

Assessment Information

Assessment Details				Information Source(s)	Information for User
1	Site Name:			User	
2	Assessor Name:			User	
3	Date of Desktop Assessment:			User	
4	Date of Field Assessment:			User	
5	If delineated, file reference number (if known):			User	

Location Details				Information Source(s)	Information for User
6	Nearest Town:			Desktop	
7	County:			Desktop	
8	State:			Desktop	
9	Latitude (decimal degrees):			Desktop	
10	Longitude (decimal degrees):			Desktop	
11	PLSS, quarter/quarter section or tax lot(s) reference:			Desktop	
12	Size of the Assessment Area (AA, in acres):			Desktop	See Assessment Area Establishment in ☒ Screenshot required: Outline of AA
13	Size of the catchment area draining into the AA (in acres):			Desktop	Use GIS software or EnviroAtlas rainfall and determine its size. ☒ Screenshot required: Outline of the
14	What percent of the catchment area is occupied by the AA? (AA divided by catchment area multiplied by 100).			Desktop	Auto-populated from questions 12 and 13
15	What is the dominant HGM class of the AA?			Desktop; Field	A dichotomous key to HGM classes is

Land Cover and Connectivity				Information Source(s)	Information for User
16	Use the <i>Summarize by Area</i> tool in EPA's EnviroAtlas or a GIS software program with the latest National Land Cover Database map layer to determine the following land cover percentages:			Desktop	Use EnviroAtlas' Summarize My Area tool to specified areas. ☒ Screenshots required: NLCD cover type
	Percent of the catchment area (excluding the AA) that is developed and agricultural cover classes combined.				
	Percent of the catchment area (excluding the AA) that is natural cover classes (deciduous, evergreen and mixed forest; shrub/scrub; grassland/herbaceous; and emergent herbaceous).				
	Percent of the catchment area (excluding the AA) that is water from the catchment area.				



WI/MN Wetland Rapid Assessment Method User Guide

Version 1.0, September 2025



Wetland Rapid Assessment Method

Agenda

- Overview of Tool
- Assessment Area Data Entry
- Establishing assessment area
- Desktop methods
- Class Exercise
- Interpreting Functional Values

Wetland Assessment Data Form

Instructions: Users should only utilize this form in Microsoft Excel. See [User Guide](#) for instructions, definitions, and processes.

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11	PLSS, quarter/quarter section or tax lot(s) reference:	Desktop	
12	Size of the Assessment Area (AA, in acres):	Desktop	See Assessment Area Establishment instructions in User Guide .
13	Size of the catchment area draining into the AA (in acres):	Desktop	☒ Screenshot required: Outline of AA Use GIS software or EnviroAtlas raindrop tool to define the catchment area of the AA and determine its size.
14	What percent of the catchment area is occupied by the AA? (AA divided by catchment area multiplied by 100).	Desktop	☒ Screenshot required: Outline of the catchment Auto-populated from questions 12 and 13.
15	What is the dominant HGM class of the AA?	Desktop; Field	A dichotomous key to HGM classes is provided in the User Guide .
Land Cover and Connectivity		Information Source(s)	Information for User
16	Use the <i>Summarize by Area</i> tool in EPA's EnviroAtlas or a GIS software program with the latest National Land Cover Database map layer to determine the following land cover percentages:	Desktop	Use EnviroAtlas' Summarize My Area tool to find NLCD cover classes for the different specified areas. ☒ Screenshots required: NLCD cover type tables
	Percent of the catchment area (excluding the AA) that is developed and agricultural cover classes combined.		
	Percent of the catchment area (excluding the AA) that is natural cover classes (deciduous, evergreen and mixed forest; shrub/scrub; grassland/herbaceous; and emergent herbaceous wetlands).		
	Percent of the land area within 0.1 miles (0.161 km) from the edge of the AA (excluding the AA) that is natural cover classes (deciduous, evergreen and mixed forest; shrub/scrub;		

[illegible]

Learning Objectives – Wetland Rapid Assessment Method

Upon completion of this course, participants will be able to:

- Explain the purpose, scientific foundation, and appropriate applications of the Wetland Rapid Assessment Method (RAM) in wetland regulation, restoration, conservation, and mitigation.
- Describe the hydrologic, water quality, ecological, climate, and anthropogenic functional groups assessed by the RAM.
- Accurately complete the RAM assessment tool, including data entry, documentation, required screenshots, and supporting information.
- Conduct field assessments to verify desktop information and collect vegetation, hydrology, soils, habitat, and other site characteristics required for the RAM.
- Interpret RAM outputs to evaluate wetland functions, identify functional strengths and limitations, and support wetland regulatory, restoration, mitigation, and management decisions.

Potential Uses of RAM

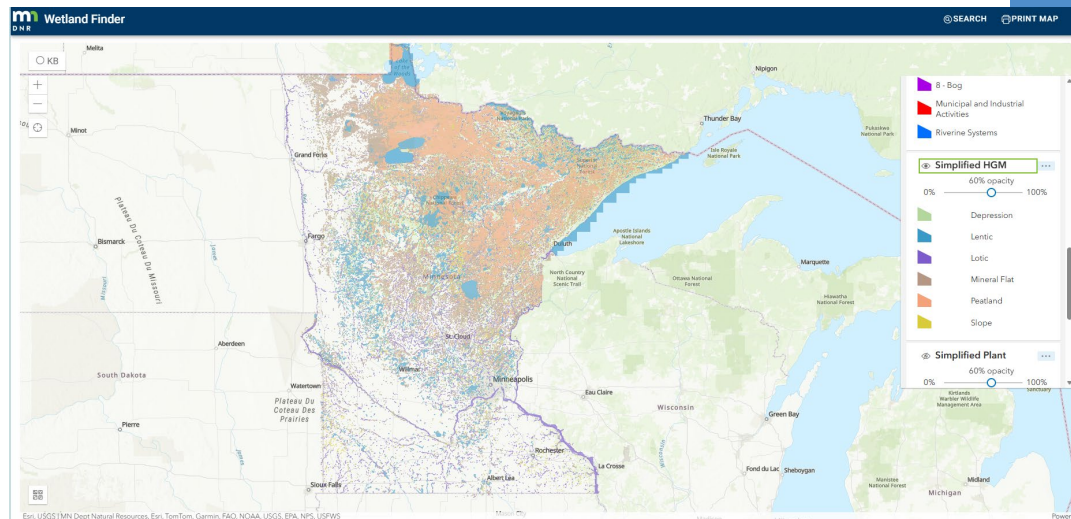
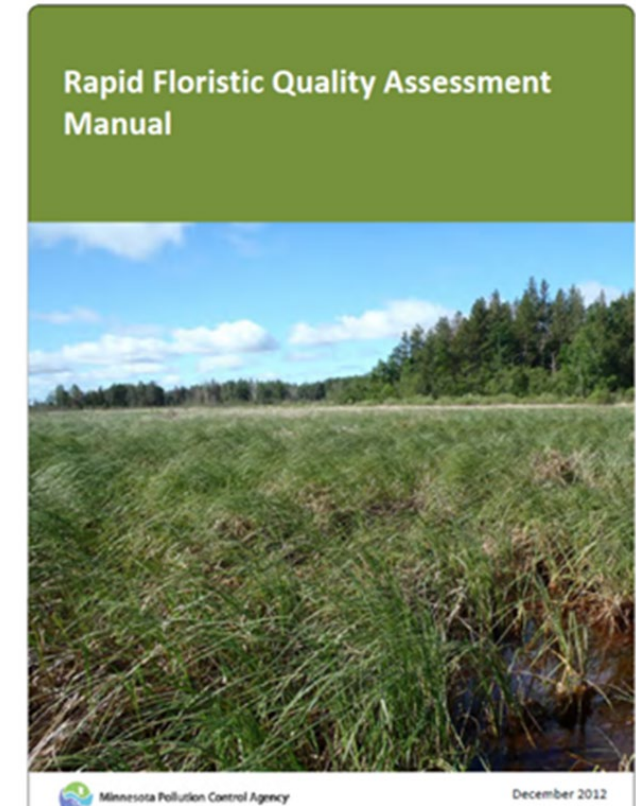
- Evaluate wetland functions to inform regulatory and conservation decisions
 - Degree of wetland impact avoidance and minimization warranted
 - Amount of compensatory mitigation needed for a wetland impact
 - Amount of compensatory mitigation credit generated from mitigation project
- Examples:
 - Determining specific functions, a restoration project will improve
 - Monitoring wetland functions
 - Determining whether activity will have a permanent impact or decrease functional capacity
 - Prioritizing high functioning wetlands in management plans
 - Sequencing flexibility

Users need working knowledge of:

- HGM
- EnviroAtlas
- Rapid FQA
- Web Soil Survey
- NWI

Classification Name	Definition
Lacustrine	Wetland occurs within a topographic depression that has a closed elevation contour that allows the accumulation of surface water and is restricted to the margin of a depressional lake basin.
Riverine	Wetland occurs on a nearly level landform and lies along and is influenced by flooding from a stream, river or flow-through ditch.
Slope	Wetland occurs on a slope (generally >2%) with groundwater discharge as its primary source of hydrology.
Mineral Flat	Wetland occurs on a nearly level landform, is not significantly influenced by flooding from a stream, river or flow-through ditch and has predominately mineral soils.
Organic Flat	Wetland occurs on a nearly level landform, is not significantly influenced by flooding from a stream, river or flow-through ditch and has predominately organic soils.
Depression	Wetland occurs within a topographic depression that has a closed elevation contour that allows the accumulation of surface water and is not associated with the margin of a depressional lake basin.

User Expertise

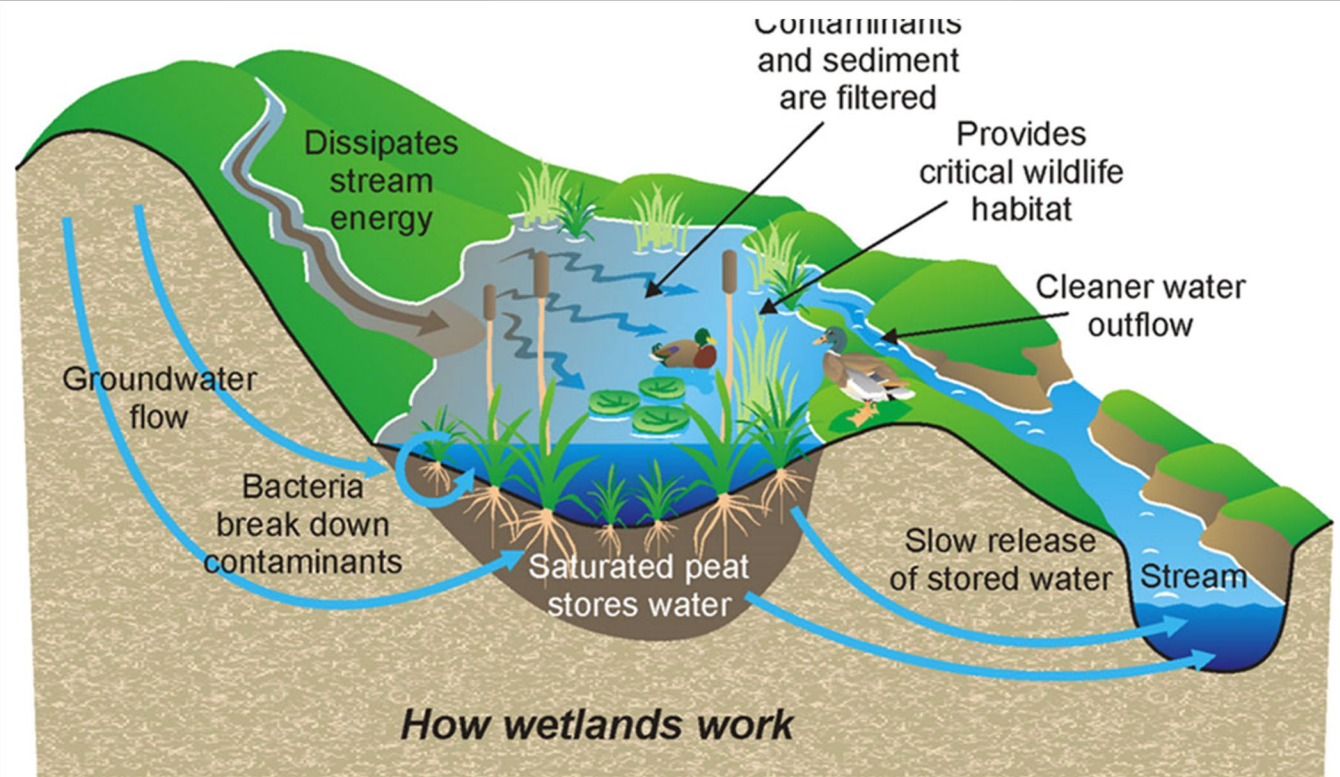


Functions & Values

Wetland Functions: in scientific assessments means natural processes

Wetland Value: wetland goods and services providing monetary or social welfare benefit.

Specific functions and values detailed in Statute and referenced throughout WCA



103A.202 WETLAND POLICY.

The legislature finds that it is in the public interest to preserve the wetlands of the state to conserve surface waters, maintain and improve water quality, preserve wildlife habitat, reduce runoff, provide for floodwater retention, reduce stream sedimentation, contribute to improved subsurface moisture, enhance the natural beauty of the landscape, and promote comprehensive and total water management planning.

Addresses two functional assessment aspects:

- **Functional capacity:** the functional capacity of a wetland to perform a specific function based on the observable characteristics of the wetland and its position in the landscape.
- **Opportunity value:** the societal benefit of a wetland to perform a specific function based on both the opportunity to perform the function and the value given the societal context of the wetland.

Functional Groups



Hydrologic focuses on three specific functions: *Surface Water Attenuation*, *Surface Water Supply*, and *Ground Water Recharge*. Wetlands play an important role in the hydrologic cycle – influencing and controlling surface water flows in watersheds in ways that often are an interface between surface and groundwater.



Water Quality focuses on the ability of a wetland to improve water quality of downstream resources and is comprised of five specific functions: *Nitrate Removal*, *Phosphorus Retention*, *Sediment and General Pollutant Retention*, *Shoreline Stabilization*, and *Thermoregulation*. The water quality of a wetland is accounted for in other functions, specifically the ecological function related to fish and wildlife habitat. Wetland water quality influences wetland condition which drives ecological functioning.



Ecological focuses on fish and wildlife habitat of endemic species. Specific functions include *Native Plant Habitat*, *Wildlife Habitat*, and *Fish Habitat*. This group also emphasizes the natural, ecological functioning of a wetland in its landscape.



Climate relates to the physical attributes and biochemical processes of wetlands that mitigate the effects of excess atmospheric carbon and methane gas. The specific function evaluated is *Carbon Sequestration*. Wetlands accumulate carbon through internal (e.g., vegetation growth) and external (e.g., runoff) processes, and store much of that accumulated carbon in anoxic sediment over decadal and longer timescales, thereby decreasing atmospheric CO₂ concentrations as well as avoiding loss of terrestrial carbon as CO₂.



Anthropogenic function represents the attributes of wetlands that affect direct human uses, including commercial production of goods, recreation, education and research. Specific anthropogenic functions are *Historic or Cultural Uses*, *Scientific or Educational Importance*, *Commercial Uses*, *Recreational Uses*, and *Scenic Beauty*.

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

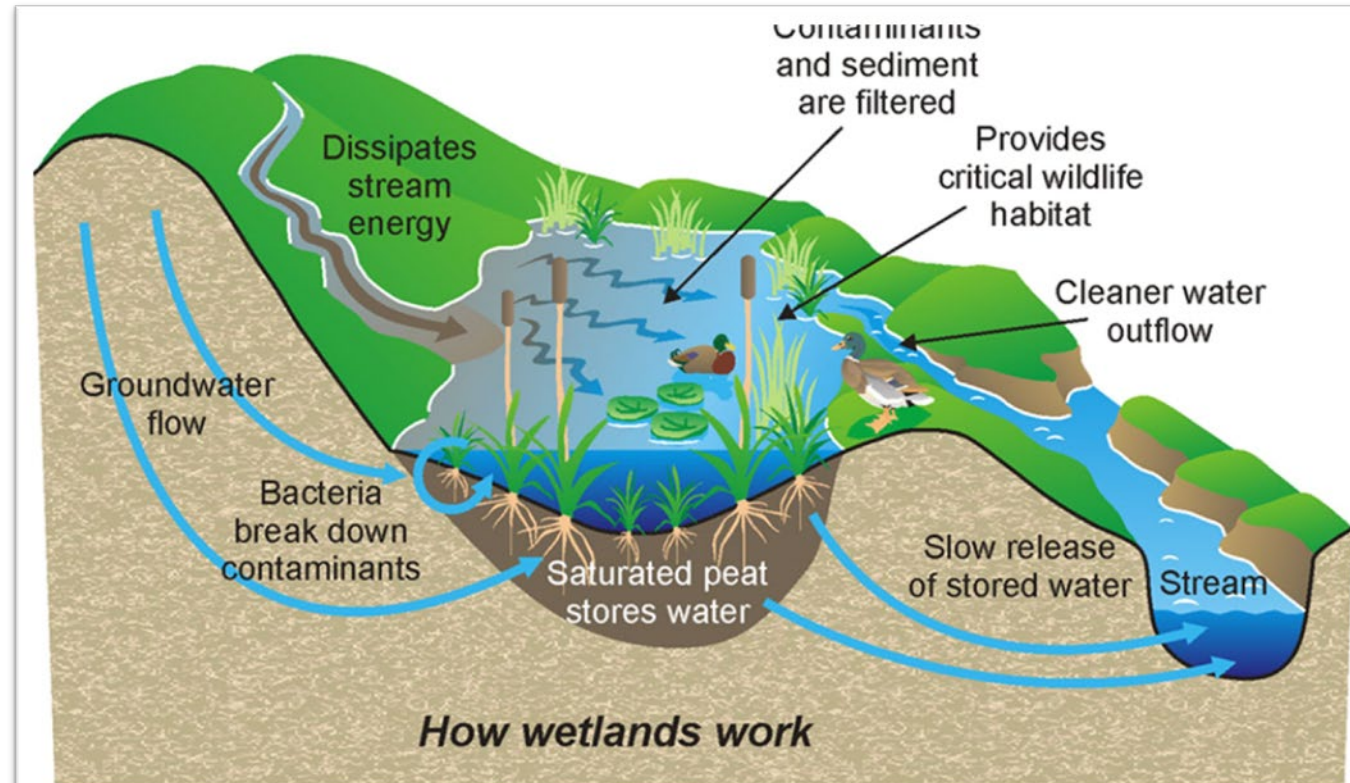
Description of Functions in each Group- Hydrology

Focuses on ability to affect the movement and distribution of water on the landscape- including interface between surface and groundwater

- Surface water attenuation
 - Ability to store surface water
- Surface water supply
 - Ability to supply water downstream
- Groundwater recharge
 - Ability to recharge groundwater



Hydrologic focuses on three specific functions: *Surface Water Attenuation*, *Surface Water Supply*, and *Ground Water Recharge*. Wetlands play an important role in the hydrologic cycle – influencing and controlling surface water flows in watersheds in ways that often are an interface between surface and groundwater.



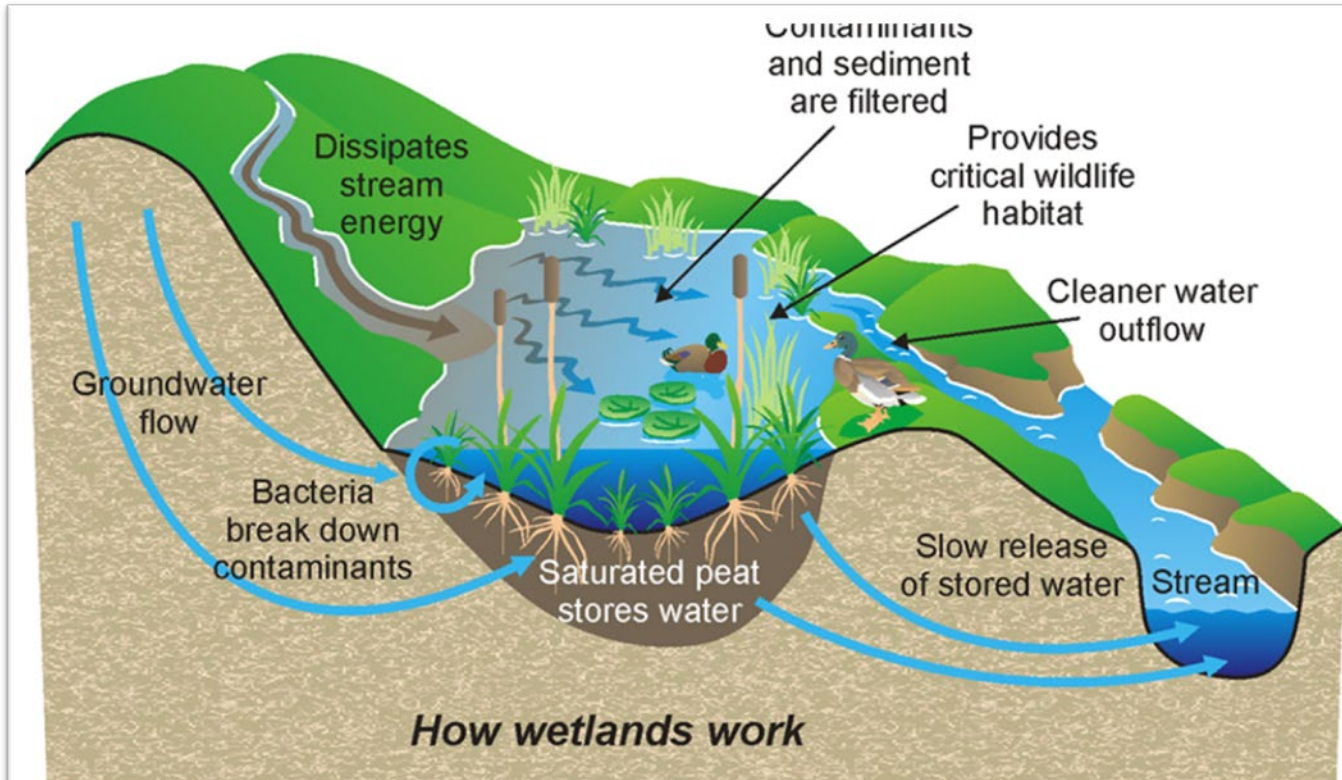
Description of Functions in each Group- Water Quality

Focuses on ability of wetland to improve water quality of downstream resources

- Nitrate Removal
- Phosphorous retention
- Sediment and pollutant retention
- Shoreline stabilization
- Thermoregulation



Water Quality focuses on the ability of a wetland to improve water quality of downstream resources and is comprised of five specific functions: *Nitrate Removal*, *Phosphorus Retention*, *Sediment and General Pollutant Retention*, *Shoreline Stabilization*, and *Thermoregulation*. The water quality of a wetland is accounted for in other functions, specifically the ecological function related to fish and wildlife habitat. Wetland water quality influences wetland condition which drives ecological functioning.



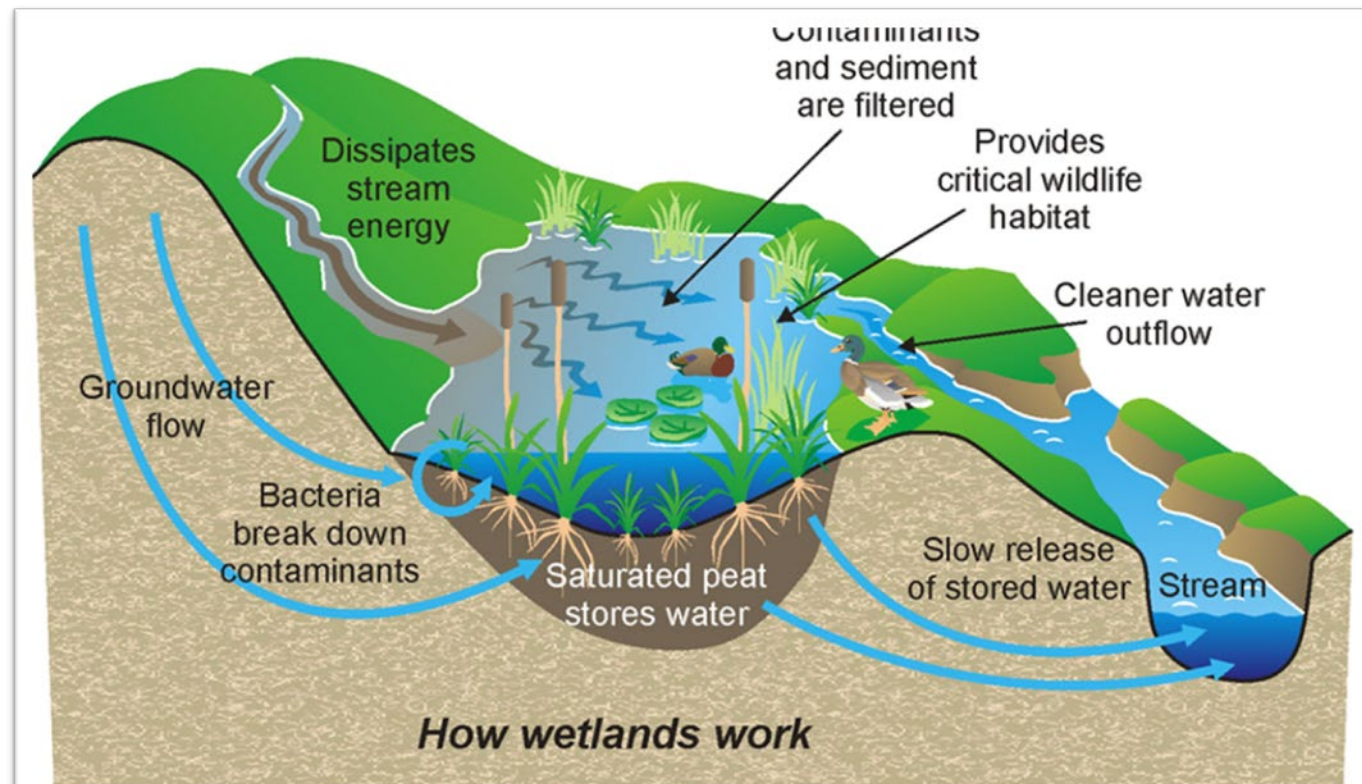
Description of Functions in each Group- Ecological

Focuses on the ability to affect natural relationships of organisms in wetland and surrounding landscape

- Native plant habitat
- Wildlife habitat
- Fish habitat



Ecological focuses on fish and wildlife habitat of endemic species. Specific functions include *Native Plant Habitat*, *Wildlife Habitat*, and *Fish Habitat*. This group also emphasizes the natural, ecological functioning of a wetland in its landscape.



