MN Wetland Professional Certification Program Introduction Class- Day 4

BOARD OF WATER AND SOIL RESOURCES

Minnesota Wetland Professional Certification Program

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Quiz

1) The Wetland Conservation Act is a:

a) Federal Law passed in 1972.

b) State Rule, passed as a bipartisan statute in 1991, implemented by Local Government Units.

c) State Rule, passed in 1991, which is administered by the MNDNR.

d) Recommended set of best management practices for activities in wetlands.

2) When describing a soil profile, which of the following steps should a delineator do first?

a) Texture all layers in profile

b) Determine matrix and redoximorphic colors of all layers

c) Apply hydric soil indicator

d) Determine all hydrology indicators present within the borehole

2

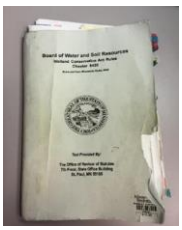
3) Which Agency has administrative oversight and Rulemaking authority for the WCA?

a) Local Government Units

b) MN Board of Water and Soil Resources

c) MN Department of Natural Resources

d) Local Soil & Water Conservation Districts



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4) While most wetlands are non-navigable, they still may be considered the following and thus regulated under the Federal Clean Water Act:

a) Incidental wetlands

b) Perpetual Conservation Easement

c) Upland

d) Waters of the United States

5) Which regulatory program defines it's jurisdictional boundary by the ordinary high water level?

a) Section 404 of Clean Water Act

b) Wetland Conservation Act

c) Section 401 of Clean Water Act

d) Public Water Works Permitting Program

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6) Which Federal regulatory program regulates the discharge of dredged or fill material:

a) Food Security Act

b) Rules of the Department of the Interior

c) Section 401 of the Clean Water Act

d) Section 404 of the Clean Water Act

7) The WCA regulates:

a) Peat mining

b) Normal farming practices

c) Draining, filling of all wetland types

d) Incidental wetlands

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8) Which of the following is not a LGU's role in administering the WCA:

a) Make decisions on applications made under the WCA

b) Completely fill out a joint application for the landowner

c) Coordinate TEP meetings when needed

d) Provide knowledgeable and trained staff

9) The role of the Technical Evaluation Panel does not include:

a) Operate objectively.

b) Perform LGU duties such as noticing applications.

c) Generate findings as requested by the LGU.

d) Make recommendations to the LGU based their findings.

6

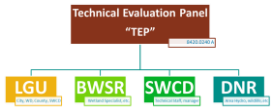
10) For a project in a shoreland area, the Technical Evaluation Panel consists of:

a) The LGU, Army Corps and DNR.

b) The LGU, SWCD, BWSR and Army Corps.

c) The LGU, SWCD, BWSR and DNR.

d) The Army Corps and DNR.



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11) What are the 3 general types of adaptations that plants have made to grow in anaerobic soil conditions:

Morphologic, reproductive, physiologic

12) In the table, place the following plant indicators from most likely to least likely to occur in a wetland.

OBL
FACW
FAC
FACU
UPL

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13) A delineator walks into a wetland edge and observes over 75% areal coverage of cattail (OBL) with 2 other species (both FAC) that are less than 5% coverage each. What hydrophytic vegetation indicator test should they use?

a) Rapid Test of Hydrophytic Vegetation
b) Dominance Text is >50%
c) Prevalence Index is ≤ 3.0
d) Morphological Adaptations

14) How many dominant species are there in the sample point data below?

Species	Strata	% Coverage
Species A	Shrub/sapling	5
Species B	Herbaceous	20
Species C	Herbaceous	20
Species D	Herbaceous	30
Species E	Herbaceous	15
Species F	Herbaceous	30
Species G	Tree	3

a) 1
b) 2
c) 3
d) 4

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Quiz

15) What is the recommended sampling size for the sapling/shrub, herbaceous, and tree strata? Use the table below.

Strata	Plot Size (feet)
Tree	30
Shrub/sapling	15
Herbaceous	5
Woody vine	30

Minnesota Wetland Professional Certification Program

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Basic WCA Decision Types

BOARD OF WATER AND SOIL RESOURCES

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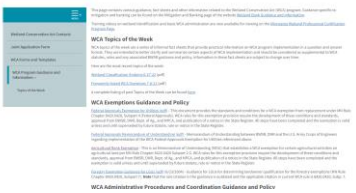
WCA

- WCA Program Guidance



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Basic WCA Decision Types

WCA Basic Decision Types	
Boundary and Type	Approves wetland delineation
No-Loss	Approves activities that do not result in permanent impacts
Exemption	Approves impacts exempt from replacement

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1. Is it a *Wetland*?
2. Is the activity *Regulated*?
3. Is the activity an *Impact*?

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What is regulated by WCA?

What is considered Impact?

A loss in quantity, quality, or biological diversity of a wetland *caused* by draining or filling in all types or by excavation in semipermanently and permanently flooded areas.

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What is Drainage?

Any method for removing or diverting waters from a wetland.

- Excavation of a ditch
- Tile Installation
- Filling
- Diking
- Pumping
- Diverted water
- Etc.

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What is Fill?

Any solid material **added or redeposited** in a wetland

- Alters cross-section or hydrological characteristics,
- Obstructs flow patterns,
- Changes Boundary, or
- Converts to non-wetland.

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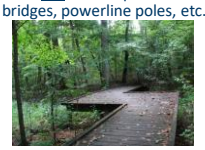
Wetland Fill

- Does not include posts for walkways, bridges, powerline poles, etc.



- Does not include slash or woody vegetation as long as it originated from vegetation growing in the wetland and does not impair flow or circulation of water.

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- Wetland fill *does not* include posts and pilings unless it turns wetland into a nonaquatic use or significantly alters its functions and value.

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What is Excavation?

Removal of soil by any method if it results in an impact.

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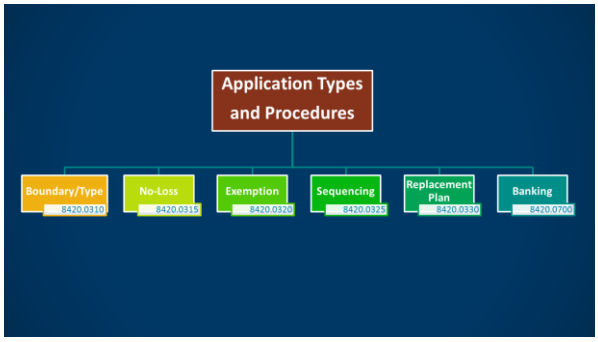

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Boundary/Type Applications: Where wetland regulation meets science

- Boundaries must be delineated using USACE 1987 Manual and Supplements (8420.0405 subp 1)
- Wetland Types must be identified using HGM (WCA) and Eggers and Reed (Corps)
- Requires NOA and NOD.
- Technical Decision- one member of TEP must make a site visit

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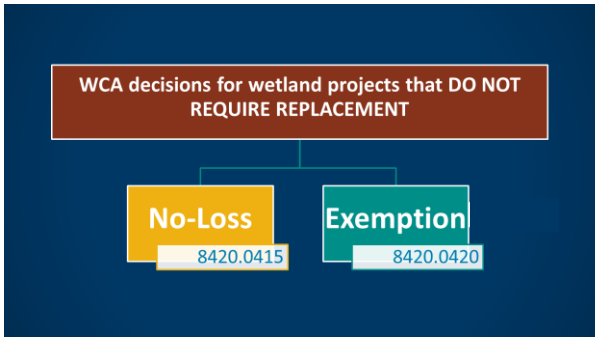

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No-loss and Exemption conditions

- Every activity in wetland, regardless of whether an application is submitted must:
  - Implement erosion control measures to prevent sedimentation of wetlands
  - Not block fish activity
  - Comply with all other applicable local, State, Federal requirements, including best management practices

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No Loss Activity Basics

Defined:

No permanent loss of, or impact to, wetlands from an activity.

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No-Loss Criteria

"No-loss" means no permanent loss of, or impact to, wetlands from an activity according to the criteria in this part.

- **Will not impact a wetland (**8420.0415 Subp A.)
- **Excavation limited to removal of sediment or debris** Trees, logs, beaver dams, trash, blockage of culverts (8420.0415 Subp B.)
- **Water level management (**8420.0415 Subp C.)
- **Excavation limited to removal of sediment** in wetlands utilized as storm water basins. (8420.0415 Subp E.)
- **Operation, Maintenance or Emergency Repair**. (culverts) (8420.0415 Subp F.)
- **Temporary impact** if: Returned to previous conditions. Activity completed within 6 months (8420.0415 Subp H.)

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No-Loss

- **Temporarily crossing or entering a wetland to perform silvicultural activities**, including timber harvest as part of a forest management activity, so long as the activity limits the impact on the hydrologic and biologic characteristics of the wetland; the activity does not result in the construction of dikes, drainage ditches, tile lines, or buildings; and the timber harvesting and other silvicultural practices do not result in the drainage of the wetland or public waters (8420.0415 Subp G)
- **Activity conducted as part of an approved replacement or banking plan, conducted or authorized by public agencies** for the purpose of wetland restoration or fish and wildlife habitat restoration (8420.0415 Subp D)

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General Exemption Requirements for ALL

- Only has to fit one; not disqualified if not exempt by another
- If impacts exceed max allowed = nothing is exempt
- Max may not apply to all situations or wetlands-**very specific**
- May not be combined on a project
- Must stabilized to prevent sedimentation/erosion.

