % Moderate		0							
		adjacent area slope: % Steep		0							
Digital worksheet, section II	27	Downstream sensitivity/WQ protection	B	0.5							
	28	Nutrient loading	A	1							
	29	Shoreline wetland?	N	N							
	30	Rooted shoreline vegetation (%cover)		Enter a percentage							
	31	Wetland in-water width (in feet, average)		Enter a percentage							
	32	Emergent vegetation erosion resistance		Enter valid choice							
	33	Shoreline erosion potential		Enter valid cho							
	34	Bank protection/upslope veg.		Enter valid choice							
	35	Rare Wildlife	N	N							
	36	Scarce/Rare/S1/S2 local community	N	N							
	37	Vegetation interspersion cover (see diagram 1)	3	M	0.5						
	38	Community interspersion (see diagram 2)	2	M	0.5					0	
	39	Wetland detritus	A	1							
	40	Wetland interspersion on landscape	A	1	1						
	41	Wildlife barriers	A	1							
	42	Amphibian breeding potential-hydroperiod	A	1							
	43	Amphibian breeding potential--fish presence	A	1							
	44	Amphibian & reptile overwintering habitat	C	0.1							
	45	Wildlife species (list)									
	46	Fish habitat quality	C	0.1							
	47	Fish species (list)									
	48	Unique/rare educ./cultural/rec.opportunity	N	N							
	49	Wetland visibility	C	0.1							
	50	Proximity to population	N	0.1							
	51	Public ownership	C	0.1							
	52	Public access	C	0.1							
	53	Human influence on wetland	A	1							
	54	Human influence on viewshed	A	1							
	55	Spatial buffer	C	0.1							
	56	Recreational activity potential	C	0.1							
	57	Commercial crop--hydrologic impact	N/A	N/A							

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.

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

Additional questions

58	*GW - Wetland soils*	D	R or D	1		
59	*GW - Subwatershed land use*	D	R or D	1		
60	*GW - Wetland size and soil group*	D	R or D	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	D	R or D	1		
64	Restoration potential w/o flooding		Y or N	5.1		
65	*Landowners affected by restoration*		*E a b c*	Enter valid choice		
66A	*Existing wetland size (acres) [from #10]*	1	__ acres			
66B	Total wetland restoration size (acres)		__ acres	0.1		
66C	(Calculated) Potential New Wetland Area [B-A]	-1	__ acres	% effectively drained:	####	
67	Average width of naturalized upland buffer (poten	0	__ feet	0.1	value:	####
68	Likelihood of restoration success		a b c	Enter valid choice		
69	Hydrologic alteration type		Outlet, Tile, Ditch, GW pump, Wtrshd div., Filling			
70	Potential wetland type (Circ. 39)		1, 2, 3, 4, 5, 6, 7, 8			
71	Wetland sensitivity to stormwater		E a b c			
72	Additional stormwater treatment needs		a b c			

Functional Rating Summaries

Function Name	Raw score	Final Rating	Rating Category	Formula shown to the right.
Vegetative Diversity/Integrity		0.50	Med	####
				####
Hydrology - Characteristic		1.00	High	####
				####
Flood Attenuation		0.68	High	####
Water Quality--Downstream		0.75	High	
Water Quality--Wetland		0.81	High	
Shoreline Protection		N/A	N/A	
Characteristic Wildlife Habitat Structure	0.80	0.80	High	#REF!
				#REF!
Maintenance of Characteristic Fish Habitat	0.70	0.70	High	#REF!
				#REF!
Maintenance of Characteristic Amphibian Habitat		0.85	High	
				#REF!
Aesthetics/Recreation/Education/Cultural	0.33	0.33	Med	#REF!
				#REF!
Commercial use		N/A	N/A	0
Special Features listing:			#REF!	####
Groundwater Interaction		discharge		#REF!
Groundwater Functional Index		#REF!	#REF!	
Restoration Potential (draft formula)		#VALUE!	#####	
Stormwater Sensitivity (not active)				

MnRAM 3.2 Digital Worksheet, Side 2

WTL15

		Question Description	User entry	Rating							
1		Veg. Table 2, Option 4		0.33							
		TOTAL VEG Rating	0.33	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	I	Depressional/Isolated							
	8	Water depth (inches)	18								
		Water depth (% inundation)									
	9	Local watershed/immedita drainage (acres)									
	10	Existing wetland size	2								
	11	SOILS: Up/Wetland (survey classification + site)									
Digital worksheet, section I	12	Outlet characteristics for flood retention	A	1							
	13	Outlet characteristics for hydrologic regime	A	1							
	14	Dominant upland land use (within 500 ft)	A	1	0.1						
	15	Soil condition (wetland)	A	1							
	16	Vegetation (% cover)	95%	H	1						
	17	Emerg. veg. flood resistance	A	1							
	18	Sediment delivery	A	1							
	19	Upland soils (based on soil group)	B	0.5							
	20	Stormwater runoff pretreatment & detention	C	0.1	1						
	21	Subwatershed wetland density	C	0.1							
	22	Channels/sheet flow	A	1							
	23	Adjacent naturalized buffer average width (feet)	500	H	WQ	1	H	1			
	24	Adjacent Area Management: % Full	100%	1	1	**1**					
		adjacent area mgmt: % Manicured		0							
		adjacent area mgmt: % Bare		0							
	25	Adjacent Area Diversity & Structure: % Native	100%	1	1	**1**					
		adjacent area diversity: % Mixed		0							
		adjacent area diversity: % Sparse/Inv./Exotic		0							
	26	Adjacent Area Slope: % Gentle	5%	0.05	1	**0.05**					
		adjacent area slope: % Moderate		0							
		adjacent area slope: % Steep		0							
Digital worksheet, section II	27	Downstream sensitivity/WQ protection	A	1							
	28	Nutrient loading	A	1							
	29	Shoreline wetland?	N	N							
	30	Rooted shoreline vegetation (%cover)		Enter a percentage							
	31	Wetland in-water width (in feet, average)		Enter a percentage							
	32	Emergent vegetation erosion resistance		Enter valid choice							
	33	Shoreline erosion potential		Enter valid cho							
	34	Bank protection/upslope veg.		Enter valid choice							
	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	A	1							
	40	Wetland interspersion on landscape	A	1	1						
	41	Wildlife barriers	A	1							
	42	Amphibian breeding potential-hydroperiod	A	1							
	43	Amphibian breeding potential--fish presence	A	1							
	44	Amphibian & reptile overwintering habitat	C	0.1							
	45	Wildlife species (list)									
	46	Fish habitat quality	N/A	N/A							
	47	Fish species (list)									
	48	Unique/rare educ./cultural/rec.opportunity	N	N							
	49	Wetland visibility	C	0.1							
	50	Proximity to population	N	0.1							
	51	Public ownership	C	0.1							
	52	Public access	C	0.1							
	53	Human influence on wetland	A	1							
	54	Human influence on viewshed	A	1							
	55	Spatial buffer	C	0.1							
	56	Recreational activity potential	C	0.1							
	57	Commercial crop--hydrologic impact	N/A	N/A							

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.

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

72												
73		58	*GW - Wetland soils*	D	R or D	1						
74		59	*GW - Subwatershed land use*	D	R or D	1						
75		60	*GW - Wetland size and soil group*	D	R or D	1						
76	Additional questions	61	GW - Wetland hydroperiod	R	R or D	0.1						
77		62	GW - Inlet/Outlet configuration	D	R or D	1						
78		63	GW - Surrounding upland topographic relief	D	R or D	1						
79		64	Restoration potential w/o flooding		Y or N	5.1						
80		65	*Landowners affected by restoration*		*E a b c*	Enter valid choice						
81		66A	*Existing wetland size (acres) [from #10]*	2	__ acres							
82		66B	Total wetland restoration size (acres)		__ acres	0.1						
83		66C	(Calculated) Potential New Wetland Area [B-A]	-2	__ acres	% effectively drained:	####					
84		67	Average width of naturalized upland buffer (poten	0	__ feet	0.1	value:	####				
85		68	Likelihood of restoration success		a b c	Enter valid choice						
86		69	Hydrologic alteration type		Outlet, Tile, Ditch, GW pump, Wtrshd div., Filling							
87		70	Potential wetland type (Circ. 39)		1, 2, 3, 4, 5, 6, 7, 8							
88		71	Wetland sensitivity to stormwater		E a b c							
89		72	Additional stormwater treatment needs		a b c							
90												
92												
93												
94												

95		Function Name	Raw score	Final Rating	Rating Category		Formula shown to the right.
96	Functional Rating Summaries	Vegetative Diversity/Integrity		0.33	Med		####
97							####
98		Hydrology - Characteristic		1.00	High		####
99							####
100		Flood Attenuation		0.68	High		####
101							
102		Water Quality--Downstream		0.83	High		
103							
104		Water Quality--Wetland		0.76	High		
105							
106		Shoreline Protection		N/A	N/A		
107							
108		Characteristic Wildlife Habitat Structure	0.80	0.80	High		#REF!
109							#REF!
110		Maintenance of Characteristic Fish Habitat	######	0.70	High		#REF!
111							#REF!
112		Maintenance of Characteristic Amphibian Habitat		0.85	High		
113							#REF!
114		Aesthetics/Recreation/Education/Cultural	0.33	0.33	Med		#REF!
115							#REF!
116		Commercial use		N/A	N/A		0
117							
118		Special Features listing:			#REF!	####	
119							
120		Groundwater Interaction		discharge			#REF!
121		Groundwater Functional Index		#REF!	#REF!		
122							
123		Restoration Potential (draft formula)		#VALUE!	#####		
124		Stormwater Sensitivity (not active)					

MnRAM 3.2 Digital Worksheet, Side 2

WTL16

		Question Description	User entry	Rating							
	1	Veg. Table 2, Option 4		0.40							
		TOTAL VEG Rating	0.4	Medium							
Digital worksheet, section I	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	FT	Depress'l/Flow-through							
	8	Water depth (inches)	18								
		Water depth (% inundation)									
	9	Local watershed/immedita drainage (acres)									
	10	Existing wetland size	25								
	11	SOILS: Up/Wetland (survey classification + site)									
	12	Outlet characteristics for flood retention	N/A	N/A							
	13	Outlet characteristics for hydrologic regime	A	1							
	14	Dominant upland land use (within 500 ft)	A	1	0.1						
	15	Soil condition (wetland)	A	1							
	16	Vegetation (% cover)	95%	H	1						
	17	Emerg. veg. flood resistance	A	1							
	18	Sediment delivery	A	1							
	19	Upland soils (based on soil group)	B	0.5							
	20	Stormwater runoff pretreatment & detention	C	0.1	1						
	21	Subwatershed wetland density	C	0.1							
	22	Channels/sheet flow	A	1							
	23	Adjacent naturalized buffer average width (feet)	500	H	WQ	1	H	1			
	24	Adjacent Area Management: % Full	100%	1	1	**1**					
		adjacent area mgmt: % Manicured		0							
		adjacent area mgmt: % Bare		0							
	25	Adjacent Area Diversity & Structure: % Native	100%	1	1	**1**					
		adjacent area diversity: % Mixed		0							
		adjacent area diversity: % Sparse/Inv./Exotic		0							
	26	Adjacent Area Slope: % Gentle	5%	0.05	1	**0.05**					
		adjacent area slope: % Moderate		0							
		adjacent area slope: % Steep		0							
Digital worksheet, section II	27	Downstream sensitivity/WQ protection	A	1							
	28	Nutrient loading	A	1							
	29	Shoreline wetland?	N	N							
	30	Rooted shoreline vegetation (%cover)		Enter a percentage							
	31	Wetland in-water width (in feet, average)		Enter a percentage							
	32	Emergent vegetation erosion resistance		Enter valid choice							
	33	Shoreline erosion potential		Enter valid cho							
	34	Bank protection/upslope veg.		Enter valid choice							
	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	A	1							
	40	Wetland interspersion on landscape	A	1	1						
	41	Wildlife barriers	A	1							
	42	Amphibian breeding potential-hydroperiod	A	1							
	43	Amphibian breeding potential--fish presence	A	1							
	44	Amphibian & reptile overwintering habitat	C	0.1							
	45	Wildlife species (list)									
	46	Fish habitat quality	B	0.5							
	47	Fish species (list)									
	48	Unique/rare educ./cultural/rec.opportunity	N	N							
	49	Wetland visibility	C	0.1							
	50	Proximity to population	N	0.1							
	51	Public ownership	C	0.1							
	52	Public access	C	0.1							
	53	Human influence on wetland	A	1							
	54	Human influence on viewshed	A	1							
	55	Spatial buffer	C	0.1							
	56	Recreational activity potential	C	0.1							
	57	Commercial crop--hydrologic impact	N/A	N/A							

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.

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

72												
73		58	*GW - Wetland soils*	D	R or D	1						
74		59	*GW - Subwatershed land use*	D	R or D	1						
75		60	*GW - Wetland size and soil group*	D	R or D	1						
76	Additional questions	61	GW - Wetland hydroperiod	D	R or D	1						
77		62	GW - Inlet/Outlet configuration	D	R or D	1						
78		63	GW - Surrounding upland topographic relief	D	R or D	1						
79		64	Restoration potential w/o flooding		Y or N	6						
80		65	*Landowners affected by restoration*		*E a b c*	Enter valid choice						
81		66A	*Existing wetland size (acres) [from #10]*	25	__ acres							
82		66B	Total wetland restoration size (acres)		__ acres	0.1						
83		66C	(Calculated) Potential New Wetland Area [B-A]	-25	__ acres	% effectively drained:	####					
84		67	Average width of naturalized upland buffer (poten	0	__ feet	0.1	value:	####				
85		68	Likelihood of restoration success		a b c	Enter valid choice						
86		69	Hydrologic alteration type		Outlet, Tile, Ditch, GW pump, Wtrshd div., Filling							
87		70	Potential wetland type (Circ. 39)		1, 2, 3, 4, 5, 6, 7, 8							
88		71	Wetland sensitivity to stormwater		E a b c							
89		72	Additional stormwater treatment needs		a b c							
90												
92												
93												
94												
95			**Function Name**	Raw score	**Final Rating**	**Rating Category**		**Formula shown to the right.**				
96	Functional Rating Summaries		Vegetative Diversity/Integrity		0.40	Med			####			
97									####			
98			Hydrology - Characteristic		1.00	High			####			
99									####			
100			Flood Attenuation		0.60	Med			####			
101												
102			Water Quality--Downstream		0.80	High						
103												
104			Water Quality--Wetland		0.78	High						
105												
106			Shoreline Protection		N/A	N/A						
107												
108			Characteristic Wildlife Habitat Structure	0.81	0.81	High			#REF!			
109									#REF!			
110			Maintenance of Characteristic Fish Habitat	0.83	0.83	High			#REF!			
111									#REF!			
112			Maintenance of Characteristic Amphibian Habitat		0.85	High						
113									#REF!			
114			Aesthetics/Recreation/Education/Cultural	0.33	0.33	Med			#REF!			
115									#REF!			
116			Commercial use		N/A	N/A			0			
117												
118			Special Features listing:			#REF!	####					
119												
120			Groundwater Interaction		discharge	#REF!						
121			Groundwater Functional Index		#REF!	#REF!						
122												
123			Restoration Potential (draft formula)		#VALUE!	#####						
124			Stormwater Sensitivity (not active)									

		Wetland ID HW17 UTM Coordinates 526245 5268890	Wetland ID HW18 UTM Coordinates 546160 5268553	Wetland name ID HW19 UTM Coordinates 545822 5268222	Wetland ID HW20 UTM Coordinates 5455600 5267210
	Date	**24-Jun-09**	**24-Jun-09**	**24-Jun-09**	**24-Jun-09**
	Special Features (from list, p.2--enter letter/s)	- PHOTOS 111-112	- 113-114	- 115-118	- NONE
#1	Community Number (circle each community which represents at least 10% of the wetland)	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	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 (wet meadow, marsh)	13A Sedge Meadow	4A Coniferous Bog	12B Deep Marsh	8A Alder Thicket
	Community Proportion (% of total)	17%	40%	100%	80%
	Dominant Vegetation / Cover Class	SEDGE/6	BLACK SPRUCE/2	YELLOW LILY/5	SPECKLED ALDER/4
		SWAMP BIRCH/2	LARCH/4		PUSSY WILLOW/3
		SPECKLED ALDER/2	LABRADOR TEA/4		MEADOWSWEET/2
		TAMARACK/2	BUNCHBERRY/2		SEDGE/4
		RASPBERRY/1	FERN/2		CANADA BLUEJOINT/3
		SLENDER-LEAVED WILLOW/2	SPECKLED ALDER/4		
			SPAGNUM MOSS/5		
			IRIS/2		
	Invasive/exotic Vegetation / Cover Class				
	Community Quality (E, H, M, L)	H 1	H 1	H 1	H 1
Plant Community #2	Community Type (wet meadow, marsh)	8A Alder Thicket		13B Shallow Marsh	
	Community Proportion (% of total)	50%		100%	
	Dominant Vegetation / Cover Class	SPECKLED ALDER/6	CANADA BLUEJOINT/2	HORSETAIL/6	
		SWAMP BIRCH/2	FORB/2		
		PUSSY WILLOW/2	PAPER BIRCH/1		
		SEDGE/4			
		LARCH/2			
		SPAGNUM MOSS/4			
	Invasive/exotic Vegetation / Cover Class				
	Community Quality (E, H, M, L)	H 1	0	H 1	0
Plant Community #3	Community Type (wet meadow, marsh)	- -	- -	13A Sedge Meadow	- -
	Community Proportion (% of total)			40%	
	Dominant Vegetation / Cover Class			SEDGE/6	
				LEATHERLEAF/2	
				ARROWHEAD/1	
				NARROW LEAF CATTAIL/2	
				SPAGNUM MOSS/4	
	Invasive/exotic Vegetation / Cover Class				
	Community Quality (E, H, M, L)	0	0	H 1	0
Plant Community #4*	Community Type (wet meadow, marsh)	- -	- -	- -	- -
	Community Proportion (% of total)				
	Dominant Vegetation / Cover Class				
	Invasive/exotic Vegetation / Cover Class				
	Community Quality (E, H, M, L)	- 0	0	0	0
	Circular 39 Types (primary <TAB> others)				2
	Cowardin Types				
	Photo ID				
Highest rated community veg. div./integ:		1.0 High	1 High	1 High	1 High
Average vegetative diversity/integrity:		1.00 High	1.00 High	1.00 High	1.00 High
Weighted Average veg. diversity/integrity:		0.34 Medium	0.40 Medium	0.80 High	0.80 High
#4	Listed, rare, special plant species?	N	N	N	N
#5	**Rare community or habitat?**	**N**	**N**	**N**	**N**
#6	Pre-European-settlement conditions?	N	N	N	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]

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

*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.