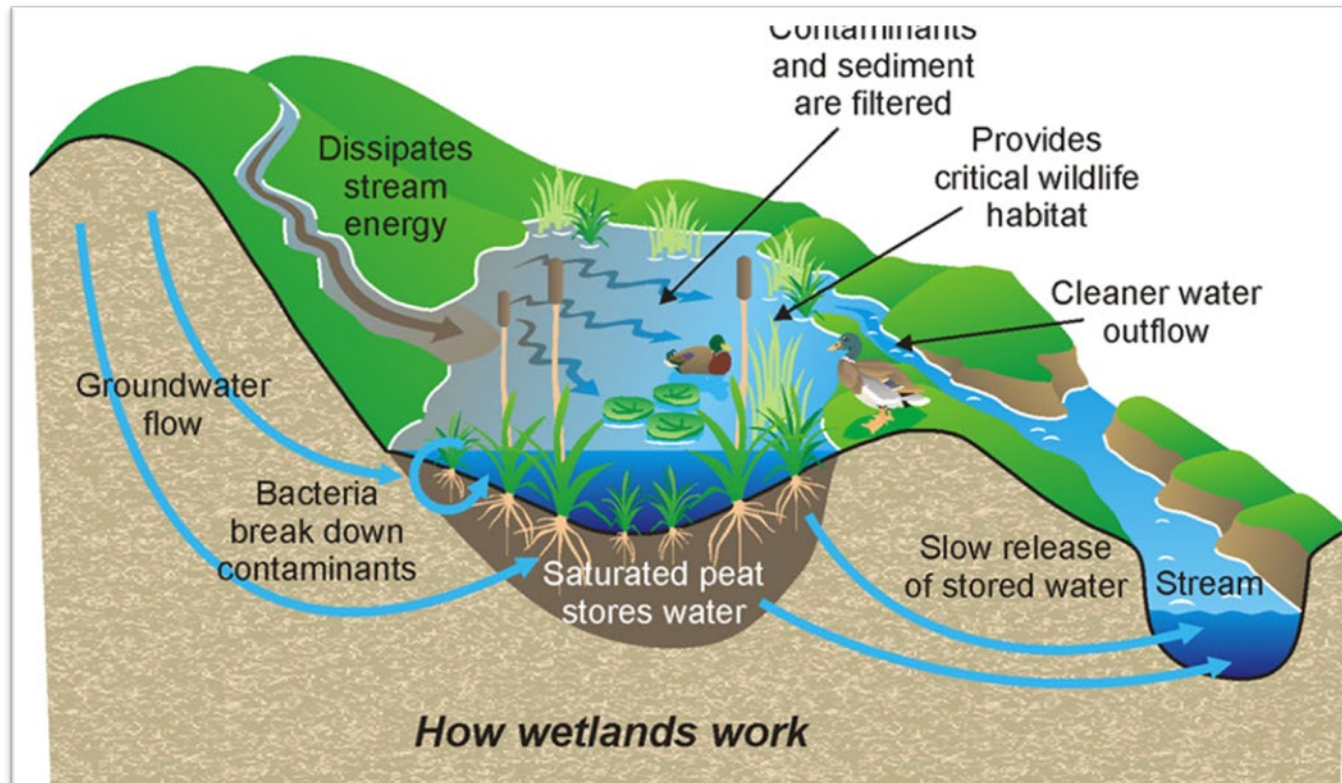
Description of Functions in each Group- Climate

Focuses on ability to mitigate the negative effects of excess atmospheric carbon and methane gas

- Soils (% organic)
- Water regime (sat. vs inundated)
- Catchment Characteristics (HGM)
- Vegetation (sphagnum and woody)



Climate relates to the physical attributes and biochemical processes of wetlands that mitigate the effects of excess atmospheric carbon and methane gas. The specific function evaluated is *Carbon Sequestration*. Wetlands accumulate carbon through internal (e.g., vegetation growth) and external (e.g., runoff) processes, and store much of that accumulated carbon in anoxic sediment over decadal and longer timescales, thereby decreasing atmospheric CO₂ concentrations as well as avoiding loss of terrestrial carbon as CO₂.



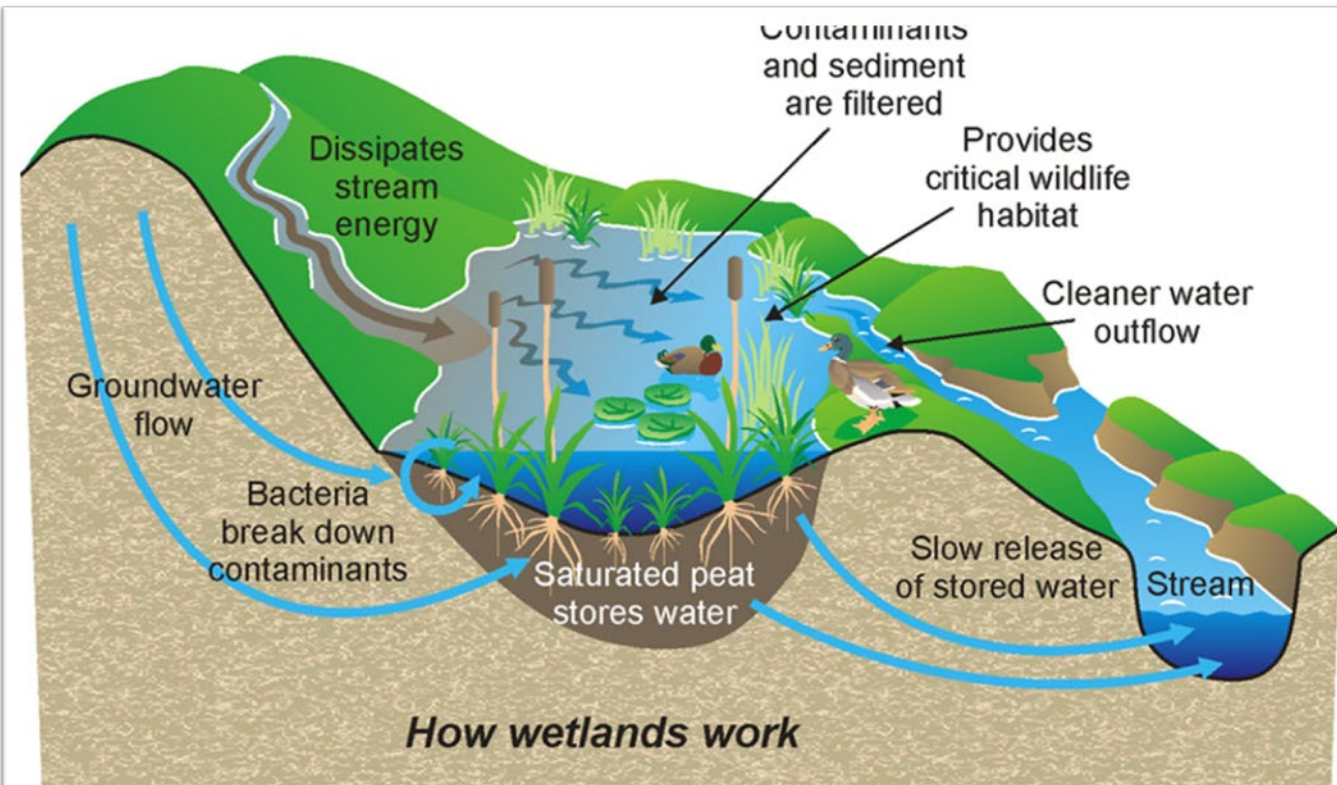
Description of Functions in each Group-Anthropogenic

Focuses on ability to provide various types of direct human uses

- Historic or cultural uses
- Scientific or education importance
- Commercial uses
- Recreational uses
- Scenic beauty



Anthropogenic function represents the attributes of wetlands that affect direct human uses, including commercial production of goods, recreation, education and research. Specific anthropogenic functions are *Historic or Cultural Uses*, *Scientific or Educational Importance*, *Commercial Uses*, *Recreational Uses*, and *Scenic Beauty*.



RAM Wetland Assessment Tool

Wetland Assessment Data Form				Instructions: Users should only utilize this form in Microsoft Excel. See <i>User Guide</i> for instructions, definitions, and processes.	
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11	PLSS, quarter/quarter section or tax lot(s) reference:		Desktop		
12	Size of the Assessment Area (AA, in acres):		Desktop	See Assessment Area Establishment instructions in <i>User Guide</i> . ☒ Screenshot required: Outline of AA	
13	Size of the catchment area draining into the AA (in acres):		Desktop	Use GIS software or EnviroAtlas raindrop tool to define the catchment area of the AA and determine its size. ☒ Screenshot required: Outline of the catchment	
14	What percent of the catchment area is occupied by the AA? (AA divided by catchment area multiplied by 100).		Desktop	Auto-populated from questions 12 and 13.	
15	What is the dominant HGM class of the AA?		Desktop; Field	A dichotomous key to HGM classes is provided in the <i>User Guide</i> .	
Land Cover and Connectivity			Information Source(s)	Information for User	
16	Use the <i>Summarize by Area</i> tool in EPA's EnviroAtlas or a GIS software program with the latest National Land Cover Database map layer to determine the following land cover percentages:				
	Percent of the catchment area (excluding the AA) that is developed and agricultural cover classes combined.				

AA DATA ENTRY

User Notes & Screenshots

Hydro

WtrQlty

Eco

Carbon

Display Settings

60%

Layout of Spreadsheet Tool

	Tan cells allow for user-entered data and information.		
	Yellow cells require users to select from a drop-down menu of options.		
	Gray cells are autopopulated from answers to previous questions.		
	Cells with question highlighted orange should be answered during desktop review		
	Cells with question highlighted lavender should be answered during desktop review and confirmed during field visit		

[Info](#)
[AA DATA ENTRY](#)
[User Notes & Screenshots](#)
[Hydro](#)
[WtrQlty](#)
[Eco](#)
[Carbon](#)
[Anthro](#)
[Results Summary](#)

Completing the Assessment

- Requires combination of field observations, data collection, desktop review
- Recommend desktop review prior to field observations
- Users enter data using the AA DATA Entry tab
- Screenshots are required
- Include photos and documentation in accompanying report

User Notes & Screenshots Tab

Supporting Information and Notes

Use the space below to provide additional information available about the project, assessment area, catchment, etc. This can be screenshots, links to resources or studies, or other pertinent information. If the user deviated from the User Guide instructions or other established Wetland RAM processes, provide a detailed description of which question and answer was modified and why.



Screenshots and Other Visual References

EnviroAtlas can be accessed via: <https://www.epa.gov/enviroatlas/enviroatlas-interactive-map>

Paste screenshots of EnviroAtlas and other mapping or visual references used here.

How do I create a screenshot?

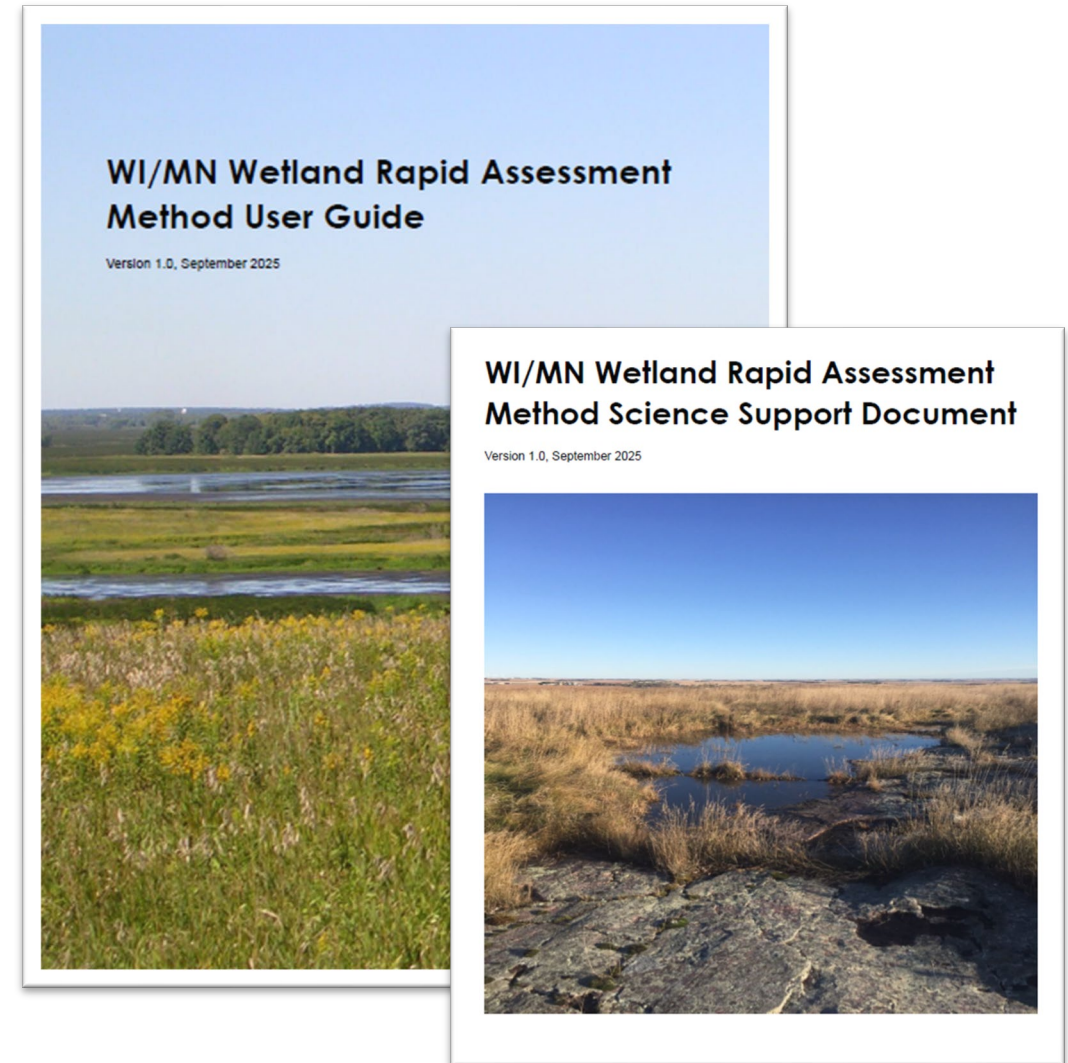
Screen shots of the following resources are required. Additional screenshots may be provided. Please label screenshots as needed.

- 1) Q12: Outline of the Assessment Area (AA). Attach sketch map if AA is smaller than the entire contiguous wetland OR if the field assessment area is smaller than the desktop assessment area (restricted access or other barriers).
- 2) Q13: Outline of the Catchment Area.
- 3) Q16: NLCD maps and associated summary tables for: a) the catchment area (excluding the AA) and b) the area within 0.1mi from the edge of the AA (excluding the AA).
- 4) Q17: Map of the AA with core MSPA data.
- 5) Q18: Map of the 2mi buffer around the AA with core MSPA data.
- 6) Q19: Map of the high and low points within the catchment and the distance between the two points.
- 7) Q20: Map of the HUC 12 with AA location identified.
- 8) Q36: Web Soil Survey map and associated OM table.
- 9) Q37: Web Soil Survey map and associated soil texture table.



User Guide & Science Support Document

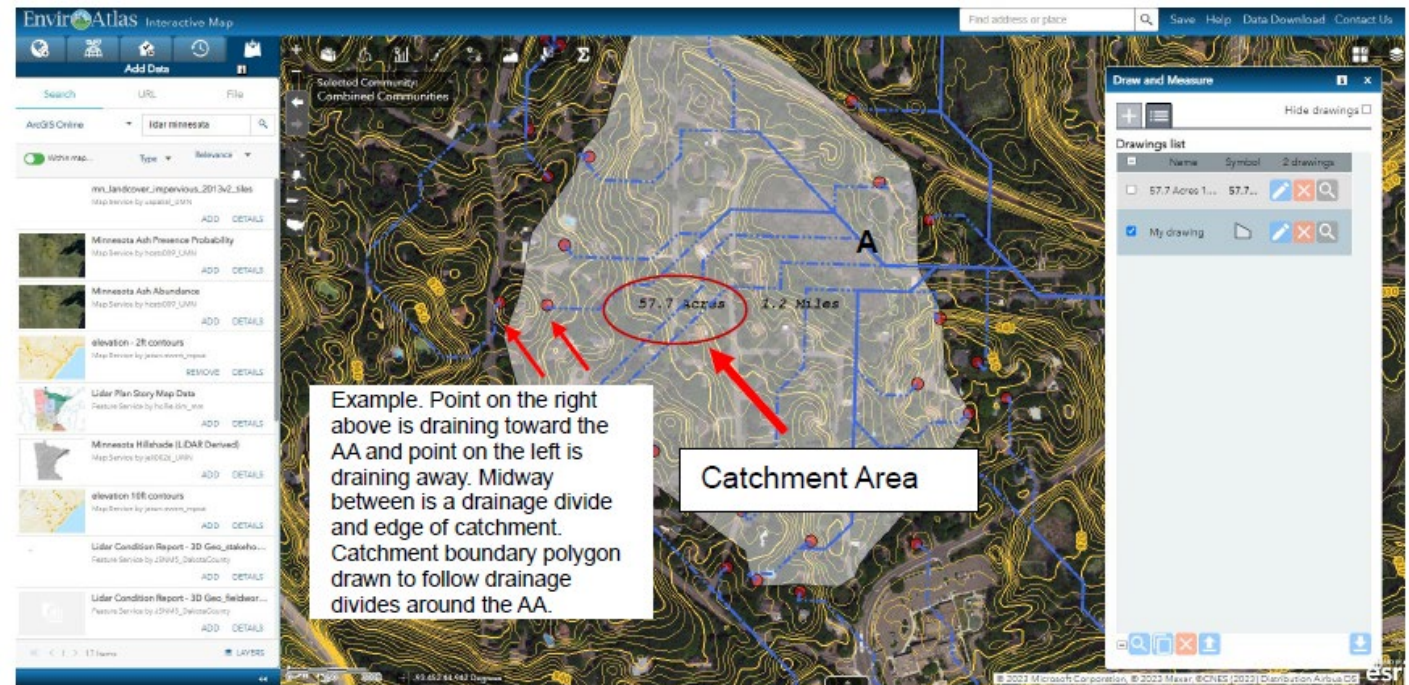
- User guide supplements and provides guidance on completing the RAM spreadsheet tool.
- Science Support Document details how functions were selected and how questions and answers were developed to evaluate function capacity and opportunity value.



User Guide

- Definitions
- Purpose of tool
- Establishing assessment area
- Details step to complete the assessment
 - Desktop review
 - Field assessment
- Instruction for answering tool questions
- Appendix with instructions for complex methods and HGM guide

FIGURE C.4



If the AA is a portion of a larger contiguous wetland, only include the areas upstream/upgradient of the AA that directly contribute surface water to the AA (Figure C.5).

WI/MN Wetland Rapid Assessment Method Science Support Document

Version 1.0, September 2025

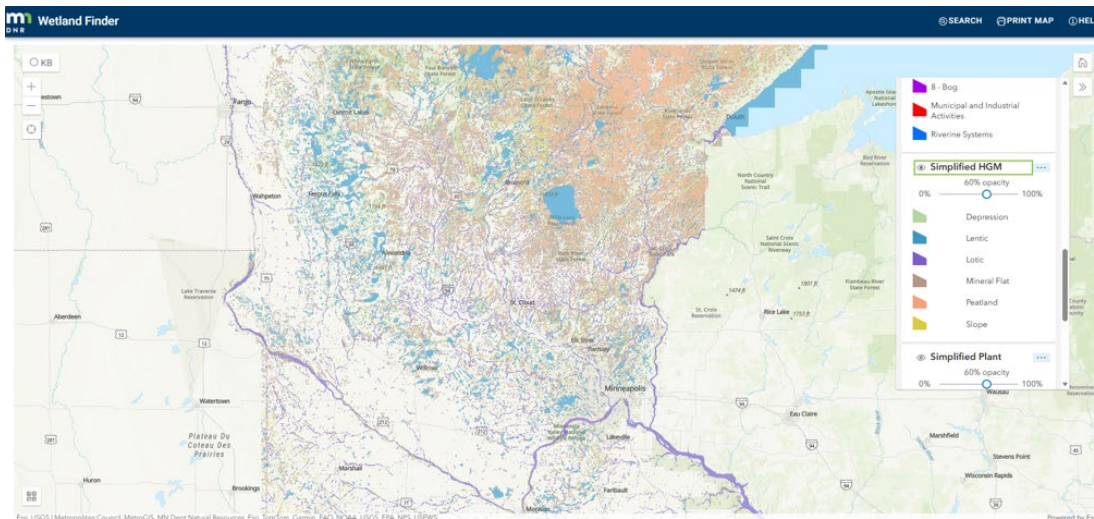
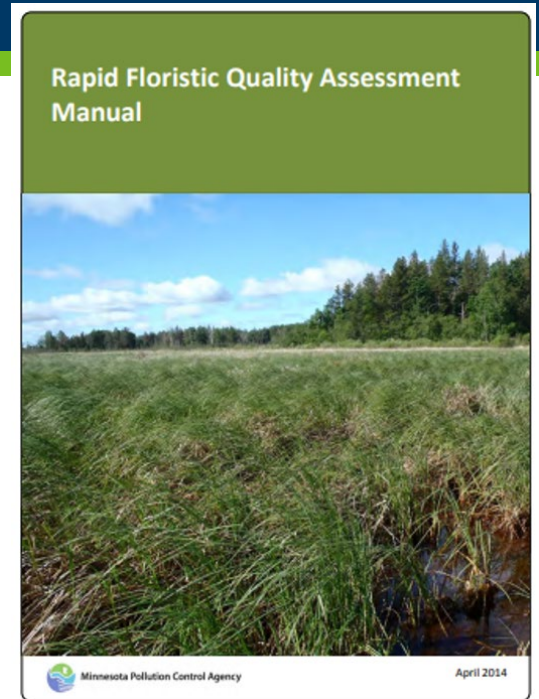


Science Support Document

- Provides scientific background for method
- Rationale for all functions opportunity-value

Key Data Sources

- EnviroAtlas
- FQA
- Web Soil Survey
- Wetland Finder



EnviroAtlas

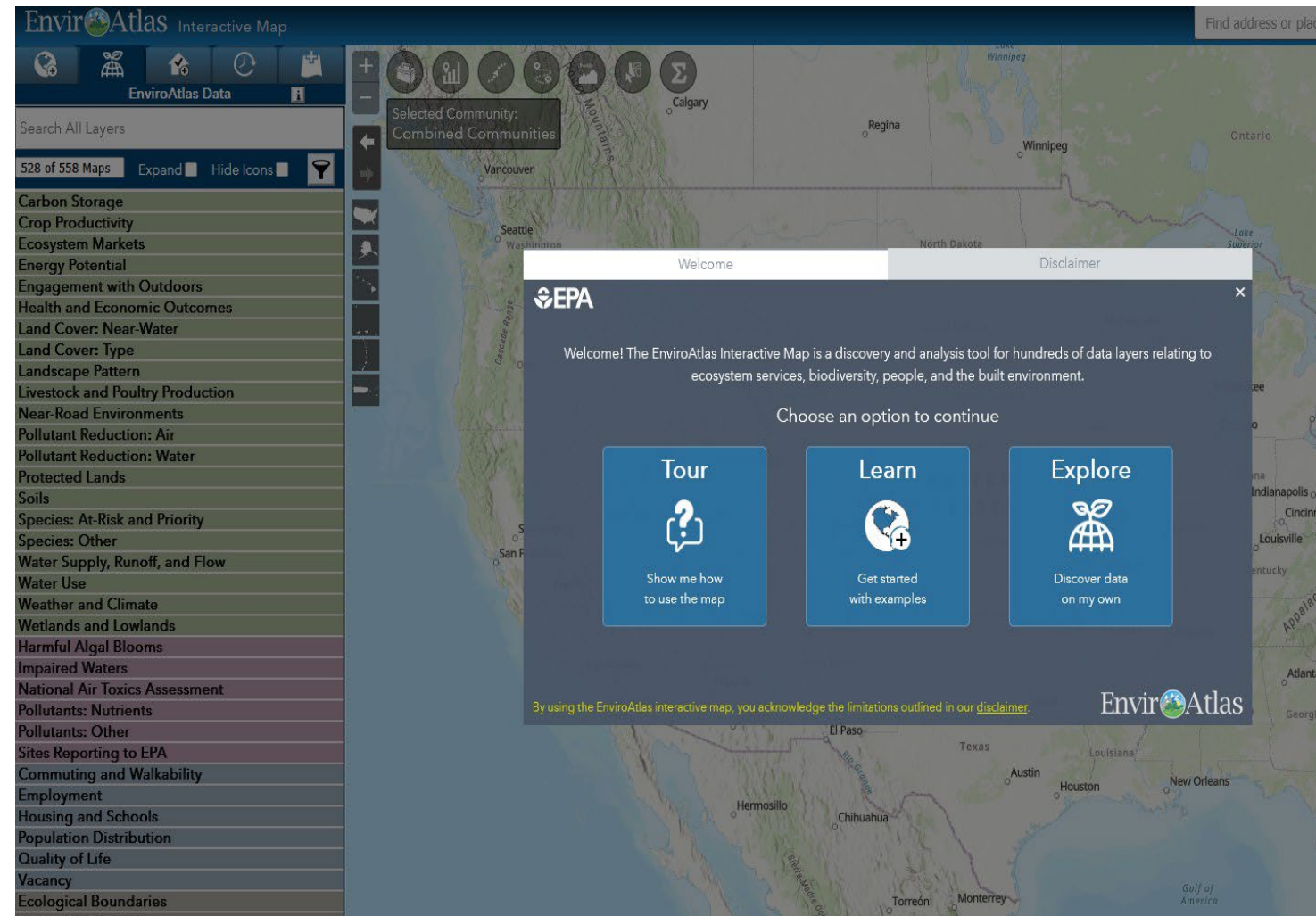
[EnviroAtlas \(epa.gov\)](http://epa.gov)



You can use EnviroAtlas to determine ...