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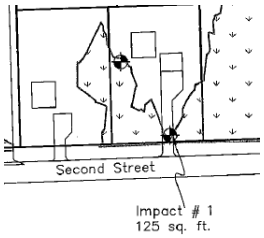
Exemptions 8420.0420

- Impacts to wetlands that **DO NOT** require replacement.
  - The activity is still regulated.
  - WCA does not REQUIRE an application; some LGU's may via ordinance.
  - May not be combined on a project.
- Exemptions do not apply to calcareous fens, wetland bank sites, project-specific replacement sites (8420.0420 Subp 1B)



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Exemptions – Agricultural Activities

"Agricultural land" means land devoted to the following uses and includes any contiguous land associated with the uses:

(1) pasture or hayland for domestic livestock or dairy animals;

(2) producing agricultural crops;

(3) growing nursery stocks; or

(4) animal feedlots.

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Agricultural Exemption Statute

Replacement plan for wetlands is not required for:

- impacts to wetlands on agricultural land labeled prior-converted (PC) cropland and
- impacts to wetlands resulting from drainage maintenance activities authorized by the Natural Resources Conservation Service, on areas labeled farmed wetland, farmed wetland pasture, and wetland.

Provision 1

Provision 2

The prior-converted cropland, farmed wetland, farmed-wetland pasture, or wetland must be labeled on a valid final certified wetland determination issued by the Natural Resources Conservation Service.

Applies to both

Landowner is responsible to provide a copy of the final certified wetland determination (026 and CWD map) to, and allow the Natural Resources Conservation Service to share related information with, the local government unit and the board for purposes of verification;

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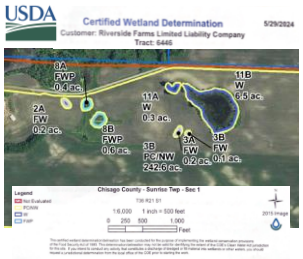
Exemptions – Ag Activities

Exempt under Ag Exemption

- Prior Converted Cropland (PC)

Exempt if applying for drainage maintenance under Ag Exemption

- Wetland (W)
- Farmed Wetland (FW)
- Farmed Wetland Pasture/Hayland (FWP)



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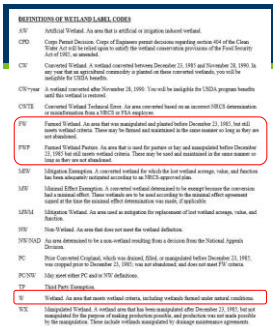
Other CWD Labels



DEFINITIONS OF WETLAND LABEL CODES

AW	Artificial Wetland. An area that is artificial or irrigation induced wetland.
CPD	Corps Permit Decision. Corps of Engineers permit decision regarding section 404 of the Clean Water Act will be relied upon to satisfy the wetland conservation provisions of the Food Security Act of 1985, as amended.
CW	Converted Wetland. A wetland converted between December 23, 1985 and November 28, 1990. In any year that an agricultural commodity is planted on these converted wetlands, you will be ineligible for USDA benefits.
CW+year	A wetland converted after November 28, 1990. You will be ineligible for USDA program benefits until this wetland is restored.
CWTE	Converted Wetland Technical Error. An area converted based on an incorrect NRCS determination or misinformation from a NRCS or FSA employee.
FW	Farmed Wetland. An area that was manipulated and planted before December 23, 1985, but still meets wetland criteria. These may be farmed and maintained in the same manner so long as they are not abandoned.
FWP	Farmed Wetland Pasture. An area that is used for pasture or hay and manipulated before December 23, 1985 but still meets wetland criteria. These may be used and maintained in the same manner so long as they are not abandoned.
MW	Mitigation Exemption. A converted wetland for which the lost wetland acreage, value, and function has been adequately restituted according to an NRCS-approved plan.
MW	Minimal Effect Exemption. A converted wetland determined to be exempt because the conversion had a minimal effect. These wetlands are to be used according to the minimal effect agreement signed at the time the minimal effect determination was made, if applicable.
MWM	Mitigation Wetland. An area used as mitigation for replacement of lost wetland acreage, value, and function.
NW	Non-Wetland. An area that does not meet the wetland definition.
NW/NAD	An area determined to be a non-wetland resulting from a decision from the National Appeals Division.
PC	Prior Converted Cropland, which was drained, filled, or manipulated before December 23, 1985, was cropped prior to December 23, 1985, was not abandoned, and does not meet FW criteria.
PC/NW	May meet either PC and/or NW definitions.
TP	Third Party Exemption.
W	Wetland. An area that meets wetland criteria, including wetlands farmed under natural conditions.
WX	Manipulated Wetland. A wetland area that has been manipulated after December 23, 1985, but not manipulated for the purpose of making production possible, and production was not made possible by the manipulation. These include wetlands manipulated by drainage maintenance agreements.

- Numerous other label codes
- Only PC, W, FW and FWP specific to the new statute

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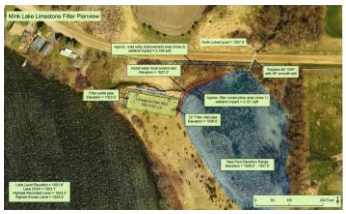
Exemptions – Agricultural Activities

Subp. 2. C.

Impacts resulting form soil and water conservation projects that are certified by the SWCD staff after review by TEP

- The projects must minimize impacts to the hydrologic and biologic characteristics of the wetland.



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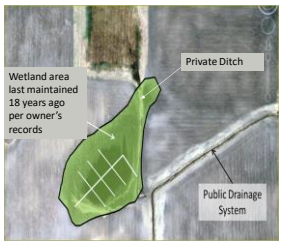
Exemptions – Drainage Exemption

A replacement plan is not required for draining or filling of wetlands, except for draining wetlands that have been in existence for more than 25 years, resulting from maintenance and repair of existing drainage systems, including public drainage systems.



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Drainage/Ditch Maintenance

Replacement not required for maintenance or repair of existing drainage systems

WHEN:

The work does not drain Wetland that have existed more than 25 years.

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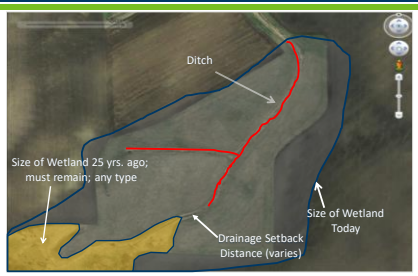
Drainage/Ditch Maintenance Illustration



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Ditch Maintenance

CONDITIONS:

- Spoil must be placed and stabilized to minimize impacts.
  - remove
  - place on existing spoil
  - incorporate
  - side cast
- Ditch must be stable and not degrade water quality downstream.

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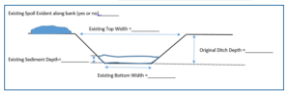
Drainage/Ditch Maintenance

What items may be needed to demonstrate this exemption is met?

- Past records of maintenance (receipt to contractors)
- Aerial Photo review
- Amount of Sediment Proposed to be removed(can be critical)
- Depth of ditch/soil types
- Culvert elevation and location
- Site visit
- Lateral Effect Calculations or estimates



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Exemptions

- **Federal Approvals** 8420.0420 Subp 4

Impacts authorized by Corps of Engineers that meet standards agreed to by BWSR, Dept. of Ag., DNR, and MPCA.

  - Pipelines, electrical, broadband, etc.

- **Utilities** MS 103G.2241

A replacement plan for wetlands is not required for wetland impacts resulting from:

- new placement or maintenance, repair, enhancement, realignment, or replacement of existing utility or utility-type service, including pipelines, when wetland impacts are authorized under and conducted in accordance with a permit issued by the United States Army Corps of Engineers under section 404 of the federal Clean Water Act
- Repair and updating existing septic systems to comply with local, state and federal regulations

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Exemptions – de minimis

- The de minimis exemption covers small impacts to wetlands typically used for driveways, culverts, small projects by landowners, etc.
- Very specific requirements depending on location in state, local area, shoreland, etc.

Table 1: Maximum de minimis exemption amounts for per MS 103G.2241 (Aug. 1, 2024)

Impacts to wetlands, **excluding** permanent and semipermanently flooded areas of wetland.	Presettlement area of state	Impact area up to (acres):	Impact area up to: (square feet):
Outside of Shoreland Wetland Protection Zone	Greater than 80 percent area	One-quarter (1/4)	10,890
	30 to 80 percent area	One-tenth (1/10)	4,356
	Less than 50 percent area	One-twentieth (1/20)	2,178
Within Shoreland Protection Zone, but beyond structure setback	Statewide	N/A	100
Within Shoreland Protection Zone and structure setback	Statewide	N/A	20 ▲(100)
Impacts to permanent and semipermanently flooded areas of wetlands	Statewide	N/A	400

▲ Increased amount shown in parenthesis my be allowed if wetland is isolated from the public water, or if permanent water runoff retention or infiltration measures are established in proximity to the impact and approved by the shoreland management authority.