MnRAM 3.2 Digital Worksheet, Side 2

WTL17

		Question Description	User entry	Rating			
	1	Veg. Table 2, Option 4		0.34			
		TOTAL VEG Rating	0.34	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	FT	Depress'l/Flow-through			
	8	Water depth (inches)	12				
		Water depth (% inundation)					
	9	Local watershed/immedita drainage (acres)					
	10	Existing wetland size	7				
	11	SOILS: Up/Wetland (survey classification + site)					
Digital worksheet, section I	12	Outlet characteristics for flood retention	N/A	N/A			
	13	Outlet characteristics for hydrologic regime	A	1			
	14	Dominant upland land use (within 500 ft)	A	1	0.1		
	15	Soil condition (wetland)	A	1			
	16	Vegetation (% cover)	95%	H	1		
	17	Emerg. veg. flood resistance	A	1			
	18	Sediment delivery	A	1			
	19	Upland soils (based on soil group)	B	0.5			
	20	Stormwater runoff pretreatment & detention	C	0.1	1		
	21	Subwatershed wetland density	C	0.1			
	22	Channels/sheet flow	A	1			
	23	Adjacent naturalized buffer average width (feet)	500	H	WQ	1 H	1
	24	Adjacent Area Management: % Full	100%	1	1	**1**	
		adjacent area mgmt: % Manicured		0			
		adjacent area mgmt: % Bare		0			
	25	Adjacent Area Diversity & Structure: % Native	100%	1	1	**1**	
		adjacent area diversity: % Mixed		0			
		adjacent area diversity: % Sparse/Inv./Exotic		0			
	26	Adjacent Area Slope: % Gentle	10%	0.1	1	**0.1**	
		adjacent area slope: % Moderate		0			
		adjacent area slope: % Steep		0			
Digital worksheet, section II	27	Downstream sensitivity/WQ protection	A	1			
	28	Nutrient loading	A	1			
	29	Shoreline wetland?	N	N			
	30	Rooted shoreline vegetation (%cover)		Enter a percentage			
	31	Wetland in-water width (in feet, average)		Enter a percentage			
	32	Emergent vegetation erosion resistance		Enter valid choice			
	33	Shoreline erosion potential		Enter valid cho			
	34	Bank protection/upslope veg.		Enter valid choice			
	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)	1	L	0.1		0
	39	Wetland detritus	A	1			
	40	Wetland interspersion on landscape	A	1	1		
	41	Wildlife barriers	A	1			
	42	Amphibian breeding potential-hydroperiod	A	1			
	43	Amphibian breeding potential--fish presence	A	1			
	44	Amphibian & reptile overwintering habitat	C	0.1			
	45	Wildlife species (list)					
	46	Fish habitat quality	N/A	N/A			
	47	Fish species (list)					
	48	Unique/rare educ./cultural/rec.opportunity	N	N			
	49	Wetland visibility	C	0.1			
	50	Proximity to population	N	0.1			
	51	Public ownership	C	0.1			
	52	Public access	C	0.1			
	53	Human influence on wetland	A	1			
	54	Human influence on viewshed	A	1			
	55	Spatial buffer	C	0.1			
	56	Recreational activity potential	C	0.1			
	57	Commercial crop--hydrologic impact	N/A	N/A			

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:
#REF!

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

Functional Rating Summaries

Function Name	Raw score	Final Rating	Rating Category	Formula shown to the right.
Vegetative Diversity/Integrity		0.34	Med	####
				####
Hydrology - Characteristic		1.00	High	####
				####
Flood Attenuation		0.60	Med	####
Water Quality--Downstream		0.80	High	
Water Quality--Wetland		0.77	High	
Shoreline Protection		N/A	N/A	
Characteristic Wildlife Habitat Structure	0.75	0.75	High	#REF!
				#REF!
Maintenance of Characteristic Fish Habitat	######	N/A	N/A	#REF!
				#REF!
Maintenance of Characteristic Amphibian Habitat		0.85	High	
				#REF!
Aesthetics/Recreation/Education/Cultural	0.33	0.33	Med	#REF!
				#REF!
Commercial use		N/A	N/A	0
Special Features listing:			#REF!	####

Groundwater Interaction	discharge	#REF!
Groundwater Functional Index	#REF!	#REF!
Restoration Potential (draft formula)	#VALUE!	#####
Stormwater Sensitivity (not active)		

MnRAM 3.2 Digital Worksheet, Side 2

WTL18

		Question Description	User entry	Rating			
	1	Veg. Table 2, Option 4		0.40			
		TOTAL VEG Rating	0.4	Medium			
Digital worksheet, section I	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	FT	Depress'l/Flow-through			
	8	Water depth (inches)	12				
		Water depth (% inundation)					
	9	Local watershed/immedita drainage (acres)					
	10	Existing wetland size	200				
	11	SOILS: Up/Wetland (survey classification + site)					
	12	Outlet characteristics for flood retention	N/A	N/A			
	13	Outlet characteristics for hydrologic regime	A	1			
	14	Dominant upland land use (within 500 ft)	A	1	0.1		
	15	Soil condition (wetland)	A	1			
	16	Vegetation (% cover)	90%	H	1		
	17	Emerg. veg. flood resistance	A	1			
	18	Sediment delivery	A	1			
	19	Upland soils (based on soil group)	B	0.5			
	20	Stormwater runoff pretreatment & detention	C	0.1	1		
	21	Subwatershed wetland density	C	0.1			
	22	Channels/sheet flow	A	1			
	23	Adjacent naturalized buffer average width (feet)	500	H	WQ	1 H	1
	24	Adjacent Area Management: % Full	100%	1	1	**1**	
		adjacent area mgmt: % Manicured		0			
		adjacent area mgmt: % Bare		0			
	25	Adjacent Area Diversity & Structure: % Native	100%	1	1	**1**	
		adjacent area diversity: % Mixed		0			
		adjacent area diversity: % Sparse/Inv./Exotic		0			
	26	Adjacent Area Slope: % Gentle	10%	0.1	1	**0.1**	
		adjacent area slope: % Moderate		0			
		adjacent area slope: % Steep		0			
Digital worksheet, section II	27	Downstream sensitivity/WQ protection	A	1			
	28	Nutrient loading	A	1			
	29	Shoreline wetland?	N	N			
	30	Rooted shoreline vegetation (%cover)		Enter a percentage			
	31	Wetland in-water width (in feet, average)		Enter a percentage			
	32	Emergent vegetation erosion resistance		Enter valid choice			
	33	Shoreline erosion potential		Enter valid cho			
	34	Bank protection/upslope veg.		Enter valid choice			
	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)	3	H	1		0
	39	Wetland detritus	A	1			
	40	Wetland interspersion on landscape	A	1	1		
	41	Wildlife barriers	A	1			
	42	Amphibian breeding potential-hydroperiod	A	1			
	43	Amphibian breeding potential--fish presence	A	1			
	44	Amphibian & reptile overwintering habitat	C	0.1			
	45	Wildlife species (list)					
	46	Fish habitat quality	N/A	N/A			
	47	Fish species (list)					
	48	Unique/rare educ./cultural/rec.opportunity	N	N			
	49	Wetland visibility	C	0.1			
	50	Proximity to population	N	0.1			
	51	Public ownership	C	0.1			
	52	Public access	C	0.1			
	53	Human influence on wetland	A	1			
	54	Human influence on viewshed	A	1			
	55	Spatial buffer	C	0.1			
	56	Recreational activity potential	C	0.1			
	57	Commercial crop--hydrologic impact	N/A	N/A			

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:
#REF!

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*	D	R or D	1
59	*GW - Subwatershed land use*	D	R or D	1
60	*GW - Wetland size and soil group*	D	R or D	1
61	GW - Wetland hydroperiod	R	R or D	0.1
62	GW - Inlet/Outlet configuration	D	R or D	1
63	GW - Surrounding upland topographic relief	D	R or D	1
64	Restoration potential w/o flooding		Y or N	5.1
65	*Landowners affected by restoration*		*E a b c*	Enter valid choice
66A	*Existing wetland size (acres) [from #10]*	200	__ acres	
66B	Total wetland restoration size (acres)		__ acres	0.1
66C	(Calculated) Potential New Wetland Area [B-A]	-200	__ acres	% effectively drained: ####
67	Average width of naturalized upland buffer (poten	0	__ feet	0.1 value: ####
68	Likelihood of restoration success		a b c	Enter valid choice
69	Hydrologic alteration type		Outlet, Tile, Ditch, GW pump, Wtrshd div., Filling	
70	Potential wetland type (Circ. 39)		1, 2, 3, 4, 5, 6, 7, 8	
71	Wetland sensitivity to stormwater		E a b c	
72	Additional stormwater treatment needs		a b c	

Functional Rating Summaries

Function Name	Raw score	Final Rating	Rating Category	Formula shown to the right.
Vegetative Diversity/Integrity		0.40	Med	####
				####
Hydrology - Characteristic		1.00	High	####
				####
Flood Attenuation		0.60	Med	####
Water Quality--Downstream		0.80	High	
Water Quality--Wetland		0.79	High	
Shoreline Protection		N/A	N/A	
Characteristic Wildlife Habitat Structure	0.87	0.87	High	#REF!
				#REF!
Maintenance of Characteristic Fish Habitat	######	N/A	N/A	#REF!
				#REF!
Maintenance of Characteristic Amphibian Habitat		0.85	High	
				#REF!
Aesthetics/Recreation/Education/Cultural	0.33	0.33	Med	#REF!
				#REF!
Commercial use		N/A	N/A	0
Special Features listing:			#REF!	####

Groundwater Interaction	discharge	#REF!
Groundwater Functional Index	#REF!	#REF!
Restoration Potential (draft formula)	#VALUE!	#####
Stormwater Sensitivity (not active)		

MnRAM 3.2 Digital Worksheet, Side 2

WTL19

		Question Description	User entry	Rating									
	1	Veg. Table 2, Option 4		0.80									
		TOTAL VEG Rating	0.8	High									
	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	Lac	Lacustrine									
	8	Water depth (inches)	48										
		Water depth (% inundation)											
	9	Local watershed/immedita drainage (acres)											
	10	Existing wetland size	4										
	11	SOILS: Up/Wetland (survey classification + site)											
Digital worksheet, section I	12	Outlet characteristics for flood retention	N/A	N/A									
	13	Outlet characteristics for hydrologic regime	A	1									
	14	Dominant upland land use (within 500 ft)	A	1	0.1								
	15	Soil condition (wetland)	A	1									
	16	Vegetation (% cover)	80%	H	1								
	17	Emerg. veg. flood resistance	A	1									
	18	Sediment delivery	A	1									
	19	Upland soils (based on soil group)	B	0.5									
	20	Stormwater runoff pretreatment & detention	C	0.1	1								
	21	Subwatershed wetland density	C	0.1									
	22	Channels/sheet flow	A	1									
	23	Adjacent naturalized buffer average width (feet)	500	H	WQ	1	H		1				
	24	Adjacent Area Management: % Full	100%	1	1	**1**							
		adjacent area mgmt: % Manicured		0									
		adjacent area mgmt: % Bare		0									
	25	Adjacent Area Diversity & Structure: % Native	100%	1	1	**1**							
		adjacent area diversity: % Mixed		0									
		adjacent area diversity: % Sparse/Inv./Exotic		0									
	26	Adjacent Area Slope: % Gentle	5%	0.05	1	**0.05**							
		adjacent area slope: % Moderate		0									
		adjacent area slope: % Steep		0									
Digital worksheet, section II	27	Downstream sensitivity/WQ protection	A	1									
	28	Nutrient loading	A	1									
	29	Shoreline wetland?	Y	Y									
	30	Rooted shoreline vegetation (%cover)	100%	1									
	31	Wetland in-water width (in feet, average)	200	1									
	32	Emergent vegetation erosion resistance	A	1									
	33	Shoreline erosion potential	C	0.1	1								
	34	Bank protection/upslope veg.	C	0.1									
	35	Rare Wildlife	N	N									
	36	Scarce/Rare/S1/S2 local community	N	N									
	37	Vegetation interspersion cover (see diagram 1)	6	M	0.5								
	38	Community interspersion (see diagram 2)	2	M	0.5					0			
	39	Wetland detritus	A	1									
	40	Wetland interspersion on landscape	A	1	1								
	41	Wildlife barriers	A	1									
	42	Amphibian breeding potential-hydroperiod	A	1									
	43	Amphibian breeding potential--fish presence	C	0.1									
	44	Amphibian & reptile overwintering habitat	A	1									
	45	Wildlife species (list)											
	46	Fish habitat quality	A	1									
	47	Fish species (list)											
	48	Unique/rare educ./cultural/rec.opportunity	N	N									
	49	Wetland visibility	C	0.1									
	50	Proximity to population	N	0.1									
	51	Public ownership	C	0.1									
	52	Public access	C	0.1									
	53	Human influence on wetland	A	1									
	54	Human influence on viewshed	A	1									
	55	Spatial buffer	C	0.1									
	56	Recreational activity potential	C	0.1									
	57	Commercial crop--hydrologic impact	N/A	N/A									

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:
#REF!