Questions answered by EnviroAtlas

- Catchment Area
- Catchment Slope
- Land Cover Types in Catchment Area
- Regional Landscape Habitat Connectivity
- Stream and Surface Water Connectivity



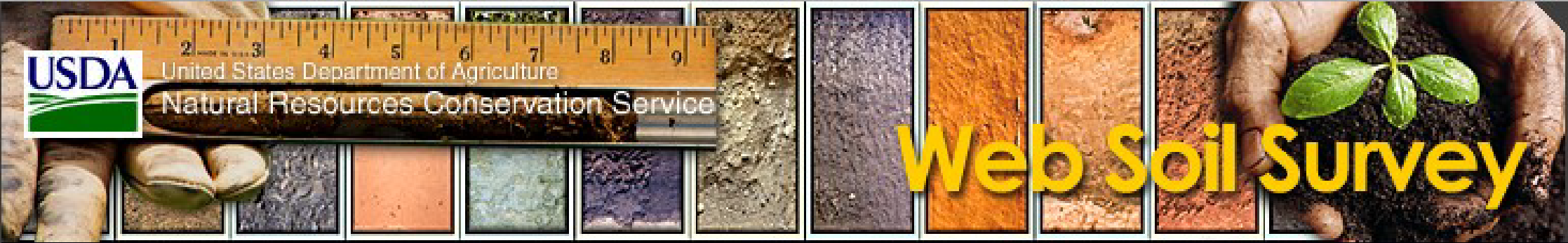
Species Checklist (circle community space when species is present in community, record cover class in circle following number)			
Aquatic Stratum (use aquatic plants that are submerged or have floating leaves)			
Community #	Community #	Community #	Community #
1 2 3	1 2 3	1 2 3	1 2 3
<i>Brasenia schreberi</i>	<i>Najaspa odorata</i>	<i>Ranunculus trichophyllus</i> var. <i>trichophyllus</i>	
<i>Ceratophyllum demersum</i>	<i>Potamogeton amplifolius</i>	<i>Spirodelia polymorpha</i>	
<i>Eelodea canadensis</i>	<i>Potamogeton amplifolius</i>	<i>Utricularia pectinatus</i>	
<i>Lemna minor</i>	<i>Potamogeton crispus</i>	<i>Utricularia macrocarpa</i>	
<i>Lemna trisulca</i>	<i>Potamogeton natans</i>	<i>Valisneria spiralis</i>	
<i>Najas flexilis</i>	<i>Potamogeton zosterifolius</i>	<i>Wolffia columbiana</i>	
<i>Najaspa lutea</i>	<i>Ranunculus flabellatus</i>		
<i>Najaspa lutea</i> ssp. <i>variegata</i>	<i>Ranunculus longirostris</i>		
Tree Stratum (woody plants with typical max growth > 3' DBH)			
Community #	Community #	Community #	Community #
1 2 3	1 2 3	1 2 3	1 2 3
<i>Abies balsamea</i>	<i>Larix laricina</i>	<i>Quercus laevis</i>	
<i>Acer negundo</i>	<i>Salix virginiana</i> var. <i>virginiana</i>	<i>Salix amygdaloides</i>	
<i>Acer rubrum</i> var. <i>rubrum</i>	<i>Picea glauca</i>	<i>Salix nigra</i>	
<i>Acer saccharinum</i>	<i>Picea mariana</i>	<i>Salix X rubens</i>	
<i>Betula papyrifera</i> ssp. <i>argentea</i>	<i>Pinus strobus</i>	<i>Sorbus americana</i>	
<i>Betula papyrifera</i> var. <i>papyrifera</i>	<i>Populus balsamifera</i> ssp. <i>balsamifera</i>	<i>Tilia occidentalis</i>	
<i>Celtis occidentalis</i> var. <i>occidentalis</i>	<i>Populus deltoides</i> ssp. <i>monifera</i>	<i>Tilia americana</i>	
<i>Fraxinus nigra</i>	<i>Populus tremuloides</i>	<i>Ulmus americana</i>	
<i>Fraxinus pennsylvanica</i>	<i>Quercus macrocarpa</i> var. <i>macrocarpa</i>		
Shrub Stratum (woody plants with typical max growth > 3' DBH and < 1m tall)			
Community #	Community #	Community #	Community #
1 2 3	1 2 3	1 2 3	1 2 3
<i>Acer spicatum</i>	<i>Myrica gale</i>	<i>Salix interior</i>	
<i>Alnus incana</i> ssp. <i>rigosa</i>	<i>Physocarpus opulifolius</i>	<i>Salix petiolaris</i>	
<i>Anemone fruticosa</i>	<i>Ranunculus acris</i>	<i>Saliciscus nigra</i> ssp. <i>canadensis</i>	
<i>Betula pumila</i> var. <i>glauca</i>	<i>Ranunculus catharticus</i>	<i>Spiraea alba</i>	
<i>Comus racemosa</i>	<i>Ribes americanum</i>	<i>Spiraea tomentosa</i> var. <i>rosea</i>	
<i>Comus racemosa</i> ssp. <i>sericea</i>	<i>Rubus idaeus</i> ssp. <i>strigosus</i>	<i>Spiraea trifida</i>	
<i>Dasiphora floribunda</i>	<i>Salix bebbiana</i>	<i>Tormentilla verticillata</i>	
<i>Frangula alnus</i>	<i>Salix candida</i>	<i>Viburnum lentago</i>	
<i>Ilex verticillata</i>	<i>Salix discolor</i>	<i>Viburnum opulus</i> var. <i>americanum</i>	
Woody Vine Stratum (all woody vines)			
Community #	Community #	Community #	Community #
1 2 3	1 2 3	1 2 3	1 2 3
<i>Clematis virginiana</i>	<i>Parthenocissus vitacea</i>	<i>Vitis riparia</i>	
<i>Menipempum canadense</i>	<i>Solanum dulcamara</i> var. <i>dulcamara</i>		
Herb Stratum (all non-aquatic herbaceous plants and woody plants with typical max growth < 1m tall)			
Community #	Community #	Community #	Community #
1 2 3	1 2 3	1 2 3	1 2 3
<i>Achillea millefolium</i>	<i>Ambrosia trifida</i> var. <i>trifida</i>	<i>Aralia nudicaulis</i>	
<i>Aconitum americanum</i>	<i>Ampelopsis brevipedunculata</i>	<i>Argentina anserina</i>	
<i>Andropogon scoparius</i>	<i>Andropogon scoparius</i>	<i>Athyrium filix-femina</i>	
<i>Andropogon scoparius</i>	<i>Andropogon scoparius</i>	<i>Asplenium platyneuron</i>	
<i>Anemone canadensis</i>	<i>Anemone canadensis</i>	<i>Bidens biternata</i>	
<i>Anemone quinquefolia</i> var. <i>trifida</i>	<i>Anemone quinquefolia</i> var. <i>trifida</i>	<i>Bidens biternata</i>	
<i>Angelica atropurpurea</i>	<i>Angelica atropurpurea</i>	<i>Bidens biternata</i>	
<i>Antennaria plantaginifolia</i>	<i>Antennaria plantaginifolia</i>	<i>Bidens biternata</i>	

Rapid Floristic Quality Assessment (FQA)

Condition Category	wC
Exceptional	$> 4.6^*$
Good	> 4.2
Fair	$2.5 - 4.2$
Poor	< 2.5

Condition Category	Description
Exceptional	Composition/structure completely intact
Good	Minor composition/structure changes
Fair	Moderate composition/structure changes
Poor	Large-extreme changes in composition/structure
Absent	Devoid of wetland vegetation

Web Soil Survey

A banner image for the Web Soil Survey. It features a wooden ruler at the top with the USDA logo and text 'United States Department of Agriculture' and 'Natural Resources Conservation Service'. Below the ruler are several small images of soil samples in different colors (brown, orange, green, purple). On the right side of the banner, a hand is shown holding a small green seedling in dark soil. The text 'Web Soil Survey' is written in large, bold, yellow letters across the middle of the banner.

USDA United States Department of Agriculture
Natural Resources Conservation Service

Web Soil Survey

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- ▶ [National Cooperative](#)

The simple yet powerful way to access and use soil data.

A large, circular green button with a 3D effect and a grey border. The text 'START WSS' is written in white, bold, capital letters in the center of the button.

Welcome to Web Soil Survey (WSS)

Web Soil Survey (WSS) provides soil data

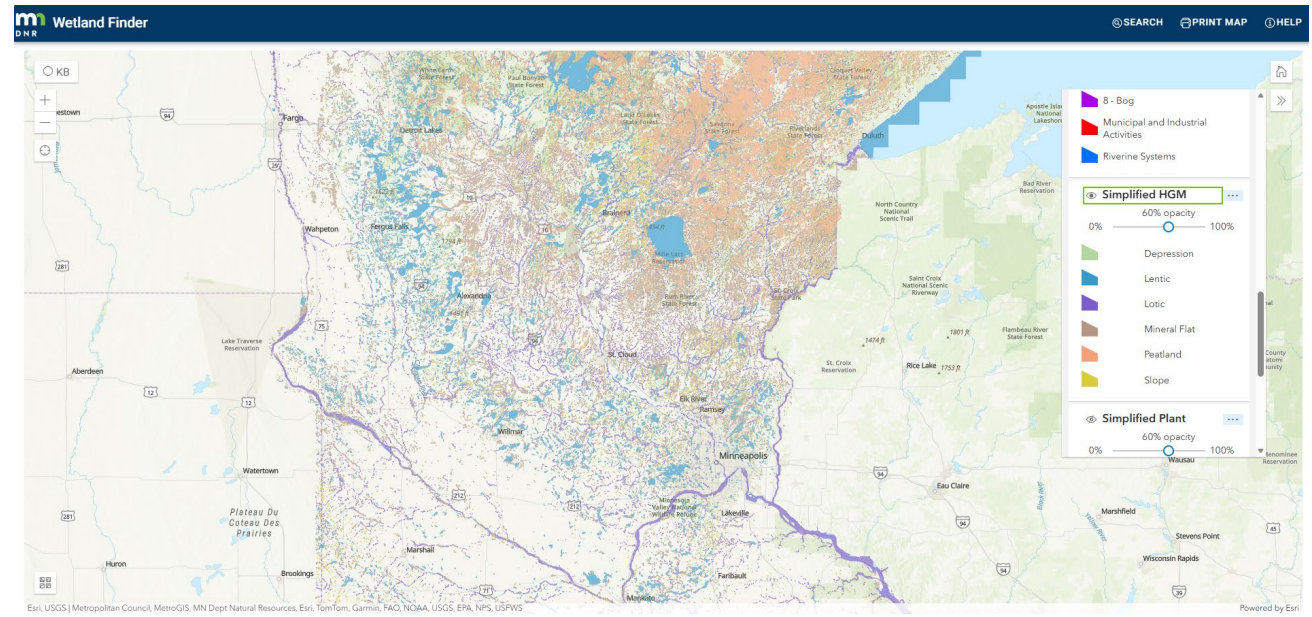
I Want To...

- [Start Web Soil Survey \(WSS\)](#)
- [Know the requirements for running Web Soil Survey — will Web Soil Survey work in my web browser?](#)
- [Know the Web Soil Survey hours of operation](#)
- [Find what areas of the U.S. have soil data](#)

MN Wetland Finder

- Hosted by MN Department of Natural Resources
- Depicts national wetland inventory data for Minnesota
- Multiple wetland classification systems
- Uses remote sensing data (aerial imagery and lidar elevation models)

MN Wetland Finder



Relevant to RAM:

- HGM Classification
- Cowardin water regime

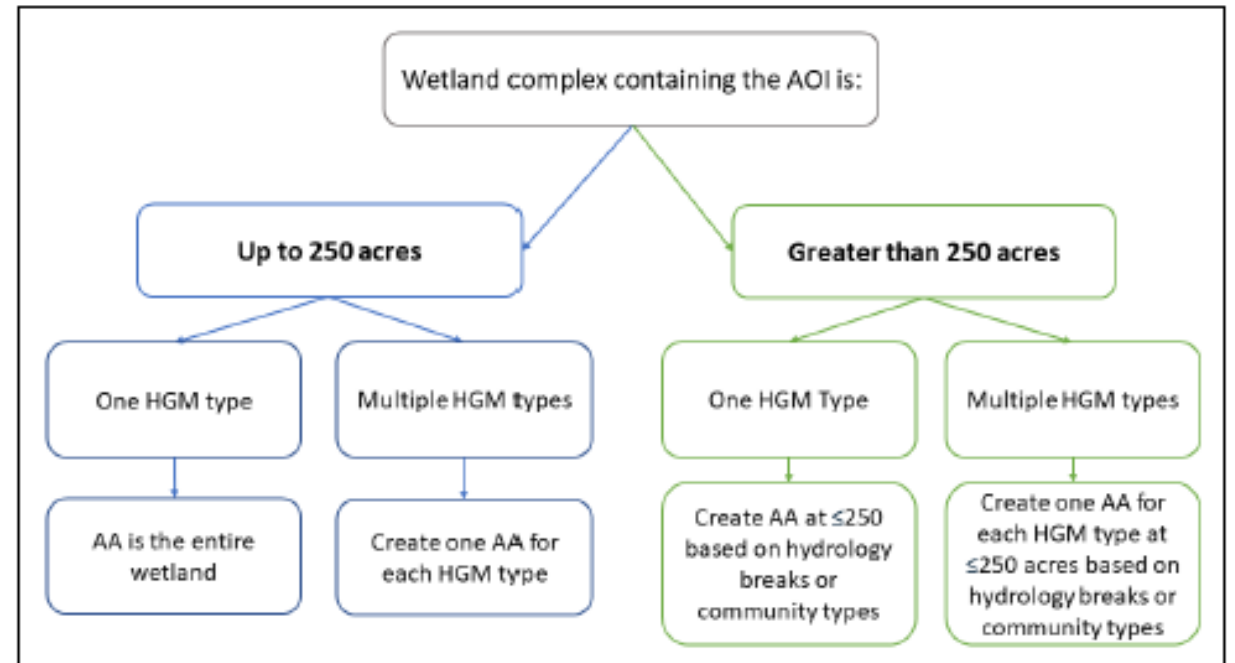
Location Details

- Site Name, assessor name, dates of assessment (DD/MM/YYYY), delineation file reference
- Nearest town, County, State
- Latitude and Longitude (decimal degrees)
 - Approximate center of AA
- PLSS, quarter/quarter section
 - optional

Wetland Assessment Data Form				Instructions: Users should only utilize this form in Microsoft Excel. See <i>User Guide</i> for instructions, definitions, and processes.	
Assessment Information					
Assessment Details				Information Source(s)	Information for User
1	Site Name:	Rice Creek Depression 1		User	
2	Assessor Name:	David Demmer		User	
3	Date of Desktop Assessment:	9/29/2026		User	
4	Date of Field Assessment:	10/13/2026		User	
5	If delineated, file reference number (if known):			User	
Location Details				Information Source(s)	Information for User
6	Nearest Town:	Shoreview		Desktop	
7	County:	Ramsey		Desktop	
8	State:	Minnesota		Desktop	
9	Latitude (decimal degrees):	45.113587		Desktop	
10	Longitude (decimal degrees):	-93.179006		Desktop	
11	PLSS, quarter/quarter section or tax lot(s) reference:			Desktop	
12	Size of the Assessment Area (AA, in acres):	7.60		Desktop	See Assessment Area Establishment instructions in <i>User Guide</i> . ☒ Screenshot required: Outline of AA
13	Size of the catchment area draining into the AA (in acres):	60.30		Desktop	Use GIS software or EnviroAtlas raindrop tool to define the catchment area of the AA and determine its size. ☒ Screenshot required: Outline of the catchment
14	What percent of the catchment area is occupied by the AA? (AA divided by catchment area multiplied by 100).	12.6%		Desktop	Auto-populated from questions 12 and 13.
15	What is the dominant HGM class of the AA?	Depressional		Desktop; Field	A dichotomous key to HGM classes is provided in the <i>User Guide</i> .

Establishing Assessment Area

- **Assessment area:** A wetland or portion of a wetland being evaluated using this assessment method.
- RAM is intended to assess a contiguous wetland area



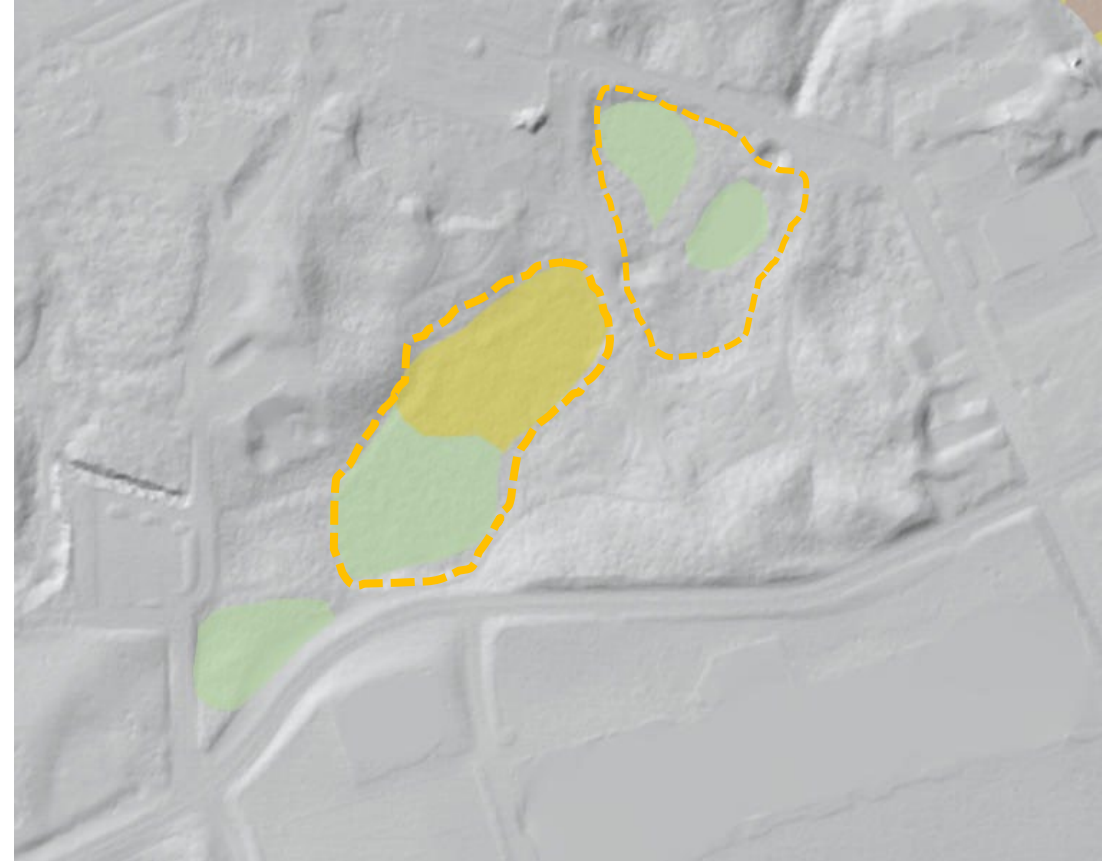
1) Identify the specific area of wetland needing assessment

- Area of interest: area of wetland identified as needing assessment.
- Can be a proposed wetland impact area, restoration area, portion of a wetland on a specific property, etc.
- Sometimes the same as the Assessment Area but should not be equated with the AA.



2) Delineate the contiguous wetland area containing the AOI

- Delineation can vary from formal level 2 delineation, level one delineation or approximated using offsite methods
- Degree of accuracy should be based upon the purpose of the assessment



3) Determine HGM Class of Wetland



Click to mouse Key to the Hydrogeomorphic (HGM) Classes (water regimes defined below)

1. Wetland is associated with a perennially flowing stream, floodplain, or fringing a lake or reservoir.....2
2. Wetland is associated with a perennially flowing stream or floodplain.....3
3. Stream is designated 1st or 2nd order in the National Hydrography Dataset (NHD).....4
4. Regular overbank flooding occurs (e.g., there is an apparent change in water regime or vegetation close to the channel compared to broader contiguous wetland).....**RIVERINE - Upper Perennial**
4. Regular overbank flooding typically does not occur (e.g., no apparent change in water regime or vegetation in broad or contiguous wetland).....7
3. Stream is designated 3rd order or higher in NHD and regular overbank flooding occurs.....5
5. Wetland lacks a closed topographic contour to retain water following overbank flooding conditions (i.e., the wetland is the floodplain).....**RIVERINE - Lower Perennial**
5. Wetland has a closed topographic contour such that floodwater is retained relative to the adjacent floodplain wetland following overbank flooding conditions (i.e., a depression within a broader floodplain).....**DEPRESSIONAL - Floodplain**
2. Wetland is fringing a lake or reservoir (e.g., named lake in Public Water Inventory, has Unincorporated NHD subpolygon polygons in the contiguous basin).....6
6. Lake water elevation maintains wetland hydrology - surface water flows bi-directionally between the wetland and lake (wetlands with A, C, or F water regimes) AND/OR the wetland consists of a floating mat (with a C or D water regime).....**LACUSTRINE FRINGE**
6. Wetland elevation above high water lake elevation and not consisting of a floating mat (typically wetlands with a D water regime that are not floating).....7
1. Wetland is not associated with a perennially flowing stream channel, floodplain, or fringing a designated lake.....7
7. Wetland is within a closed elevation contour that allows for water accumulation (i.e., a depressional basin, includes beaver and manmade impoundments and excavations).....8
8. Wetland has a predominantly D water regime, is not floating, AND vertical accretion of peat has produced a flat surface.....**ORGANIC SOIL FLAT**
8. Wetland has any other predominant water regime or has a D water regime but does not have significant vertical accretion of peat.....**DEPRESSIONAL**
7. Wetland is not within a closed elevation contour.....9
9. Wetland is on a topographic slope (e.g., > 1% percent slope).....10
10. Groundwater is the primary water source (e.g., histosol pedon/histosol, groundwater indicator species).....**SLOPE - Groundwater**
10. Predipitation is the primary water source (e.g., groundwater indicator species not prevalent).....**SLOPE - Surface Water**
9. Wetland is topographically flat (e.g., < 1% slope).....11
11. Wetland has predominantly mineral soil (if organic surface layer present, < 20 cm in depth).....**MINERAL SOIL FLAT**
11. Wetland has predominantly organic soil (an organic surface layer > 20 cm present).....12
12. Predipitation is the primary water source.....**ORGANIC SOIL FLAT**
12. Groundwater is the primary water source (e.g., groundwater indicator species prevalent).....**SLOPE - Groundwater**

Depressional

Depressional - Floodplain

Riverine - Upper Perennial

Riverine - Lower Perennial

Lacustrine Fringe

Mineral Soil Flat

Organic Soil Flat

Slope - Surface Water

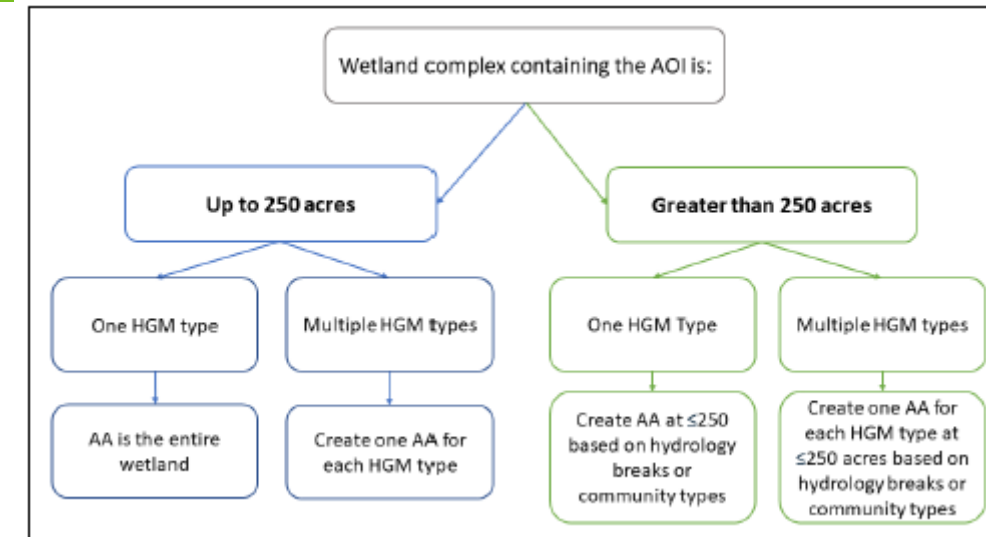
Slope - Groundwater

Q15 HGM Type



1. Wetland is not associated with a perennially flowing stream channel, floodplain, or fringing a designated lake.....7
7. Wetland is within a closed elevation contour that allows for water accumulation (i.e., a depressional basin, includes beaver and manmade impoundments and excavations) 8
8. Wetland has a predominantly D water regime, is not floating, AND vertical accretion of peat has produced a flat surface. **ORGANIC SOIL FLAT**
8. Wetland has any other predominant water regime or has a D water regime but does not have significant vertical accretion of peat. **DEPRESSIONAL**

4) Determine the Bounds of the AA



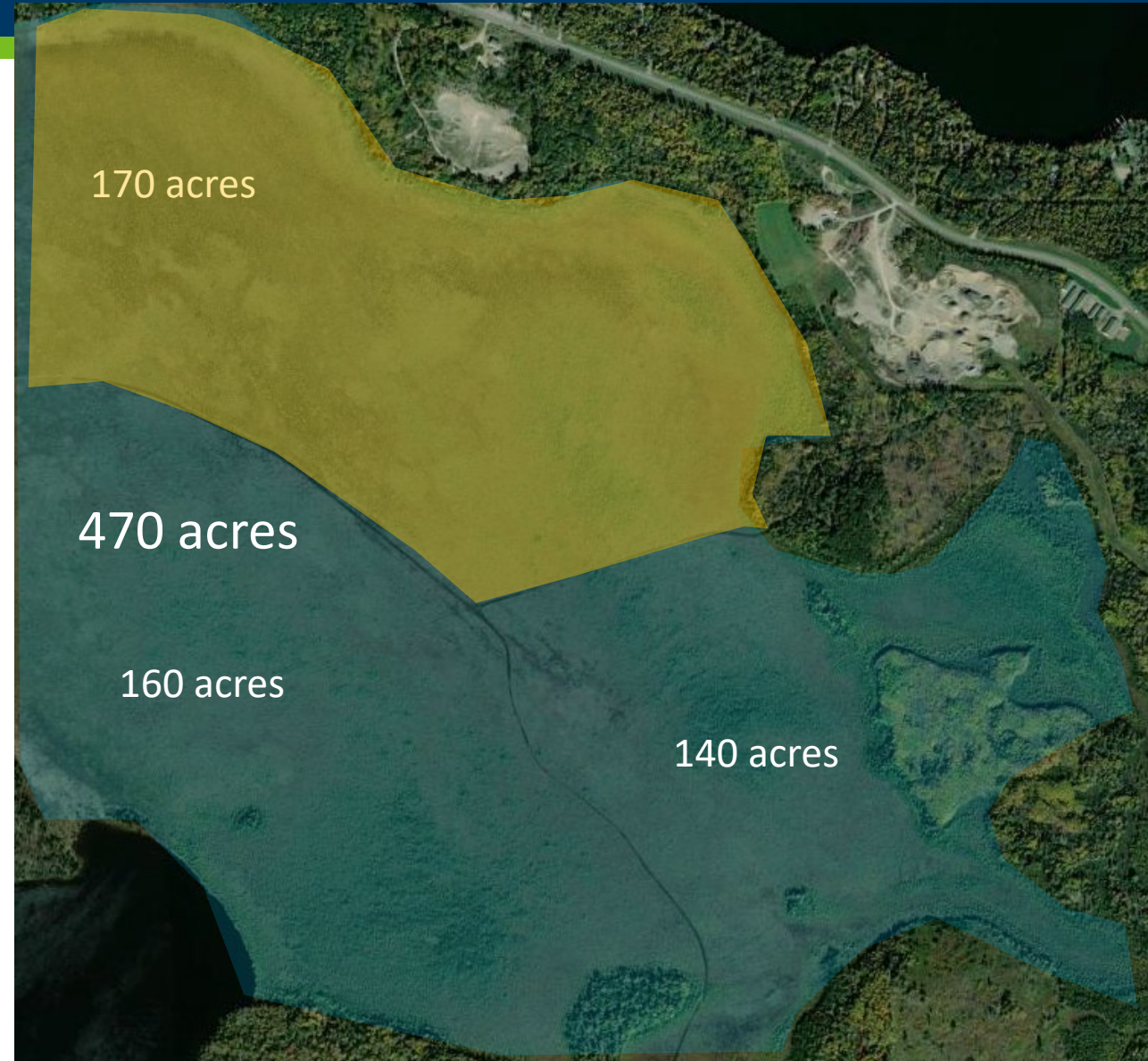
Combining Noncontiguous Wetlands

- Can combine similar wetlands
- However, should not be combined if they are significantly different:
 - HGM classes
 - Hydrologic alterations
- Combined should not exceed 250 acres