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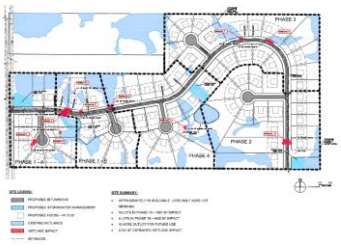
De Minimis Exemption

- Can't be combined
- If total area of impacts exceed de minimis, a replacement plan is required for the entire amount.
- May not divide property simply to get more



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Exemptions

- Subp. 7. **Forestry.** The exemption under this subpart is for roads and crossings solely constructed, and primarily used, for the purpose of providing access for the conduct of silvicultural activities. A replacement plan is not required for impacts resulting from construction of forest roads and crossings so long as the activity limits the impact on the hydrologic and biologic characteristics of the wetland; the construction activities do not include, or result in, the access becoming a dike, drainage ditch, or tile line; impacts are avoided wherever possible; and there is no drainage of the wetland or public waters.

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Exemptions

- **Wildlife Habitat** 8420.0420 Subp 9
- Excavation or the associated deposition of spoil within a wetland for the primary purpose of wildlife habitat, if:
  - Deposition is less than 5% or ½ acre
  - No adverse effect on Threatened & Endangered Species
  - Certified by SWCD or TEP
  - All spoil must be stabilized with native, noninvasive vegetation.

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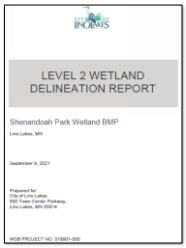
Summary of Basic WCA Decisions

- Boundary/Type: approving wetland delineation that used Corps manual: Level 1, 2, 3 or comprehensive.
- No-loss: activity that does not result in wetland impacts
- Exemptions: wetland impacts that are exempt from replacement



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Exempt?

- Located in >80% area
- Not in shoreland
- Proposed impact=7,490 SF

Impacts to wetlands, **excluding** permanent and semipermanently flooded areas of wetland.	Presettlement area of state	Impact area up to (acres):	Impact area up to: (square feet):
Outside of Shoreland Wetland Protection Zone	Greater than 80 percent area	One-quarter (1/4)	10,890
	50 to 80 percent area	One-tenth (1/10)	4,356
	Less than 50 percent area	One-twentieth (1/20)	2,178

Figure 3: Proposed Driveway

Qualifies for de minimis exemption
MN Rule 8420.0420 Subp. 8

Yes, less than ¼ acre (10,890 SF)

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De minimis - Examples

Table 1: Maximum de minimis exemption amounts for per MS 103G.2241 (Aug. 1, 2024)

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Within Shoreland Protection Zone, but beyond structure setback	Statewide	N/A	100
Within Shoreland Protection Zone and structure setback	Statewide	N/A	20 ▲(100)
Impacts to permanent and semipermanently flooded areas of wetlands	Statewide	N/A	400

▲ Increased amount shown in parenthesis my be allowed if wetland is isolated from the public water, or if permanent water runoff retention or infiltration measures are established in proximity to the impact and approved by the shoreland management authority.

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Scenario 1

A project is located outside of shoreland in a 50-80% area of the State and proposes to fill and impact 4,975 ft^2 of saturated mineral flat wetland for a driveway access.

Does Not Qualify:
De minimis is up to 1/10 acre (4,356 sf)

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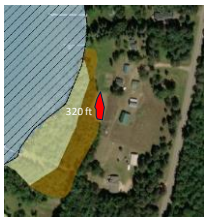
Scenario 2

A project is located within the building setback zone within shoreland in a >80% area of the State and proposes to fill and impact 320 ft^2 of a lacustrine fringe wetland.

Does not Qualify:
De minimis statewide for all wetland types within building setback is up to 20 sf.



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Scenario 3

A project is located outside of shoreland in a greater 80% area of the State and proposes to fill and impact 5,800 ft^2 of a saturated mineral flat wetland.

Qualifies:
De minimis is up to 10,890 sf (1/4 acre)

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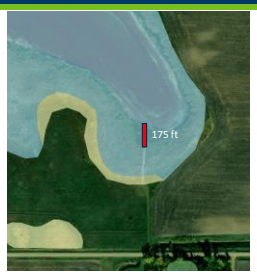
Scenario 4

A project is located in the less than 50% area of the State and proposes to excavate 175 ft^2 of a permanently flooded area of wetland.

Not enough info to determine:
What is the shoreland status?



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Replacement Plan Applications

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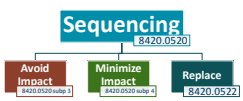
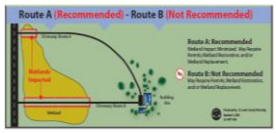
Replacement Plans



8420.0330 REPLACEMENT PLAN APPLICATIONS.

Subpart 1. **Requirement.** A landowner proposing a wetland impact that requires replacement under this chapter must apply to the local government unit and receive approval of a replacement plan before impacting the wetland.



BWSR Wetland Section | www.bwsr.state.mn.us/wetlands

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Preapplication Meeting

- Prior to preparation of an application;
- Meet with the LGU/TEP, provide basic information of the project
- LGU/TEP inform the applicant of sequencing requirements and criteria to evaluate the replacement plan

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Application Contents

- Information necessary to be considered a complete application (a lot of this info can be pulled from the delineation report)
- For the impacted Wetland:

1. The amount of wetland impact (in sq ft or acres) by type
2. Minor/Major watershed, County, and Bank Service Area (BSA)
3. Soil survey of site, identify hydric soils
4. Hydrologic inlets and outlets, adjacent Public Waters (shoreland), floodplain

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Application Contents Continued…

5. Information pertaining to special considerations (8420.0515) (Threatened & Endangered species, rare communities, cultural resources, etc.)
6. List of known local, state, and federal permits required for the activity
7. Identify project purpose and need and alternatives considered

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56

Application Contents Continued…

- C. for the replacement wetland when the replacement consists of wetland bank credits:
- (1) the wetland bank account number;
- (2) the minor watershed, major watershed, county, and bank service area; (3) the amount of credits to be withdrawn in square feet; and
- (4) a completed application for withdrawal of wetland credits from the wetland bank in a form provided by the board or a purchase agreement signed by the applicant and bank account holder; and
- D. a description of the required replacement as determined according to the proposed replacement actions and the replacement standards in part 8420.0522.

57

57

Special Considerations (8420.0515)

These factors must be considered by the applicant before submitting a replacement and by the LGU during the review

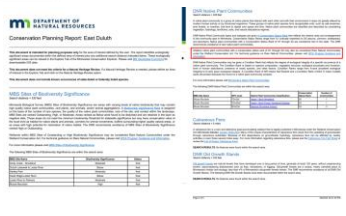
1. Endangered and threatened species (DNR natural heritage/nongame)
2. Rare natural communities (DNR natural heritage)https://mce.dnr.state.mn.us/
3. Special fish and wildlife resources (fish spawning, water birds, waterfowl, deer wintering/wildlife corridor)
4. Archaeological, historic, or cultural resource sites (National Register of Historic Places, State Historical Preservation Office) https://mn.gov/admin/shpo/
5. Groundwater sensitivity (Decorah edge, Geologic Sensitivity)

58

Special Considerations Continued…

6. Sensitive surface waters (trout stream)
7. Education or research use (Cedar Creek, Anoka Co)
8. Waste disposal site (former dump, superfund, TCAAP/AHATS)
9. Consistency with other plans (watershed management, land use, planning and zoning)

59



MN Conservation Explorer

60

Sequencing: 8420.0520

- LGU **MUST NOT** approve a wetland replacement plan unless the LGU finds the project complies with sequencing.

61

Key Concepts

- Sequencing is a MUST for all replacement plans
- TWO avoidance alternatives
- Evaluate projects…can wetlands be avoided?
- Are impacts minimized?
- Long term effects
- 8420.0520 Subp C – Page 45 of 2009 Rule book

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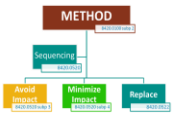
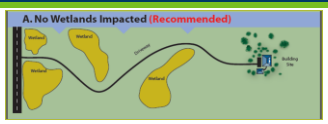
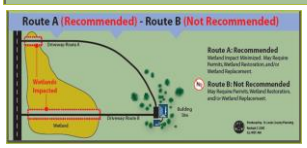
Sequencing

- **Avoid**
- **Minimize**
- **Replace**







63

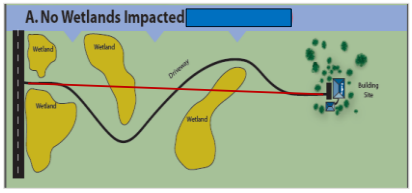
How does applicant *demonstrate* sequencing?

- Clearly define the **purpose** of the project.
- Identify the physical, economic, and/or demographic **requirements** of the project.
- **Justify** why this project should or must go on this site.
- Show (concept plans, discarded grading plans, etc.) and describe other *reasonable* **alternatives** that were considered or could be considered.

64

Impact Avoidance

- If LGU finds that a Feasible and Prudent Alternative exists that avoids impacts, the application must be denied.



65

Alternatives Analysis

What is *feasible* and *prudent*?