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*	D	R or D	1
59	*GW - Subwatershed land use*	D	R or D	1
60	*GW - Wetland size and soil group*	D	R or D	1
61	GW - Wetland hydroperiod	R	R or D	0.1
62	GW - Inlet/Outlet configuration	D	R or D	1
63	GW - Surrounding upland topographic relief	D	R or D	1
64	Restoration potential w/o flooding		Y or N	5.1
65	*Landowners affected by restoration*		*E a b c*	Enter valid choice
66A	*Existing wetland size (acres) [from #10]*	4	__ acres	
66B	Total wetland restoration size (acres)		__ acres	0.1
66C	(Calculated) Potential New Wetland Area [B-A]	-4	__ acres	% effectively drained: ####
67	Average width of naturalized upland buffer (poten	0	__ feet	0.1 value: ####
68	Likelihood of restoration success		a b c	Enter valid choice
69	Hydrologic alteration type		Outlet, Tile, Ditch, GW pump, Wtrshd div., Filling	
70	Potential wetland type (Circ. 39)		1, 2, 3, 4, 5, 6, 7, 8	
71	Wetland sensitivity to stormwater		E a b c	
72	Additional stormwater treatment needs		a b c	

Functional Rating Summaries

Function Name	Raw score	Final Rating	Rating Category	Formula shown to the right.
Vegetative Diversity/Integrity		0.80	High	####
				####
Hydrology - Characteristic		1.00	High	####
				####
Flood Attenuation		0.60	Med	####
Water Quality--Downstream		0.80	High	
Water Quality--Wetland		0.90	High	
Shoreline Protection		0.64	Med	
Characteristic Wildlife Habitat Structure	0.86	0.86	High	#REF!
				#REF!
Maintenance of Characteristic Fish Habitat	1.00	1.00	High	#REF!
				#REF!
Maintenance of Characteristic Amphibian Habitat		0.10	Low	
				#REF!
Aesthetics/Recreation/Education/Cultural	0.33	0.33	Med	#REF!
				#REF!
Commercial use		N/A	N/A	0
Special Features listing:			#REF!	####

Groundwater Interaction	discharge	#REF!
Groundwater Functional Index	#REF!	#REF!
Restoration Potential (draft formula)	#VALUE!	#####
Stormwater Sensitivity (not active)		

MnRAM 3.2 Digital Worksheet, Side 2

WTL20

		Question Description	User entry	Rating										
	1	Veg. Table 2, Option 4		0.80										
		TOTAL VEG Rating	0.8	High										
	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	R	Riverine										
	8	Water depth (inches)	16											
		Water depth (% inundation)												
	9	Local watershed/immedita drainage (acres)												
	10	Existing wetland size	5											
	11	SOILS: Up/Wetland (survey classification + site)												
Digital worksheet, section I	12	Outlet characteristics for flood retention	N/A	N/A										
	13	Outlet characteristics for hydrologic regime	A	1										
	14	Dominant upland land use (within 500 ft)	A	1	0.1									
	15	Soil condition (wetland)	A	1										
	16	Vegetation (% cover)	95%	H	1									
	17	Emerg. veg. flood resistance	A	1										
	18	Sediment delivery	A	1										
	19	Upland soils (based on soil group)	B	0.5										
	20	Stormwater runoff pretreatment & detention	C	0.1	1									
	21	Subwatershed wetland density	C	0.1										
	22	Channels/sheet flow	A	1										
	23	Adjacent naturalized buffer average width (feet)	500	H	WQ	1	H		1					
	24	Adjacent Area Management: % Full	100%	1	1	**1**								
		adjacent area mgmt: % Manicured		0										
		adjacent area mgmt: % Bare		0										
	25	Adjacent Area Diversity & Structure: % Native	100%	1	1	**1**								
		adjacent area diversity: % Mixed		0										
		adjacent area diversity: % Sparse/Inv./Exotic		0										
	26	Adjacent Area Slope: % Gentle	5%	0.05	1	**0.05**								
		adjacent area slope: % Moderate		0										
		adjacent area slope: % Steep		0										
Digital worksheet, section II	27	Downstream sensitivity/WQ protection	A	1										
	28	Nutrient loading	A	1										
	29	Shoreline wetland?	Y	Y										
	30	Rooted shoreline vegetation (%cover)	100%	1										
	31	Wetland in-water width (in feet, average)	100	1										
	32	Emergent vegetation erosion resistance	A	1										
	33	Shoreline erosion potential	C	0.1	1									
	34	Bank protection/upslope veg.	C	0.1										
	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	A	1										
	40	Wetland interspersion on landscape	A	1	1									
	41	Wildlife barriers	A	1										
	42	Amphibian breeding potential-hydroperiod	A	1										
	43	Amphibian breeding potential--fish presence	A	1										
	44	Amphibian & reptile overwintering habitat	C	0.1										
	45	Wildlife species (list)												
	46	Fish habitat quality	A	1										
	47	Fish species (list)												
	48	Unique/rare educ./cultural/rec.opportunity	N	N										
	49	Wetland visibility	C	0.1										
	50	Proximity to population	N	0.1										
	51	Public ownership	C	0.1										
	52	Public access	C	0.1										
	53	Human influence on wetland	A	1										
	54	Human influence on viewshed	A	1										
	55	Spatial buffer	C	0.1										
	56	Recreational activity potential	C	0.1										
	57	Commercial crop--hydrologic impact	N/A	N/A										

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: #REF!

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*	D	R or D	1
59	*GW - Subwatershed land use*	D	R or D	1
60	*GW - Wetland size and soil group*	D	R or D	1
61	GW - Wetland hydroperiod	R	R or D	0.1
62	GW - Inlet/Outlet configuration	D	R or D	1
63	GW - Surrounding upland topographic relief	D	R or D	1
64	Restoration potential w/o flooding		Y or N	5.1
65	*Landowners affected by restoration*		*E a b c*	Enter valid choice
66A	*Existing wetland size (acres) [from #10]*	5	__ acres	
66B	Total wetland restoration size (acres)		__ acres	0.1
66C	(Calculated) Potential New Wetland Area [B-A]	-5	__ acres	% effectively drained: ####
67	Average width of naturalized upland buffer (poten	0	__ feet	0.1 value: ####
68	Likelihood of restoration success		a b c	Enter valid choice
69	Hydrologic alteration type		Outlet, Tile, Ditch, GW pump, Wtrshd div., Filling	
70	Potential wetland type (Circ. 39)		1, 2, 3, 4, 5, 6, 7, 8	
71	Wetland sensitivity to stormwater		E a b c	
72	Additional stormwater treatment needs		a b c	

Functional Rating Summaries

Function Name	Raw score	Final Rating	Rating Category	Formula shown to the right.
Vegetative Diversity/Integrity		0.80	High	####
				####
Hydrology - Characteristic		1.00	High	####
				####
Flood Attenuation		0.60	Med	####
Water Quality--Downstream		0.80	High	
Water Quality--Wetland		0.90	High	
Shoreline Protection		0.64	Med	
Characteristic Wildlife Habitat Structure	0.90	0.90	High	#REF!
				#REF!
Maintenance of Characteristic Fish Habitat	1.00	1.00	High	#REF!
				#REF!
Maintenance of Characteristic Amphibian Habitat		0.85	High	
				#REF!
Aesthetics/Recreation/Education/Cultural	0.33	0.33	Med	#REF!
				#REF!
Commercial use		N/A	N/A	0
Special Features listing:			#REF!	####

Groundwater Interaction	discharge	#REF!
Groundwater Functional Index	#REF!	#REF!
Restoration Potential (draft formula)	#VALUE!	#####
Stormwater Sensitivity (not active)		

		Wetland ID HW21 UTM Coordinates 545570 5267210	Wetland ID HW22 UTM Coordinates 545113 5267281	Wetland name ID HW23 UTM Coordinates 544903 5267316	Wetland ID HW24 UTM Coordinates 544100 5267370
	Date	25-Jun-09	25-Jun-09	25-Jun-09	25-Jun-09
	Special Features (from list, p.2--enter letter/s)	- PHOTOS 120-121	- 122-123	- 126-127	- 129-130
#1	Community Number (circle each community which represents at least 10% of the wetland)	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	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 (wet meadow, marsh)	16A Shallow, Open Water	4B Coniferous Swamp	4B Coniferous Swamp	4B Coniferous Swamp
	Community Proportion (% of total)	66%	67%	75%	56%
	Dominant Vegetation / Cover Class	YELLOW LILY/2 COONTAIL/4 WILD RICE/5	WILD SASPARILLA/4 FORB/3 COTTONGRASS/1 LABRADOR TEA/4 LEATHERLEAF/5 SEDGE/1	POLE SPRUCE/2 SAPLING LARCH/4 SAPLING SPRUCE/4 LABRADOR TEA/4 LEATHERLEAF/5 BLUEBERRY/2 SPAGNUM MOSS/6 LARCH/4	POLE SPRUCE/3 LARCH/3 SAPLING SPRUCE/2 SAPLING LARCH/2 LABRADOR TEA/4 LEATHERLEAF/4 FORB/2 SPAGNUM MOSS/5
	Invasive/exotic Vegetation / Cover Class				
	Community Quality (E, H, M, L)	H 1	H 1	H 1	H 1
Plant Community #2	Community Type (wet meadow, marsh)	- -		- -	
	Community Proportion (% of total)				
	Dominant Vegetation / Cover Class				SPECKLED ALDER/2
	Invasive/exotic Vegetation / Cover Class				
	Community Quality (E, H, M, L)	0	0	0	0
Plant Community #3	Community Type (wet meadow, marsh)	- -	- -	- -	- -
	Community Proportion (% of total)				
	Dominant Vegetation / Cover Class				
	Invasive/exotic Vegetation / Cover Class				
	Community Quality (E, H, M, L)	0	0	0	0
Plant Community #4*	Community Type (wet meadow, marsh)	- -	- -	- -	- -
	Community Proportion (% of total)				
	Dominant Vegetation / Cover Class				
	Invasive/exotic Vegetation / Cover Class				
	Community Quality (E, H, M, L)	- 0	0	0	0
	Circular 39 Types (primary <TAB> others)				2
	Cowardin Types				
	Photo ID				
Highest rated community veg. div./integ:		1.0 High	1 High	1 High	1 High
Average vegetative diversity/integrity:		1.00 High	1.00 High	1.00 High	1.00 High
Weighted Average veg. diversity/integrity:		0.66 High	0.67 High	0.75 High	0.56 Medium
#4	Listed, rare, special plant species?	N	N	N	N
#5	**Rare community or habitat?**	**N**	**N**	**N**	**N**
#6	Pre-European-settlement conditions?	N	N	N	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]

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

*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.

MnRAM 3.2 Digital Worksheet, Side 2

WTL21

		Question Description	User entry	Rating			
	1	Veg. Table 2, Option 4		0.66			
		TOTAL VEG Rating	0.66	High			
Digital worksheet, section I	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	R	Riverine			
	8	Water depth (inches)	60				
		Water depth (% inundation)					
	9	Local watershed/immedita drainage (acres)					
	10	Existing wetland size	15				
	11	SOILS: Up/Wetland (survey classification + site)					
	12	Outlet characteristics for flood retention	N/A	N/A			
	13	Outlet characteristics for hydrologic regime	A	1			
	14	Dominant upland land use (within 500 ft)	A	1	0.1		
	15	Soil condition (wetland)	A	1			
	16	Vegetation (% cover)	80%	H	1		
	17	Emerg. veg. flood resistance	C	0.1			
	18	Sediment delivery	B	0.5			
	19	Upland soils (based on soil group)	B	0.5			
	20	Stormwater runoff pretreatment & detention	C	0.1	1		
	21	Subwatershed wetland density	C	0.1			
	22	Channels/sheet flow	C	0.1			
	23	Adjacent naturalized buffer average width (feet)	500	H	WQ	1 H	1
	24	Adjacent Area Management: % Full	100%	1	1	**1**	
		adjacent area mgmt: % Manicured		0			
		adjacent area mgmt: % Bare		0			
	25	Adjacent Area Diversity & Structure: % Native	100%	1	1	**1**	
		adjacent area diversity: % Mixed		0			
		adjacent area diversity: % Sparse/Inv./Exotic		0			
	26	Adjacent Area Slope: % Gentle	5%	0.05	1	**0.05**	
		adjacent area slope: % Moderate		0			
		adjacent area slope: % Steep		0			
Digital worksheet, section II	27	Downstream sensitivity/WQ protection	A	1			
	28	Nutrient loading	A	1			
	29	Shoreline wetland?	N	N			
	30	Rooted shoreline vegetation (%cover)		Enter a percentage			
	31	Wetland in-water width (in feet, average)		Enter a percentage			
	32	Emergent vegetation erosion resistance		Enter valid choice			
	33	Shoreline erosion potential		Enter valid cho			
	34	Bank protection/upslope veg.		Enter valid choice			
	35	Rare Wildlife	N	N			
	36	Scarce/Rare/S1/S2 local community	N	N			
	37	Vegetation interspersion cover (see diagram 1)	8	L	0.1		
	38	Community interspersion (see diagram 2)	1	L	0.1		0
	39	Wetland detritus	N/A	N/A			
	40	Wetland interspersion on landscape	A	1	1		
	41	Wildlife barriers	A	1			
	42	Amphibian breeding potential-hydroperiod	A	1			
	43	Amphibian breeding potential--fish presence	C	0.1			
	44	Amphibian & reptile overwintering habitat	A	1			
	45	Wildlife species (list)					
	46	Fish habitat quality	A	1			
	47	Fish species (list)					
	48	Unique/rare educ./cultural/rec.opportunity	N	N			
	49	Wetland visibility	C	0.1			
	50	Proximity to population	N	0.1			
	51	Public ownership	C	0.1			
	52	Public access	C	0.1			
	53	Human influence on wetland	A	1			
	54	Human influence on viewshed	A	1			
	55	Spatial buffer	C	0.1			
	56	Recreational activity potential	C	0.1			
	57	Commercial crop--hydrologic impact	N/A	N/A			

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:
#REF!

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*	D	R or D	1
59	*GW - Subwatershed land use*	D	R or D	1
60	*GW - Wetland size and soil group*	D	R or D	1
61	GW - Wetland hydroperiod	D	R or D	1
62	GW - Inlet/Outlet configuration	D	R or D	1
63	GW - Surrounding upland topographic relief	D	R or D	1
64	Restoration potential w/o flooding		Y or N	6
65	*Landowners affected by restoration*		*E a b c*	Enter valid choice
66A	*Existing wetland size (acres) [from #10]*	15	__ acres	
66B	Total wetland restoration size (acres)		__ acres	0.1
66C	(Calculated) Potential New Wetland Area [B-A]	-15	__ acres	% effectively drained: ####
67	Average width of naturalized upland buffer (poten	0	__ feet	0.1 value: ####
68	Likelihood of restoration success		a b c	Enter valid choice
69	Hydrologic alteration type		Outlet, Tile, Ditch, GW pump, Wtrshd div., Filling	
70	Potential wetland type (Circ. 39)		1, 2, 3, 4, 5, 6, 7, 8	
71	Wetland sensitivity to stormwater		E a b c	
72	Additional stormwater treatment needs		a b c	

Functional Rating Summaries

Function Name	Raw score	Final Rating	Rating Category	Formula shown to the right.
Vegetative Diversity/Integrity		0.66	High	####
				####
Hydrology - Characteristic		1.00	High	####
				####
Flood Attenuation		0.39	Med	####
Water Quality--Downstream		0.64	Med	
Water Quality--Wetland		0.79	High	
Shoreline Protection		N/A	N/A	
Characteristic Wildlife Habitat Structure	0.72	0.72	High	#REF!
				#REF!
Maintenance of Characteristic Fish Habitat	0.92	0.92	High	#REF!
				#REF!
Maintenance of Characteristic Amphibian Habitat		0.10	Low	
				#REF!
Aesthetics/Recreation/Education/Cultural	0.33	0.33	Med	#REF!
				#REF!
Commercial use		N/A	N/A	0
Special Features listing:			#REF!	####

Groundwater Interaction		discharge	#REF!
Groundwater Functional Index		#REF!	#REF!
Restoration Potential (draft formula)		#VALUE!	#####
Stormwater Sensitivity (not active)			

MnRAM 3.2 Digital Worksheet, Side 2

WTL22

		Question Description	User entry	Rating			
	1	Veg. Table 2, Option 4		0.67			
		TOTAL VEG Rating	0.67	High			
Digital worksheet, section I	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	FT	Depress'l/Flow-through			
	8	Water depth (inches)	6				
		Water depth (% inundation)					
	9	Local watershed/immedita drainage (acres)					
	10	Existing wetland size	5				
	11	SOILS: Up/Wetland (survey classification + site)					
	12	Outlet characteristics for flood retention	N/A	N/A			
	13	Outlet characteristics for hydrologic regime	A	1			
	14	Dominant upland land use (within 500 ft)	A	1	0.1		
	15	Soil condition (wetland)	A	1			
	16	Vegetation (% cover)	95%	H	1		
	17	Emerg. veg. flood resistance	A	1			
	18	Sediment delivery	A	1			
	19	Upland soils (based on soil group)	B	0.5			
	20	Stormwater runoff pretreatment & detention	C	0.1	1		
	21	Subwatershed wetland density	C	0.1			
	22	Channels/sheet flow	A	1			
	23	Adjacent naturalized buffer average width (feet)	500	H	WQ	1 H	1
	24	Adjacent Area Management: % Full	100%	1	1	**1**	
		adjacent area mgmt: % Manicured		0			
		adjacent area mgmt: % Bare		0			
	25	Adjacent Area Diversity & Structure: % Native	100%	1	1	**1**	
		adjacent area diversity: % Mixed		0			
		adjacent area diversity: % Sparse/Inv./Exotic		0			
	26	Adjacent Area Slope: % Gentle	20%	0.2	1	**0.2**	
		adjacent area slope: % Moderate		0			
		adjacent area slope: % Steep		0			
Digital worksheet, section II	27	Downstream sensitivity/WQ protection	A	1			
	28	Nutrient loading	A	1			
	29	Shoreline wetland?	N	N			
	30	Rooted shoreline vegetation (%cover)		Enter a percentage			
	31	Wetland in-water width (in feet, average)		Enter a percentage			
	32	Emergent vegetation erosion resistance		Enter valid choice			
	33	Shoreline erosion potential		Enter valid cho			
	34	Bank protection/upslope veg.		Enter valid choice			
	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	A	1			
	40	Wetland interspersion on landscape	A	1	1		
	41	Wildlife barriers	A	1			
	42	Amphibian breeding potential-hydroperiod	A	1			
	43	Amphibian breeding potential--fish presence	A	1			
	44	Amphibian & reptile overwintering habitat	C	0.1			
	45	Wildlife species (list)					
	46	Fish habitat quality	N/A	N/A			
	47	Fish species (list)					
	48	Unique/rare educ./cultural/rec.opportunity	N	N			
	49	Wetland visibility	C	0.1			
	50	Proximity to population	N	0.1			
	51	Public ownership	C	0.1			
	52	Public access	C	0.1			
	53	Human influence on wetland	A	1			
	54	Human influence on viewshed	A	1			
	55	Spatial buffer	C	0.1			
	56	Recreational activity potential	C	0.1			
	57	Commercial crop--hydrologic impact	N/A	N/A			

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:
#REF!