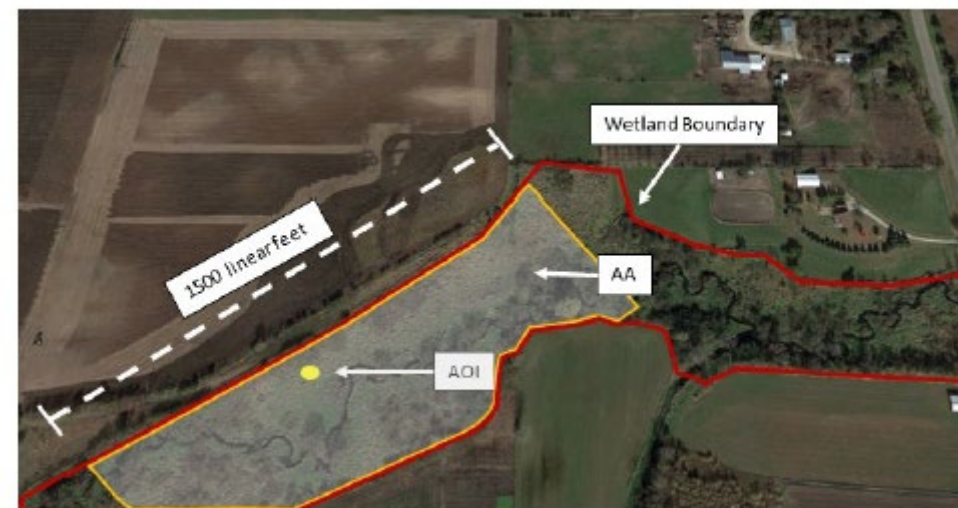
Large Wetlands (>250 acres)

- Divide into separate assessment areas based on hydrology or plant community breaks
- Hydrology breaks such as ditches, tile, beaver dams should be used to divide areas
- If no obvious breaks exist, establish the 250 acre AA to include AOI
- Document any steps taken to refine AA in the user notes



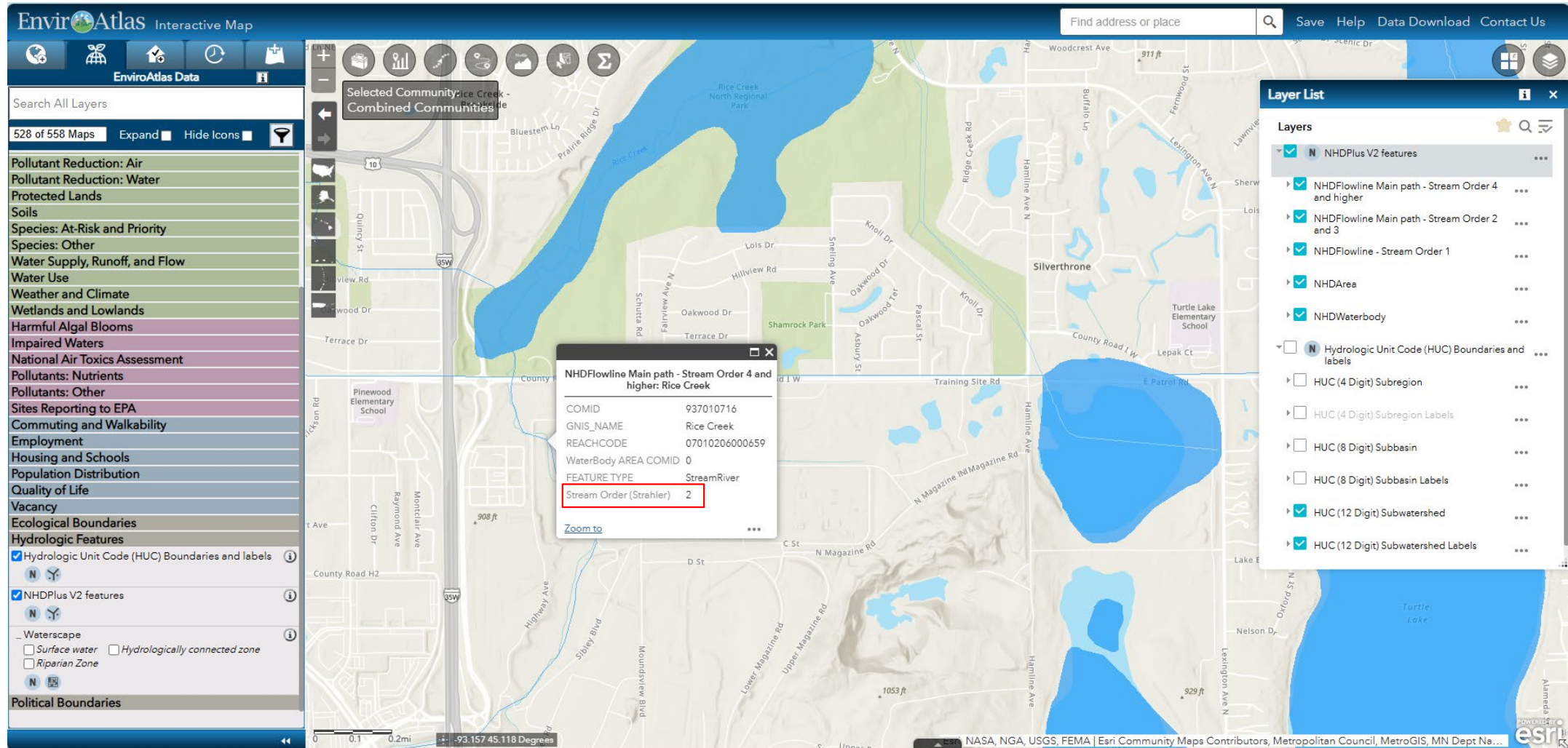
Rivers and Streams

- Limit AA to 1,500 linear feet adjacent to lake or stream
- Center AOI within AA
- Include wetlands on both sides of ditches and 1st or 2nd order streams
- 3rd order or higher- AA is wetland on the side of AOI

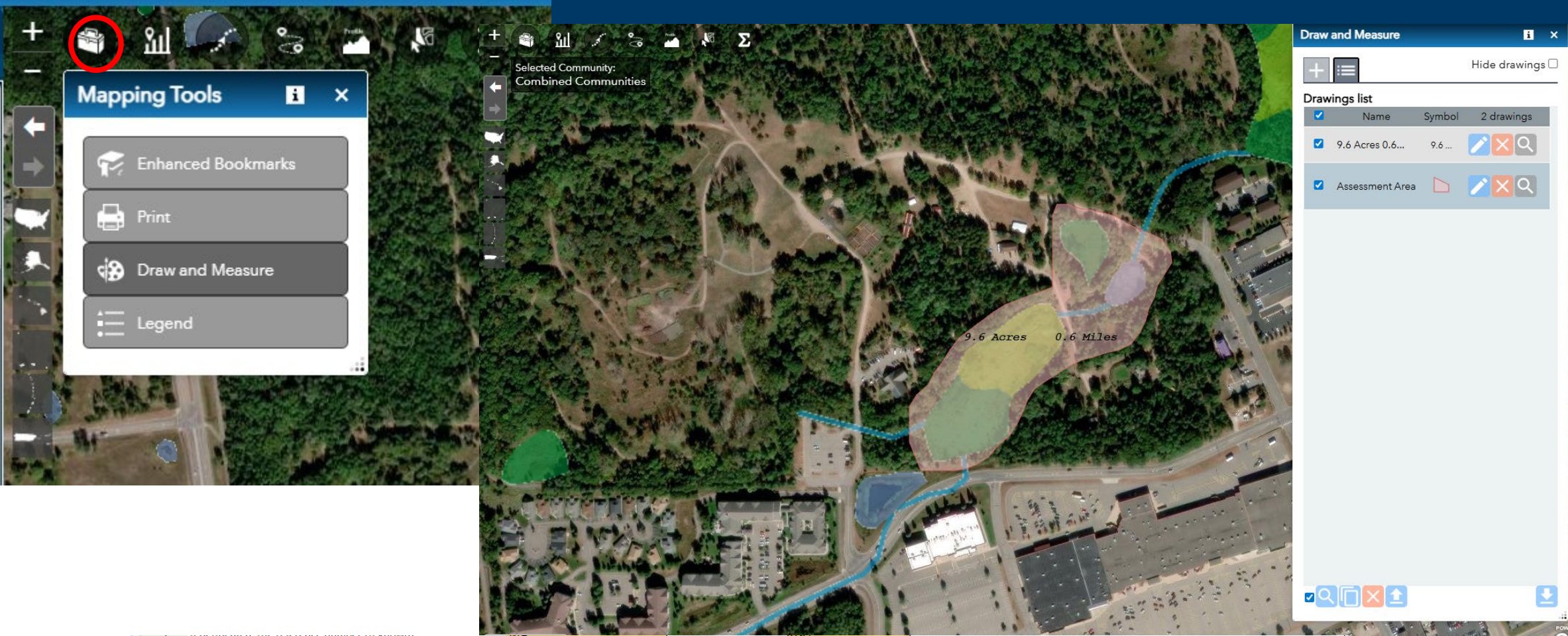


Determining Stream Order

- Hydrologic Features> NHD Plus v2 layers
- Select Feature



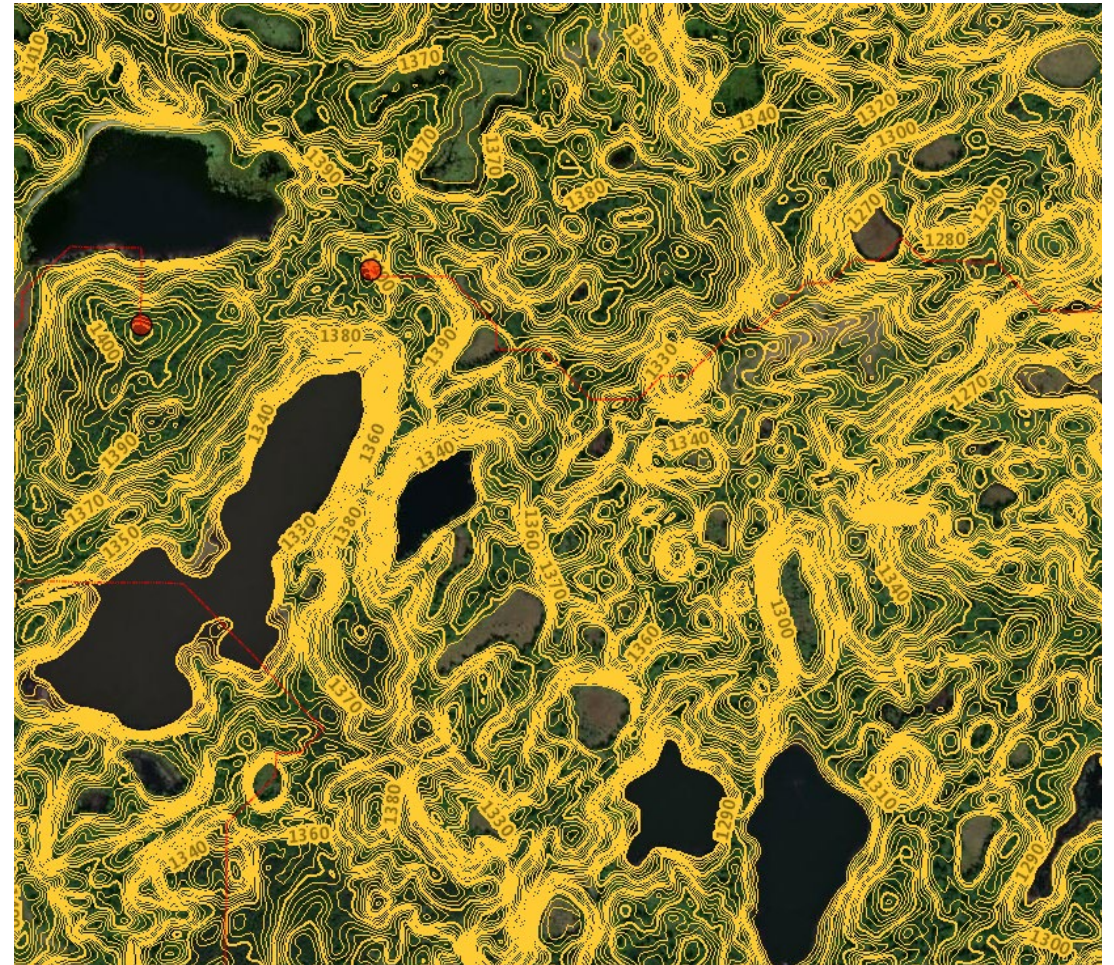
Size of Assessment Area



Location Details			Information Source(s)	Information for User
6	Nearest Town:	Baxter	Desktop	
7	County:	Crow Wing County	Desktop	
8	State:	Minnesota	Desktop	
9	Latitude (decimal degrees):		Desktop	
10	Longitude (decimal degrees):	-94.233000	Desktop	
11	PLSS, quarter/quarter section or tax lot(s) reference:		Desktop	
12	Size of the Assessment Area (AA, in acres):	9.60	Desktop	See Assessment Area Establishment instructions in <i>User Guide</i> . ☒ Screenshot required: Outline of AA

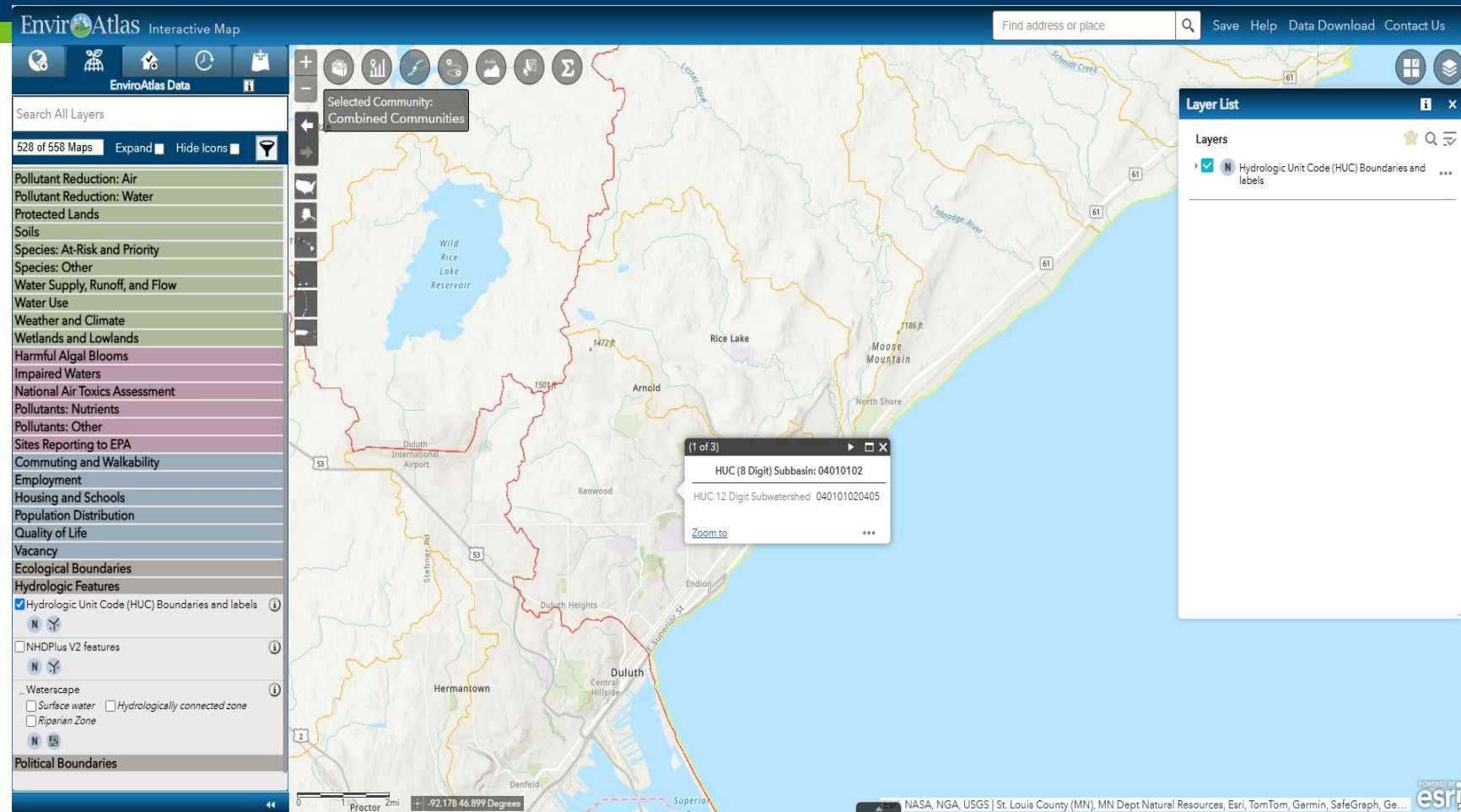
Size of the Catchment Area

- Catchment Area is the land area contributing surface water directly into AA
- Use topographic data and Raindrop Tool to define
- Instructions found in Appendix C
- Riverine and depressional floodplain catchment areas are larger drainage
 - Established watershed areas used



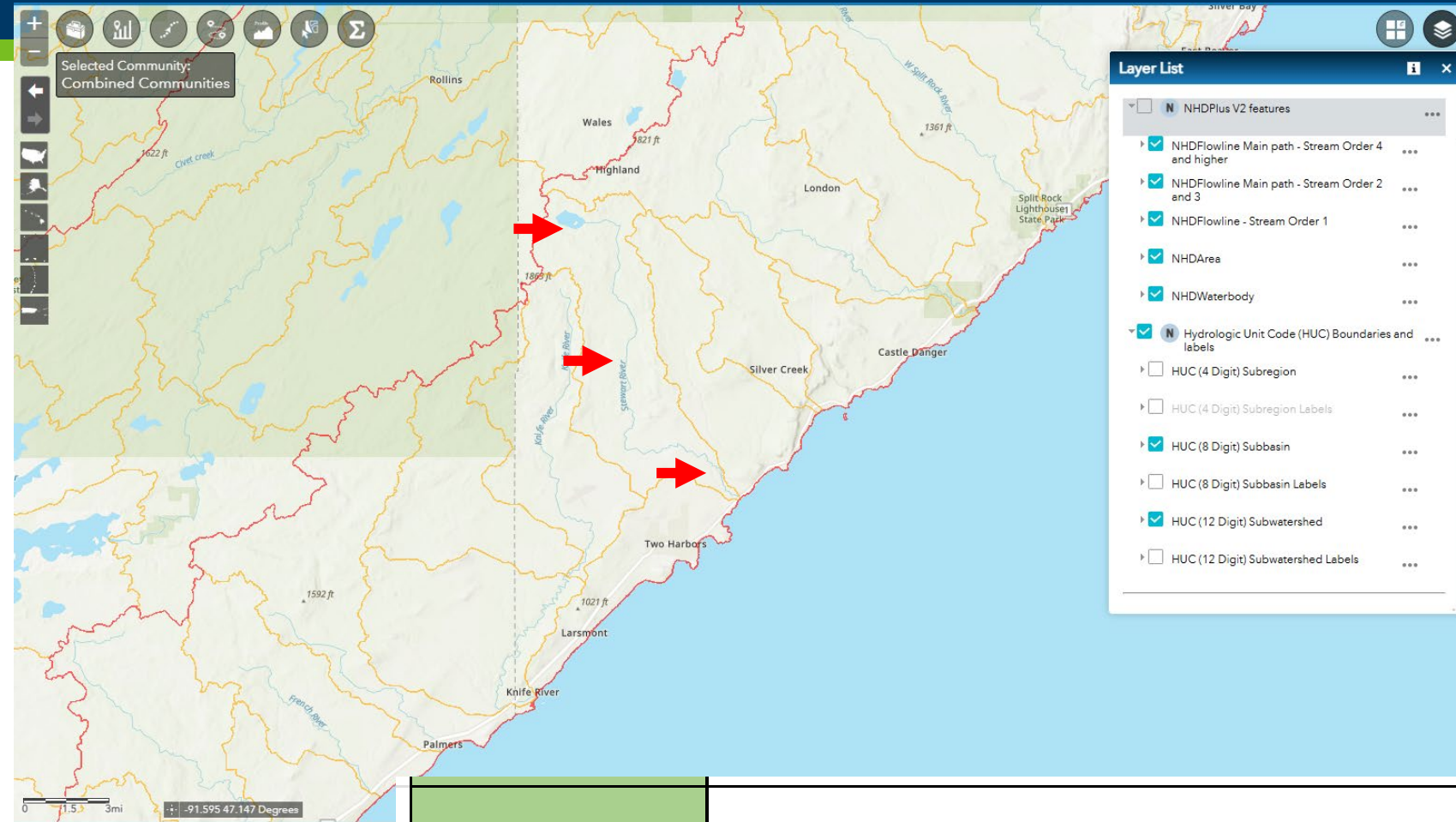
Determining Catchment Area for Riverine Settings

- Includes riverine and depressional floodplain
- 1st and 2nd Order uses HUC 12
- Lower perennial uses HUC 8
- Use draw and measure to determine area upstream of AA



HUC 12 local high or local low?

- Answer default local low for slope, riverine, lacustrine fringe
- Hydrologic Features>Hydrologic Unit Code
- Visually estimate the relative location of AA within HUC12 watershed



20

Is the AA situated in elevation closer to the Hydrologic Unit Code 12 (HUC 12) watershed's local high or the local low for topography?

In between local high and local low

Q20 AA location in HUC12

Local high

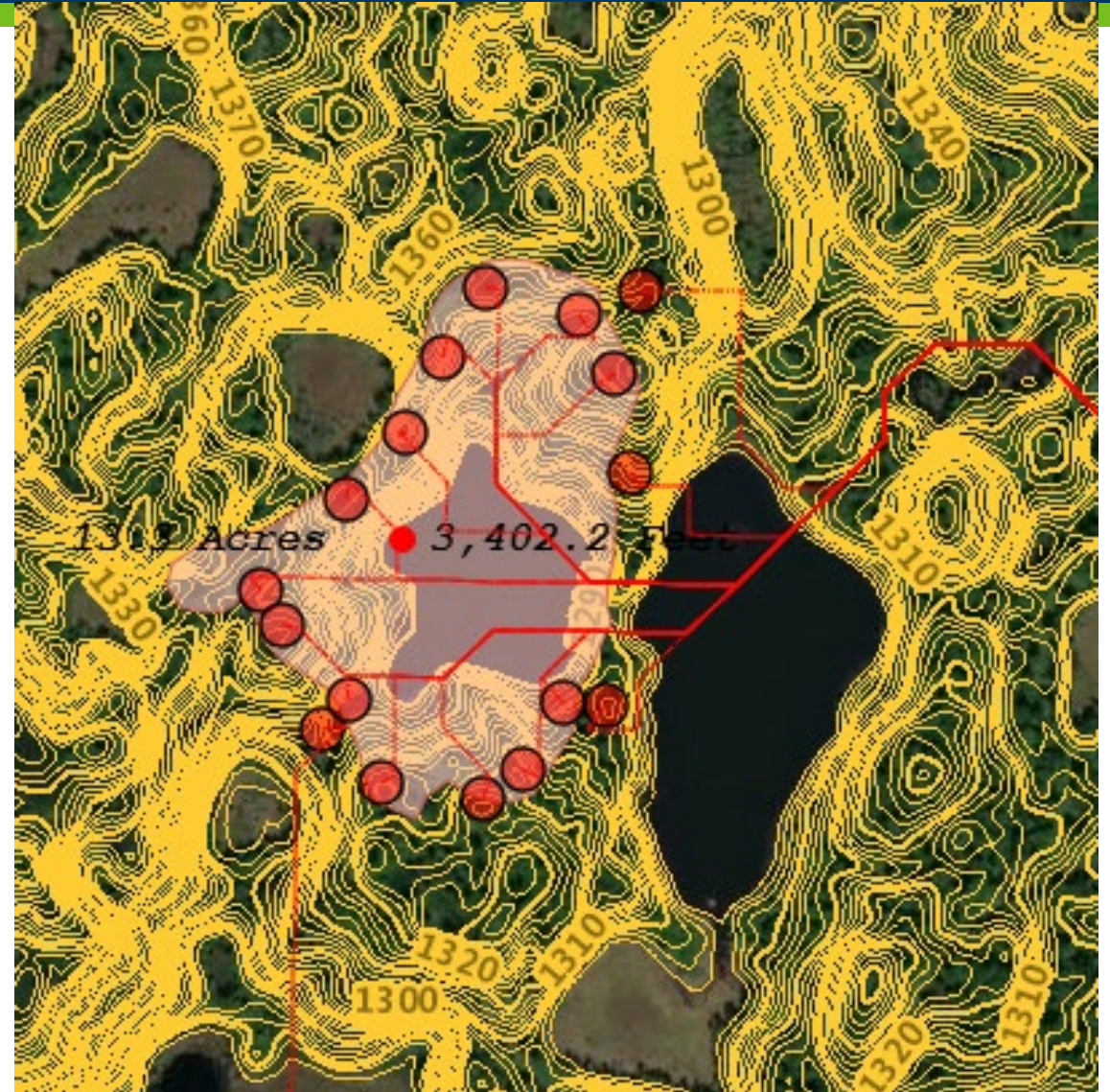
Local low

In between local high and local low

In a flat landscape without a local high and low

Defining Catchment Area

- Depressional, Organic Flat, Slope and Lacustrine Fringe
- Upper limits are topographic breaks where precipitation drains towards AA
- Upgradient depressions and lakes should be excluded from immediate catchment
- Lower elevation limit of catchment is edge of AA