WCA rule tells us (8420.0520 subp 3C(2)):

- Can be done from an engineering perspective
- Is in accordance with accepted engineering standards and practices
- Is consistent with public health, safety, and welfare requirements
- Is environmentally preferable based on social, economic, and environmental impacts
- Would not create any truly unusual problems

66

Evaluating Alternatives (continued)

- LGU must consider (8420.0520 subp 3C(3)):
  - Could the size, configuration, or density of the project be modified to avoid wetlands?
  - Has the applicant made efforts to remove constraints (zoning restrictions, ordinance requirements, etc.) that are causing wetland impacts (i.e. request for variances, PUD, conditional use permit, etc.)?

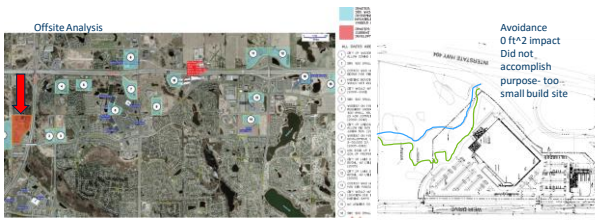
67

What if an avoidance alternative DOES exist?

- If the LGU determines that a feasible and prudent alternative exist that avoids wetland impacts, it MUST DENY the replacement plan.

68

Avoidance



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70

Alternatives Analysis Continued…

Future considerations when reviewing a site and potential off-site impacts

71

Figure 4 - Proposed Plan and Wetland/Tributary Impacts

Alternatives Analysis

- Direct and secondary impacts:

A wetland may not be directly impacted (filled/drained/excavated) but can be impacted through loss of hydrology (storm pond, curb/gutter, pipes, etc.)

72

What if an avoidance alternative does NOT exist?

- LGU evaluates:
  - Minimization
  - Rectification
  - Reduction/Elimination of impacts over time
  - Replacement

73

Impact Rectification

- Temporary impacts must be rectified by repairing, rehabilitating, or restoring the affected wetland to pre-project conditions

74

Reduction or Elimination of Impacts Over Time

- Once complete, further impacts must be reduced or eliminated and preserve or maintain wetland functions
- Best Management Practices (BMP)
- Silt fence
- Storm-ponds
- Buffers
- Rip-Rap

75

Sequencing Flexibility

Allowed at the discretion of the LGU if:

1. Impacted wetland degraded;
2. Avoidance results in severe degradation;
3. Upland site of the project or replacement has greater function and value;
4. Human health and safety is a factor.

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Sequencing – Replacement

Final Review Step

LGU must evaluate if unavoidable impacts will be adequately replaced AND if correctly sited.

Adequate Replacement

- Must replace the functions and values at an equal or greater level than that which was lost.
- Uses wetland area as the unit of measurement (acreage or sq. ft.)

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Replacement Ratios

Minimum Replacement Ratios: Banking

Location of impact	Replacement	Minimum replacement ratio
>80% area or agricultural land	Outside bank service area	1.5:1
	Within bank service area	1:1
<50% area, 50-80% area, and nonagricultural land	Outside bank service area	2.5:1
	Within bank service area	2:1

Must follow a priority order:

1. Minor Watershed
2. Major Watershed
3. Same BSA
4. Another BSA

If not available in 1, move to next, etc.

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Result?


BOARD OF WATER AND SOIL RESOURCES

Minnesota Wetland Conservation Act
Notice of Decision

A formal NOD document that summarizes the decision, is supported by technical findings and is valid for 5 years.

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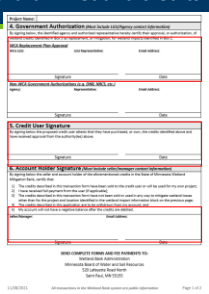
Application to withdraw wetland credits


Credit Withdrawal Form
Minnesota Wetland Bank Program

- Be sure to complete all sections!
- Form auto calculates fees
- Signatures



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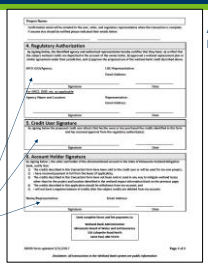
Credit Transactions

When processing transactions we need LGU name and contact. Typed or printed information makes it easier to figure out.

Transaction forms cannot be processed without required signatures.



Applicant and LGU will get verification letter once BWSR processes.


Wetland Bank Credit Withdrawal Verification

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Wetland Banking

BOARD OF WATER AND SOIL RESOURCES

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Overview

- Purpose of Wetland Banking
- Types of Wetland Banks
- Actions Eligible for Credit
- Establishing a Wetland Bank
- Certification and deposit of credits
- Withdrawals and transfers
- Replacement for Public Road Projects

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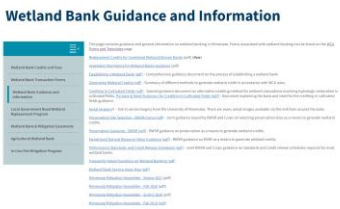
Banking

- Wetland Bank Guidance and Information



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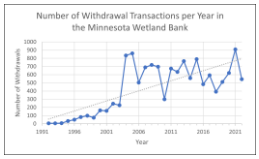
Purpose

What is Wetland Banking?

- WCA rule: "The purpose of the state **wetland banking** system is to provide a market-based structure that allows for replacement of unavoidable impacts with pre-established replacement wetlands."
- Federal Mitigation Rule definition (33 CFR 332.2): "A **mitigation bank** sells compensatory mitigation credits to permittees whose obligation to provide compensatory mitigation is then transferred to the mitigation bank sponsor."

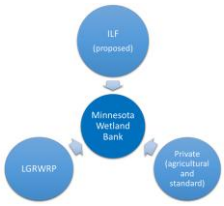


Number of Withdrawal Transactions per Year in the Minnesota Wetland Bank

85

Bank types

- Private
  - Standard- Landowners establish bank on private land to mitigate impacts on non-ag or transportation projects
  - Agriculture- Credits can only be used for Ag projects
- In-lieu Fee (proposed)
  - Mitigation not always completed in advance
  - Open to only government and NGOs, requires compensation planning framework
- Local Government Road Wetland Replacement Program
  - Replaces impacts resulting from local transportation projects



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Actions Eligible for Credit

- Restoration of completely drained wetland
- Restoration of partially drained wetland
- Vegetative restoration of farmed wetlands
- Protection of wetland previously restored via conservation easements
- Wetland Creations
- Restoration and protection of Exceptional Natural Resource Value
- Preservation of wetlands
- (Upland) buffer areas

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Actions Eligible for Credit 8420.0526

Subpart	Action
2	Buffer
3	Restoration, Completely Drained or Filled
4	Restoration, Partially Drained or Filled
5	Vegetative Restoration of Farmed Wetland
6	Protection of Wetlands Previously Restored
7	Wetland Creation
8	ENRV
9	Preservation

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Establishing a Wetland Bank

State and Federal Review Process in Minnesota

- Draft Prospectus
  - State: Optional
  - Federal: Optional
- Prospectus
  - State: Optional
  - Federal: Required
- Mitigation Plan/Draft MBI
  - State and Federal: Required
- Final Mitigation Plan and MBI
  - Federal only and required

WCA	Corps
Draft Prospectus (optional)	Draft Prospectus (optional)
Prospectus (optional)	Prospectus (required)
Mitigation Plan (required)	Mitigation Plan (required)
Easement Acquisition	Final Mitigation Plan (MBI) (required)

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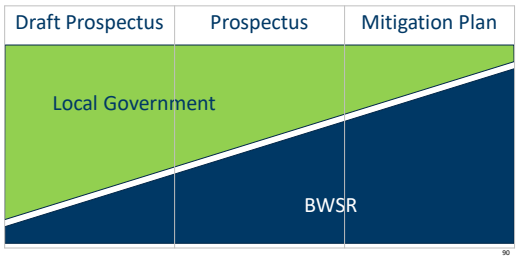
Roles in Establishing a Wetland Bank



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Draft Prospectus


Wetland Mitigation Proposal
Draft Prospectus
BWSR

- Optional
- No decision required
- Help sponsors
- Complex or difficult projects
- Minimal investment

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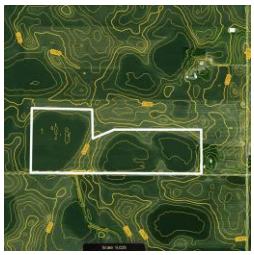
Draft Prospectus

- Basic project information
- Easement questionnaire
- Basic Features
- Why is it a good bank project
- Constraints
- Existing wetlands



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Draft Prospectus

- BWSR provides “Discussion Items”
- WS uses discussion items at TEP meeting
- TEP writes Findings based on discussion
- Sponsor receives TEP findings and decides what to do

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Prospectus


Wetland Mitigation Proposal
Prospectus

- Required by Corps
- No decision required
- Baseline Information
- Justify Credit Actions
- Justify Credit Allocation
- General Concept Plans

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Prospectus

- Crediting
- Topographic Information
- Wetland Determination
- Title Opinion
- Site Hydrology Information