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*	D	R or D	1
59	*GW - Subwatershed land use*	D	R or D	1
60	*GW - Wetland size and soil group*	D	R or D	1
61	GW - Wetland hydroperiod	R	R or D	0.1
62	GW - Inlet/Outlet configuration	D	R or D	1
63	GW - Surrounding upland topographic relief	D	R or D	1
64	Restoration potential w/o flooding		Y or N	5.1
65	*Landowners affected by restoration*		*E a b c*	Enter valid choice
66A	*Existing wetland size (acres) [from #10]*	5	__ acres	
66B	Total wetland restoration size (acres)		__ acres	0.1
66C	(Calculated) Potential New Wetland Area [B-A]	-5	__ acres	% effectively drained: ####
67	Average width of naturalized upland buffer (poten	0	__ feet	0.1 value: ####
68	Likelihood of restoration success		a b c	Enter valid choice
69	Hydrologic alteration type		Outlet, Tile, Ditch, GW pump, Wtrshd div., Filling	
70	Potential wetland type (Circ. 39)		1, 2, 3, 4, 5, 6, 7, 8	
71	Wetland sensitivity to stormwater		E a b c	
72	Additional stormwater treatment needs		a b c	

Functional Rating Summaries

Function Name	Raw score	Final Rating	Rating Category	Formula shown to the right.
Vegetative Diversity/Integrity		0.67	High	####
				####
Hydrology - Characteristic		1.00	High	####
				####
Flood Attenuation		0.60	Med	####
Water Quality--Downstream		0.81	High	
Water Quality--Wetland		0.87	High	
Shoreline Protection		N/A	N/A	
Characteristic Wildlife Habitat Structure	0.87	0.87	High	#REF!
				#REF!
Maintenance of Characteristic Fish Habitat	######	N/A	N/A	#REF!
				#REF!
Maintenance of Characteristic Amphibian Habitat		0.85	High	
				#REF!
Aesthetics/Recreation/Education/Cultural	0.33	0.33	Med	#REF!
				#REF!
Commercial use		N/A	N/A	0
Special Features listing:			#REF!	####

Groundwater Interaction	discharge	#REF!
Groundwater Functional Index	#REF!	#REF!
Restoration Potential (draft formula)	#VALUE!	#####
Stormwater Sensitivity (not active)		

MnRAM 3.2 Digital Worksheet, Side 2

WTL23

		Question Description	User entry	Rating			
	1	Veg. Table 2, Option 4		0.75			
		TOTAL VEG Rating	0.75	High			
Digital worksheet, section I	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	FT	Depress'l/Flow-through			
	8	Water depth (inches)	6				
		Water depth (% inundation)					
	9	Local watershed/immedita drainage (acres)					
	10	Existing wetland size	100				
	11	SOILS: Up/Wetland (survey classification + site)					
	12	Outlet characteristics for flood retention	N/A	N/A			
	13	Outlet characteristics for hydrologic regime	A	1			
	14	Dominant upland land use (within 500 ft)	A	1	0.1		
	15	Soil condition (wetland)	A	1			
	16	Vegetation (% cover)	95%	H	1		
	17	Emerg. veg. flood resistance	A	1			
	18	Sediment delivery	A	1			
	19	Upland soils (based on soil group)	B	0.5			
	20	Stormwater runoff pretreatment & detention	C	0.1	1		
	21	Subwatershed wetland density	C	0.1			
	22	Channels/sheet flow	A	1			
	23	Adjacent naturalized buffer average width (feet)	500	H	WQ	1 H	1
	24	Adjacent Area Management: % Full	100%	1	1	**1**	
		adjacent area mgmt: % Manicured		0			
		adjacent area mgmt: % Bare		0			
	25	Adjacent Area Diversity & Structure: % Native	100%	1	1	**1**	
		adjacent area diversity: % Mixed		0			
		adjacent area diversity: % Sparse/Inv./Exotic		0			
	26	Adjacent Area Slope: % Gentle	15%	0.15	1	**0.15**	
		adjacent area slope: % Moderate		0			
		adjacent area slope: % Steep		0			
Digital worksheet, section II	27	Downstream sensitivity/WQ protection	B	0.5			
	28	Nutrient loading	A	1			
	29	Shoreline wetland?	N	N			
	30	Rooted shoreline vegetation (%cover)		Enter a percentage			
	31	Wetland in-water width (in feet, average)		Enter a percentage			
	32	Emergent vegetation erosion resistance		Enter valid choice			
	33	Shoreline erosion potential		Enter valid cho			
	34	Bank protection/upslope veg.		Enter valid choice			
	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	A	1			
	40	Wetland interspersion on landscape	A	1	1		
	41	Wildlife barriers	A	1			
	42	Amphibian breeding potential-hydroperiod	A	1			
	43	Amphibian breeding potential--fish presence	A	1			
	44	Amphibian & reptile overwintering habitat	C	0.1			
	45	Wildlife species (list)					
	46	Fish habitat quality	N/A	N/A			
	47	Fish species (list)					
	48	Unique/rare educ./cultural/rec.opportunity	N	N			
	49	Wetland visibility	C	0.1			
	50	Proximity to population	N	0.1			
	51	Public ownership	C	0.1			
	52	Public access	C	0.1			
	53	Human influence on wetland	A	1			
	54	Human influence on viewshed	A	1			
	55	Spatial buffer	C	0.1			
	56	Recreational activity potential	C	0.1			
	57	Commercial crop--hydrologic impact	N/A	N/A			

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:
#REF!

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*	D	R or D	1
59	*GW - Subwatershed land use*	D	R or D	1
60	*GW - Wetland size and soil group*	D	R or D	1
61	GW - Wetland hydroperiod	R	R or D	0.1
62	GW - Inlet/Outlet configuration	D	R or D	1
63	GW - Surrounding upland topographic relief	D	R or D	1
64	Restoration potential w/o flooding		Y or N	5.1
65	*Landowners affected by restoration*		*E a b c*	Enter valid choice
66A	*Existing wetland size (acres) [from #10]*	100	__ acres	
66B	Total wetland restoration size (acres)		__ acres	0.1
66C	(Calculated) Potential New Wetland Area [B-A]	-100	__ acres	% effectively drained: ####
67	Average width of naturalized upland buffer (poten	0	__ feet	0.1 value: ####
68	Likelihood of restoration success		a b c	Enter valid choice
69	Hydrologic alteration type		Outlet, Tile, Ditch, GW pump, Wtrshd div., Filling	
70	Potential wetland type (Circ. 39)		1, 2, 3, 4, 5, 6, 7, 8	
71	Wetland sensitivity to stormwater		E a b c	
72	Additional stormwater treatment needs		a b c	

Functional Rating Summaries

Function Name	Raw score	Final Rating	Rating Category	Formula shown to the right.
Vegetative Diversity/Integrity		0.75	High	####
				####
Hydrology - Characteristic		1.00	High	####
				####
Flood Attenuation		0.60	Med	####
Water Quality--Downstream		0.72	High	
Water Quality--Wetland		0.89	High	
Shoreline Protection		N/A	N/A	
Characteristic Wildlife Habitat Structure	0.89	0.89	High	#REF!
				#REF!
Maintenance of Characteristic Fish Habitat	######	N/A	N/A	#REF!
				#REF!
Maintenance of Characteristic Amphibian Habitat		0.85	High	
				#REF!
Aesthetics/Recreation/Education/Cultural	0.33	0.33	Med	#REF!
				#REF!
Commercial use		N/A	N/A	0
Special Features listing:			#REF!	####

Groundwater Interaction	discharge	#REF!
Groundwater Functional Index	#REF!	#REF!
Restoration Potential (draft formula)	#VALUE!	#####
Stormwater Sensitivity (not active)		

MnRAM 3.2 Digital Worksheet, Side 2

WTL24

		Question Description	User entry	Rating			
	1	Veg. Table 2, Option 4		0.56			
		TOTAL VEG Rating	0.56	Medium			
Digital worksheet, section I	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	FT	Depress'l/Flow-through			
	8	Water depth (inches)	6				
		Water depth (% inundation)					
	9	Local watershed/immedita drainage (acres)					
	10	Existing wetland size	5				
	11	SOILS: Up/Wetland (survey classification + site)					
	12	Outlet characteristics for flood retention	N/A	N/A			
	13	Outlet characteristics for hydrologic regime	A	1			
	14	Dominant upland land use (within 500 ft)	A	1	0.1		
	15	Soil condition (wetland)	A	1			
	16	Vegetation (% cover)	90%	H	1		
	17	Emerg. veg. flood resistance	A	1			
	18	Sediment delivery	A	1			
	19	Upland soils (based on soil group)	B	0.5			
	20	Stormwater runoff pretreatment & detention	C	0.1	1		
	21	Subwatershed wetland density	C	0.1			
	22	Channels/sheet flow	A	1			
	23	Adjacent naturalized buffer average width (feet)	500	H	WQ	1 H	1
	24	Adjacent Area Management: % Full	100%	1	1	**1**	
		adjacent area mgmt: % Manicured		0			
		adjacent area mgmt: % Bare		0			
	25	Adjacent Area Diversity & Structure: % Native	100%	1	1	**1**	
		adjacent area diversity: % Mixed		0			
		adjacent area diversity: % Sparse/Inv./Exotic		0			
	26	Adjacent Area Slope: % Gentle	15%	0.15	1	**0.15**	
		adjacent area slope: % Moderate		0			
		adjacent area slope: % Steep		0			
Digital worksheet, section II	27	Downstream sensitivity/WQ protection	B	0.5			
	28	Nutrient loading	A	1			
	29	Shoreline wetland?	N	N			
	30	Rooted shoreline vegetation (%cover)		Enter a percentage			
	31	Wetland in-water width (in feet, average)		Enter a percentage			
	32	Emergent vegetation erosion resistance		Enter valid choice			
	33	Shoreline erosion potential		Enter valid cho			
	34	Bank protection/upslope veg.		Enter valid choice			
	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	A	1			
	40	Wetland interspersion on landscape	A	1	1		
	41	Wildlife barriers	A	1			
	42	Amphibian breeding potential-hydroperiod	A	1			
	43	Amphibian breeding potential--fish presence	A	1			
	44	Amphibian & reptile overwintering habitat	C	0.1			
	45	Wildlife species (list)					
	46	Fish habitat quality	N/A	N/A			
	47	Fish species (list)					
	48	Unique/rare educ./cultural/rec.opportunity	N	N			
	49	Wetland visibility	C	0.1			
	50	Proximity to population	N	0.1			
	51	Public ownership	C	0.1			
	52	Public access	C	0.1			
	53	Human influence on wetland	A	1			
	54	Human influence on viewshed	A	1			
	55	Spatial buffer	C	0.1			
	56	Recreational activity potential	C	0.1			
	57	Commercial crop--hydrologic impact	N/A	N/A			

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:
#REF!

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*	D	R or D	1
59	*GW - Subwatershed land use*	D	R or D	1
60	*GW - Wetland size and soil group*	D	R or D	1
61	GW - Wetland hydroperiod	R	R or D	0.1
62	GW - Inlet/Outlet configuration	D	R or D	1
63	GW - Surrounding upland topographic relief	D	R or D	1
64	Restoration potential w/o flooding		Y or N	5.1
65	*Landowners affected by restoration*		*E a b c*	Enter valid choice
66A	*Existing wetland size (acres) [from #10]*	5	__ acres	
66B	Total wetland restoration size (acres)		__ acres	0.1
66C	(Calculated) Potential New Wetland Area [B-A]	-5	__ acres	% effectively drained: ####
67	Average width of naturalized upland buffer (poten	0	__ feet	0.1 value: ####
68	Likelihood of restoration success		a b c	Enter valid choice
69	Hydrologic alteration type		Outlet, Tile, Ditch, GW pump, Wtrshd div., Filling	
70	Potential wetland type (Circ. 39)		1, 2, 3, 4, 5, 6, 7, 8	
71	Wetland sensitivity to stormwater		E a b c	
72	Additional stormwater treatment needs		a b c	

Functional Rating Summaries

Function Name	Raw score	Final Rating	Rating Category	Formula shown to the right.
Vegetative Diversity/Integrity		0.56	Med	####
				####
Hydrology - Characteristic		1.00	High	####
				####
Flood Attenuation		0.60	Med	####
Water Quality--Downstream		0.72	High	
Water Quality--Wetland		0.83	High	
Shoreline Protection		N/A	N/A	
Characteristic Wildlife Habitat Structure	0.85	0.85	High	#REF!
				#REF!
Maintenance of Characteristic Fish Habitat	######	N/A	N/A	#REF!
				#REF!
Maintenance of Characteristic Amphibian Habitat		0.85	High	
				#REF!
Aesthetics/Recreation/Education/Cultural	0.33	0.33	Med	#REF!
				#REF!
Commercial use		N/A	N/A	0
Special Features listing:			#REF!	####

Groundwater Interaction	discharge	#REF!
Groundwater Functional Index	#REF!	#REF!
Restoration Potential (draft formula)	#VALUE!	#####
Stormwater Sensitivity (not active)		

		Wetland ID HW25 UTM Coordinates 543868 5267384	Wetland ID HW26 UTM Coordinates 544486 5267542	Wetland name ID HW27 UTM Coordinates 546997 5268518	Wetland ID HW28 UTM Coordinates 544542 5265936
	Date	**25-Jun-09**	**25-Jun-09**	**26-Jun-09**	**26-Jun-09**
	Special Features (from list, p.2--enter letter/s)	- PHOTOS 132-133	- 134-135	- 141-142	- 143-144
#1	Community Number (circle each community which represents at least 10% of the wetland)	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	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 (wet meadow, marsh)	3B Hardwood Swamp	13B Shallow Marsh	16A Shallow Open Water	13A Sedge Meadow
	Community Proportion (% of total)	71%	14%	25%	80%
	Dominant Vegetation / Cover Class	BLACK ASH/4 MOUNTAIN MAPLE/4 BLACK SPRUCE/2 SPECKLED ALDER/4 FERN/3 HORSETAIL/2 FORBS/4	NARROW LEAF CATTAIL/6 SEDGE/2 SPECKLED ALDER/2 RUSH/1 WOOLLY SEDGE/2 LILY/2 TAMARACK/2	COONTAIL/2 YELLOW LILY/2 WILD RICE/4 PONDWEED/1	SHRUB WILLOW/3 CANADA BLUEJOINT/4 LEATHERLEAF/3 MEADOWSWEET/2 SEDGE/3
	Invasive/exotic Vegetation / Cover Class				
	Community Quality (E, H, M, L)	H 1	H 1	H 1	H 1
Plant Community #2	Community Type (wet meadow, marsh)	- -		- -	
	Community Proportion (% of total)				
	Dominant Vegetation / Cover Class				
	Invasive/exotic Vegetation / Cover Class				
	Community Quality (E, H, M, L)	0	0	0	0
Plant Community #3	Community Type (wet meadow, marsh)	- -	- -	- -	- -
	Community Proportion (% of total)				
	Dominant Vegetation / Cover Class				
	Invasive/exotic Vegetation / Cover Class				
	Community Quality (E, H, M, L)	0	0	0	0
Plant Community #4*	Community Type (wet meadow, marsh)	- -	- -	- -	- -
	Community Proportion (% of total)				
	Dominant Vegetation / Cover Class				
	Invasive/exotic Vegetation / Cover Class				
	Community Quality (E, H, M, L)	- 0	0	0	0
	Circular 39 Types (primary <TAB> others)				
	Cowardin Types				
	Photo ID				
Highest rated community veg. div./integ:		1.0 High	1 High	1 High	1 High
Average vegetative diversity/integrity:		1.00 High	1.00 High	1.00 High	1.00 High
Weighted Average veg. diversity/integrity:		0.71 High	0.14 Low	0.25 Medium	0.80 High
#4	Listed, rare, special plant species?	N	N	N	N
#5	**Rare community or habitat?**	**N**	**N**	**N**	**N**
#6	Pre-European-settlement conditions?	N	N	N	N

Floodplain Forest [1A, 2A, 3A] * Hardwood Swamp [3B] * ConiferNous 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]

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

*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.