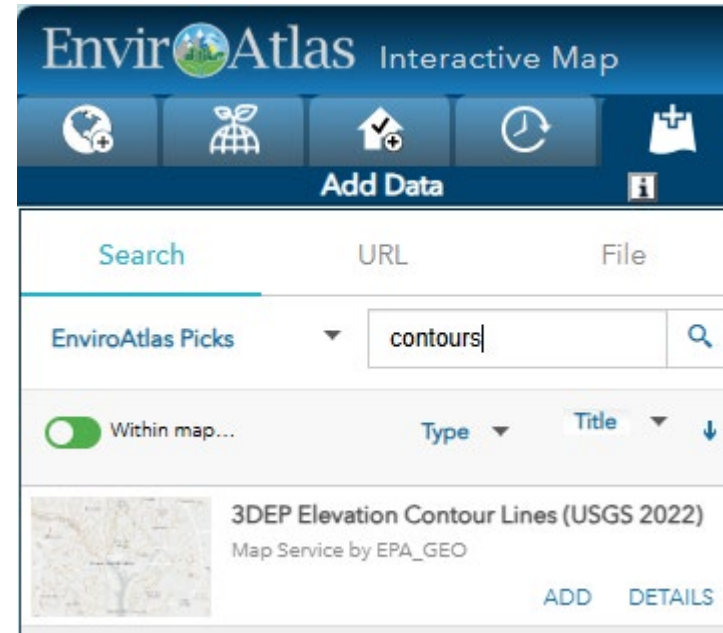
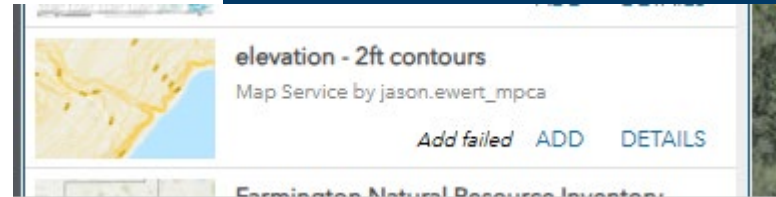


Note on Adding Contours

- 2 ft contours work best
- Link to data appears broken
- Can add 3DEP 10 ft contours

OR

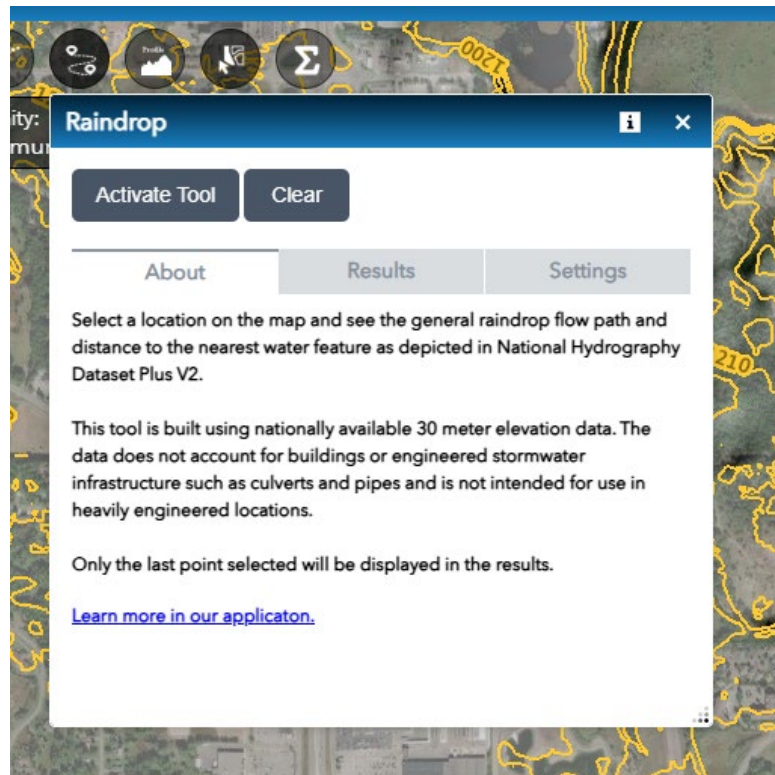
- Paste URL of MN Topo 2ft and add



[MnTopo/1st Generation 2ft Contours \(VectorTileServer\)](#)

- Add 2-foot contour map
 - Add data>search ArcGIS Online>Minnesota contours
 - Add data layer
- Activate Raindrop Tool

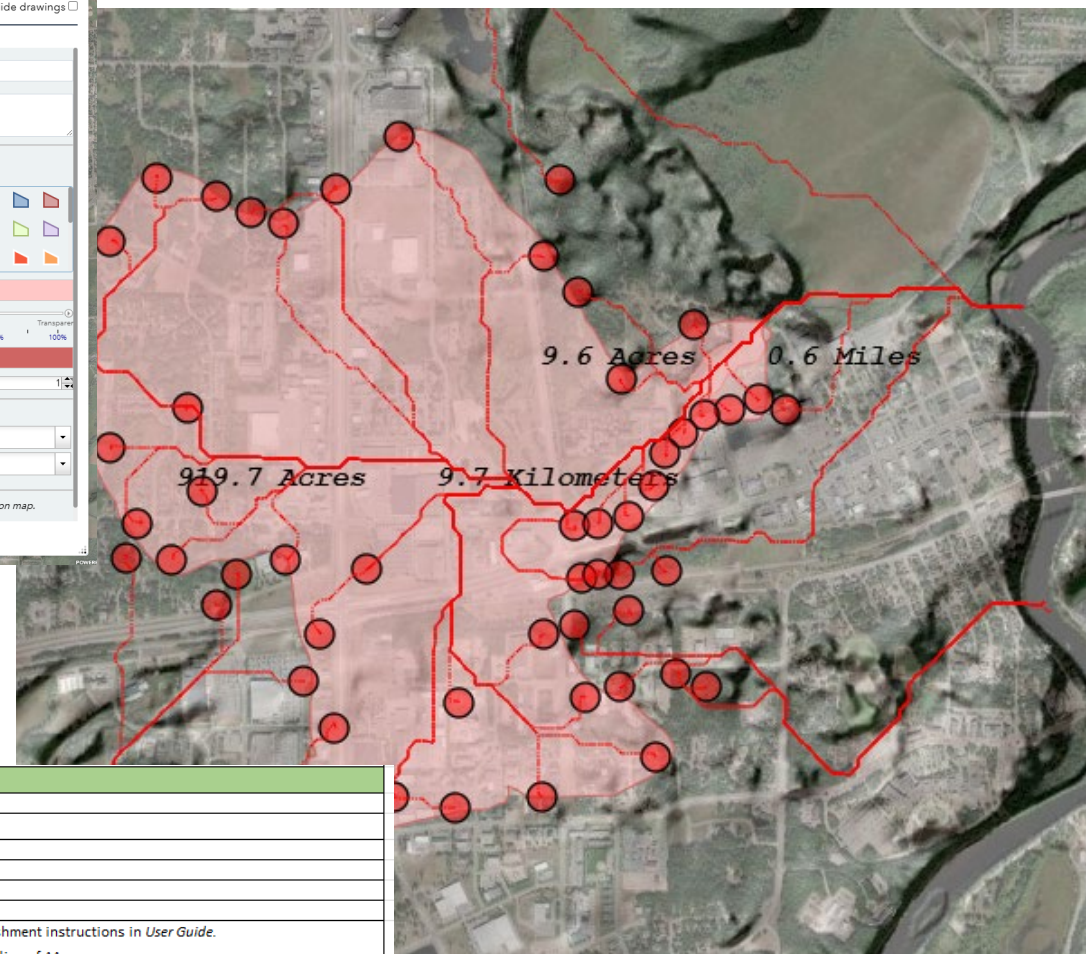
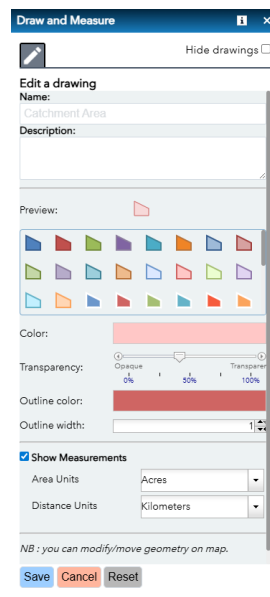
Use Raindrop Tool



- Create polygon around the catchment area

Connect the Dots

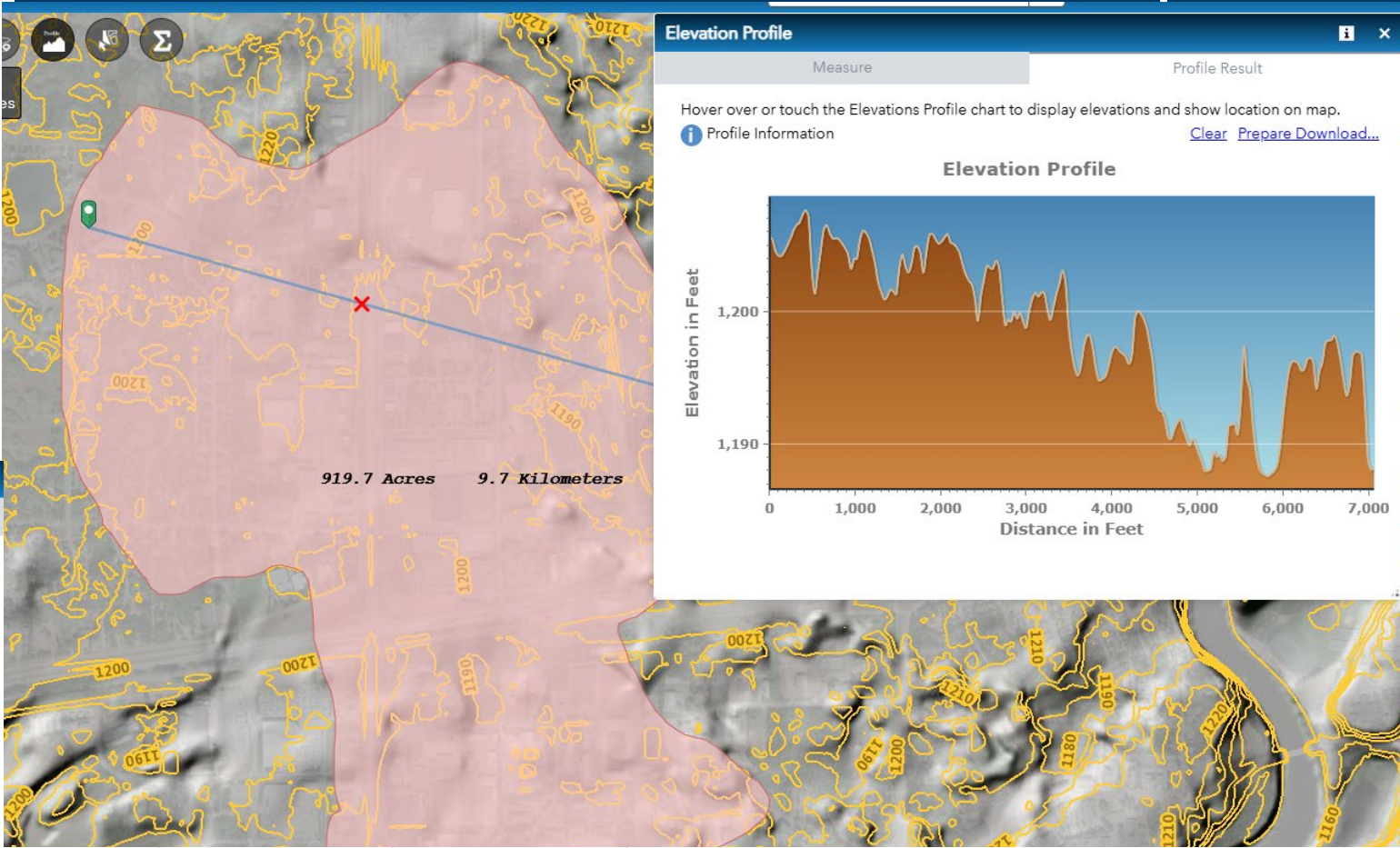
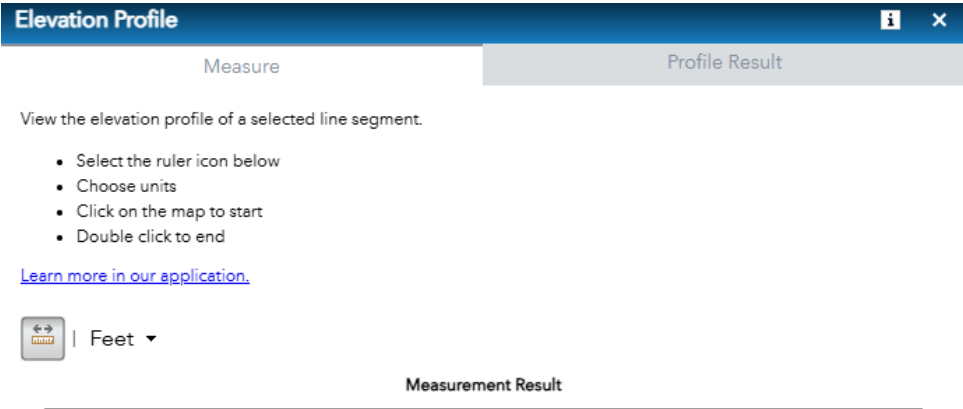
- Draw and Measure tool
 - Set units of measurement
 - Layer table>select layer>edit a drawing
- Answer Q 13
- Q14 auto populates



Location Details			Information Source(s)	Information for User
6	Nearest Town:	Baxter	Desktop	
7	County:	Crow Wing County	Desktop	
8	State:	Minnesota	Desktop	
9	Latitude (decimal degrees):		Desktop	
10	Longitude (decimal degrees):	-94.233000	Desktop	
11	PLSS, quarter/quarter section or tax lot(s) reference:		Desktop	
12	Size of the Assessment Area (AA, in acres):	9.60	Desktop	See Assessment Area Establishment instructions in <i>User Guide</i> . ☒ Screenshot required: Outline of AA
13	Size of the catchment area draining into the AA (in acres):	919.70	Desktop	Use GIS software or EnviroAtlas raindrop tool to define the catchment area of the AA and determine its size. ☒ Screenshot required: Outline of the catchment
14	What percent of the catchment area is occupied by the AA? (AA divided by catchment area multiplied by 100).	1.0%	Desktop	Auto-populated from questions 12 and 13.
15	What is the dominant HGM class of the AA?	Riverine - Upper Perennial	Desktop; Field	A dichotomous key to HGM classes is provided in the <i>User Guide</i> .

- Using topo and LIDAR layer
- Elevation profile tool
- Find highest and lowest point of catchment
- Determine change of elevation distance

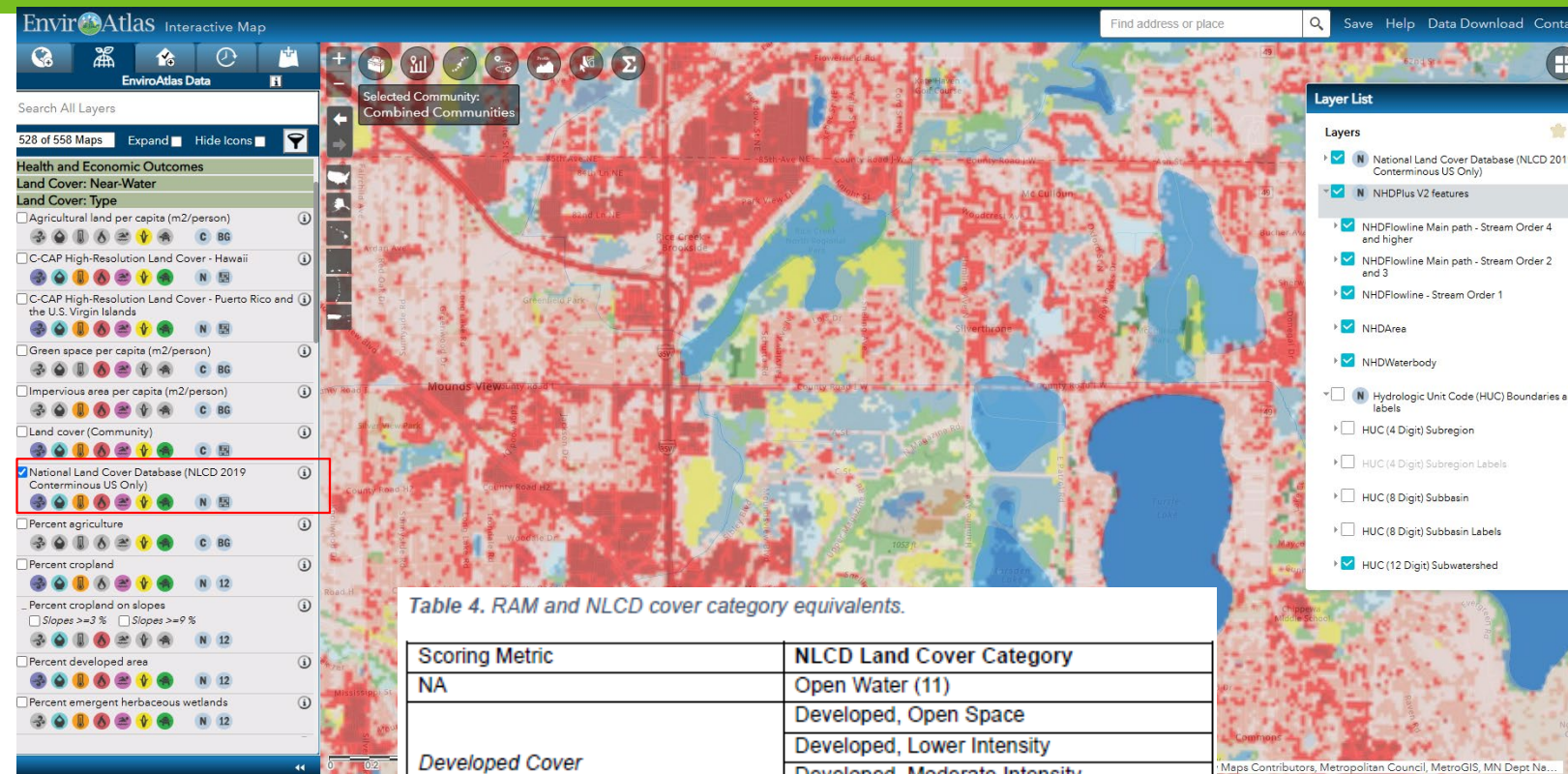
Catchment Area Slope



Watershed Catchment Area			Information Source(s)		Information for User
19	What is the slope across the AA's catchment area?	<2%	Q19 Catchment Slope	0-2% 2-6% >6%	desktop
Slope calculation: 1) determine the change in elevation from highest point in the upstream portion of the catchment to the lowest point in the downstream portion catchment; 2) determine the distance between the two points; 3) divide the change elevation by the distance (in the same units); 4) multiply the result by 100. ☒ Screenshot required: Map of the high and low points within catchment and distance between the two points.					

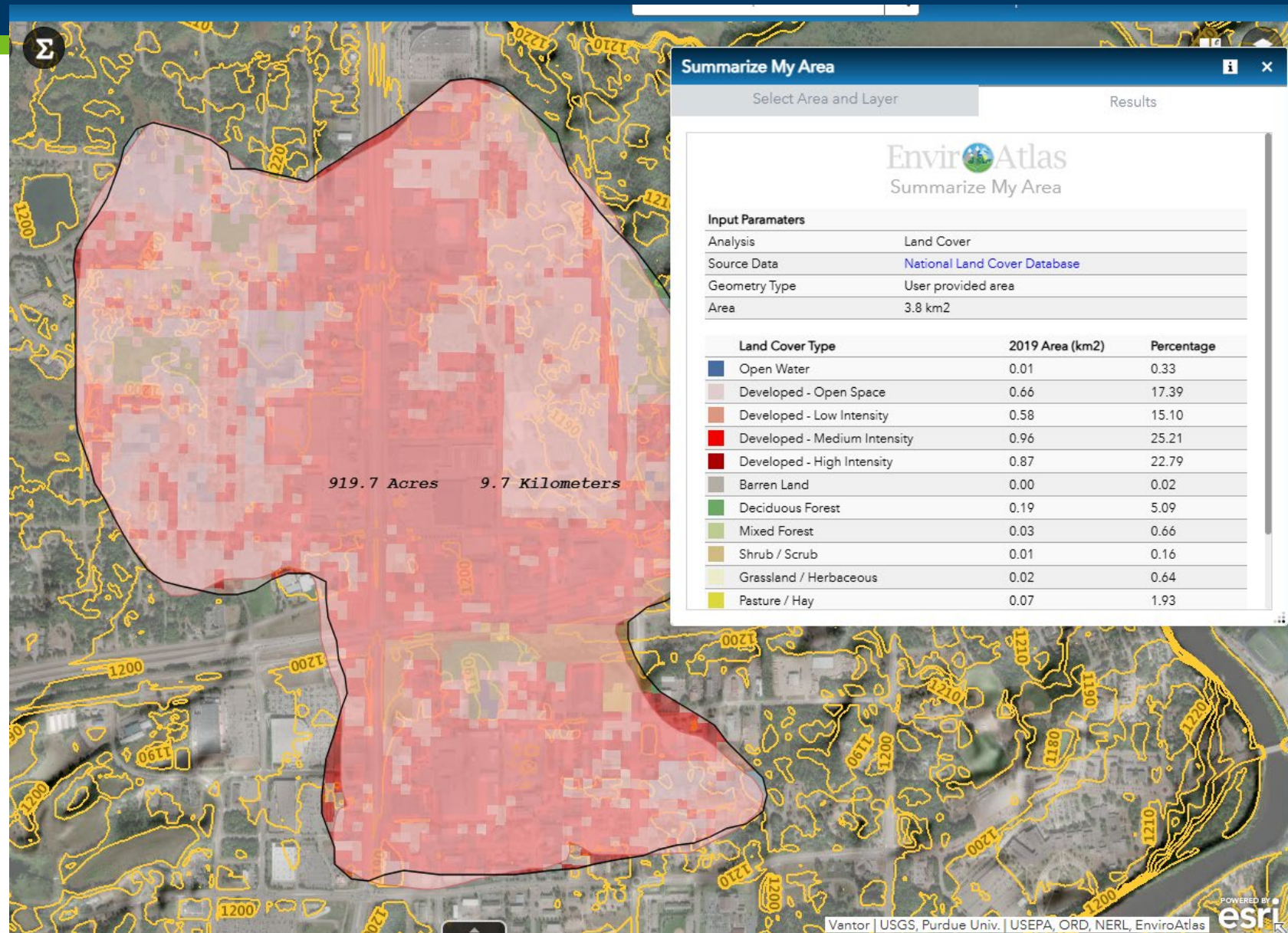
National Land Cover Database map layer

- Land Cover: Type> National Land Cover Database
- Answer 3 Questions:
 - Percent developed and agriculture cover
 - Percent catchment area that is natural cover class
 - Percent of land within 0.1 miles that is natural cover class
- See Appendix D

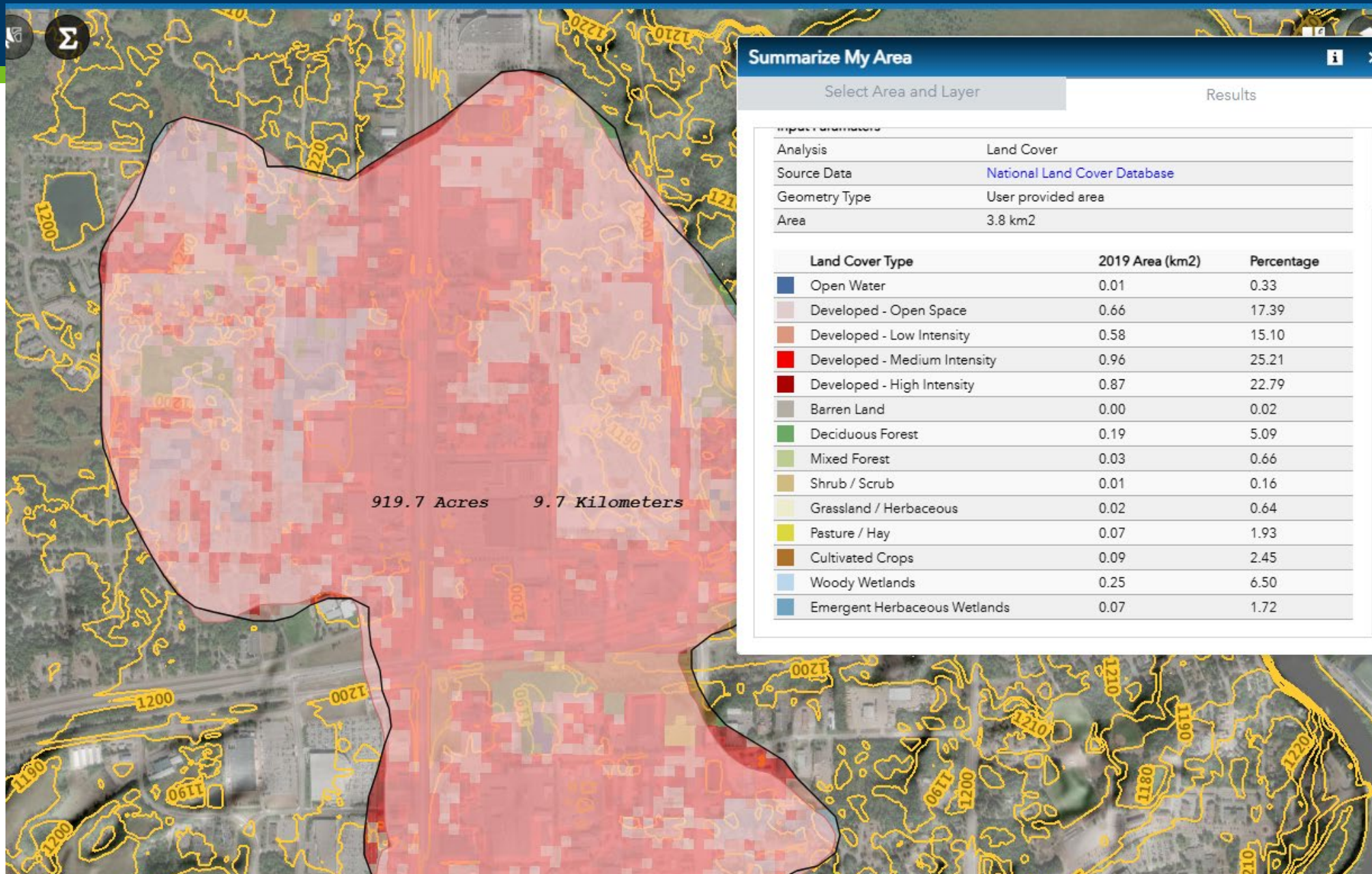


Developed and Agricultural Cover Classes

- Summarize My Area tool
- Land cover>Draw an area
- No buffer
- Exclude AA
- Trace around catchment Area
- Calculate
- Sum percentage of developed and agriculture classes