WCA Wetland Bank Credit Allocation Table

Map ID	Credit Action [2]	Acres [3]	Credit Allocation			
			Minimum Credit [4]		Maximum Credit [5]	
			% Credit	Credit Amount	% Credit	Credit Amount
1	Subp 4.A/Rehabilitation	21.4	75	16.0500	100	21.4000
2	Subp 4.A/Rehabilitation	16.2	75	12.1500	100	16.2000
3	Subp 4.B/Rehabilitation	3.3	25	0.8133	50	1.6266
4	Subp 4.B/Rehabilitation	1.7	25	0.4307	50	0.8614
5	Subp 4.B/Rehabilitation	1.3	25	0.3068	50	0.6138
6	Subp 2/Upland Buffer	0.8	10	0.0774	25	0.1934
7	Subp 2/Upland Buffer	17.6	10	1.7648	25	4.4121
8A	Subp 2/Upland Buffer	2.2	10	0.2162	25	0.5405
8B	Subp 2/Upland Buffer	1.7	10	0.1728	25	0.4321
9	Earthen Embankment	0.5	0	-	0	-
	TOTAL EASEMENT SIZE	67.6	TOTAL:	32.0820	TOTAL:	46.529%

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Roles for reviewing prospectus

TEP/LGU Roles:

- Verify previous comments addressed
- Verify sponsor adequately described the site
- Review wetland delineation or determination
- Review crop history (if necessary)
- Provide LOCAL perspective on project and eligibility

BWSR Role:

- Evaluate easement issues
- Vegetation, Engineering, and Bank Coordinator comments included
- Statewide consistency
- Technical answers and interpretations
- Coordination with Corps

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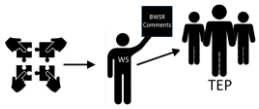
Review

- Comments become more direct
- Baseline information must justify credit actions and allocations
- Some credit actions require more information
- Project takes shape but detailed plans not required
- Balance information needs versus sponsor's cost



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Wetland Mitigation Proposal
Mitigation Plan (Full Application)
BWSR

Mitigation Plan

- Document of record
- Required for both programs
- LGU Decision Required
- Section 15.99 time limits!
- Attached to Corps' MBI

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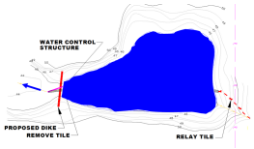
Mitigation Plan

Required:

- Detailed vegetation plans
- Detailed construction plans
- Detailed monitoring plans
- Performance standards
- Credit release schedule



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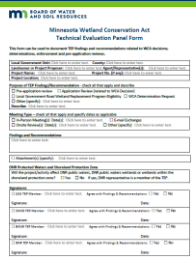
TEP Review

- Verify Corps has completed Prospectus phase
- Verify Prospectus information carried forward and comments addressed
- Verify Baseline Information is complete and adequate
- Wetland delineation approval
- Review detailed plans to your comfort level



Minnesota Wetland Conservation Act
Technical Evaluation Panel Form

100

Mitigation Plan

"Plans are nice but performance releases credits." J. Overland

- Monitoring plan must relate to performance standards
- Performance standards must relate to credit releases
- The Mitigation Plan is the basis for implementation, credit releases, and allowable actions into the future
- DOCUMENTATION IS CRITICAL

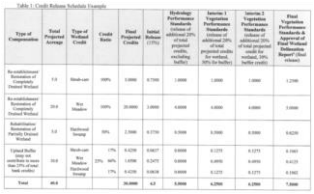


Table 1. Credit Release Schedule Example

Type of Compensation	Total Projected Acreage	Type of Wetland Credit	Credit Ratio	Final Projected Credits	Initial Release (15%)	Hydrology Performance Standards (release of additional 20% of total projected credits excluding buffer)	Interim 1 Vegetation Performance Standards (release of additional 20% of total projected credits for wetland; 50% for buffer)	Interim 2 Vegetation Performance Standards (release of additional 20% of total projected credits for wetland; 50% buffer credit)	Final Vegetation Performance Standards & Submittal of Final Wetland Delineation Report* (final release)
Re-establishment/ Restoration of Completely Drained Wetland	5.0	Shrub-carr	100%	5.0000	0.7500	1.0000	1.0000	1.0000	1.2500
Re-establishment/ Restoration of Completely Drained Wetland	20.0	Wet Meadow	100%	20.0000	3.0000	4.0000	4.0000	4.0000	5.0000
Rehabilitation/ Restoration of Partially Drained Wetland	5.0	Hardwood Swamp	50%	2.5000	0.3750	0.5000	0.5000	0.5000	0.6250
Upland Buffer (may not contribute to more than 15% of total bank credits)	10.0	Shrub-carr	17%	1.6729	0.2509	0.3345	0.3345	0.3345	0.4181
		Wet Meadow	25%	2.4990	0.3749	0.4998	0.4998	0.4998	0.6248
		Hardwood Swamp	17%	1.6729	0.2509	0.3345	0.3345	0.3345	0.4181
Total	40.0			34.0000	5.0	6.6690	6.2990	6.2990	7.8360

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Mitigation Plan Decision

- Track 15.99 time limits, extensions needed
- Most Mitigation Plans will require some revision
- Make final decision in accordance with section 15.99
- Clearly identify and retain approved Mitigation Plan
- When possible the WCA and Corps approved plans should be the same

Minnesota Wetland Conservation Act
Notice of Decision

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Easement Acquisition

GENERAL PROCESS INFORMATION

- Easement acquisition is typically initiated after mitigation plan approval
- Easement acquisition does not have to be completed prior to construction
- The process is managed at BWSR by Easement Section Staff, not Wetland Specialists
- It is the responsibility of the sponsor/landowner to initiate the easement acquisition process

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LGU role in Easement Acquisition

- Help the sponsor find the "Conservation Easement Acquisition Overview for Private Wetland Banks"
- BWSR easement staff will take it from there

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Easement Acquisition

The significant steps in the easement acquisition process include:

1. **Sponsor** submits initial $1,000 Easement Acquisition Fee **to BWSR** along with application
2. **BWSR** performs a preliminary review of ownership information to identify potential issues
3. **Sponsor provides** DRAFT Certificate of Survey in required format **for BWSR review & comment**
4. **BWSR provides** sponsor with instructions to obtain Title Commitment
5. **Sponsor (landowner) provides** Title Commitment **to BWSR** for State Attorney General (AG) review & comment
6. **BWSR prepares** Conservation Easement document to be signed by landowner
7. **Landowner signs Easement and returns to BWSR** with $2,400 Easement Acquisition Fee balance
8. **BWSR sends** instructions to record the Easement and issue a Title Insurance Policy
9. **BWSR notifies sponsor** that easement acquisition process is complete

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Construction Certification

- LGU must certify the initial construction
  - Documentation:
    - as-built drawing
    - surveyed map
    - seed tags
    - construction photos
- Site Visit with TEP
  - Recommend TEP Findings of Fact

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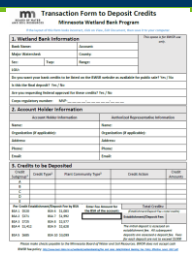
Credit Deposits

- Up to 15% of the credits are eligible for deposit after the certification of construction
- Remaining credits are eligible for deposit based on the credit release schedule and performance standards in the approved bank plan
- Subject to review by the LGU & TEP
- After certifying the credit for deposit, the LGU must forward to BWSR banking administrator


Transaction Form to Deposit Credits
Minnesota Wetland Bank Program

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Local Government Road Wetland Replacement Program

- WCA exempts certain local road projects from State wetland replacement requirements
- BWSR is required to replace the associated wetland impacts so the local governments don't have to
- These wetland credits also satisfy Corps of Engineers' Section 404 permit requirements

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What projects Qualify?

- **Repair, rehabilitation, reconstruction** or **replacement** of **currently serviceable** existing State, City, County or Town public road.
  - Provided that:
    - Project **minimizes impacts**
    - **Plans are provided** to the LGU
- What doesn't qualify?
  - New roads
  - Roads expanded solely for additional capacity lanes

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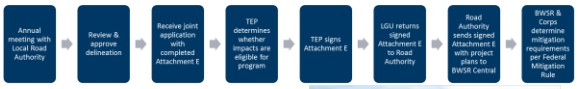
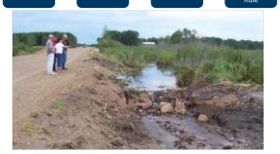
Reviewing Local Road Projects





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Joint Application Form


Joint Application Form for Activities Affecting Water Resources in Minnesota

For Local Road Projects:

- Parts 1-5; Attachments C and E
- May need Attachment D if there will be impacts that do not meet the Local Road Program eligibility requirements

111

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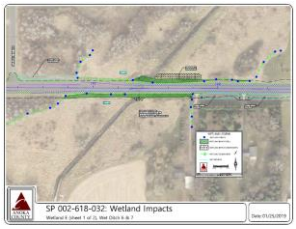
Application Requirements

Local Road Unit should provide TEP the following:

- Project plans depicting wetland boundaries
- Description of wetland impacts by type
- Information demonstrating wetland impact minimization
- Only one alternative is required



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Good Example

MnDOT's Road Design Manual (2000) also recommends turn and/or bypass lanes for rural undivided roadways with traffic volumes over 1,500 ADT and speed limits above 45 mph. Current road condition compared with required and proposed are laid out in the table below.