MnRAM 3.2 Digital Worksheet, Side 2

WTL25

		Question Description	User entry	Rating			
	1	Veg. Table 2, Option 4		0.71			
		TOTAL VEG Rating	0.71	High			
Digital worksheet, section I	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	FT	Depress'l/Flow-through			
	8	Water depth (inches)	6				
		Water depth (% inundation)					
	9	Local watershed/immedita drainage (acres)					
	10	Existing wetland size	2				
	11	SOILS: Up/Wetland (survey classification + site)					
	12	Outlet characteristics for flood retention	N/A	N/A			
	13	Outlet characteristics for hydrologic regime	A	1			
	14	Dominant upland land use (within 500 ft)	A	1	0.1		
	15	Soil condition (wetland)	A	1			
	16	Vegetation (% cover)	90%	H	1		
	17	Emerg. veg. flood resistance	A	1			
	18	Sediment delivery	A	1			
	19	Upland soils (based on soil group)	B	0.5			
	20	Stormwater runoff pretreatment & detention	C	0.1	1		
	21	Subwatershed wetland density	C	0.1			
	22	Channels/sheet flow	A	1			
	23	Adjacent naturalized buffer average width (feet)	500	H	WQ	1 H	1
	24	Adjacent Area Management: % Full	100%	1	1	**1**	
		adjacent area mgmt: % Manicured		0			
		adjacent area mgmt: % Bare		0			
	25	Adjacent Area Diversity & Structure: % Native	100%	1	1	**1**	
		adjacent area diversity: % Mixed		0			
		adjacent area diversity: % Sparse/Inv./Exotic		0			
	26	Adjacent Area Slope: % Gentle	5%	0.05	1	**0.05**	
		adjacent area slope: % Moderate		0			
		adjacent area slope: % Steep		0			
Digital worksheet, section II	27	Downstream sensitivity/WQ protection	B	0.5			
	28	Nutrient loading	A	1			
	29	Shoreline wetland?	N	N			
	30	Rooted shoreline vegetation (%cover)		Enter a percentage			
	31	Wetland in-water width (in feet, average)		Enter a percentage			
	32	Emergent vegetation erosion resistance		Enter valid choice			
	33	Shoreline erosion potential		Enter valid cho			
	34	Bank protection/upslope veg.		Enter valid choice			
	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	A	1			
	40	Wetland interspersion on landscape	A	1	1		
	41	Wildlife barriers	A	1			
	42	Amphibian breeding potential-hydroperiod	A	1			
	43	Amphibian breeding potential--fish presence	A	1			
	44	Amphibian & reptile overwintering habitat	C	0.1			
	45	Wildlife species (list)					
	46	Fish habitat quality	N/A	N/A			
	47	Fish species (list)					
	48	Unique/rare educ./cultural/rec.opportunity	N	N			
	49	Wetland visibility	C	0.1			
	50	Proximity to population	N	0.1			
	51	Public ownership	C	0.1			
	52	Public access	C	0.1			
	53	Human influence on wetland	A	1			
	54	Human influence on viewshed	A	1			
	55	Spatial buffer	C	0.1			
	56	Recreational activity potential	C	0.1			
	57	Commercial crop--hydrologic impact	N/A	N/A			

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:
#REF!

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*	D	R or D	1
59	*GW - Subwatershed land use*	D	R or D	1
60	*GW - Wetland size and soil group*	D	R or D	1
61	GW - Wetland hydroperiod	R	R or D	0.1
62	GW - Inlet/Outlet configuration	D	R or D	1
63	GW - Surrounding upland topographic relief	D	R or D	1
64	Restoration potential w/o flooding		Y or N	5.1
65	*Landowners affected by restoration*		*E a b c*	Enter valid choice
66A	*Existing wetland size (acres) [from #10]*	2	__ acres	
66B	Total wetland restoration size (acres)		__ acres	0.1
66C	(Calculated) Potential New Wetland Area [B-A]	-2	__ acres	% effectively drained: ####
67	Average width of naturalized upland buffer (poten	0	__ feet	0.1 value: ####
68	Likelihood of restoration success		a b c	Enter valid choice
69	Hydrologic alteration type		Outlet, Tile, Ditch, GW pump, Wtrshd div., Filling	
70	Potential wetland type (Circ. 39)		1, 2, 3, 4, 5, 6, 7, 8	
71	Wetland sensitivity to stormwater		E a b c	
72	Additional stormwater treatment needs		a b c	

Functional Rating Summaries

Function Name	Raw score	Final Rating	Rating Category	Formula shown to the right.
Vegetative Diversity/Integrity		0.71	High	####
				####
Hydrology - Characteristic		1.00	High	####
				####
Flood Attenuation		0.60	Med	####
Water Quality--Downstream		0.71	High	
Water Quality--Wetland		0.87	High	
Shoreline Protection		N/A	N/A	
Characteristic Wildlife Habitat Structure	0.88	0.88	High	#REF!
				#REF!
Maintenance of Characteristic Fish Habitat	######	0.70	High	#REF!
				#REF!
Maintenance of Characteristic Amphibian Habitat		0.85	High	
				#REF!
Aesthetics/Recreation/Education/Cultural	0.33	0.33	Med	#REF!
				#REF!
Commercial use		N/A	N/A	0
Special Features listing:			#REF!	####

Groundwater Interaction	discharge	#REF!
Groundwater Functional Index	#REF!	#REF!
Restoration Potential (draft formula)	#VALUE!	#####
Stormwater Sensitivity (not active)		

MnRAM 3.2 Digital Worksheet, Side 2

WTL26

		Question Description	User entry	Rating										
	1	Veg. Table 2, Option 4		0.14										
		TOTAL VEG Rating	0.14	L										
	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	I	Depressional/Isolated										
	8	Water depth (inches)	36											
		Water depth (% inundation)												
	9	Local watershed/immedita drainage (acres)												
	10	Existing wetland size	18											
	11	SOILS: Up/Wetland (survey classification + site)												
Digital worksheet, section I	12	Outlet characteristics for flood retention	B	0.5										
	13	Outlet characteristics for hydrologic regime	A	1										
	14	Dominant upland land use (within 500 ft)	A	1	0.1									
	15	Soil condition (wetland)	A	1										
	16	Vegetation (% cover)	95%	H	1									
	17	Emerg. veg. flood resistance	A	1										
	18	Sediment delivery	A	1										
	19	Upland soils (based on soil group)	B	0.5										
	20	Stormwater runoff pretreatment & detention	C	0.1	1									
	21	Subwatershed wetland density	C	0.1										
	22	Channels/sheet flow	A	1										
	23	Adjacent naturalized buffer average width (feet)	500	H	WQ	1	H		1					
	24	Adjacent Area Management: % Full	100%	1	1	**1**								
		adjacent area mgmt: % Manicured		0										
		adjacent area mgmt: % Bare		0										
	25	Adjacent Area Diversity & Structure: % Native	100%	1	1	**1**								
		adjacent area diversity: % Mixed		0										
		adjacent area diversity: % Sparse/Inv./Exotic		0										
	26	Adjacent Area Slope: % Gentle	20%	0.2	1	**0.2**								
		adjacent area slope: % Moderate		0										
		adjacent area slope: % Steep		0										
Digital worksheet, section II	27	Downstream sensitivity/WQ protection	A	1										
	28	Nutrient loading	A	1										
	29	Shoreline wetland?	N	N										
	30	Rooted shoreline vegetation (%cover)		Enter a percentage										
	31	Wetland in-water width (in feet, average)		Enter a percentage										
	32	Emergent vegetation erosion resistance		Enter valid choice										
	33	Shoreline erosion potential		Enter valid cho										
	34	Bank protection/upslope veg.		Enter valid choice										
	35	Rare Wildlife	N	N										
	36	Scarce/Rare/S1/S2 local community	N	N										
	37	Vegetation interspersion cover (see diagram 1)	1	L	0.1									
	38	Community interspersion (see diagram 2)	2	M	0.5							0		
	39	Wetland detritus	A	1										
	40	Wetland interspersion on landscape	A	1	1									
	41	Wildlife barriers	A	1										
	42	Amphibian breeding potential-hydroperiod	A	1										
	43	Amphibian breeding potential--fish presence	A	1										
	44	Amphibian & reptile overwintering habitat	B	0.5										
	45	Wildlife species (list)												
	46	Fish habitat quality	C	0.1										
	47	Fish species (list)												
	48	Unique/rare educ./cultural/rec.opportunity	N	N										
	49	Wetland visibility	C	0.1										
	50	Proximity to population	N	0.1										
	51	Public ownership	C	0.1										
	52	Public access	C	0.1										
	53	Human influence on wetland	A	1										
	54	Human influence on viewshed	A	1										
	55	Spatial buffer	C	0.1										
	56	Recreational activity potential	C	0.1										
	57	Commercial crop--hydrologic impact	N/A	N/A										

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:
#REF!

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*	D	R or D	1
59	*GW - Subwatershed land use*	D	R or D	1
60	*GW - Wetland size and soil group*	D	R or D	1
61	GW - Wetland hydroperiod	R	R or D	0.1
62	GW - Inlet/Outlet configuration	D	R or D	1
63	GW - Surrounding upland topographic relief	D	R or D	1
64	Restoration potential w/o flooding		Y or N	5.1
65	*Landowners affected by restoration*		*E a b c*	Enter valid choice
66A	*Existing wetland size (acres) [from #10]*	18	__ acres	
66B	Total wetland restoration size (acres)		__ acres	0.1
66C	(Calculated) Potential New Wetland Area [B-A]	-18	__ acres	% effectively drained: ####
67	Average width of naturalized upland buffer (poten	0	__ feet	0.1 value: ####
68	Likelihood of restoration success		a b c	Enter valid choice
69	Hydrologic alteration type		Outlet, Tile, Ditch, GW pump, Wtrshd div., Filling	
70	Potential wetland type (Circ. 39)		1, 2, 3, 4, 5, 6, 7, 8	
71	Wetland sensitivity to stormwater		E a b c	
72	Additional stormwater treatment needs		a b c	

Functional Rating Summaries

Function Name	Raw score	Final Rating	Rating Category	Formula shown to the right.
Vegetative Diversity/Integrity		0.14	L	####
				####
Hydrology - Characteristic		1.00	High	####
				####
Flood Attenuation		0.58	Med	####
Water Quality--Downstream		0.76	High	
Water Quality--Wetland		0.72	High	
Shoreline Protection		N/A	N/A	
Characteristic Wildlife Habitat Structure	0.69	0.69	High	#REF!
				#REF!
Maintenance of Characteristic Fish Habitat	0.70	0.70	High	#REF!
				#REF!
Maintenance of Characteristic Amphibian Habitat		0.92	High	
				#REF!
Aesthetics/Recreation/Education/Cultural	0.33	0.33	Med	#REF!
				#REF!
Commercial use		N/A	N/A	0
Special Features listing:			#REF!	####

Groundwater Interaction	discharge	#REF!
Groundwater Functional Index	#REF!	#REF!
Restoration Potential (draft formula)	#VALUE!	#####
Stormwater Sensitivity (not active)		

MnRAM 3.2 Digital Worksheet, Side 2

WTL27

		Question Description	User entry	Rating									
	1	Veg. Table 2, Option 4		0.25									
		TOTAL VEG Rating	0.25	L									
	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	Flood	Floodplain									
	8	Water depth (inches)	60										
		Water depth (% inundation)											
	9	Local watershed/immedita drainage (acres)											
	10	Existing wetland size	5										
	11	SOILS: Up/Wetland (survey classification + site)											
Digital worksheet, section I	12	Outlet characteristics for flood retention	N/A	N/A									
	13	Outlet characteristics for hydrologic regime	A	1									
	14	Dominant upland land use (within 500 ft)	A	1	0.1								
	15	Soil condition (wetland)	A	1									
	16	Vegetation (% cover)	35%	M	0.5								
	17	Emerg. veg. flood resistance	C	0.1									
	18	Sediment delivery	B	0.5									
	19	Upland soils (based on soil group)	B	0.5									
	20	Stormwater runoff pretreatment & detention	C	0.1	1								
	21	Subwatershed wetland density	C	0.1									
	22	Channels/sheet flow	A	1									
	23	Adjacent naturalized buffer average width (feet)	500	H	WQ	1	H		1				
	24	Adjacent Area Management: % Full	100%	1	1	**1**							
		adjacent area mgmt: % Manicured		0									
		adjacent area mgmt: % Bare		0									
	25	Adjacent Area Diversity & Structure: % Native	100%	1	1	**1**							
		adjacent area diversity: % Mixed		0									
		adjacent area diversity: % Sparse/Inv./Exotic		0									
	26	Adjacent Area Slope: % Gentle	5%	0.05	1	**0.05**							
		adjacent area slope: % Moderate		0									
		adjacent area slope: % Steep		0									
Digital worksheet, section II	27	Downstream sensitivity/WQ protection	A	1									
	28	Nutrient loading	A	1									
	29	Shoreline wetland?	Y	Y									
	30	Rooted shoreline vegetation (%cover)	90%	1									
	31	Wetland in-water width (in feet, average)	100	1									
	32	Emergent vegetation erosion resistance	A	1									
	33	Shoreline erosion potential	C	0.1	1								
	34	Bank protection/upslope veg.	C	0.1									
	35	Rare Wildlife	N	N									
	36	Scarce/Rare/S1/S2 local community	N	N									
	37	Vegetation interspersion cover (see diagram 1)	2	L	0.1								
	38	Community interspersion (see diagram 2)	1	L	0.1					0			
	39	Wetland detritus	N/A	N/A									
	40	Wetland interspersion on landscape	A	1	1								
	41	Wildlife barriers	A	1									
	42	Amphibian breeding potential-hydroperiod	A	1									
	43	Amphibian breeding potential--fish presence	C	0.1									
	44	Amphibian & reptile overwintering habitat	A	1									
	45	Wildlife species (list)											
	46	Fish habitat quality	A	1									
	47	Fish species (list)											
	48	Unique/rare educ./cultural/rec.opportunity	N	N									
	49	Wetland visibility	C	0.1									
	50	Proximity to population	N	0.1									
	51	Public ownership	C	0.1									
	52	Public access	C	0.1									
	53	Human influence on wetland	A	1									
	54	Human influence on viewshed	A	1									
	55	Spatial buffer	C	0.1									
	56	Recreational activity potential	C	0.1									
	57	Commercial crop--hydrologic impact	N/A	N/A									

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:
#REF!