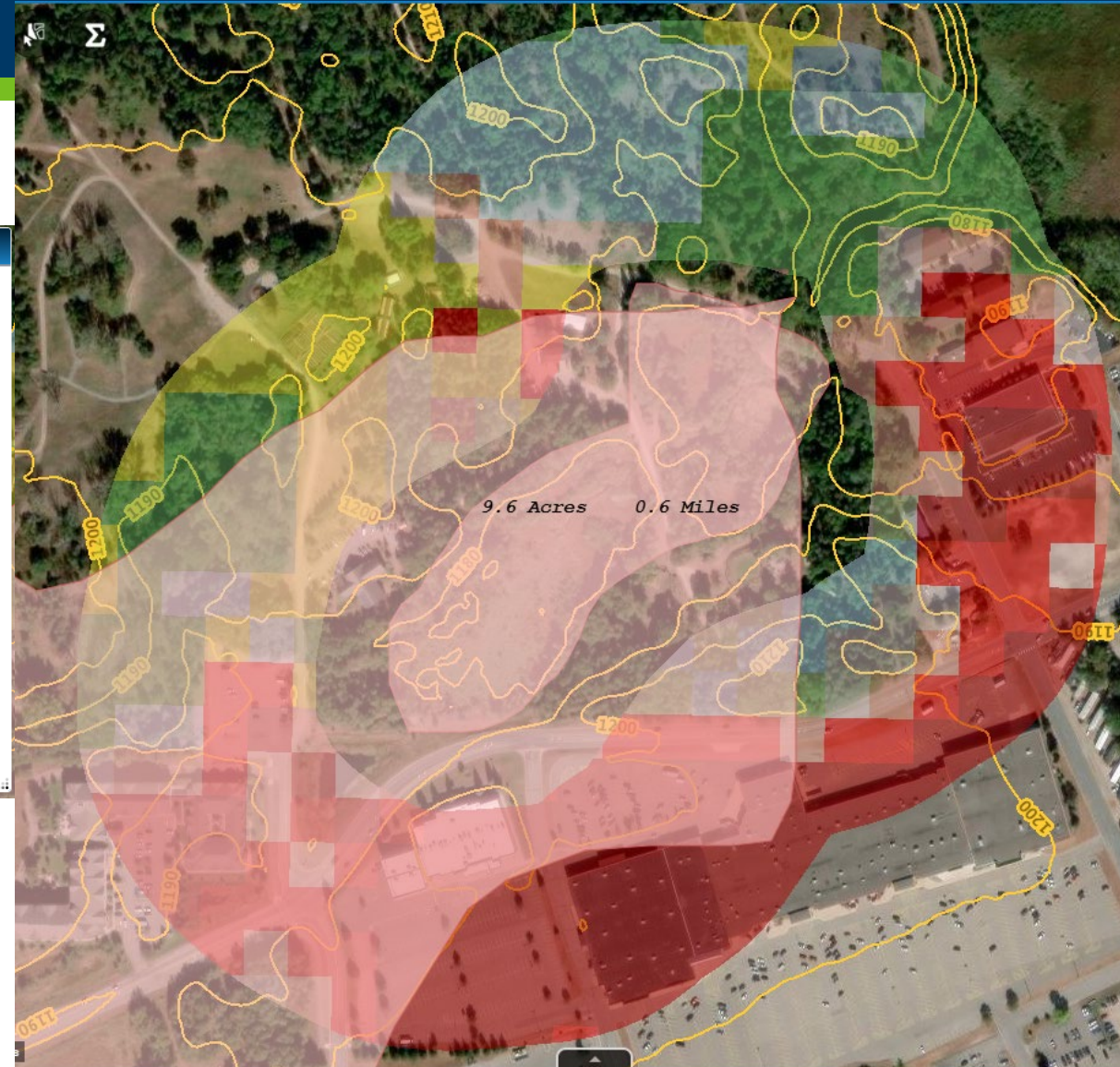
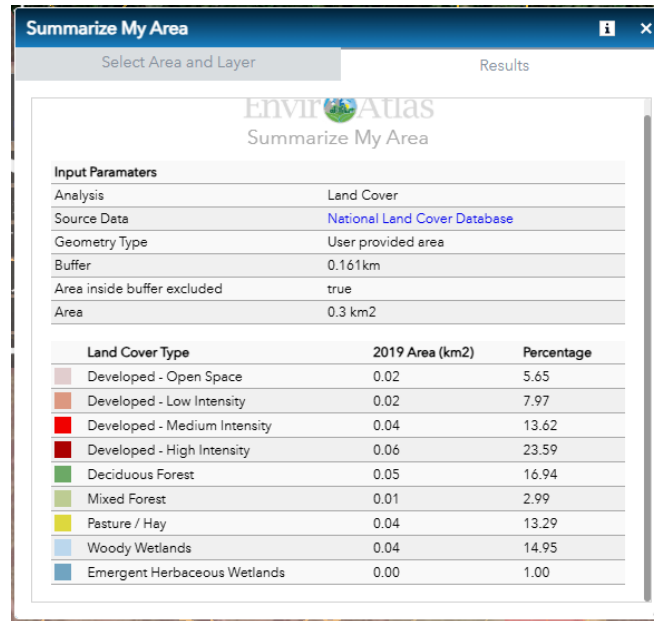


Natural Cover Classes



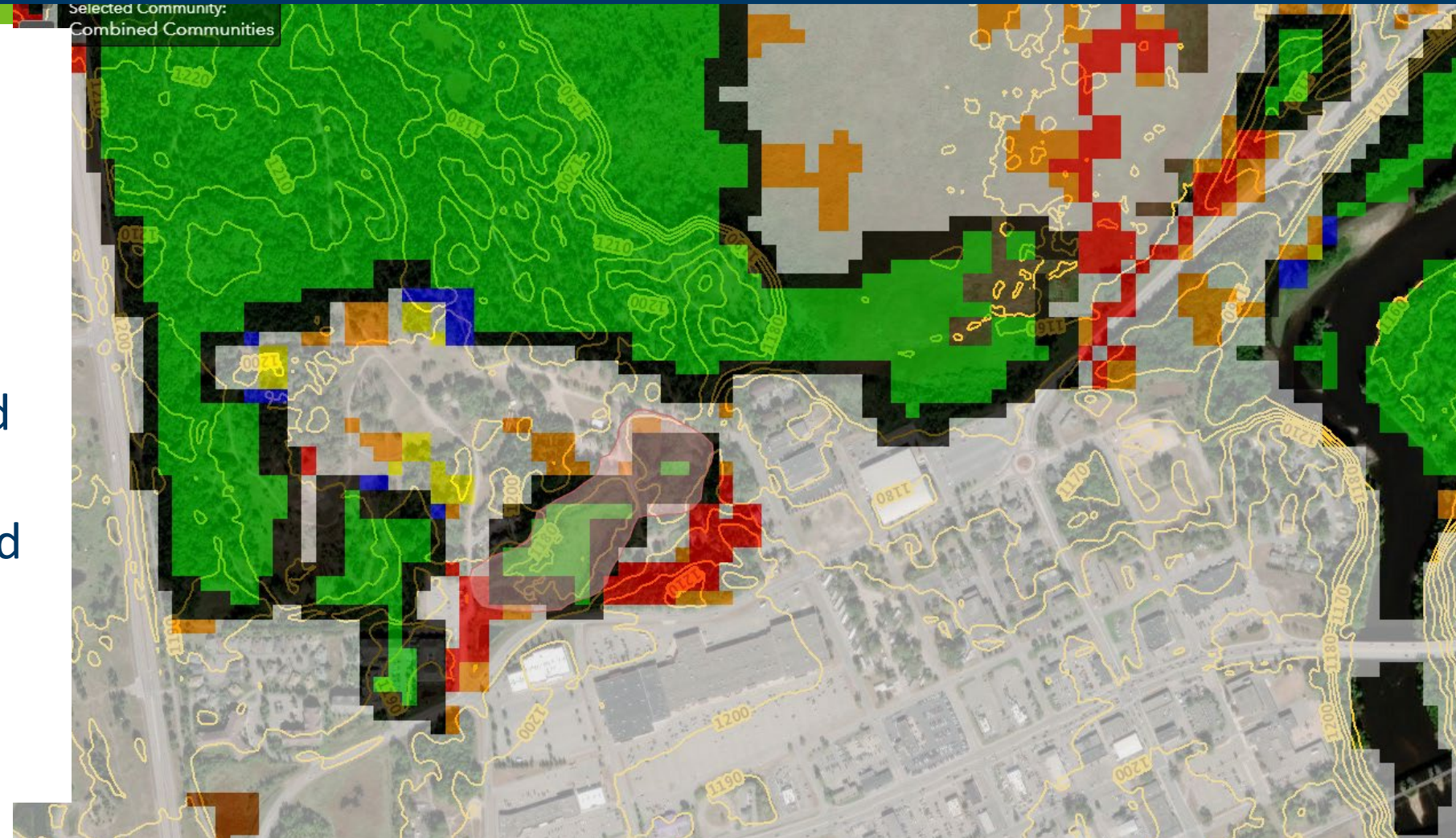
Percent Natural Cover within 0.1 miles of AA

- Summarize by Area tool
- Select Land Cover as the indicator
 - National Land Cover Database map layer
- Draw an area as the summary unit
- Enter 0.161 (0.1 mile)
- Exclude Inner Feature Box
- Trace AA
- Calculate



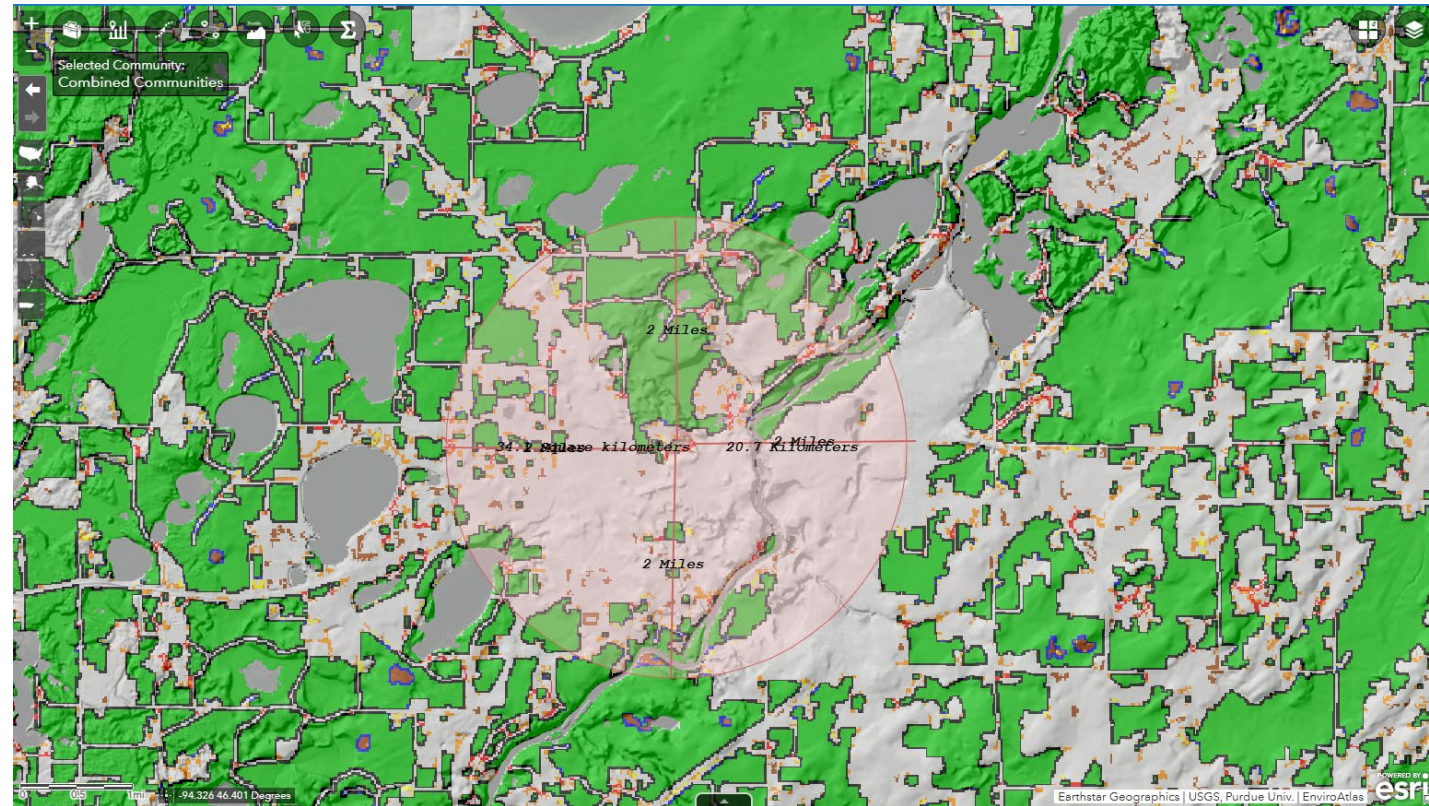
Landscape Habitat Connectivity

- Is the AA in a core area?
- Landscape Pattern Data Layer
- MSPA connectivity with water as foreground and 30-meter edge with for the conterminous United States
- Red areas are “bridges”



Assessment Area within Core Area?

- What is the coverage of core area within 2-mile buffer around AA?
- If AA connected via “bridges” (red), include all connected areas in estimate
- Landscape Pattern Map layer
- Overlay polygon representing 2-mile distance (Appendix E)
 - Draw and Measure Tool
 - Add drawing>line>unit of measurement
 - Adjust transparency
- Estimate the percent of the core area within 2-mile radius



Q18 Percent Area in Core	<25%
	25-75%
	>75%

- Desktop review with field verification
- Cowardin water regimes
- Use aerials
- Note hydrology signatures

Water Regimes

Hydrology		
21	What is the percent of the AA with each water regime listed below?	
	NWI Water Regime	Percent Cover
	Seasonally saturated (B)	
	Temporarily flooded (A)	5%
	Continuously saturated (D)	45%
	Seasonally flooded (C)	
	Seasonally saturated - flooded (E)	
	Semi-permanently flooded (F)	45%
	Intermittently exposed (G)	
	Permanently flooded (H)	5%
	TOTAL (Total cover must equal 100%)	100%



Predominant Surface Flow input into the AA

- Use aerial imagery, topography, field observations and Raindrop Tool
- Confirm with field observation
- Consider size and scope of catchment area
- Normal hydrologic conditions
- Select most representative response



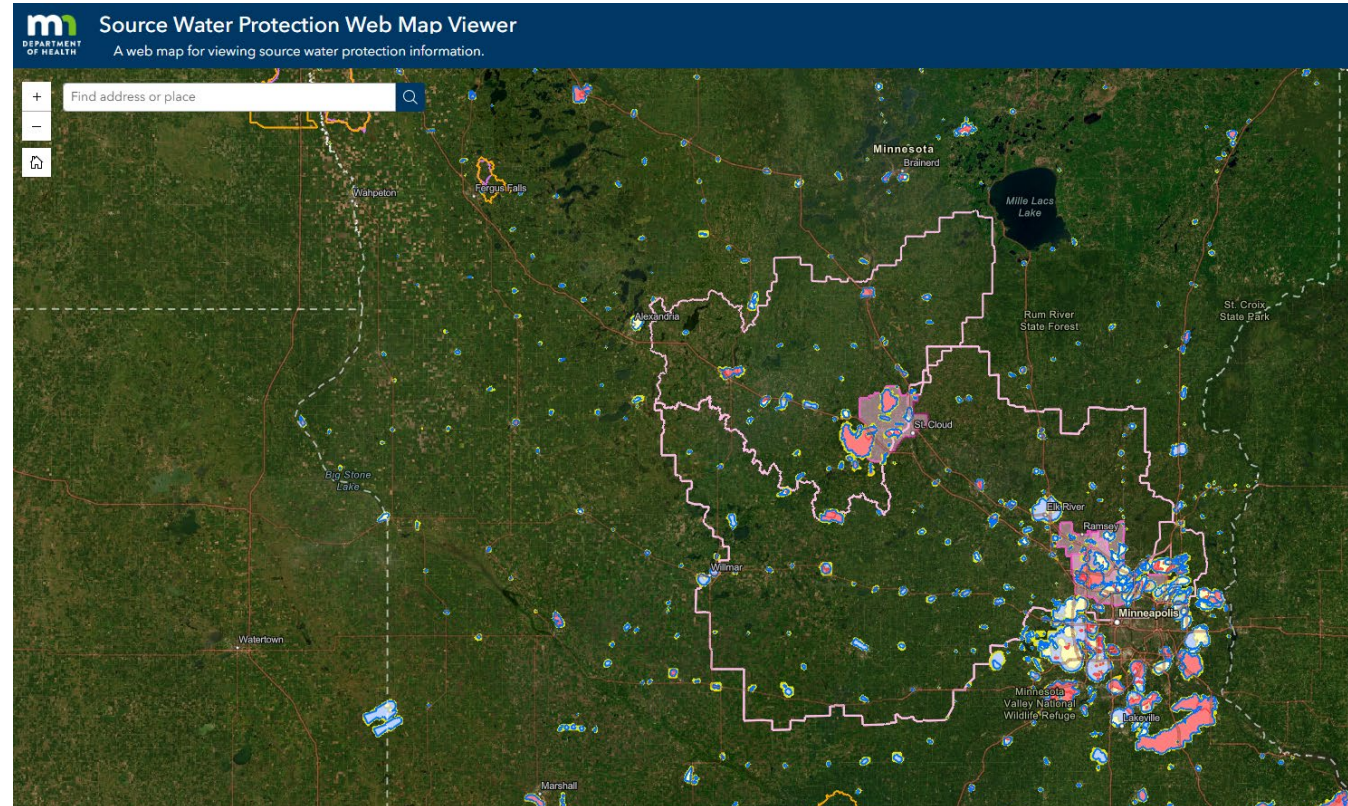
	SURFACE WATER AND THE DRAINAGE/
Q26 Surface water within AA	Natural overland flow across the soil surface, no constructed channels, ditches, or streams that significantly facilitate flow. AA predominately standing open water. Natural channels or streams facilitate flow. Constructed ditches, channels, or straightened stream facilitate flow.

Is AA located in area of notable groundwater importance?

Areas of high-volume groundwater extraction and/or areas that are designated for groundwater protection

Select “yes” if any of the following:

- Groundwater Management Plan Area
 - [Groundwater Management Areas \(GWMAs\) | Minnesota DNR](#)
- Drinking water supply management of wellhead protection area
 - [Source Water Protection Web Map Viewer - MN Dept. of Health](#)
- Within 2 miles of center-pivot irrigation

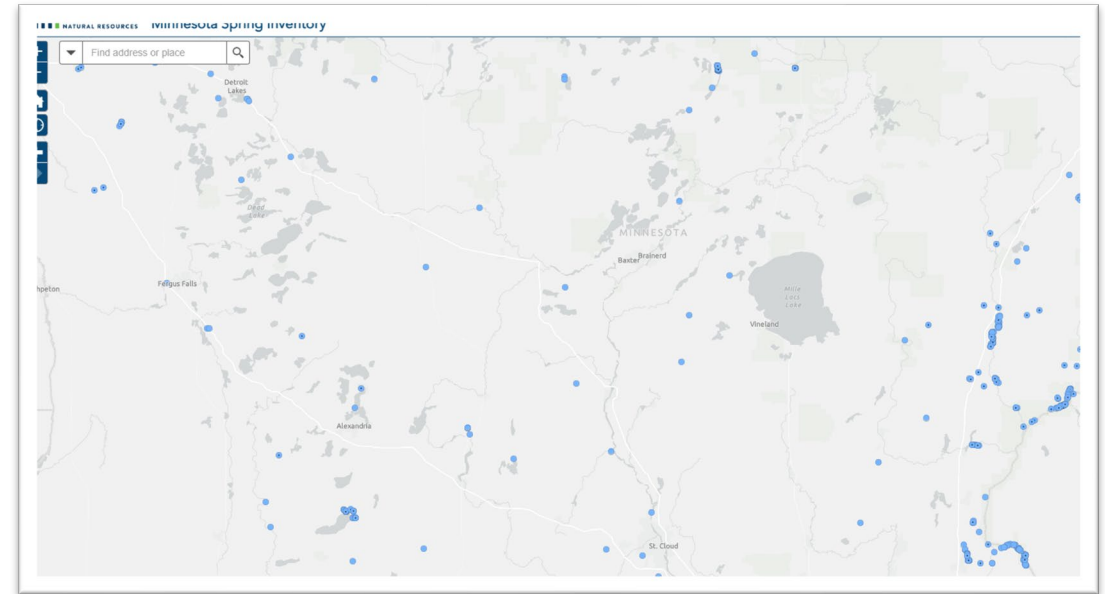


Springs or Seeps

- Groundwater interaction within AA?
- Field review should note indicators:
 - cold water
 - iron or marl deposits
 - rainbow film on surface water
 - prevalence of groundwater indicator plants (skunk cabbage, marsh marigold, watercress, great angelica)

- Springs or seeps within 2 miles of the AA?

- [MN Spring Inventory](#)



Characterize predominant water flow through AA

- Based on field observations and supported by features visible on imagery
- Predominant flow
- Only functioning ditches should be considered “constructed ditches”



stormwater and the outlets).

Q26 Surface water
within AA

Natural overland flow across the soil surface, no constructed channels, ditches, or streams that significantly facilitate flow.
AA predominately standing open water.
Natural channels or streams facilitate flow.
Constructed ditches, channels, or straightened stream facilitate flow.

Does the AA have a surface water outlet to another waterbody?

- Use aerial imagery, field observations and Raindrop Tool
- Confirm with field observation
- If more than one answer applies, select which greatest volume discharges

Q24 Surface water connection	No, Isolated
	Yes, wetland
	Yes, river, stream, or ditch
	Yes, lake

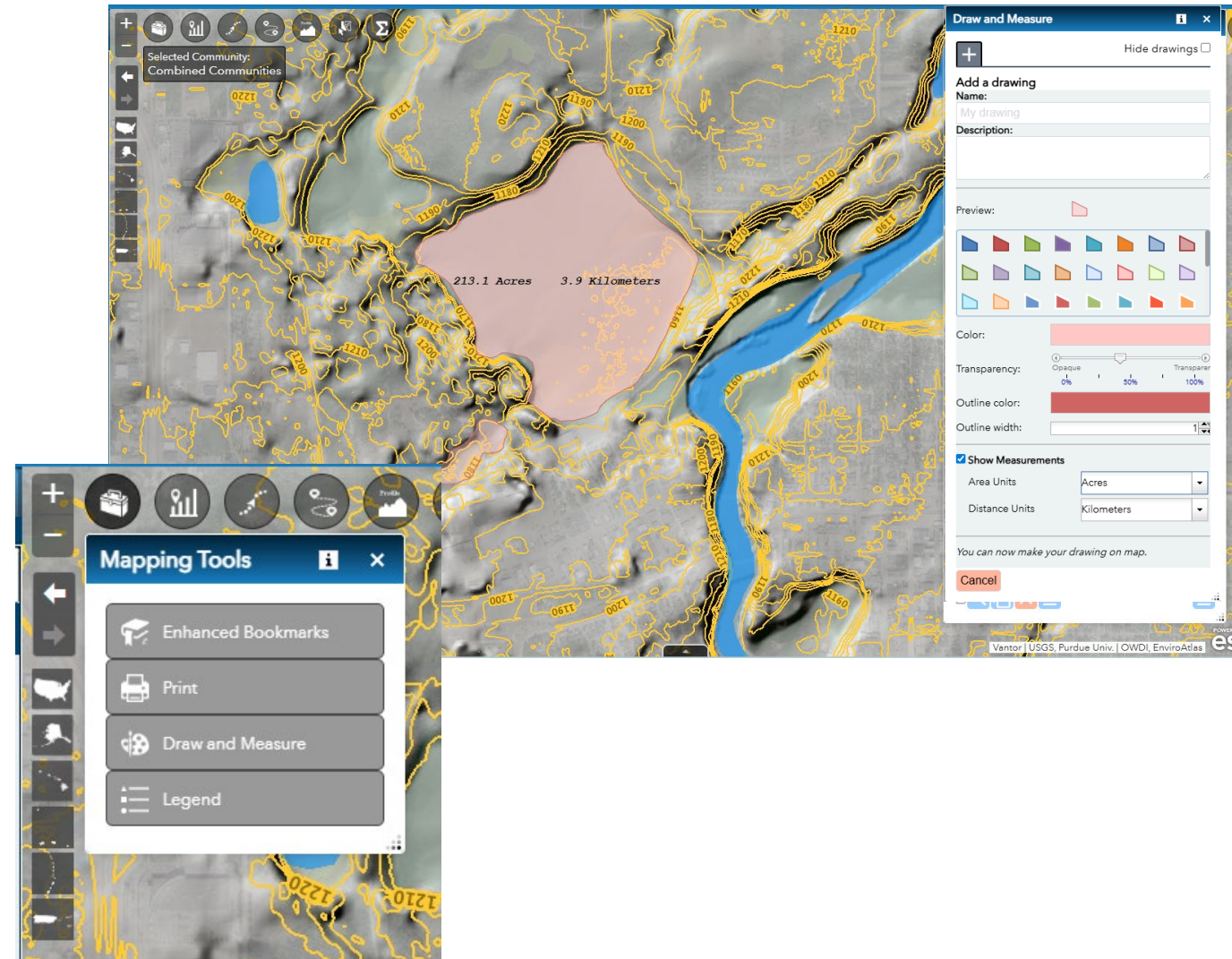


Predominate outflow of surface water

- Question applicable if AA is not isolated (Q24)
- Consider site during precipitation events or high-water flows
- Use aerials and field observations to identify outlets and make determinations
- Field verify
- Highly restricted- outlet is overtopped only during extreme flow. Marks of inundation above outlet elevation.
- Moderately restricted- outlet near the normal surface water level. Outlet overtopped during normal events.
- No constriction- Water can flow freely between receiving waters
- Outflow expedited via ditching

Size of lake or wetland with surface connection to AA

- Q32- Applicable if the AA outlets to lake or wetland (Q24)
- Can use Draw and Measure tool to draw polygon
- Select acres for the area units
- This is an approximate size
 - Do not need to delineate!



Ratio of AA to wetland or lake

- Applicable if the AA outlets to lake or wetland
- Auto-calculated from Q32 and Q12
- No input required

12	Size of the Assessment Area (AA, in acres):	4.50
----	---	------

24	Does the AA have a surface water outlet to another waterbody?	Yes, wetland
----	---	--------------

32	What is the approximate size in acres of the lake or wetland that has a surface water connection to the AA?	3
33	What is the ratio of AA area to the wetland or lake area with a surface water connection to the AA?	1.5

Stream Order of receiving waterbody

- If AA outlets to river, stream or ditch
- Hydrologic Features> NHDPlus V2 layer
- If not mapped, consider 1st order stream



What is the density of Woody Vegetation in AA

- Field observation of the density and overall coverage of persistent, erect vegetation capable of intercepting surface water
- Can include senesced rooted vegetation
- Do not include unrooted vegetation such as fallen trees
- Do not include annual crops or other harvested vegetation

Figure 19. Visual guide for estimating percent cover.