	Existing	Required	Proposed
Lane Width (ft)	12	11-12	12
Shoulder Width (ft)	0-6	8	8
In-Slope	1:4	1:4	1:4

This project is proposed to improve CSAH 18 to meet today's State Aid Standards and improve safety along the corridor.

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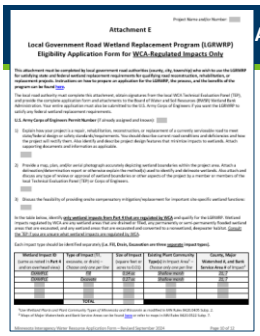
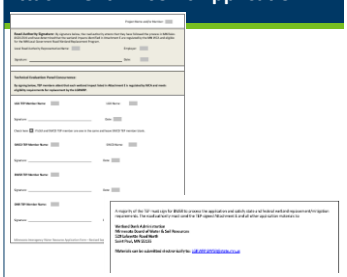
Attachment E – Joint Application


Attachment E

Local Government Road Wetland Replacement Program (LGRWRP)
Eligibility Application Form for WCA-Regulated Impacts Only



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Quick facts on Ag bank

Eligibility to USE the Ag Bank:

✓The wetland must be proposed to be impacted for agricultural use.

✓The land must remain in agricultural use.

✓The wetland must be a farmed wetland (FW) or otherwise degraded wetland on existing agricultural land.

Differences with Standard Bank:

- Credits can only be used for Ag projects
- Flexibility on Vegetation Standards
- Expired CRP sites could be eligible "as-is"

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Review

- Types of Wetland Banks
  - Standard
    - Private and Agriculture
  - Local Road Program
- Replacement for Public Road Projects
  - Repair, rehabilitate, reconstruction of currently serviceable roads
- Actions Eligible for Credit
  - Restoration of drained wetlands, vegetation restoration, protection, ENRV, Preservation, upla buffer
- Establishing a Wetland Bank
  - Draft Prospectus
  - Prospectus
  - Mitigation Plan
- LGU and TEP procedures for banking
  - Construction Certification, deposit of credits, withdrawal of credits

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Wetland Bank Monitoring

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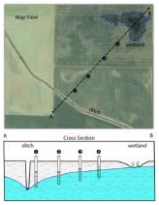
Overview of Wetland Bank Monitoring

- Monitoring process
  - Construction Certification
  - Duration of monitoring
  - Deposit of Credits
- Maintenance responsibilities
  - Monitoring reports
  - Timeline
  - Reports
- Corrective Actions



- Hydrology Monitoring
  - Performance standards
- Vegetation Monitoring
  - Performance standards

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General Monitoring roles once wetland bank is approved

LGU/Corps roles:

- certify construction
- certify credits for deposit
- review monitoring reports
- may require corrective actions as needed

Sponsor/landowner roles:

- Sponsor responsible for maintenance
- Submitting as-built documentation
- Submitting wetland credit deposit transaction form(s)
- Submitting monitoring reports
- Paying administrative fees

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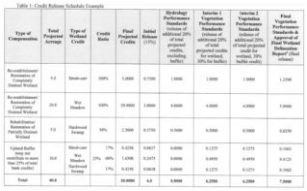
Monitoring Schedule

- Monitoring must begin no later than first full growing season after construction certification
- Must continue for at least 5 full growing seasons
- If unsuccessful, the LGU may extend the monitoring period (<5 additional years)
- Actual monitoring schedule may vary for different bank types (restoration vs preservation)



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Performance Standards

- Performance standard: observable or measurable physical (including hydrological), chemical and/or biological attributes that are used to determine if a compensatory mitigation project meets its objectives.

Examples:

- Vegetation
  - *"85% of the site is vegetated by planted species and/or regenerated species as per approved plan by end of 5th complete growing season."*
- Hydrology
  - *"Hydrology must meet wetland definition of 1987 Corps of Engineers Manual with saturation to the surface of the soil for at least 31 days of the growing season."*

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Monitoring Report

- Submitted following the first full growing season no later than 12/31
- Then submitted as per approved bank plan
- May include Transaction Form to Deposit Credits


Transaction Form to Deposit Credits
Minnesota Wetland Bank Program

Contents of the report:

- Project location map
- Description of performance standards
- Activities completed and planned
- Hydrology measurements
- Plant communities map
- Color photographs
- Other information specified from approved plan

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Reviewing Monitoring Reports

A. Success Criteria Summary

Summary of Success Criteria Standards and Current Metrics for 2017.

Metric	Success Criteria	Measured Criteria	Success Criteria Met?	Comments
Hydrology – *Standards used for 2011 - 2016*				
Elevation	Water between 6-inches above and one foot below ground surface	Measured hydrology is between 6 inches above and one foot below ground surface	Yes	*Formal hydrology monitoring not required for 2017. Success based on direct site observations*
Duration	Majority of the growing season	Hydrology was within the desired range for the majority of the growing season.	Yes	
Vegetation				
Diversity	Minimum of five native species	79 native species have been observed	Yes	Species diversity increased from 2016 to 2017
Composition	Minimum two sedges and two grasses	Eight sedges and eight grasses have been identified	Yes	Species composition stable
Invasive species coverage	No more than 10% total cover	Total cover of invasive species is less than 10%, and has been effectively controlled.	Yes	Reed canary grass is less than 5% coverage.
Invasive species concentration	No single areas greater than one-quarter acre in size	Invasive species remain under control with no single area greater than one-quarter acre in size	Yes	Slight increase of wing ditches, but sprayed again in fall 2017 to control

- Know performance standards
- Interpret data to determine whether the site meets those standards
- If not, document with data what is not meeting standard
- Consult with TEP & Corps
- Then corrective actions should be recommended

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Hydrology

Considerations in planning hydrologic monitoring project:

- What is the question?
- What is the performance criteria?
  - Precision?
- Site characteristics
  - Landscape position, hydrology setting, soil, vegetation, drainage features
- Pre-existing data
- Timeline and available resources

- BWSR Hydrology Guidance documents

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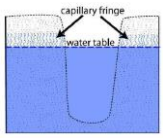
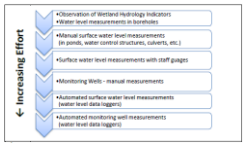
Methods to monitor hydrology

- Observation of indicators
- Staff gauges
- Open boreholes



- Monitoring wells
  - Manual measurements
  - Automated measurements



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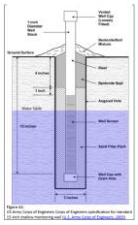
Design and location of monitoring wells

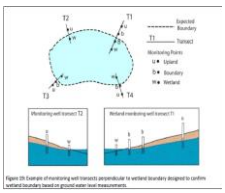


Monitoring wells

- Screen, Riser, Sand Pack, Bentonite seal

Well location

- Depends on the question:
  - Single well will tell if hydrology is present
  - Complex sites require transects based on landscape position, etc.
    - Professional judgement



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Monitoring Well Data

Hydrograph:

- Growing season
- Normal “envelope”
- 30 day rolling total
- Daily Precipitation

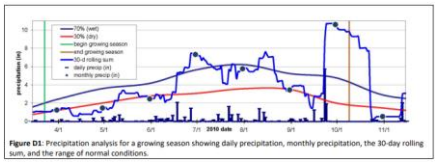

Figure D1: Precipitation analysis for a growing season showing daily precipitation, monthly precipitation, the 30-day rolling sum, and the range of normal conditions.

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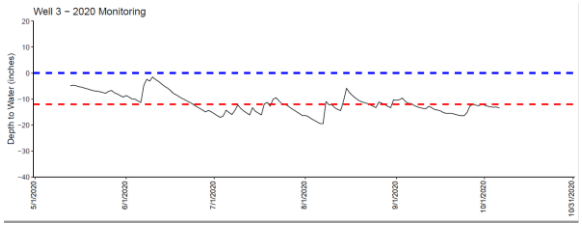
Seasonally Saturated



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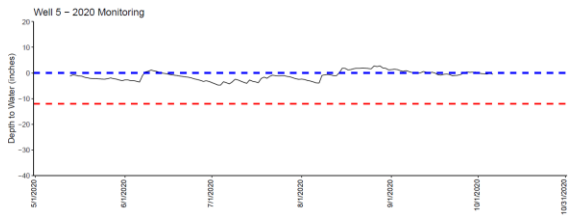
Shallow Inundation



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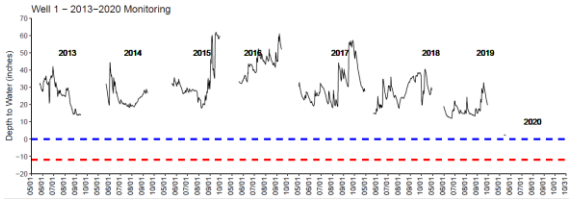
Permanent inundation



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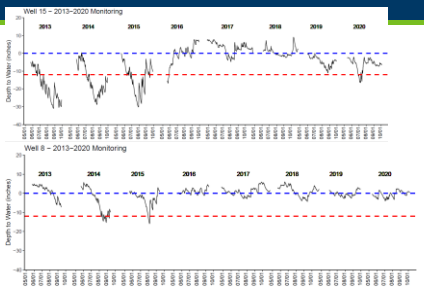
Shows restoration of mid 2015