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*	D	R or D	1
59	*GW - Subwatershed land use*	D	R or D	1
60	*GW - Wetland size and soil group*	D	R or D	1
61	GW - Wetland hydroperiod	R	R or D	0.1
62	GW - Inlet/Outlet configuration	D	R or D	1
63	GW - Surrounding upland topographic relief	D	R or D	1
64	Restoration potential w/o flooding		Y or N	5.1
65	*Landowners affected by restoration*		*E a b c*	Enter valid choice
66A	*Existing wetland size (acres) [from #10]*	5	__ acres	
66B	Total wetland restoration size (acres)		__ acres	0.1
66C	(Calculated) Potential New Wetland Area [B-A]	-5	__ acres	% effectively drained: ####
67	Average width of naturalized upland buffer (poten	0	__ feet	0.1 value: ####
68	Likelihood of restoration success		a b c	Enter valid choice
69	Hydrologic alteration type		Outlet, Tile, Ditch, GW pump, Wtrshd div., Filling	
70	Potential wetland type (Circ. 39)		1, 2, 3, 4, 5, 6, 7, 8	
71	Wetland sensitivity to stormwater		E a b c	
72	Additional stormwater treatment needs		a b c	

Functional Rating Summaries

Function Name	Raw score	Final Rating	Rating Category	Formula shown to the right.
Vegetative Diversity/Integrity		0.25	L	####
				####
Hydrology - Characteristic		1.00	High	####
				####
Flood Attenuation		0.42	Med	####
Water Quality--Downstream		0.60	Med	
Water Quality--Wetland		0.67	High	
Shoreline Protection		0.64	Med	
Characteristic Wildlife Habitat Structure	0.63	0.65	Med	#REF!
				#REF!
Maintenance of Characteristic Fish Habitat	0.94	0.94	High	#REF!
				#REF!
Maintenance of Characteristic Amphibian Habitat		0.10	Low	
				#REF!
Aesthetics/Recreation/Education/Cultural	0.33	0.33	Med	#REF!
				#REF!
Commercial use		N/A	N/A	0
Special Features listing:			#REF!	####

Groundwater Interaction	discharge	#REF!
Groundwater Functional Index	#REF!	#REF!
Restoration Potential (draft formula)	#VALUE!	#####
Stormwater Sensitivity (not active)		

MnRAM 3.2 Digital Worksheet, Side 2

WTL28

		Question Description	User entry	Rating									
	1	Veg. Table 2, Option 4		0.80									
		TOTAL VEG Rating	0.8	High									
	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	Flood	Floodplain									
	8	Water depth (inches)	24										
		Water depth (% inundation)											
	9	Local watershed/immedita drainage (acres)											
	10	Existing wetland size	4										
	11	SOILS: Up/Wetland (survey classification + site)											
Digital worksheet, section I	12	Outlet characteristics for flood retention	N/A	N/A									
	13	Outlet characteristics for hydrologic regime	A	1									
	14	Dominant upland land use (within 500 ft)	A	1	0.1								
	15	Soil condition (wetland)	A	1									
	16	Vegetation (% cover)	100%	H	1								
	17	Emerg. veg. flood resistance	A	1									
	18	Sediment delivery	A	1									
	19	Upland soils (based on soil group)	B	0.5									
	20	Stormwater runoff pretreatment & detention	C	0.1	1								
	21	Subwatershed wetland density	C	0.1									
	22	Channels/sheet flow	A	1									
	23	Adjacent naturalized buffer average width (feet)	500	H	WQ	1	H		1				
	24	Adjacent Area Management: % Full	100%	1	1	**1**							
		adjacent area mgmt: % Manicured		0									
		adjacent area mgmt: % Bare		0									
	25	Adjacent Area Diversity & Structure: % Native	100%	1	1	**1**							
		adjacent area diversity: % Mixed		0									
		adjacent area diversity: % Sparse/Inv./Exotic		0									
	26	Adjacent Area Slope: % Gentle	5%	0.05	1	**0.05**							
		adjacent area slope: % Moderate		0									
		adjacent area slope: % Steep		0									
Digital worksheet, section II	27	Downstream sensitivity/WQ protection	A	1									
	28	Nutrient loading	A	1									
	29	Shoreline wetland?	Y	Y									
	30	Rooted shoreline vegetation (%cover)	100%	1									
	31	Wetland in-water width (in feet, average)	100	1									
	32	Emergent vegetation erosion resistance	A	1									
	33	Shoreline erosion potential	C	0.1	1								
	34	Bank protection/upslope veg.	C	0.1									
	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	A	1									
	40	Wetland interspersion on landscape	A	1	1								
	41	Wildlife barriers	A	1									
	42	Amphibian breeding potential-hydroperiod	A	1									
	43	Amphibian breeding potential--fish presence	B	0.5									
	44	Amphibian & reptile overwintering habitat	C	0.1									
	45	Wildlife species (list)											
	46	Fish habitat quality	N/A	N/A									
	47	Fish species (list)											
	48	Unique/rare educ./cultural/rec.opportunity	N	N									
	49	Wetland visibility	C	0.1									
	50	Proximity to population	N	0.1									
	51	Public ownership	C	0.1									
	52	Public access	C	0.1									
	53	Human influence on wetland	A	1									
	54	Human influence on viewshed	A	1									
	55	Spatial buffer	C	0.1									
	56	Recreational activity potential	C	0.1									
	57	Commercial crop--hydrologic impact	N/A	N/A									

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:
#REF!

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*	D	R or D	1
59	*GW - Subwatershed land use*	D	R or D	1
60	*GW - Wetland size and soil group*	D	R or D	1
61	GW - Wetland hydroperiod	R	R or D	0.1
62	GW - Inlet/Outlet configuration	D	R or D	1
63	GW - Surrounding upland topographic relief	D	R or D	1
64	Restoration potential w/o flooding		Y or N	5.1
65	*Landowners affected by restoration*		*E a b c*	Enter valid choice
66A	*Existing wetland size (acres) [from #10]*	4	__ acres	
66B	Total wetland restoration size (acres)		__ acres	0.1
66C	(Calculated) Potential New Wetland Area [B-A]	-4	__ acres	% effectively drained: ####
67	Average width of naturalized upland buffer (poten	0	__ feet	0.1 value: ####
68	Likelihood of restoration success		a b c	Enter valid choice
69	Hydrologic alteration type		Outlet, Tile, Ditch, GW pump, Wtrshd div., Filling	
70	Potential wetland type (Circ. 39)		1, 2, 3, 4, 5, 6, 7, 8	
71	Wetland sensitivity to stormwater		E a b c	
72	Additional stormwater treatment needs		a b c	

Functional Rating Summaries

Function Name	Raw score	Final Rating	Rating Category	Formula shown to the right.
Vegetative Diversity/Integrity		0.80	High	####
				####
Hydrology - Characteristic		1.00	High	####
				####
Flood Attenuation		0.60	Med	####
Water Quality--Downstream		0.80	High	
Water Quality--Wetland		0.90	High	
Shoreline Protection		0.64	Med	
Characteristic Wildlife Habitat Structure	0.90	0.90	High	#REF!
				#REF!
Maintenance of Characteristic Fish Habitat	######	0.89	High	#REF!
				#REF!
Maintenance of Characteristic Amphibian Habitat		0.43	Med	
				#REF!
Aesthetics/Recreation/Education/Cultural	0.33	0.33	Med	#REF!
				#REF!
Commercial use		N/A	N/A	0
Special Features listing:			#REF!	####

Groundwater Interaction	discharge	#REF!
Groundwater Functional Index	#REF!	#REF!
Restoration Potential (draft formula)	#VALUE!	#####
Stormwater Sensitivity (not active)		

		Wetland ID HW29 UTM Coordinates 544382 5265926	Wetland ID HW30 UTM Coordinates 544002 5265920	Wetland name ID HW31 UTM Coordinates 542925 5265105	Wetland ID HW32 UTM Coordinates 543071 5266095
	Date	**26-Jun-09**	**26-Jun-09**	**26-Jun-09**	**26-Jun-09**
	Special Features (from list, p.2--enter letter/s)	- 145-146	- 147-148	- 149-150	- 151-152
#1	Community Number (circle each community which represents at least 10% of the wetland)	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	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 (wet meadow, marsh)	8A Alder Thicket	4A Coniferous Bog	13B Shallow Marsh	13A Sedge Meadow
	Community Proportion (% of total)	25%	80%	40%	33%
	Dominant Vegetation / Cover Class	SPECKLED ALDER/5 PUSSY WILLOW/2 SLENDER-LEAVED WILLOW/2 BLACK SPRUCE/2 CEDAR/2 MOSS/3 CANADA BLUEJOINT/2 SEDGE/2	SAPLING LARCH/2 SAPLING SPRUCE/3 LABRADOR TEA/3 LEATHERLEAF/5 SPAGNUM MOSS/6	NARROW LEAF CATTAIL/6 SPECKLED ALDER/2 SEDGE/3 RED OSIER DOGWOOD/2 SLENDER-LEAVED WILLOW/2	CANADA BLUEJOINT/6 WOOLLY SEDGE/2 SPECKLED ALDER/3 RASPBERRY/2 SLENDER-LEAVED WILLOW/2 PUSSY WILLOW/1
	Invasive/exotic Vegetation / Cover Class				
	Community Quality (E, H, M, L)	H 1	H 1	H 1	H 1
Plant Community #2	Community Type (wet meadow, marsh)	- -		- -	
	Community Proportion (% of total)				
	Dominant Vegetation / Cover Class	SPAGNUM MOSS/3			
	Invasive/exotic Vegetation / Cover Class				
	Community Quality (E, H, M, L)	0	0	0	0
Plant Community #3	Community Type (wet meadow, marsh)	- -	- -	- -	- -
	Community Proportion (% of total)				
	Dominant Vegetation / Cover Class				
	Invasive/exotic Vegetation / Cover Class				
	Community Quality (E, H, M, L)	0	0	0	0
Plant Community #4*	Community Type (wet meadow, marsh)	- -	- -	- -	- -
	Community Proportion (% of total)				
	Dominant Vegetation / Cover Class				
	Invasive/exotic Vegetation / Cover Class				
	Community Quality (E, H, M, L)	- 0	0	0	0
	Circular 39 Types (primary <TAB> others)				2
	Cowardin Types				
	Photo ID				
Highest rated community veg. div./integ:		1.0 High	1 High	1 High	1 High
Average vegetative diversity/integrity:		1.00 High	1.00 High	1.00 High	1.00 High
Weighted Average veg. diversity/integrity:		0.25 Medium	0.80 High	0.40 Medium	0.33 Medium
#4	Listed, rare, special plant species?				
#5	**Rare community or habitat?**				
#6	Pre-European-settlement conditions?				

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]

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

*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.

MnRAM 3.2 Digital Worksheet, Side 2

WTL29

		Question Description	User entry	Rating			
	1	Veg. Table 2, Option 4		0.25			
		TOTAL VEG Rating	0.25	L			
	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	FT	Depress'l/Flow-through			
	8	Water depth (inches)	12				
		Water depth (% inundation)					
	9	Local watershed/immedita drainage (acres)					
	10	Existing wetland size	20				
	11	SOILS: Up/Wetland (survey classification + site)					
Digital worksheet, section I	12	Outlet characteristics for flood retention	N/A	N/A			
	13	Outlet characteristics for hydrologic regime	A	1			
	14	Dominant upland land use (within 500 ft)	A	1	0.1		
	15	Soil condition (wetland)	A	1			
	16	Vegetation (% cover)	95%	H	1		
	17	Emerg. veg. flood resistance	A	1			
	18	Sediment delivery	A	1			
	19	Upland soils (based on soil group)	B	0.5			
	20	Stormwater runoff pretreatment & detention	C	0.1	1		
	21	Subwatershed wetland density	C	0.1			
	22	Channels/sheet flow	A	1			
	23	Adjacent naturalized buffer average width (feet)	500	H	WQ	1 H	1
	24	Adjacent Area Management: % Full	100%	1	1	**1**	
		adjacent area mgmt: % Manicured		0			
		adjacent area mgmt: % Bare		0			
	25	Adjacent Area Diversity & Structure: % Native	100%	1	1	**1**	
		adjacent area diversity: % Mixed		0			
		adjacent area diversity: % Sparse/Inv./Exotic		0			
	26	Adjacent Area Slope: % Gentle	5%	0.05	1	**0.05**	
		adjacent area slope: % Moderate		0			
		adjacent area slope: % Steep		0			
Digital worksheet, section II	27	Downstream sensitivity/WQ protection	A	1			
	28	Nutrient loading	A	1			
	29	Shoreline wetland?	N	N			
	30	Rooted shoreline vegetation (%cover)		Enter a percentage			
	31	Wetland in-water width (in feet, average)		Enter a percentage			
	32	Emergent vegetation erosion resistance		Enter valid choice			
	33	Shoreline erosion potential		Enter valid cho			
	34	Bank protection/upslope veg.		Enter valid choice			
	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)	3	H	1		0
	39	Wetland detritus	A	1			
	40	Wetland interspersion on landscape	A	1	1		
	41	Wildlife barriers	A	1			
	42	Amphibian breeding potential-hydroperiod	A	1			
	43	Amphibian breeding potential--fish presence	A	1			
	44	Amphibian & reptile overwintering habitat	C	0.1			
	45	Wildlife species (list)					
	46	Fish habitat quality	N/A	N/A			
	47	Fish species (list)					
	48	Unique/rare educ./cultural/rec.opportunity	N	N			
	49	Wetland visibility	C	0.1			
	50	Proximity to population	N	0.1			
	51	Public ownership	C	0.1			
	52	Public access	C	0.1			
	53	Human influence on wetland	A	1			
	54	Human influence on viewshed	A	1			
	55	Spatial buffer	C	0.1			
	56	Recreational activity potential	C	0.1			
	57	Commercial crop--hydrologic impact	N/A	N/A			

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:
#REF!

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*	D	R or D	1
59	*GW - Subwatershed land use*	D	R or D	1
60	*GW - Wetland size and soil group*	D	R or D	1
61	GW - Wetland hydroperiod	R	R or D	0.1
62	GW - Inlet/Outlet configuration	D	R or D	1
63	GW - Surrounding upland topographic relief	D	R or D	1
64	Restoration potential w/o flooding		Y or N	5.1
65	*Landowners affected by restoration*		*E a b c*	Enter valid choice
66A	*Existing wetland size (acres) [from #10]*	20	__ acres	
66B	Total wetland restoration size (acres)		__ acres	0.1
66C	(Calculated) Potential New Wetland Area [B-A]	-20	__ acres	% effectively drained: ####
67	Average width of naturalized upland buffer (poten	0	__ feet	0.1 value: ####
68	Likelihood of restoration success		a b c	Enter valid choice
69	Hydrologic alteration type		Outlet, Tile, Ditch, GW pump, Wtrshd div., Filling	
70	Potential wetland type (Circ. 39)		1, 2, 3, 4, 5, 6, 7, 8	
71	Wetland sensitivity to stormwater		E a b c	
72	Additional stormwater treatment needs		a b c	

Functional Rating Summaries

Function Name	Raw score	Final Rating	Rating Category	Formula shown to the right.
Vegetative Diversity/Integrity		0.25	L	####
				####
Hydrology - Characteristic		1.00	High	####
				####
Flood Attenuation		0.60	Med	####
Water Quality--Downstream		0.80	High	
Water Quality--Wetland		0.74	High	
Shoreline Protection		N/A	N/A	
Characteristic Wildlife Habitat Structure	0.83	0.81	High	#REF!
				#REF!
Maintenance of Characteristic Fish Habitat	######	0.70	High	#REF!
				#REF!
Maintenance of Characteristic Amphibian Habitat		0.85	High	
				#REF!
Aesthetics/Recreation/Education/Cultural	0.33	0.33	Med	#REF!
				#REF!
Commercial use		N/A	N/A	0
Special Features listing:			#REF!	####

Groundwater Interaction	discharge	#REF!
Groundwater Functional Index	#REF!	#REF!
Restoration Potential (draft formula)	#VALUE!	#####
Stormwater Sensitivity (not active)		

MnRAM 3.2 Digital Worksheet, Side 2

WTL30

		Question Description	User entry	Rating			
	1	Veg. Table 2, Option 4		80.00			
		TOTAL VEG Rating	0.8	High			
Digital worksheet, section I	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	FT	Depress'l/Flow-through			
	8	Water depth (inches)	6				
		Water depth (% inundation)					
	9	Local watershed/immedita drainage (acres)					
	10	Existing wetland size	11				
	11	SOILS: Up/Wetland (survey classification + site)					
	12	Outlet characteristics for flood retention	N/A	N/A			
	13	Outlet characteristics for hydrologic regime	A	1			
	14	Dominant upland land use (within 500 ft)	A	1	0.1		
	15	Soil condition (wetland)	A	1			
	16	Vegetation (% cover)	95%	H	1		
	17	Emerg. veg. flood resistance	A	1			
	18	Sediment delivery	A	1			
	19	Upland soils (based on soil group)	B	0.5			
	20	Stormwater runoff pretreatment & detention	C	0.1	1		
	21	Subwatershed wetland density	C	0.1			
	22	Channels/sheet flow	A	1			
	23	Adjacent naturalized buffer average width (feet)	500	H	WQ	1 H	1
	24	Adjacent Area Management: % Full	100%	1	1	**1**	
		adjacent area mgmt: % Manicured		0			
		adjacent area mgmt: % Bare		0			
	25	Adjacent Area Diversity & Structure: % Native	100%	1	1	**1**	
		adjacent area diversity: % Mixed		0			
		adjacent area diversity: % Sparse/Inv./Exotic		0			
	26	Adjacent Area Slope: % Gentle	5%	0.05	1	**0.05**	
		adjacent area slope: % Moderate		0			
		adjacent area slope: % Steep		0			
Digital worksheet, section II	27	Downstream sensitivity/WQ protection	A	1			
	28	Nutrient loading	A	1			
	29	Shoreline wetland?	N	N			
	30	Rooted shoreline vegetation (%cover)		Enter a percentage			
	31	Wetland in-water width (in feet, average)		Enter a percentage			
	32	Emergent vegetation erosion resistance		Enter valid choice			
	33	Shoreline erosion potential		Enter valid cho			
	34	Bank protection/upslope veg.		Enter valid choice			
	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	A	1			
	40	Wetland interspersion on landscape	A	1	1		
	41	Wildlife barriers	A	1			
	42	Amphibian breeding potential-hydroperiod	A	1			
	43	Amphibian breeding potential--fish presence	A	1			
	44	Amphibian & reptile overwintering habitat	C	0.1			
	45	Wildlife species (list)					
	46	Fish habitat quality	N/A	N/A			
	47	Fish species (list)					
	48	Unique/rare educ./cultural/rec.opportunity	N	N			
	49	Wetland visibility	C	0.1			
	50	Proximity to population	N	0.1			
	51	Public ownership	C	0.1			
	52	Public access	C	0.1			
	53	Human influence on wetland	A	1			
	54	Human influence on viewshed	A	1			
	55	Spatial buffer	C	0.1			
	56	Recreational activity potential	C	0.1			
	57	Commercial crop--hydrologic impact	N/A	N/A			

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:
#REF!