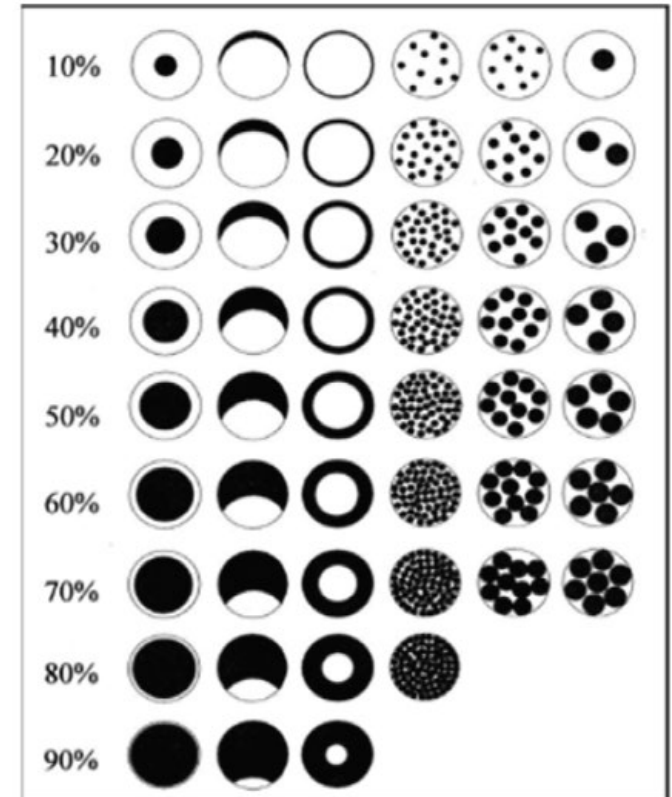


Figure citation: Oldham R.S., Keeble J., Swan M.J.S. & Jeffcott M. (2000). Evaluating the suitability of habitat for the Great Crested Newt (*Triturus cristatus*). *Herpetological Journal* 10(4), 143-155.

Q27 Density of
Vegetation

High stem density, stems occupy >75% of the soil surface.

Moderate stem density, stems occupy 50-75% of the soil surface.

Low stem density, stems occupy <50% of the soil surface.

Shoreline Bare Ground

- If AA discharges into another waterbody, what percent active bank/shoreline is bare ground?
- Active shoreline:
 - 75 feet landward from OHWL
 - Until topographic break

Q30 Shoreline Bare Ground	<30% or hard armored
	30-59%
	60-90%
	>90%

Figure 19. Visual guide for estimating percent cover.

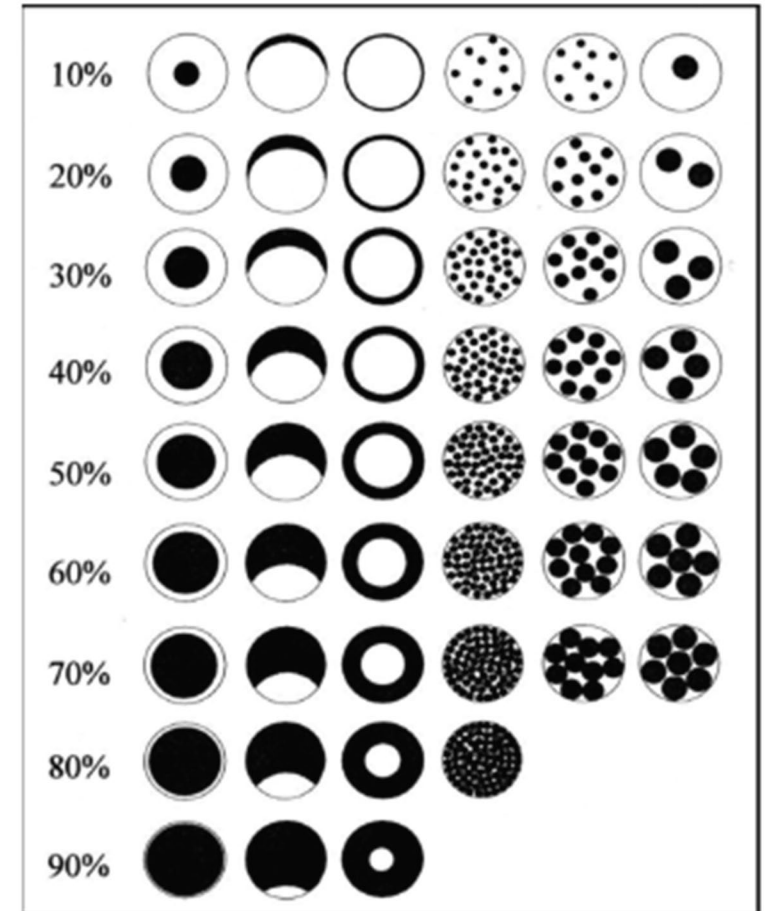


Figure citation: Oldham R.S., Keeble J., Swan M.J.S. & Jeffcote M. (2000). Evaluating the suitability of habitat for the Great Crested Newt (*Triturus cristatus*). *Herpetological Journal* 10(4), 143-155.

What is the slope of active shoreline

- Per Q30, what is the slope of the active shoreline?
- Can also use Elevation Profile Tool

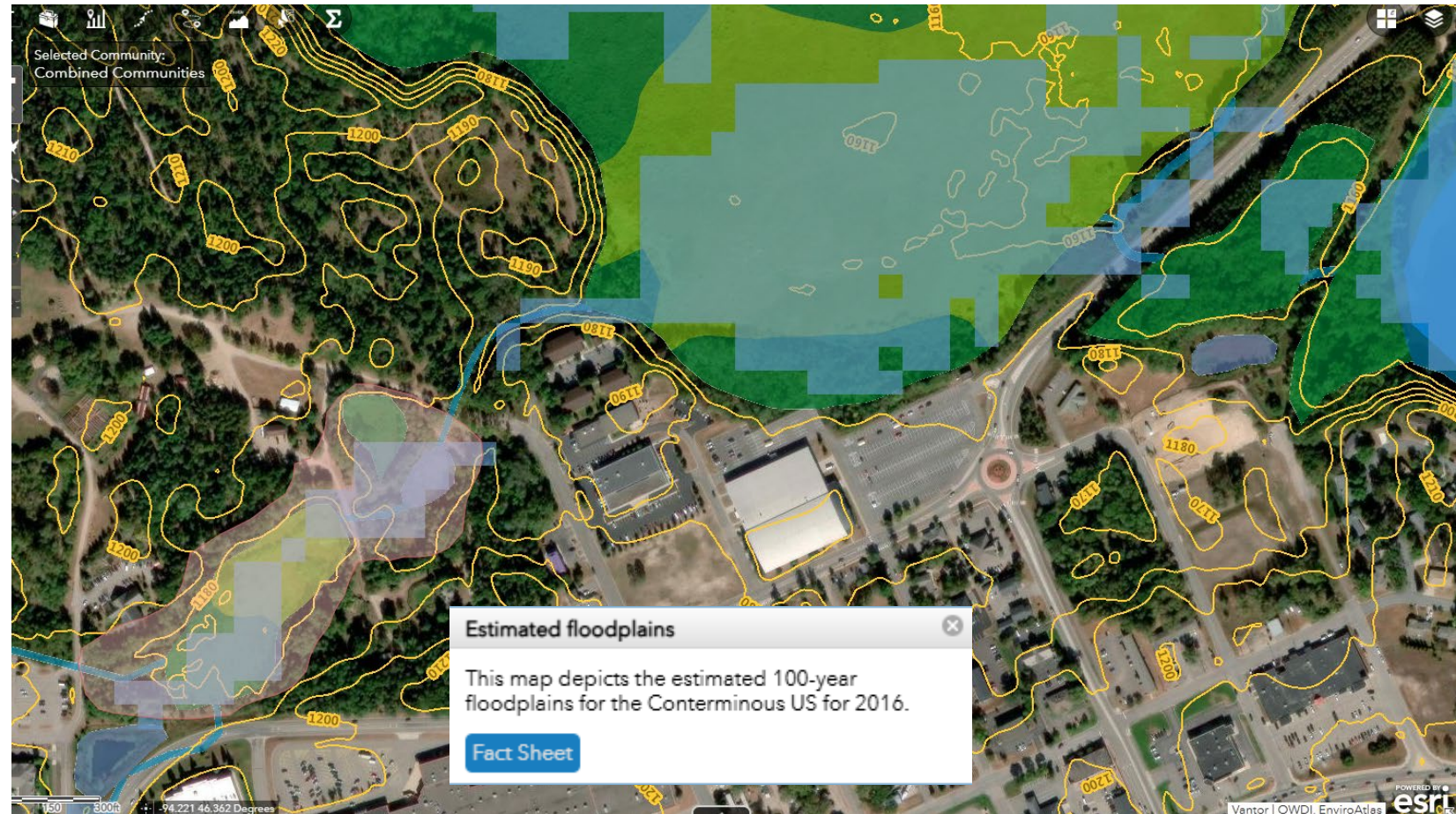
Q31 Shoreline Slope	<30%
	0-20%
	21-60%
	61-80%
	81-90%
	>90%

Figure 18. Photo example of an active shoreline with <30% bare ground and a moderate slope of 30%. (Photo credit: Sally Jarosz, WDNR).



Mapped Floodplain?

- Is any portion of the AA located in a mapped floodplain?
- EnviroAtlas Data Layers>Wetlands and Lowlands> Estimated Floodplains
- Data layer showing 100-year floodplain from 2016 data
- [Factsheet](#)

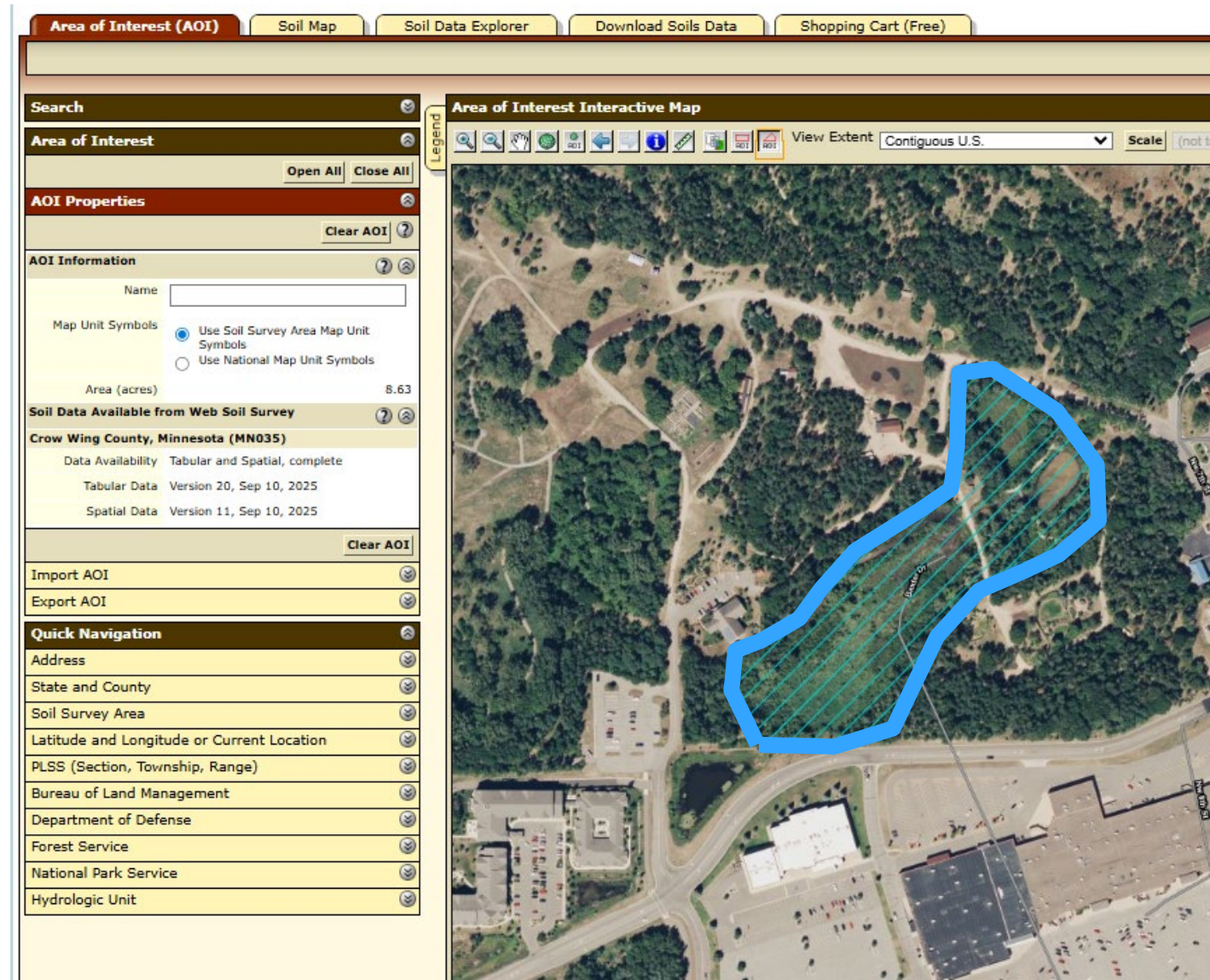


Composition and structure of floodplain vegetation

- Applicable if AA is a riverine HGM class (Q14)
- Use aerial imagery and field observations
- Determine dominate vegetation composition and structure for uppermost strata
- Must have at least 30% areal cover
- Emergent- dominated by herbaceous vegetation, open water or emergent
- Tall shrub- woody plants <20 ft tall
- Spaced trees, open understory- woody plants >20ft, understory devoid of shrubs
- Mature trees, shrub understory

Web Soil Survey

- Web Soil Survey (AOI) is the same boundary as the Assessment Area (AA)
- Two primary data outputs:
 1. Average Organic Matter
 2. Predominant Soil Texture
- Web Soil Survey is down or inaccurate?
 - Gather field data and use that!



Average Organic Matter

- **Identify Area of Interest**

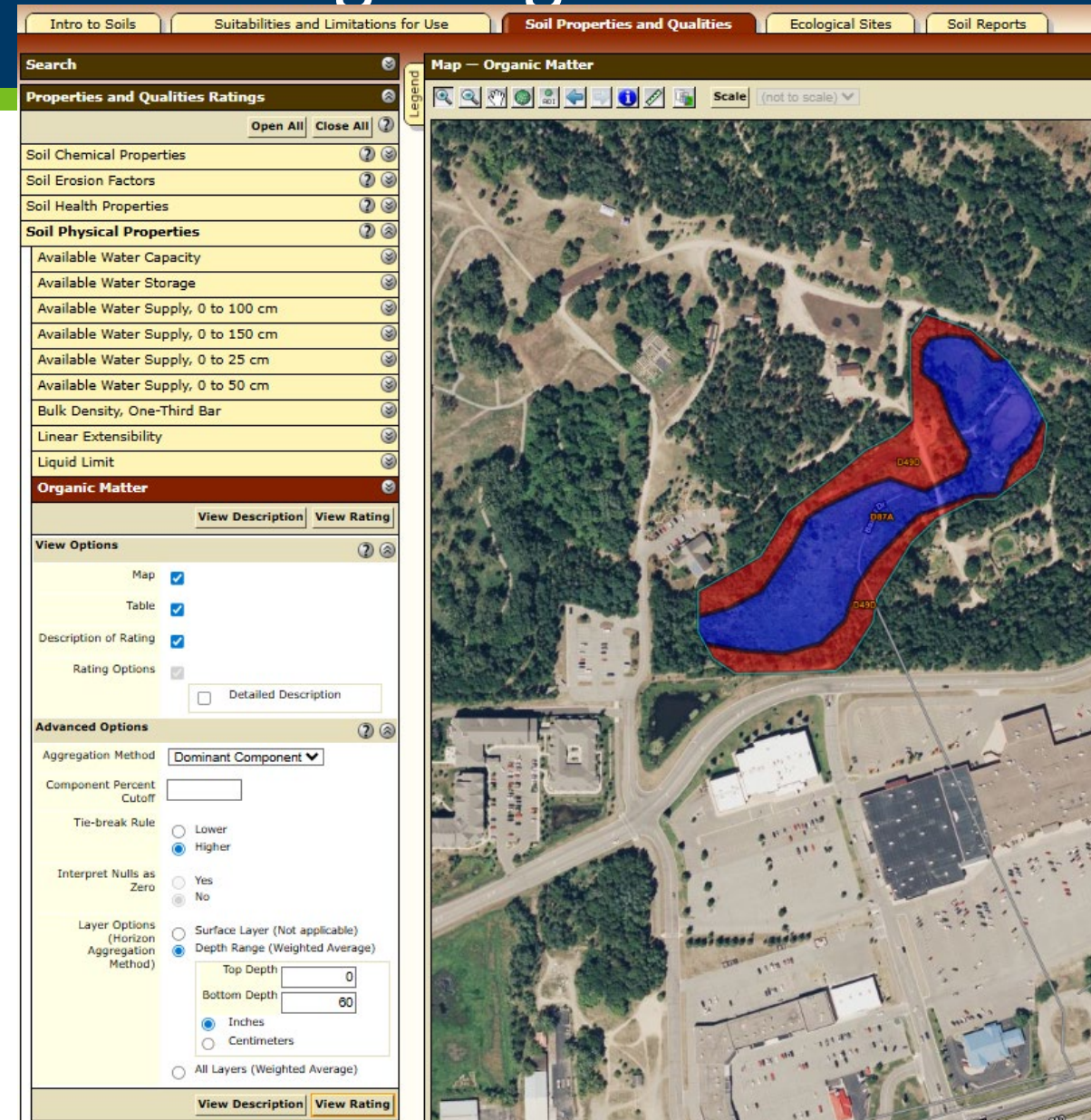
- Soil Data Explorer> Soil Properties & Qualities> Soil Physical Properties>Organic Matter

- View Rating Button

- Find:

- Soil Map Unit Rating Percent
- Percent of AOI (=AA)

- Tool calculates average organic matter content



Summary by Map Unit — Crow Wing County, Minnesota (MN035)

Summary by Map Unit — Crow Wing County, Minnesota (MN035)

Map unit symbol	Map unit name	Rating (percent)	Acres in AOI	Percent of AOI
1007	Udorthents, shallow (sanitary landfill)		17.8	16.8%
D49D	Graycalm loamy sand, 12 to 25 percent slopes	0.91	25.1	23.7%
D53B	Lougee-Barber-Guida complex, 0 to 6 percent slopes	75.42	6.2	5.9%
D62B	Zimmerman loamy fine sand, 1 to 6 percent slopes	0.72	14.0	13.2%
D62C	Zimmerman loamy fine sand, 6 to 15 percent slopes	0.72	10.4	9.8%
D69B	Zimmerman-Urban land complex, 0 to 6 percent slopes	0.72	23.0	21.6%
D70A	Barber-Urban land complex, 0 to 3 percent slopes	0.76	0.3	0.3%
D71A	Rifle, Seelyeville and Lougee soils, 0 to 1 percent slopes, ponded	90.00	4.0	3.8%
D87A	Rifle-Rifle, ponded, complex, 0 to 1 percent slopes	90.00	5.4	5.1%
Totals for Area of Interest			106.2	100.0%

- Soil Map Unit Rating Percent
- Percent of AOI (=AA)
- Tool calculates average organic matter content

Rating Options ☒ Detailed Description

Advanced Options ?

Aggregation Method **Dominant Component**

Component Percent Cutoff

Tie-break Rule ☐ Lower ☒ Higher

Interpret Nulls as Zero ☐ Yes ☒ No

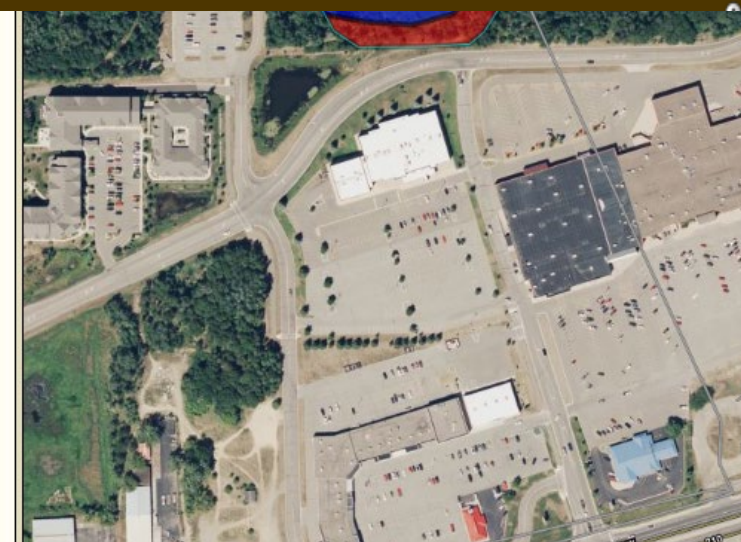
Layer Options (Horizon Aggregation Method) ☐ Surface Layer (Not applicable) ☒ Depth Range (Weighted Average)

Top Depth
Bottom Depth

☒ Inches ☐ Centimeters

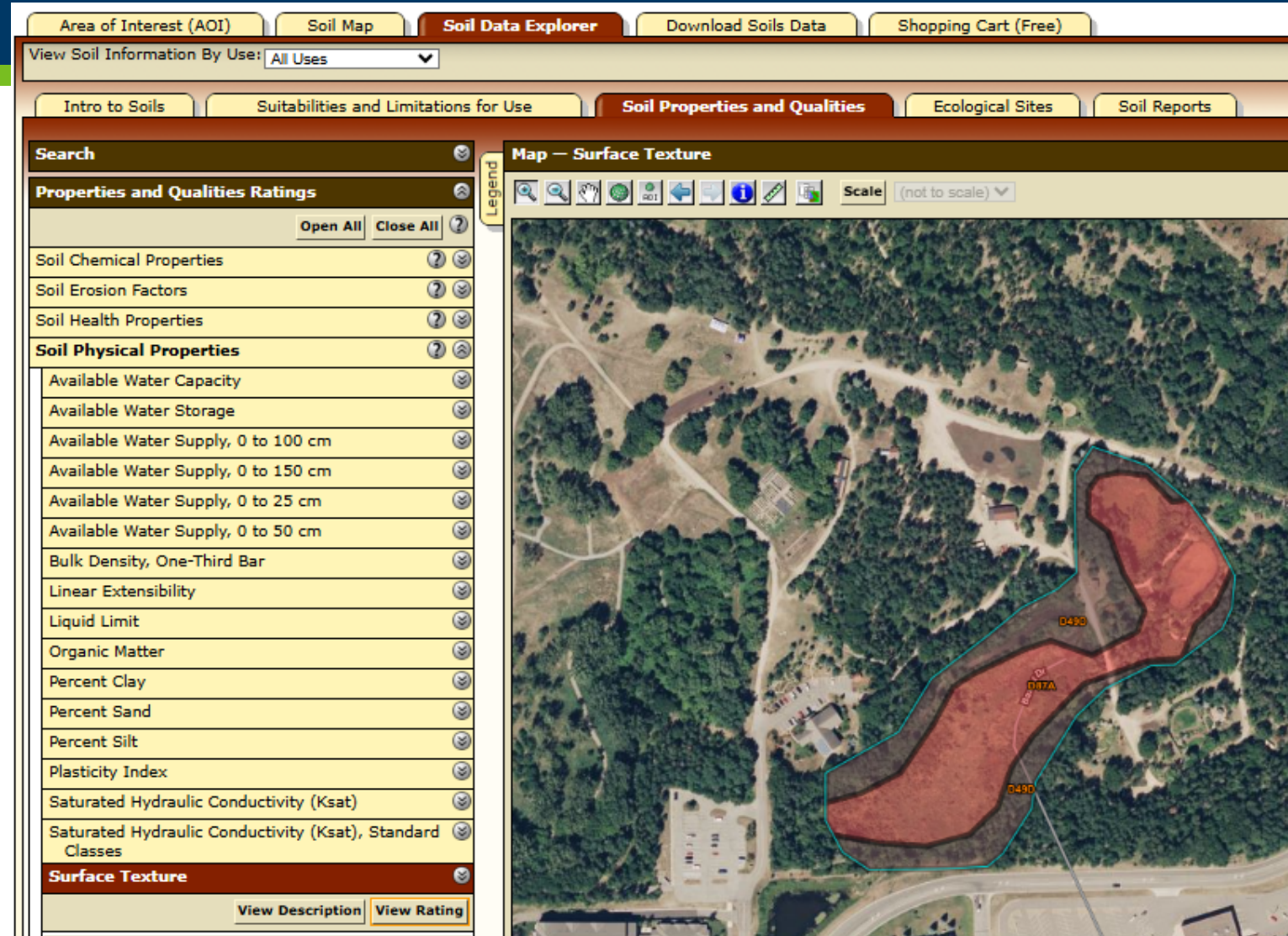
☐ All Layers (Weighted Average)

[View Description](#) [View Rating](#)



Predominate Soil Texture

- Determine predominate surface (0-18") soil texture
- Soil Data Explorer> Soil Properties & Qualities> Soil Physical Properties> Surface Texture
- View Rating button
- Enter texture rating and percent AOI



Predominate Soil Texture

Tables – Surface Texture – Summary By Map Unit				
Summary by Map Unit – Crow Wing County, Minnesota (MN035)				
Summary by Map Unit – Crow Wing County, Minnesota (MN035)				
Map unit symbol	Map unit name	Rating	Acres in AOI	Percent of AOI
D49D	Graycalm loamy sand, 12 to 25 percent slopes	Loamy sand	3.7	42.5%
D87A	Rifle-Rifle, ponded, complex, 0 to 1 percent slopes	Peat	5.0	57.5%
Totals for Area of Interest			8.6	100.0%

Surface Texture

- View Rating button
- Enter texture rating and percent AOI

Available Water Supply, 0 to 50 cm	⌵
Bulk Density, One-Third Bar	⌵
Linear Extensibility	⌵
Liquid Limit	⌵
Organic Matter	⌵
Percent Clay	⌵
Percent Sand	⌵
Percent Silt	⌵
Plasticity Index	⌵
Saturated Hydraulic Conductivity (Ksat)	⌵
Saturated Hydraulic Conductivity (Ksat), Standard Classes	⌵
Surface Texture	⌵
View Description View Rating	



Vegetation Structural Type

- Q38. Use aerial imagery to map vegetation structure types
- Estimate percent of AA each structure type – use Fig. 19 in user guide

Information Source(s)	Information for User
Field	<u>General Wetland Vegetation Structural Types</u> Forested - Dominated by woody vegetation > 6 meters (20 feet) tall. Scrub/Shrub - Dominated by woody vegetation < 6 meters tall including tree saplings and stunted trees. Emergent - Dominated by erect, herbaceous vegetation that extends above the water or soil surface. Aquatic Bed/Unconsolidated Bottom - Dominated by submerged or floating plants or unvegetated open water. Moss-Lichen - Uppermost layer of vegetation dominated by lichens and/or moss.



Vegetation Structural Type

Vegetation

Use field reconnaissance and aerial imagery to map and estimate the percent of the AA occupied by each vegetation structural type.

38

Vegetation Structural Type	Percent of AA
Forested	35%
Scrub/Shrub	40%
Emergent	20%
Aquatic Bed or Unconsolidated Bottom	5%
Moss-Lichen	
TOTAL (Total cover must equal 100%)	100%



Information Source(s)	Information for User
Field	<u>General Wetland Vegetation Structural Types</u> Forested - Dominated by woody vegetation > 6 meters (20 feet) tall. Scrub/Shrub - Dominated by woody vegetation < 6 meters tall including tree saplings and stunted trees. Emergent - Dominated by erect, herbaceous vegetation that extends above the water or soil surface. Aquatic Bed/Unconsolidated Bottom - Dominated by submerged or floating plants or unvegetated open water. Moss-Lichen - Uppermost layer of vegetation dominated by lichens and/or moss.