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Interpreting Hydrology

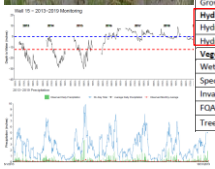

Table 1: Summary of Wetland Success Criteria for Phase I

Success Criteria	Phase I		
	Wet Meadow	Hardwood Swamp	Shallow Marsh
Duration			
Growing Seasons	5	4	5
Hydrology			
Hydrology (depth to water table)	Surface to -12"	Surface to -12"	+6" to -12"
Hydroperiod (duration within zone)	Meets duration	Meets duration	Meets duration
Vegetation			
Wetland Indicator (% FAC or wetter)	41/52 = 79%	39/51 = 76%	20/22 = 91%
Species Composition (Native Richness)	39/52 = 75%	39/51 = 76%	19/22 = 86%
Invasive Cover (% non-native)	2%	9%	2%
FQA/WFQA	20.2/26.7	20.0/21.4	16.9/19.7
Tree Coverage (trees per acre)	N/A	26.48	N/A

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Vegetation Monitoring for Wetland Bank Sites

Vegetation Monitoring for Compensatory Wetland Mitigation Sites

- Developing a vegetation monitoring plan
- Sampling methods
- Where and when to monitor
- Monitoring plan considerations
- Reporting monitoring results

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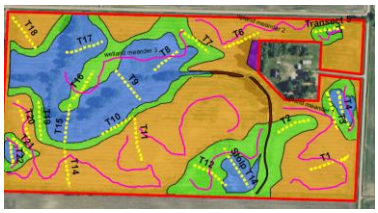
Vegetation

- Methods to monitor vegetation:
  - Floristic Quality Assessment
  - Mapping plant communities
  - Estimating invasive species



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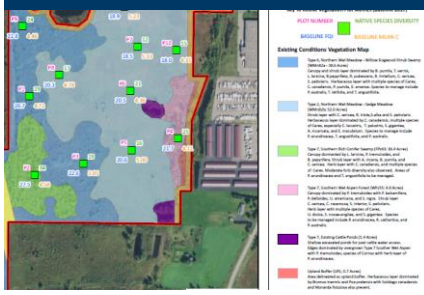
Vegetation



- Floristic Quality Assessment and plots

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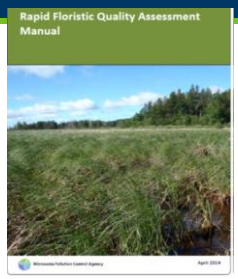
Floristic Quality Assessment

- Vegetation condition assessment to measure the quality of a native plant community
- Developed by the MN Pollution Control Agency
  - 2007, Statewide C-values
  - Efforts to regionalize C-values underway
- Intended to compliment functional assessments such as MNRAM



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FQA Key Concepts

- Key concepts:
  - Species conservatism- tolerance to degradation
    - Coefficients of Conservatism (C-value)
  - Floristic Quality Index
    - Species richness and mean C-values
- Sampling methods
  - Rapid FQA
  - Full Method

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FQA Key Concepts

- Coefficients of Conservatism
  - Numeric rating of an individual species fidelity in relationship to disturbance
  - C-values range from 0-10
    - 0= most tolerant, found in wide variety of plant communities
    - 10= least tolerant, found in narrow range of plant communities
    - Non-native species = 0
      - Reed Canary Grass (introduced) C=0
      - Ostrich Fern (FAC, NCNE) C=5
      - Pink lady slipper C=9

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Sampling Methods Overview

- FQA Sampling Protocol:
  - Map Assessment Area
  - Determine Plant community types
  - Conduct timed meander (rapid) or plot-based sampling
  - Conduct shoreland sampling (if necessary)
  - Make Areal cover estimations
  - Calculations
- Full FQA -Plot-based sampling
- Rapid FQA- Timed meander rules
  - Areal cover in cover classes for each species

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Metrics

Variables:

- Number of species = Species Richness
- Mean C-value
- Mean C-value (weighted) (wC)
  - $wC = \sum pC$

Floristic Quality Index

- Integral measurement of FQA

$$FQI = \overline{C}\sqrt{S}$$

  - mean C value
  - S= number of species (i.e. species richness)
- Both stand alone indices

Greater the FQI, the closer the condition is to a natural state

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Vegetation

- Interpreting vegetation data
  - Indicator status (% FAC or wetter)
  - Composition (% native species richness)
  - Invasive cover (%)
  - Floristic Quality Assessment (index rating)

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Tree Coverage (trees per acre)	N/A	26.48	N/A

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Corrective Actions

- If, during the monitoring period, the LGU/Corps or TEP determine that a bank site does not meet the approved plan's specifications, the LGU must require corrective actions
- BWSR can freeze accounts by restricting deposits, withdrawals, transfers until the LGU determines the site is in compliance
- Noncompliance of bank sites is subject to enforcement procedures

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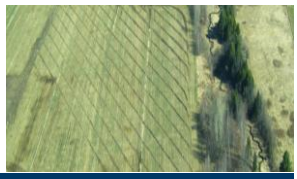

Altered Hydrology

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Minnesota Wetland Professional Certification Program

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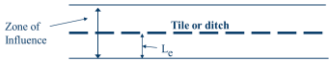
Lateral Effect

- Lateral Effect (L_e)
- The distance on each side of a tile or ditch in its longitudinal direction where the ditch or tile has an influence on the hydrology
- Measured perpendicular from midpoint of tile line or toe of ditch bank



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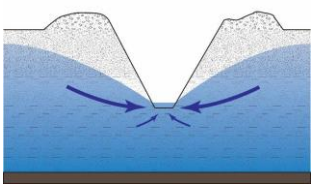
Lateral Effect

- Factors influencing Lateral Effect
- Depth
- Soil Properties
  - Hydraulic conductivity
  - Drainable porosity
- Grade
- Impermeable Layer



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Effectively Drained

- A condition where ground or surface water has been removed by artificial means to the point that an area no longer meets the wetland hydrology criterion
- "Artificial means" is usually a ditch, tile or diversion
- The area will not support a dominance of hydrophytes but hydric soil will persist

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Drainage Setback Tables

- Developed by NRCS using the van Schilfgaarde equation from the ND-Drain program
- **Setback distance** is the minimum distance from the wetland boundary to the tile line or ditch necessary to minimize adverse hydrologic impacts to adjacent wetlands
- Developed by NRCS to advise farmers

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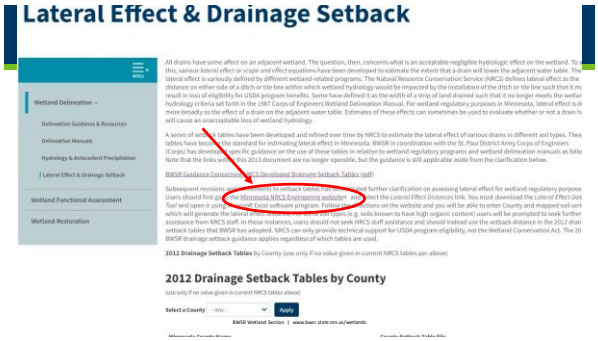

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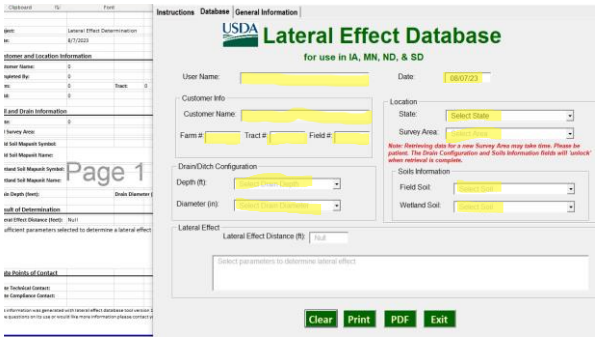

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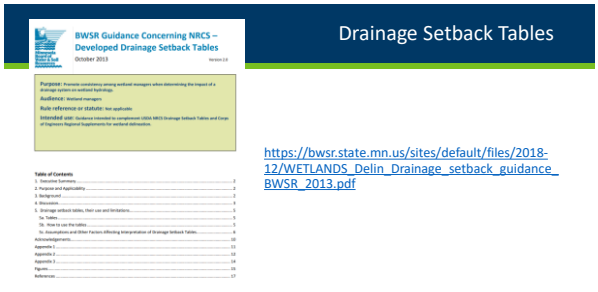

https://bwsr.state.mn.us/sites/default/files/2018-12/WETLANDS_Delin_Drainage_setback_guidance_BWSR_2013.pdf

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Drainage Setback Tables

- County-specific
- MN NRCS uses setback distance rather than lateral effect.
- **Setback distance** and **lateral effect** are not the same thing!!
- Setback tables not directly applicable for use in determining drainage impact.
- https://bwsr.state.mn.us/lateral-effect-drainage-setback

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How to use tables

1) Determine if hydrology indicators are present
2) Overlay drains on soil map
3) Determine average depth of drain per soil type
4) Determine setback distance for each soil type using NRCS table
5) Delineate setback corridor for drain
6) Identify wetlands within or adjacent to setback corridor
7) Consider all variables to determine potential wetland impact