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*	D	R or D	1
59	*GW - Subwatershed land use*	D	R or D	1
60	*GW - Wetland size and soil group*	D	R or D	1
61	GW - Wetland hydroperiod	R	R or D	0.1
62	GW - Inlet/Outlet configuration	D	R or D	1
63	GW - Surrounding upland topographic relief	D	R or D	1
64	Restoration potential w/o flooding		Y or N	5.1
65	*Landowners affected by restoration*		*E a b c*	Enter valid choice
66A	*Existing wetland size (acres) [from #10]*	11	__ acres	
66B	Total wetland restoration size (acres)		__ acres	0.1
66C	(Calculated) Potential New Wetland Area [B-A]	-11	__ acres	% effectively drained: ####
67	Average width of naturalized upland buffer (poten	0	__ feet	0.1 value: ####
68	Likelihood of restoration success		a b c	Enter valid choice
69	Hydrologic alteration type		Outlet, Tile, Ditch, GW pump, Wtrshd div., Filling	
70	Potential wetland type (Circ. 39)		1, 2, 3, 4, 5, 6, 7, 8	
71	Wetland sensitivity to stormwater		E a b c	
72	Additional stormwater treatment needs		a b c	

Functional Rating Summaries

Function Name	Raw score	Final Rating	Rating Category	Formula shown to the right.
Vegetative Diversity/Integrity		0.80	High	####
				####
Hydrology - Characteristic		1.00	High	####
				####
Flood Attenuation		0.60	Med	####
Water Quality--Downstream		0.80	High	
Water Quality--Wetland		0.90	High	
Shoreline Protection		N/A	N/A	
Characteristic Wildlife Habitat Structure	0.90	0.90	High	#REF!
				#REF!
Maintenance of Characteristic Fish Habitat	######	0.70	High	#REF!
				#REF!
Maintenance of Characteristic Amphibian Habitat		0.85	High	
				#REF!
Aesthetics/Recreation/Education/Cultural	0.33	0.33	Med	#REF!
				#REF!
Commercial use		N/A	N/A	0
Special Features listing:			#REF!	####

Groundwater Interaction	discharge	#REF!
Groundwater Functional Index	#REF!	#REF!
Restoration Potential (draft formula)	#VALUE!	#####
Stormwater Sensitivity (not active)		

MnRAM 3.2 Digital Worksheet, Side 2

WTL31

		Question Description	User entry	Rating			
	1	Veg. Table 2, Option 4		0.40			
		TOTAL VEG Rating	0.4	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	FT	Depress'l/Flow-through			
	8	Water depth (inches)	24				
		Water depth (% inundation)					
	9	Local watershed/immedita drainage (acres)					
	10	Existing wetland size	4				
	11	SOILS: Up/Wetland (survey classification + site)					
Digital worksheet, section I	12	Outlet characteristics for flood retention	B	0.5			
	13	Outlet characteristics for hydrologic regime	A	1			
	14	Dominant upland land use (within 500 ft)	A	1	0.1		
	15	Soil condition (wetland)	A	1			
	16	Vegetation (% cover)	95%	H	1		
	17	Emerg. veg. flood resistance	A	1			
	18	Sediment delivery	A	1			
	19	Upland soils (based on soil group)	B	0.5			
	20	Stormwater runoff pretreatment & detention	C	0.1	1		
	21	Subwatershed wetland density	C	0.1			
	22	Channels/sheet flow	A	1			
	23	Adjacent naturalized buffer average width (feet)	500	H	WQ	1 H	1
	24	Adjacent Area Management: % Full	100%	1	1	**1**	
		adjacent area mgmt: % Manicured		0			
		adjacent area mgmt: % Bare		0			
	25	Adjacent Area Diversity & Structure: % Native	100%	1	1	**1**	
		adjacent area diversity: % Mixed		0			
		adjacent area diversity: % Sparse/Inv./Exotic		0			
	26	Adjacent Area Slope: % Gentle	10%	0.1	1	**0.1**	
		adjacent area slope: % Moderate		0			
		adjacent area slope: % Steep		0			
Digital worksheet, section II	27	Downstream sensitivity/WQ protection	A	1			
	28	Nutrient loading	A	1			
	29	Shoreline wetland?	N	N			
	30	Rooted shoreline vegetation (%cover)		Enter a percentage			
	31	Wetland in-water width (in feet, average)		Enter a percentage			
	32	Emergent vegetation erosion resistance		Enter valid choice			
	33	Shoreline erosion potential		Enter valid cho			
	34	Bank protection/upslope veg.		Enter valid choice			
	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)	1	L	0.1		0
	39	Wetland detritus	A	1			
	40	Wetland interspersion on landscape	A	1	1		
	41	Wildlife barriers	A	1			
	42	Amphibian breeding potential-hydroperiod	A	1			
	43	Amphibian breeding potential--fish presence	A	1			
	44	Amphibian & reptile overwintering habitat	C	0.1			
	45	Wildlife species (list)					
	46	Fish habitat quality	C	0.1			
	47	Fish species (list)					
	48	Unique/rare educ./cultural/rec.opportunity	N	N			
	49	Wetland visibility	C	0.1			
	50	Proximity to population	N	0.1			
	51	Public ownership	C	0.1			
	52	Public access	C	0.1			
	53	Human influence on wetland	A	1			
	54	Human influence on viewshed	A	1			
	55	Spatial buffer	C	0.1			
	56	Recreational activity potential	C	0.1			
	57	Commercial crop--hydrologic impact	N/A	N/A			

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:
#REF!

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*	D	R or D	1
59	*GW - Subwatershed land use*	D	R or D	1
60	*GW - Wetland size and soil group*	D	R or D	1
61	GW - Wetland hydroperiod	R	R or D	0.1
62	GW - Inlet/Outlet configuration	D	R or D	1
63	GW - Surrounding upland topographic relief	D	R or D	1
64	Restoration potential w/o flooding		Y or N	5.1
65	*Landowners affected by restoration*		*E a b c*	Enter valid choice
66A	*Existing wetland size (acres) [from #10]*	4	__ acres	
66B	Total wetland restoration size (acres)		__ acres	0.1
66C	(Calculated) Potential New Wetland Area [B-A]	-4	__ acres	% effectively drained: ####
67	Average width of naturalized upland buffer (poten	0	__ feet	0.1 value: ####
68	Likelihood of restoration success		a b c	Enter valid choice
69	Hydrologic alteration type		Outlet, Tile, Ditch, GW pump, Wtrshd div., Filling	
70	Potential wetland type (Circ. 39)		1, 2, 3, 4, 5, 6, 7, 8	
71	Wetland sensitivity to stormwater		E a b c	
72	Additional stormwater treatment needs		a b c	

Functional Rating Summaries

Function Name	Raw score	Final Rating	Rating Category	Formula shown to the right.
Vegetative Diversity/Integrity		0.40	Med	####
				####
Hydrology - Characteristic		1.00	High	####
				####
Flood Attenuation		0.58	Med	####
Water Quality--Downstream		0.76	High	
Water Quality--Wetland		0.79	High	
Shoreline Protection		N/A	N/A	
Characteristic Wildlife Habitat Structure	0.77	0.77	High	#REF!
				#REF!
Maintenance of Characteristic Fish Habitat	0.70	0.70	High	#REF!
				#REF!
Maintenance of Characteristic Amphibian Habitat		0.85	High	
				#REF!
Aesthetics/Recreation/Education/Cultural	0.33	0.33	Med	#REF!
				#REF!
Commercial use		N/A	N/A	0
Special Features listing:			#REF!	####

Groundwater Interaction	discharge	#REF!
Groundwater Functional Index	#REF!	#REF!
Restoration Potential (draft formula)	#VALUE!	#####
Stormwater Sensitivity (not active)		

MnRAM 3.2 Digital Worksheet, Side 2

WTL32

		Question Description	User entry	Rating			
	1	Veg. Table 2, Option 4		0.33			
		TOTAL VEG Rating	0.33	Medium			
Digital worksheet, section I	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	FT	Depress'l/Flow-through			
	8	Water depth (inches)	16				
		Water depth (% inundation)					
	9	Local watershed/immedita drainage (acres)					
	10	Existing wetland size	4				
	11	SOILS: Up/Wetland (survey classification + site)					
	12	Outlet characteristics for flood retention	A	1			
	13	Outlet characteristics for hydrologic regime	A	1			
	14	Dominant upland land use (within 500 ft)	A	1	0.1		
	15	Soil condition (wetland)	A	1			
	16	Vegetation (% cover)	95%	H	1		
	17	Emerg. veg. flood resistance	A	1			
	18	Sediment delivery	A	1			
	19	Upland soils (based on soil group)	B	0.5			
	20	Stormwater runoff pretreatment & detention	C	0.1	1		
	21	Subwatershed wetland density	C	0.1			
	22	Channels/sheet flow	A	1			
	23	Adjacent naturalized buffer average width (feet)	500	H	WQ	1 H	1
	24	Adjacent Area Management: % Full	100%	1	1	**1**	
		adjacent area mgmt: % Manicured		0			
		adjacent area mgmt: % Bare		0			
	25	Adjacent Area Diversity & Structure: % Native	100%	1	1	**1**	
		adjacent area diversity: % Mixed		0			
		adjacent area diversity: % Sparse/Inv./Exotic		0			
	26	Adjacent Area Slope: % Gentle	15%	0.15	1	**0.15**	
		adjacent area slope: % Moderate		0			
		adjacent area slope: % Steep		0			
Digital worksheet, section II	27	Downstream sensitivity/WQ protection	B	0.5			
	28	Nutrient loading	A	1			
	29	Shoreline wetland?	N	N			
	30	Rooted shoreline vegetation (%cover)		Enter a percentage			
	31	Wetland in-water width (in feet, average)		Enter a percentage			
	32	Emergent vegetation erosion resistance		Enter valid choice			
	33	Shoreline erosion potential		Enter valid cho			
	34	Bank protection/upslope veg.		Enter valid choice			
	35	Rare Wildlife	N	N			
	36	Scarce/Rare/S1/S2 local community	N	N			
	37	Vegetation interspersion cover (see diagram 1)	1	L	0.1		
	38	Community interspersion (see diagram 2)	2	M	0.5		0
	39	Wetland detritus	A	1			
	40	Wetland interspersion on landscape	A	1	1		
	41	Wildlife barriers	A	1			
	42	Amphibian breeding potential-hydroperiod	A	1			
	43	Amphibian breeding potential--fish presence	A	1			
	44	Amphibian & reptile overwintering habitat	C	0.1			
	45	Wildlife species (list)					
	46	Fish habitat quality	C	0.1			
	47	Fish species (list)					
	48	Unique/rare educ./cultural/rec.opportunity	N	N			
	49	Wetland visibility	C	0.1			
	50	Proximity to population	N	0.1			
	51	Public ownership	C	0.1			
	52	Public access	C	0.1			
	53	Human influence on wetland	A	1			
	54	Human influence on viewshed	A	1			
	55	Spatial buffer	C	0.1			
	56	Recreational activity potential	C	0.1			
	57	Commercial crop--hydrologic impact	N/A	N/A			

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:
#REF!

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*	D	R or D	1
59	*GW - Subwatershed land use*	D	R or D	1
60	*GW - Wetland size and soil group*	D	R or D	1
61	GW - Wetland hydroperiod	R	R or D	0.1
62	GW - Inlet/Outlet configuration	D	R or D	1
63	GW - Surrounding upland topographic relief	D	R or D	1
64	Restoration potential w/o flooding		Y or N	5.1
65	*Landowners affected by restoration*		*E a b c*	Enter valid choice
66A	*Existing wetland size (acres) [from #10]*	4	__ acres	
66B	Total wetland restoration size (acres)		__ acres	0.1
66C	(Calculated) Potential New Wetland Area [B-A]	-4	__ acres	% effectively drained: ####
67	Average width of naturalized upland buffer (poten	0	__ feet	0.1 value: ####
68	Likelihood of restoration success		a b c	Enter valid choice
69	Hydrologic alteration type		Outlet, Tile, Ditch, GW pump, Wtrshd div., Filling	
70	Potential wetland type (Circ. 39)		1, 2, 3, 4, 5, 6, 7, 8	
71	Wetland sensitivity to stormwater		E a b c	
72	Additional stormwater treatment needs		a b c	

Functional Rating Summaries

Function Name	Raw score	Final Rating	Rating Category	Formula shown to the right.
Vegetative Diversity/Integrity		0.33	Med	####
				####
Hydrology - Characteristic		1.00	High	####
				####
Flood Attenuation		0.68	High	####
Water Quality--Downstream		0.76	High	
Water Quality--Wetland		0.77	High	
Shoreline Protection		N/A	N/A	
Characteristic Wildlife Habitat Structure	0.73	0.73	High	#REF!
				#REF!
Maintenance of Characteristic Fish Habitat	0.70	0.70	High	#REF!
				#REF!
Maintenance of Characteristic Amphibian Habitat		0.85	High	
				#REF!
Aesthetics/Recreation/Education/Cultural	0.33	0.33	Med	#REF!
				#REF!
Commercial use		N/A	N/A	0
Special Features listing:			#REF!	####

Groundwater Interaction	discharge	#REF!
Groundwater Functional Index	#REF!	#REF!
Restoration Potential (draft formula)	#VALUE!	#####
Stormwater Sensitivity (not active)		

		Wetland ID HW33 UTM Coordinates 543440 5266313		Wetland ID HW34 UTM Coordinates 544918 5269650		Wetland name ID HW35 UTM Coordinates 544694 5269296		Wetland ID UTM Coordinates	
	Date	**26-Jun-09**		**29-Jun-09**		**29-Jun-09**			
	Special Features (from list, p.2--enter letter/s)	- PHOTOS 153-154		- 175-176		- 179-180		-	
#1	Community Number (circle each community which represents at least 10% of the wetland)	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		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 (wet meadow, marsh)	13A	Sedge Meadow	4B	Coniferous Swamp	8A	Alder Thicket		
	Community Proportion (% of total)		80%		38%		57%		
	Dominant Vegetation / Cover Class	CANADA BLUEJOINT/6		POLE SPRUCE/4		LARCH/3			
		WILLOW/2		SPECKLED ALDER/4		SPECKLED ALDER/5			
		RASPBERRY/3		LABRADOR TEA/2		SEDGE/4			
		SPECKLED ALDER/3		NEEDLE SPIKERUSH/2		ARROWHEAD/5			
				NARROW-LEAF CATTAIL/3		CANADA BLUEJOINT/2			
				PUSSY WILLOW/2		LABRADOR TEA/2			
				SAPLING BLACK SPRUCE/2		HORSETAIL/2			
				FALSE LILY OF THE					
	Invasive/exotic Vegetation / Cover Class			VALLEY/2					
	Community Quality (E, H, M, L)	H	1	H	1	H	1		
Plant Community #2	Community Type (wet meadow, marsh)	-	-			-	-		
	Community Proportion (% of total)								
	Dominant Vegetation / Cover Class								
	Invasive/exotic Vegetation / Cover Class								
	Community Quality (E, H, M, L)		0		0		0		0
Plant Community #3	Community Type (wet meadow, marsh)	-	-	-	-	-	-	-	-
	Community Proportion (% of total)								
	Dominant Vegetation / Cover Class								
	Invasive/exotic Vegetation / Cover Class								
	Community Quality (E, H, M, L)		0		0		0		0
Plant Community #4*	Community Type (wet meadow, marsh)	-	-	-	-	-	-	-	-
	Community Proportion (% of total)								
	Dominant Vegetation / Cover Class								
	Invasive/exotic Vegetation / Cover Class								
	Community Quality (E, H, M, L)	-	0		0		0		0
	Circular 39 Types (primary <TAB> others)							2	
	Cowardin Types								
	Photo ID								
Highest rated community veg. div./integ:		1.0	High	1	High	1	High	0	-
Average vegetative diversity/integrity:		1.00	High	1.00	High	1.00	High	-	-
Weighted Average veg. diversity/integrity:		0.80	High	0.38	Medium	0.57	High		
#4	Listed, rare, special plant species?								
#5	**Rare community or habitat?**								
#6	Pre-European-settlement conditions?								