Map Unit Symbol	Drain Depth, feet			
	2	3	4	5
124	50	60	80	100
162	50	70	90	100
167	60	80	100	120
386	80	110	110	110
386	190	210	290	350
202	130	200	260	320
218	110	150	170	190
243	50	50	70	80
292	50	70	100	120
346	60	70	90	100
428	50	60	80	90
502	60	90	100	120
532	130	180	230	290
533	50	70	80	90
540	50	70	80	90
541	200	250	300	350
543	90	110	210	290
544	50	70	80	90
546	50	70	80	90
549	200	250	300	350
564	160	250	330	400
607	110	170	220	260
615	90	150	200	250
621	90	70	100	130
625	170	220	260	290
627	50	110	210	290
628	70	100	120	140
672	60	90	110	140
685	120	220	300	370

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Drainage Setback

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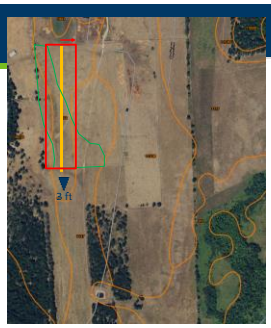
Drainage Setback



Setback Distances in feet
Cass County, Minnesota Table date: March 8, 2012

Map Unit Symbol	Drain Depth, feet			
	2	3	4	5
48	100	160	210	270
147	60	90	120	140
202	130	210	270	330
243	50	50	70	80
292	50	70	100	120
540	50	70	80	90
541	200	250	300	350
543	50	110	200	290
544	50	70	80	90
549	200	250	300	350
564	160	250	320	390
684	130	230	320	400
788	50	70	80	90
797	200	250	300	350

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Wetland Restoration

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- Wetland Restoration

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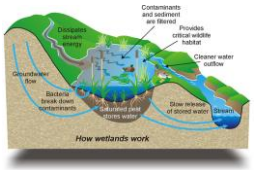
Why restore wetlands?

- Restore lost functions:
  - Wildlife habitat
  - Water Quality
  - Flood Attenuation



- Wetland Banking
- CRP/RIM
- Enforcement

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Setting function-based restoration goals and performance standards.

Establishing Goals & Measurable Outcomes:

- Restore natural hydrology
- Reestablish native plant community to site
- Performance Standards (banking)- measurable attributes to determine if restoration goals are met

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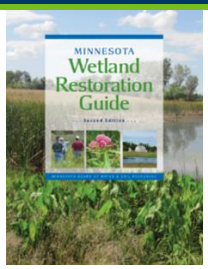
MN Wetland Restoration Guide

MN Wetland Restoration Guide:

- Planning
- Site Assessment
- Design and Construction
- Vegetation establishment
- Site Management & Monitoring



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General considerations for wetland restoration

- Identifying and selecting projects
  - Restoration over creation
- Consider potential complications from degraded sites
- Adjacent land uses (present and future?)
  - Changes to adjacent landowners?
- Location of area ditches
  - Public or private?
  - Drainage Law?
- Understand soil conditions of site (permeability, chemistry)
- Water quality

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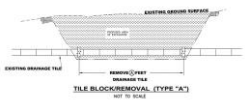
Technical Guidance Sheets

- Supplements to the MN Wetland Restoration Guide
- https://bwsr.state.mn.us/guidance-documents-tools-and-other-resources
  - Vegetation Establishment
  - Restoration Design and Construction
  - Managing Restoration Sites



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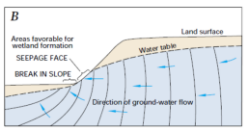
Hydrologic design considerations

Restoring natural hydrology:

- Hydrology
  - Precipitation, evapotranspiration, surface and groundwater inflow & outflow
- Hydraulics- how water flows
  - Unidirectional, bi-directional
- Landscape position
  - Surface shape
- Outlet structures
  - Location and size



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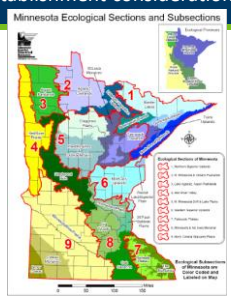
Vegetation establishment considerations

General strategies:

- Strategic site preparation
  - Planting elevation, water depth, soil type
  - Flooding frequency, duration
- Make landscape connections
- Match plant communities to site
- Restore and maintain plant diversity
  - Work with ecological variability
- Selecting seed mixes and plants
  - Species tolerance
- Manage Invasive species throughout entire site



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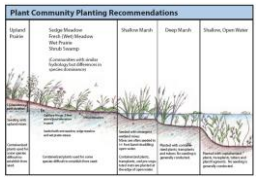
Developing a vegetation plan

- Consider topography and elevations to promote natural hydroperiods for plant species and communities
- Native Vegetation Establishment and Enhancement Guidelines
  - Comprehensive Guidebook



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Selecting seed mixes and plants

- State Seed Mixes lists
- Grassland mixes (NW, SW, SE)
- Woodland mixes (S&W, Central, NE, NW)
- Wetland mixes (NE, South & West)

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Managing Restoration Sites

- Technical Guidance Documents:
  - Herbicide application
  - Prescribed burning
  - Mowing, grazing & haying
  - Water level management (flooding & drawdown)
  - Plant Care
  - Inspecting and maintaining outlet structures
  - Animal Control

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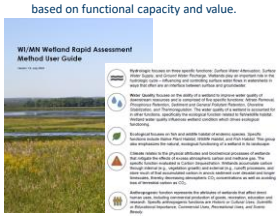
Functional Assessment Methods

- WI/MN Wetland Rapid Assessment Method
  - Rapid method for assessing wetland functions based on functional capacity and value.



- Floristic Quality Assessment
  - Vegetation based ecological condition assessment method

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WI/MN Wetland Rapid Assessment Method

- Developed by Committee of MN, Wisconsin and Federal Agencies
  - Released for public comment in 2024
- Tool assesses 17 wetland functions under five categories: hydrologic, water quality, ecological, climate, anthropogenic

Functional Group	Function
Hydrology	Surface Water Attenuation
	Surface Water Supply
	Groundwater Recharge
Water Quality	Nitrate Removal
	Phosphorus Retention
	Sediment and Pollutant Retention
	Shoreline Stabilization
	Temperature Maintenance
Ecological	Native Plant Habitat
	Wildlife Habitat
	Fish Habitat
Climate	Carbon Sequestration
Anthropogenic	Historic or Cultural Uses
	Scientific or Educational Importance
	Commercial Uses
	Recreational Uses
	Scenic Beauty

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Method

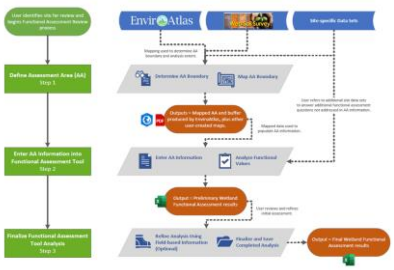
1) Identify area of interest (AOI)

2) Level one delineation of wetlands and HGM type

3) Conduct desktop review using information sources

4) Field visit- verify AOI, conduct Rapid FQA, and answer questions

5) Complete Data input and save



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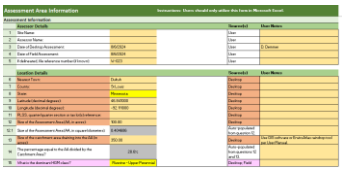
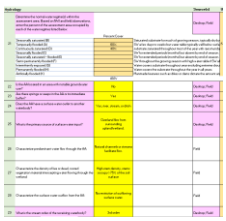
Data Entry in Spreadsheet





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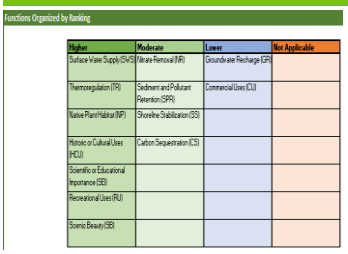
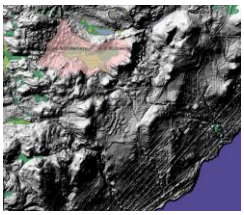
Results Summary





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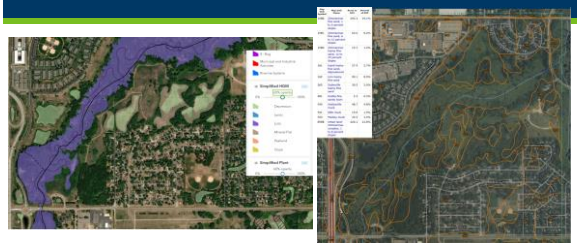
NWI and Soil Survey of Rice Creek Park



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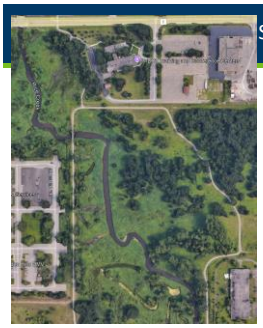
Small Group Delineation Exercise



Plan:

- Work in small groups
- Field pack, shovel, auger, field maps
- Complete at least one upland and one wetland data sheet
- Determine wetland boundary

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