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]

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

*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.

MnRAM 3.2 Digital Worksheet, Side 2

WTL33

		Question Description	User entry	Rating			
	1	Veg. Table 2, Option 4		0.80			
		TOTAL VEG Rating	0.8	High			
Digital worksheet, section I	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	FT	Depress'l/Flow-through			
	8	Water depth (inches)	18				
		Water depth (% inundation)					
	9	Local watershed/immedita drainage (acres)					
	10	Existing wetland size	4				
	11	SOILS: Up/Wetland (survey classification + site)					
	12	Outlet characteristics for flood retention	B	0.5			
	13	Outlet characteristics for hydrologic regime	A	1			
	14	Dominant upland land use (within 500 ft)	A	1	0.1		
	15	Soil condition (wetland)	A	1			
	16	Vegetation (% cover)	95%	H	1		
	17	Emerg. veg. flood resistance	A	1			
	18	Sediment delivery	A	1			
	19	Upland soils (based on soil group)	B	0.5			
	20	Stormwater runoff pretreatment & detention	C	0.1	1		
	21	Subwatershed wetland density	C	0.1			
	22	Channels/sheet flow	A	1			
	23	Adjacent naturalized buffer average width (feet)	500	H	WQ	1 H	1
	24	Adjacent Area Management: % Full	100%	1	1	**1**	
		adjacent area mgmt: % Manicured		0			
		adjacent area mgmt: % Bare		0			
	25	Adjacent Area Diversity & Structure: % Native	100%	1	1	**1**	
		adjacent area diversity: % Mixed		0			
		adjacent area diversity: % Sparse/Inv./Exotic		0			
	26	Adjacent Area Slope: % Gentle	20%	0.2	1	**0.2**	
		adjacent area slope: % Moderate		0			
		adjacent area slope: % Steep		0			
Digital worksheet, section II	27	Downstream sensitivity/WQ protection	B	0.5			
	28	Nutrient loading	A	1			
	29	Shoreline wetland?	N	N			
	30	Rooted shoreline vegetation (%cover)		Enter a percentage			
	31	Wetland in-water width (in feet, average)		Enter a percentage			
	32	Emergent vegetation erosion resistance		Enter valid choice			
	33	Shoreline erosion potential		Enter valid cho			
	34	Bank protection/upslope veg.		Enter valid choice			
	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)	1	L	0.1		0
	39	Wetland detritus	A	1			
	40	Wetland interspersion on landscape	A	1	1		
	41	Wildlife barriers	A	1			
	42	Amphibian breeding potential-hydroperiod	A	1			
	43	Amphibian breeding potential--fish presence	A	1			
	44	Amphibian & reptile overwintering habitat	C	0.1			
	45	Wildlife species (list)					
	46	Fish habitat quality	C	0.1			
	47	Fish species (list)					
	48	Unique/rare educ./cultural/rec.opportunity	N	N			
	49	Wetland visibility	C	0.1			
	50	Proximity to population	N	0.1			
	51	Public ownership	C	0.1			
	52	Public access	C	0.1			
	53	Human influence on wetland	A	1			
	54	Human influence on viewshed	A	1			
	55	Spatial buffer	C	0.1			
	56	Recreational activity potential	C	0.1			
	57	Commercial crop--hydrologic impact	N/A	N/A			

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:
#REF!

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*	D	R or D	1
59	*GW - Subwatershed land use*	D	R or D	1
60	*GW - Wetland size and soil group*	D	R or D	1
61	GW - Wetland hydroperiod	R	R or D	0.1
62	GW - Inlet/Outlet configuration	D	R or D	1
63	GW - Surrounding upland topographic relief	D	R or D	1
64	Restoration potential w/o flooding		Y or N	5.1
65	*Landowners affected by restoration*		*E a b c*	Enter valid choice
66A	*Existing wetland size (acres) [from #10]*	4	__ acres	
66B	Total wetland restoration size (acres)		__ acres	0.1
66C	(Calculated) Potential New Wetland Area [B-A]	-4	__ acres	% effectively drained: ####
67	Average width of naturalized upland buffer (poten	0	__ feet	0.1 value: ####
68	Likelihood of restoration success		a b c	Enter valid choice
69	Hydrologic alteration type		Outlet, Tile, Ditch, GW pump, Wtrshd div., Filling	
70	Potential wetland type (Circ. 39)		1, 2, 3, 4, 5, 6, 7, 8	
71	Wetland sensitivity to stormwater		E a b c	
72	Additional stormwater treatment needs		a b c	

Functional Rating Summaries

Function Name	Raw score	Final Rating	Rating Category	Formula shown to the right.
Vegetative Diversity/Integrity		0.80	High	####
				####
Hydrology - Characteristic		1.00	High	####
				####
Flood Attenuation		0.58	Med	####
Water Quality--Downstream		0.69	High	
Water Quality--Wetland		0.90	High	
Shoreline Protection		N/A	N/A	
Characteristic Wildlife Habitat Structure	0.86	0.86	High	#REF!
				#REF!
Maintenance of Characteristic Fish Habitat	0.70	0.70	High	#REF!
				#REF!
Maintenance of Characteristic Amphibian Habitat		0.85	High	
				#REF!
Aesthetics/Recreation/Education/Cultural	0.33	0.33	Med	#REF!
				#REF!
Commercial use		N/A	N/A	0
Special Features listing:			#REF!	####

Groundwater Interaction	discharge	#REF!
Groundwater Functional Index	#REF!	#REF!
Restoration Potential (draft formula)	#VALUE!	#####
Stormwater Sensitivity (not active)		

MnRAM 3.2 Digital Worksheet, Side 2

WTL34

		Question Description	User entry	Rating								
	1	Veg. Table 2, Option 4		0.38								
		TOTAL VEG Rating	0.38	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	FT	Depress'l/Flow-through								
	8	Water depth (inches)	24									
		Water depth (% inundation)										
	9	Local watershed/immedita drainage (acres)										
	10	Existing wetland size	4									
	11	SOILS: Up/Wetland (survey classification + site)										
Digital worksheet, section I	12	Outlet characteristics for flood retention	N/A	N/A								
	13	Outlet characteristics for hydrologic regime	A	1								
	14	Dominant upland land use (within 500 ft)	A	1	0.1							
	15	Soil condition (wetland)	A	1								
	16	Vegetation (% cover)	95%	H	1							
	17	Emerg. veg. flood resistance	A	1								
	18	Sediment delivery	A	1								
	19	Upland soils (based on soil group)	B	0.5								
	20	Stormwater runoff pretreatment & detention	C	0.1	1							
	21	Subwatershed wetland density	C	0.1								
	22	Channels/sheet flow	A	1								
	23	Adjacent naturalized buffer average width (feet)	500	H	WQ	1	H	1				
	24	Adjacent Area Management: % Full	100%	1	1	**1**						
		adjacent area mgmt: % Manicured		0								
		adjacent area mgmt: % Bare		0								
	25	Adjacent Area Diversity & Structure: % Native	100%	1	1	**1**						
		adjacent area diversity: % Mixed		0								
		adjacent area diversity: % Sparse/Inv./Exotic		0								
	26	Adjacent Area Slope: % Gentle	5%	0.05	1	**0.05**						
		adjacent area slope: % Moderate		0								
		adjacent area slope: % Steep		0								
Digital worksheet, section II	27	Downstream sensitivity/WQ protection	B	0.5								
	28	Nutrient loading	A	1								
	29	Shoreline wetland?	N	N								
	30	Rooted shoreline vegetation (%cover)		Enter a percentage								
	31	Wetland in-water width (in feet, average)		Enter a percentage								
	32	Emergent vegetation erosion resistance		Enter valid choice								
	33	Shoreline erosion potential		Enter valid cho								
	34	Bank protection/upslope veg.		Enter valid choice								
	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)	3	H	1				0			
	39	Wetland detritus	A	1								
	40	Wetland interspersion on landscape	A	1	1							
	41	Wildlife barriers	A	1								
	42	Amphibian breeding potential-hydroperiod	A	1								
	43	Amphibian breeding potential--fish presence	A	1								
	44	Amphibian & reptile overwintering habitat	C	0.1								
	45	Wildlife species (list)										
	46	Fish habitat quality	C	0.1								
	47	Fish species (list)										
	48	Unique/rare educ./cultural/rec.opportunity	N	N								
	49	Wetland visibility	C	0.1								
	50	Proximity to population	N	0.1								
	51	Public ownership	C	0.1								
	52	Public access	C	0.1								
	53	Human influence on wetland	A	1								
	54	Human influence on viewshed	A	1								
	55	Spatial buffer	C	0.1								
	56	Recreational activity potential	C	0.1								
	57	Commercial crop--hydrologic impact	N/A	N/A								

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:
#REF!

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*	D	R or D	1
59	*GW - Subwatershed land use*	D	R or D	1
60	*GW - Wetland size and soil group*	D	R or D	1
61	GW - Wetland hydroperiod	R	R or D	0.1
62	GW - Inlet/Outlet configuration	D	R or D	1
63	GW - Surrounding upland topographic relief	D	R or D	1
64	Restoration potential w/o flooding		Y or N	5.1
65	*Landowners affected by restoration*		*E a b c*	Enter valid choice
66A	*Existing wetland size (acres) [from #10]*	4	__ acres	
66B	Total wetland restoration size (acres)		__ acres	0.1
66C	(Calculated) Potential New Wetland Area [B-A]	-4	__ acres	% effectively drained: ####
67	Average width of naturalized upland buffer (poten	0	__ feet	0.1 value: ####
68	Likelihood of restoration success		a b c	Enter valid choice
69	Hydrologic alteration type		Outlet, Tile, Ditch, GW pump, Wtrshd div., Filling	
70	Potential wetland type (Circ. 39)		1, 2, 3, 4, 5, 6, 7, 8	
71	Wetland sensitivity to stormwater		E a b c	
72	Additional stormwater treatment needs		a b c	

Functional Rating Summaries

Function Name	Raw score	Final Rating	Rating Category	Formula shown to the right.
Vegetative Diversity/Integrity		0.38	Med	####
				####
Hydrology - Characteristic		1.00	High	####
				####
Flood Attenuation		0.60	Med	####
Water Quality--Downstream		0.69	High	
Water Quality--Wetland		0.82	High	
Shoreline Protection		N/A	N/A	
Characteristic Wildlife Habitat Structure	0.86	0.86	High	#REF!
				#REF!
Maintenance of Characteristic Fish Habitat	0.70	0.70	High	#REF!
				#REF!
Maintenance of Characteristic Amphibian Habitat		0.85	High	
				#REF!
Aesthetics/Recreation/Education/Cultural	0.33	0.33	Med	#REF!
				#REF!
Commercial use		N/A	N/A	0
Special Features listing:			#REF!	####

Groundwater Interaction	discharge	#REF!
Groundwater Functional Index	#REF!	#REF!
Restoration Potential (draft formula)	#VALUE!	#####
Stormwater Sensitivity (not active)		

MnRAM 3.2 Digital Worksheet, Side 2

WTL35

		Question Description	User entry	Rating			
	1	Veg. Table 2, Option 4		0.57			
		TOTAL VEG Rating	0.57	Medium			
Digital worksheet, section I	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	FT	Depress'l/Flow-through			
	8	Water depth (inches)	24				
		Water depth (% inundation)					
	9	Local watershed/immedita drainage (acres)					
	10	Existing wetland size	4				
	11	SOILS: Up/Wetland (survey classification + site)					
	12	Outlet characteristics for flood retention	N/A	N/A			
	13	Outlet characteristics for hydrologic regime	A	1			
	14	Dominant upland land use (within 500 ft)	A	1	0.1		
	15	Soil condition (wetland)	A	1			
	16	Vegetation (% cover)	95%	H	1		
	17	Emerg. veg. flood resistance	A	1			
	18	Sediment delivery	A	1			
	19	Upland soils (based on soil group)	B	0.5			
	20	Stormwater runoff pretreatment & detention	C	0.1	1		
	21	Subwatershed wetland density	C	0.1			
	22	Channels/sheet flow	A	1			
	23	Adjacent naturalized buffer average width (feet)	500	H	WQ	1 H	1
	24	Adjacent Area Management: % Full	100%	1	1	**1**	
		adjacent area mgmt: % Manicured		0			
		adjacent area mgmt: % Bare		0			
	25	Adjacent Area Diversity & Structure: % Native	100%	1	1	**1**	
		adjacent area diversity: % Mixed		0			
		adjacent area diversity: % Sparse/Inv./Exotic		0			
	26	Adjacent Area Slope: % Gentle	5%	0.05	1	**0.05**	
		adjacent area slope: % Moderate		0			
		adjacent area slope: % Steep		0			
Digital worksheet, section II	27	Downstream sensitivity/WQ protection	B	0.5			
	28	Nutrient loading	A	1			
	29	Shoreline wetland?	N	N			
	30	Rooted shoreline vegetation (%cover)		Enter a percentage			
	31	Wetland in-water width (in feet, average)		Enter a percentage			
	32	Emergent vegetation erosion resistance		Enter valid choice			
	33	Shoreline erosion potential		Enter valid cho			
	34	Bank protection/upslope veg.		Enter valid choice			
	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	A	1			
	40	Wetland interspersion on landscape	A	1	1		
	41	Wildlife barriers	A	1			
	42	Amphibian breeding potential-hydroperiod	A	1			
	43	Amphibian breeding potential--fish presence	A	1			
	44	Amphibian & reptile overwintering habitat	C	0.1			
	45	Wildlife species (list)					
	46	Fish habitat quality	C	0.1			
	47	Fish species (list)					
	48	Unique/rare educ./cultural/rec.opportunity	N	N			
	49	Wetland visibility	C	0.1			
	50	Proximity to population	N	0.1			
	51	Public ownership	C	0.1			
	52	Public access	C	0.1			
	53	Human influence on wetland	A	1			
	54	Human influence on viewshed	A	1			
	55	Spatial buffer	C	0.1			
	56	Recreational activity potential	C	0.1			
	57	Commercial crop--hydrologic impact	N/A	N/A			

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:
#REF!

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*	D	R or D	1
59	*GW - Subwatershed land use*	D	R or D	1
60	*GW - Wetland size and soil group*	D	R or D	1
61	GW - Wetland hydroperiod	R	R or D	0.1
62	GW - Inlet/Outlet configuration	D	R or D	1
63	GW - Surrounding upland topographic relief	D	R or D	1
64	Restoration potential w/o flooding		Y or N	5.1
65	*Landowners affected by restoration*		*E a b c*	Enter valid choice
66A	*Existing wetland size (acres) [from #10]*	4	__ acres	
66B	Total wetland restoration size (acres)		__ acres	0.1
66C	(Calculated) Potential New Wetland Area [B-A]	-4	__ acres	% effectively drained: ####
67	Average width of naturalized upland buffer (poten	0	__ feet	0.1 value: ####
68	Likelihood of restoration success		a b c	Enter valid choice
69	Hydrologic alteration type		Outlet, Tile, Ditch, GW pump, Wtrshd div., Filling	
70	Potential wetland type (Circ. 39)		1, 2, 3, 4, 5, 6, 7, 8	
71	Wetland sensitivity to stormwater		E a b c	
72	Additional stormwater treatment needs		a b c	

Functional Rating Summaries

Function Name	Raw score	Final Rating	Rating Category	Formula shown to the right.
Vegetative Diversity/Integrity		0.57	Med	####
				####
Hydrology - Characteristic		1.00	High	####
				####
Flood Attenuation		0.60	Med	####
Water Quality--Downstream		0.71	High	
Water Quality--Wetland		0.83	High	
Shoreline Protection		N/A	N/A	
Characteristic Wildlife Habitat Structure	0.85	0.85	High	#REF!
				#REF!
Maintenance of Characteristic Fish Habitat	0.70	0.70	High	#REF!
				#REF!
Maintenance of Characteristic Amphibian Habitat		0.85	High	
				#REF!
Aesthetics/Recreation/Education/Cultural	0.33	0.33	Med	#REF!
				#REF!
Commercial use		N/A	N/A	0
Special Features listing:			#REF!	####

Groundwater Interaction	discharge	#REF!
Groundwater Functional Index	#REF!	#REF!
Restoration Potential (draft formula)	#VALUE!	#####
Stormwater Sensitivity (not active)		