Rapid FQA Method

- Q39: Floristic Quality of AA
- Use Rapid FQA Method
- Drop-down menu defaults to MN categories
- Enter the overall AA condition ranking from FQA calculator tool

Rapid Floristic Quality Assessment Manual



Overall Assessment							
Community #	Community Type		wC	Condition Category	Numerical Category	Proportion of AA	Proportion x Numerical Category
1		0	0.0	#N/A	#N/A	0	#N/A
2		0	0.0	#N/A	#N/A	0	#N/A
3		0	0.0	#N/A	#N/A	0	#N/A
Weighted Average Numerical Category for AA							0
Overall AA Condition							#N/A

Rapid FQA Method

39

What is the floristic quality condition category of the AA?
Assess the wetland using the Rapid FQA methodology
(Minnesota or Wisconsin as applicable).

Fair

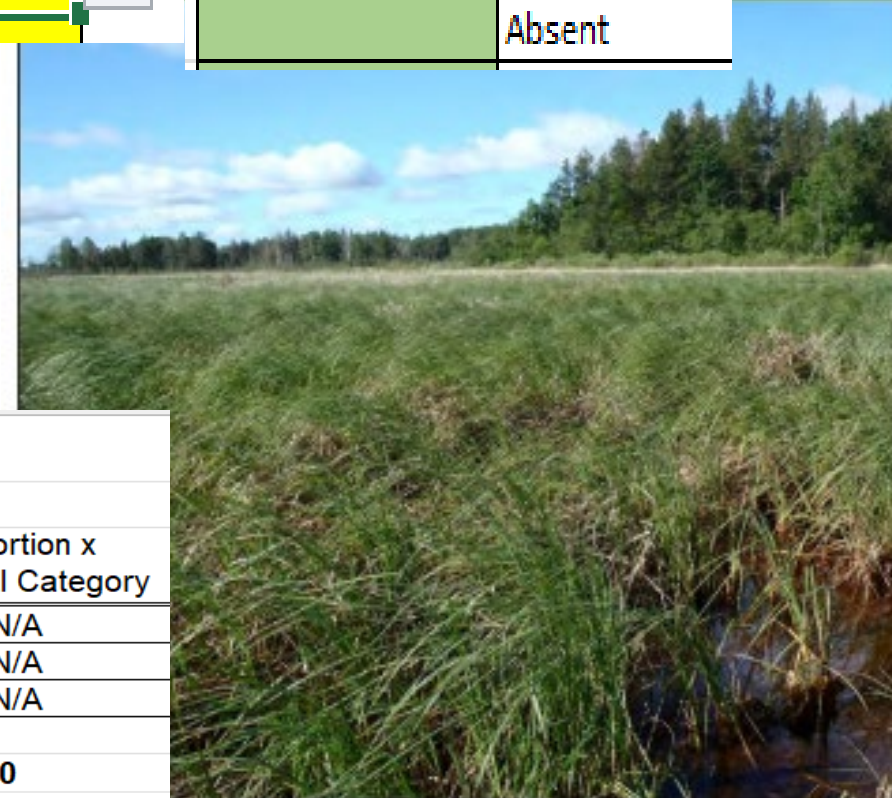
Drop-down menu options

Q39 FQA Score

Exceptional
Good
Fair
Poor
Absent

- Drop-down menu defaults to MN categories
- Enter the overall AA condition ranking from FQA calculator tool

Overall Assessment							
Community #	Community Type		wC	Condition Category	Numerical Category	Proportion of AA	Proportion x Numerical Category
1		0	0.0	#N/A	#N/A	0	#N/A
2		0	0.0	#N/A	#N/A	0	#N/A
3		0	0.0	#N/A	#N/A	0	#N/A
Weighted Average Numerical Category for AA						0	
Overall AA Condition						#N/A	

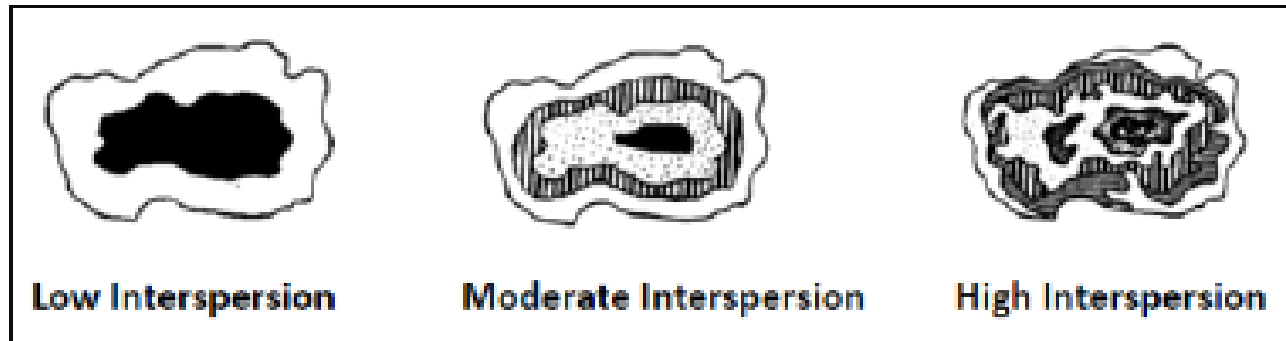


Interspersion of vegetation structural types

- Q40: Estimate the level of dispersion of vegetation structural types
- Use Figure 25 in User Guide

Q40 Wetland structural types interspersion	High
	Moderate
	Low

Figure 25. Visual guide for estimating interspersion.



Areal coverage of dead trees

- Q41: standing and downed dead trees
- Field observation to estimate the areal coverage collectively within AA.
- Choose percent range from dropdown

Interpretation	Low
Q41 % of AA with standing or down dead trees	<1% 1-10% >10%



Percent of sphagnum moss in AA

- Q42: What is the percent coverage of sphagnum moss in the AA?
- Most common in northern and eastern MN

Q42 % cover of sphagnum moss	Not present
	<50%
	50-75%
	>75%



42

What is the percent cover of sphagnum moss (*Sphagnum* spp.) in the AA?

Not present

Connection or Lake or Perennial Stream

- Q43: Does the AA have a permanent, semi-permanent, or seasonal surface water connection to a lake or perennial stream?
- Qs 44-46 apply if there is connection

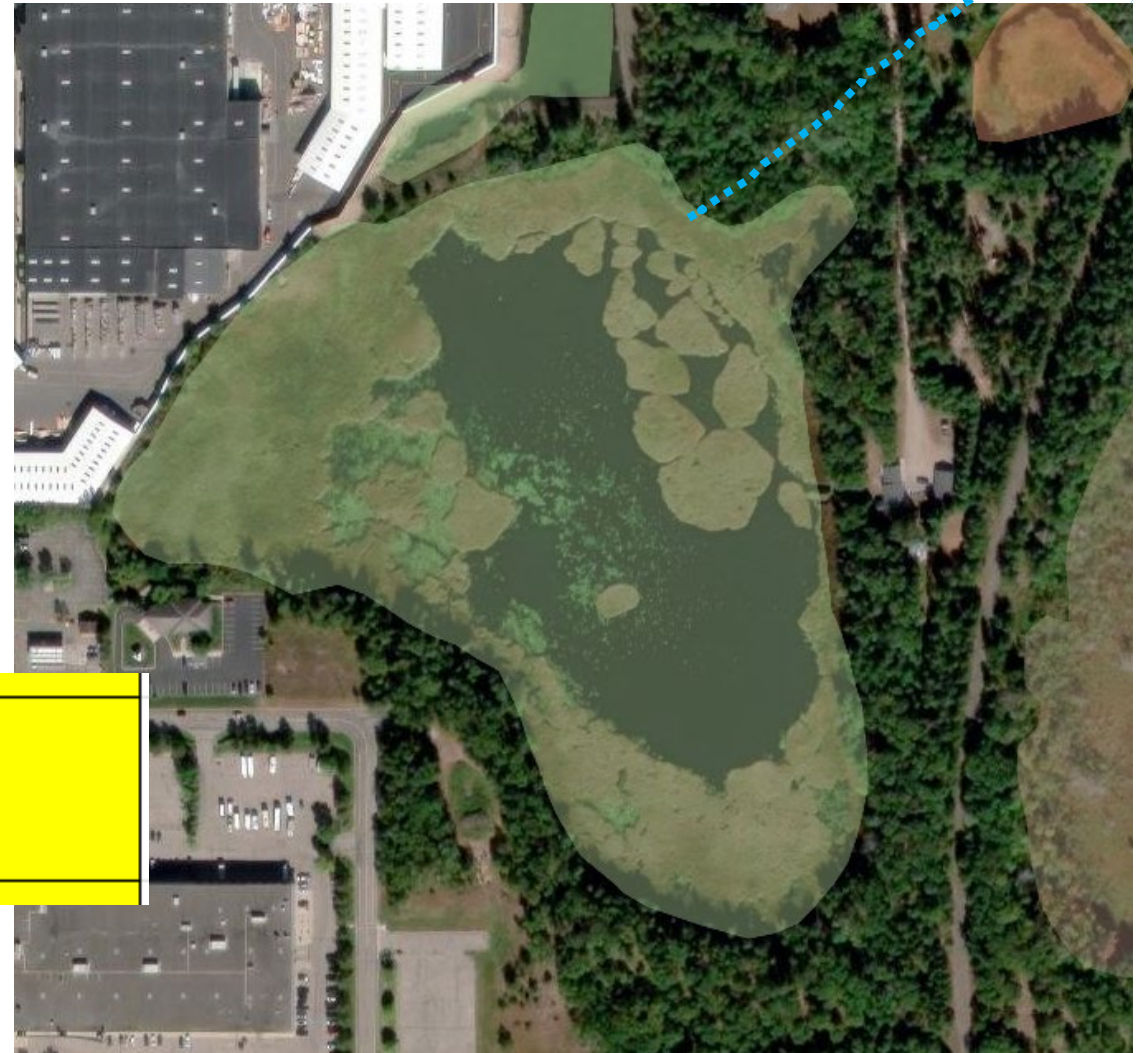


Fish Habitat		
43	Does the AA have a permanent, semi-permanent, or seasonal surface water connection to a lake or perennial stream reach?	No

Fish Habitat		
43	Does the AA have a permanent, semi-permanent, or seasonal surface water connection to a lake or perennial stream reach?	Yes
44	For all areas of the AA with permanently, semi-permanently, and seasonally-flooded water regimes, what percent of those areas are unvegetated (i.e., open water lacking emergent/submergent vegetation)?	
45	For all areas of the AA with permanently, semi-permanently, and seasonally-flooded water regimes, what percent of those areas have woody debris?	
46	Which of these best describes the extent of natural and artificial barriers to fish movement between the AA and a connected lake or stream?	

Percent of unvegetated open water

- Q44 applies if surface connection exists
- Field observations and aerial imagery
- What percent of open water lacks emergent or submergent vegetation?
- Permanently, semi-permanently, and seasonally-flooded areas (question 21)



Surface water connection to a lake or perennial stream reaches	
44	For all areas of the AA with permanently, semi-permanently, and seasonally-flooded water regimes, what percent of those areas are unvegetated (i.e., open water lacking emergent/submergent vegetation)?
	20-50%

Q44 % unvegetated or open water in wet water regimes	
<20%	
20-50%	
>50%	

Large woody debris within flooded areas

- Q45 applies if surface connection exists
- Field observation
- Woody debris is any dead woody plant material including logs, branches, standing dead trees and root wads

Q45 % live or woody debris in water regimes	<20%
	20-50%
	>50%



45

For all areas of the AA with permanently, semi-permanently, and seasonally-flooded water regimes, what percent of those areas have woody debris?

<20%

Aquatic barriers to fish movement

- Q46 applies if surface connection exists
- Field observation
- Determine level of aquatic barriers



Table 5. Types of aquatic barriers to fish movement (Adapted from The Wildlife Migration Initiative).

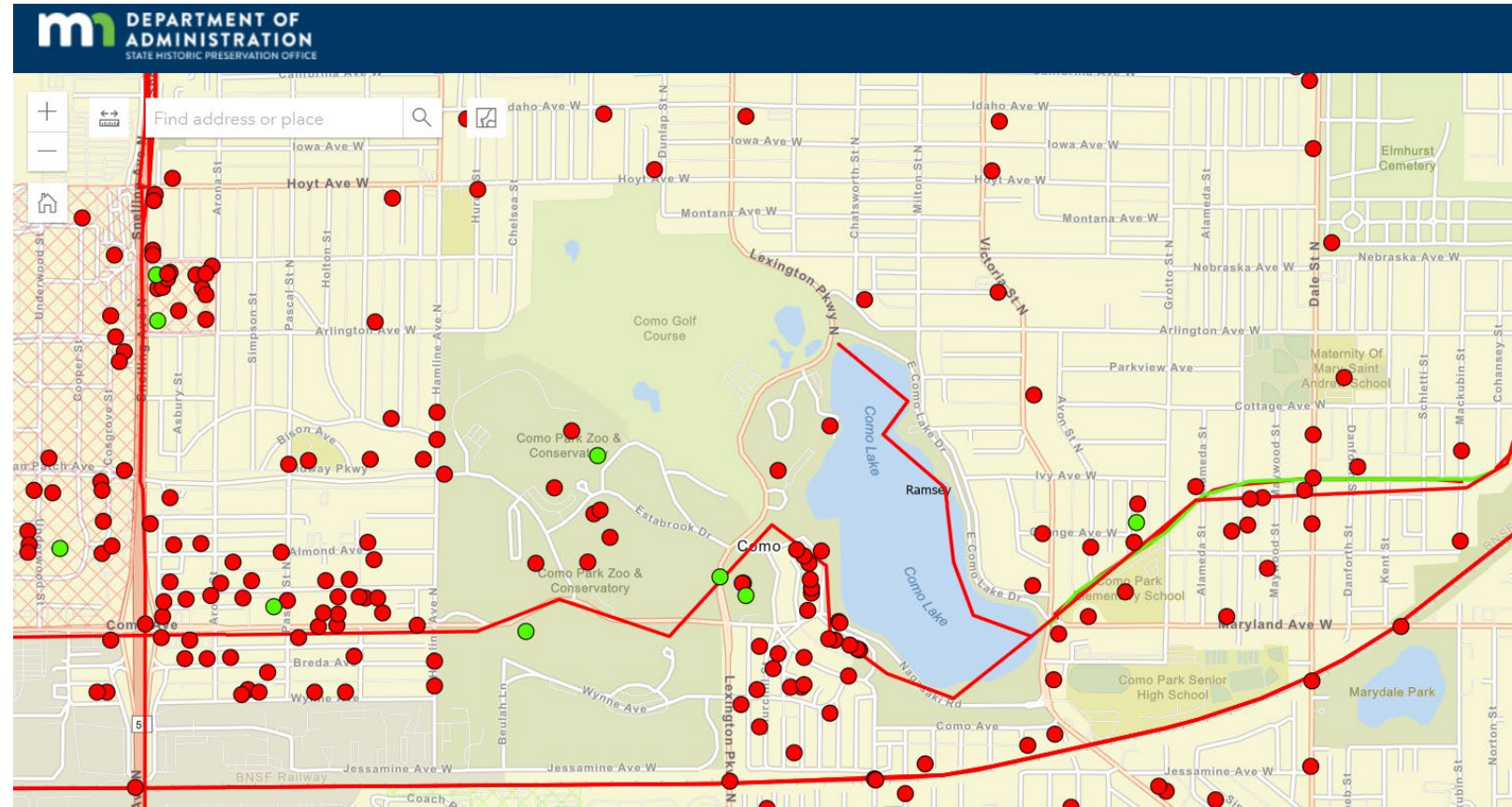
Type of Barrier	Description
Velocity Barriers	Undersized culverts that constrict water flow and create velocities that are too high, making it difficult for fish to move upstream.
Low Flow Barriers	Area where water becomes too shallow and spread out, making passage harmful or impassible to fish.
High Culvert Barriers	Culvert pipes perched above water connection point preventing fish from going upstream.

Q46 Aquatic Barriers	No barriers
	Some barriers but movement possible
	Significant barriers

Exhaustion Barriers	Very long and/or steep culverts that inhibit fish passage due to lack of resting areas needed to traverse long distances when traveling upstream.
Dams	Obvious barrier to fish passage.
Vertical Barriers	Waterfalls and other vertical structures that impede upstream fish movement.
Constructed Fish Barriers	Man made fish barriers that prevent the movement of native fishes.

Historic, archaeological, or cultural resource?

- [Minnesota's Statewide Historic Inventory Portal \(MNSHIP\)](#)
- EnviroAtlas data layers with National Register of Historic Sites.



Cultural, Historic, Commercial, Recreational Values

47

Is any portion of the AA part of an identified historic, archaeological or culturally important resource or property?

No

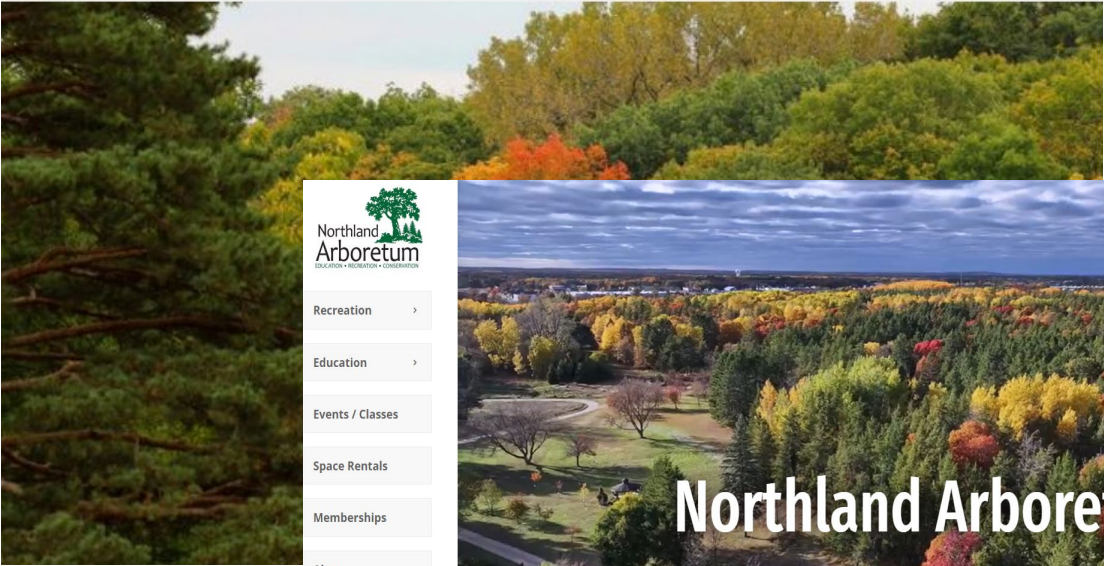
Educational or scientific research property?

- Q48: Identified Education or scientific research property
- Examples: Schools, nature center, research station, scientific natural areas

 UNIVERSITY OF MINNESOTA TWIN CITIES

University of Minnesota Landscape Arboretum

About ▾Support ▾Visit ▾Gardens & Grounds ▾Learn ▾Events ▾





Recreation >

Education >

Events / Classes

Space Rentals

Memberships

About >

Compost

Donate

Northland Arboretum

Dive Into Nature Classes

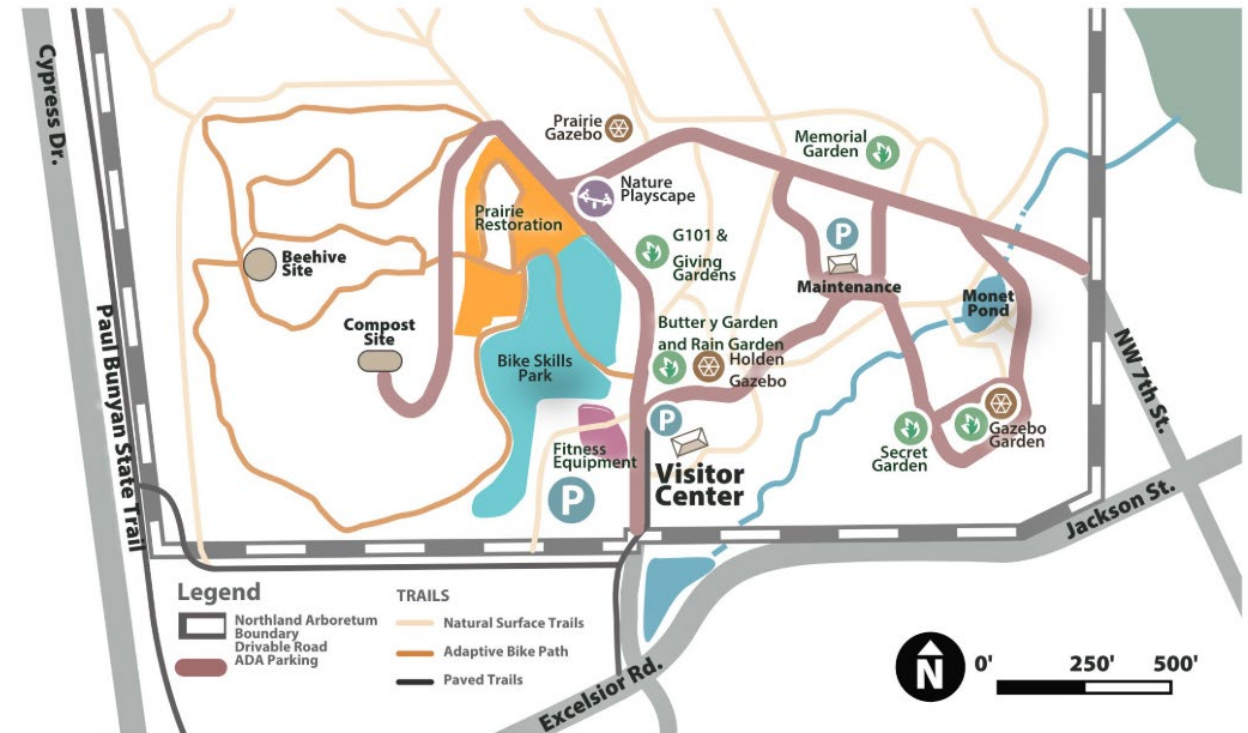
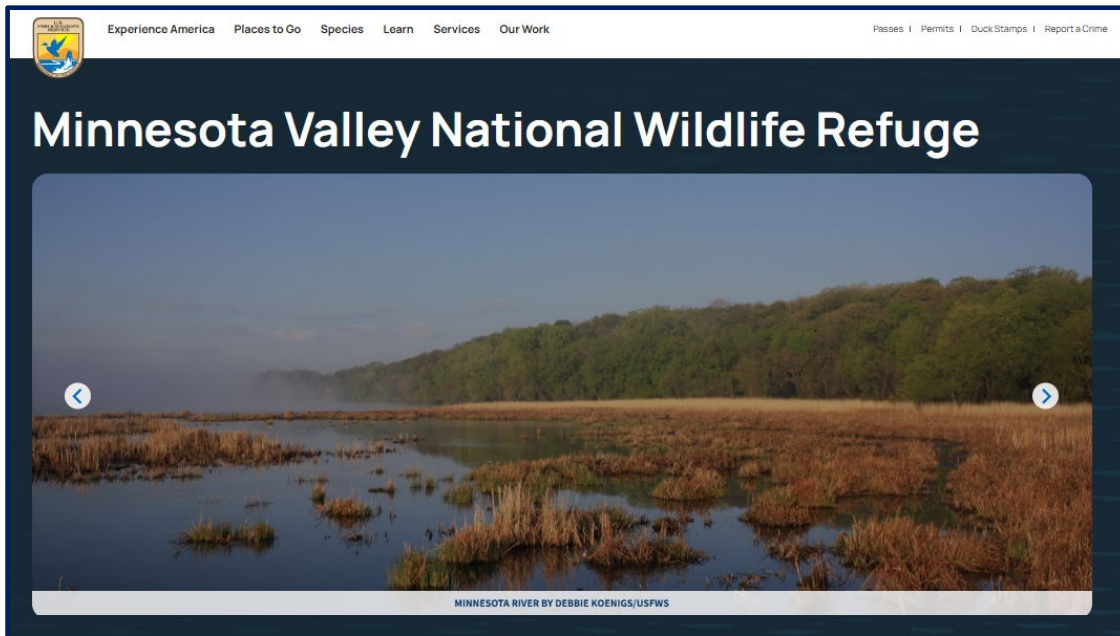
In addition to recreation, Northland's knowledgeable staff also hold regular conservation and nature classes to educate all ages on a range of topics—from tree identification to sustainable agriculture and healthy eating. Visit our Classes page, browse our upcoming nature classes and enroll today.



48	Is any portion of the AA part of an identified educational or scientific research property (e.g. school property, nature center, research station, scientific natural area, etc.)?	Yes
----	--	-----

Public recreational use area?

- Q49: Park, recreation management area, wildlife management area, public access land, state forest land



49

Is any portion of the AA part of an identified public recreational/use area (e.g. park, wildlife management area, public access land, state forest land, etc.)

Yes

Public recreation-oriented infrastructure?

- Q50-53: Constructed trail, parking lots, signage, boardwalks?

50	Does any portion of the AA contain or is a part of an area that contains public recreation-oriented infrastructure such as designated parking lot/area, signage (interpretative, trail map, etc.), constructed trails, boardwalks, or other infrastructure that supports and facilitates public recreation use?	Yes
51	Is a significant portion of the AA viewable by the public from a public road, trail, stream, lake, etc.?	Yes
52	Is the public viewable portion of the AA free of structures, trash, debris, and other materials that detract from the natural character of the wetland?	No
53	Are there viewing platforms, benches, and/or other infrastructure accessible to the public that promotes viewing some or all of the AA?	Yes



Wetland-dependent commercial activity?

- Q: 54 Is any portion of the AA used for a wetland-dependent commercial activity?
- Commercial activity that is almost exclusively conducted within wetlands such as peat mining, cranberry production, and sod farming.
- Does not include activities that require conversion to non-wetland and are preferably conducted in non-wetlands (row crops)



54	Is any portion of the AA used for a wetland-dependent commercial activity?	No
55	Is the AA within two miles of a wetland-dependent commercial activity?	No
56	Is any portion of the AA owned by an entity that operates a wetland-dependent commercial activity in the area?	No
57	Does the AA have similar characteristics (landscape setting, hydrology, vegetative structure, soils, etc.) as other wetlands being used for wetland-dependent commercial activities in the immediate area?	No

Class Exercise

- Step One:
 - Conduct desktop review for Assessment Area
- Step Two:
 - Conduct Field Assessment
- Step Three:
 - Complete all data input
- Step Four:
 - View and Interpret Results

Figure 3. Example of AA Data Entry Tab questions, answer types, and data sources.

Enter manually			
7	County:		Desktop
8	State:		Desktop
9	Latitude (decimal degrees):		Desktop
10	Longitude (decimal degrees):		Desktop
11	PLSS, quarter/quarter section or tax lot(s) reference:		Desktop
12	Size of the Assessment Area (AA, in acres):		Desktop
13	Size of the catchment area draining into the AA (in acres):		Desktop
14	What percent of the catchment area is occupied by the AA? (AA divided by catchment area multiplied by 100).		Desktop
15	What is the dominant HGM class of the AA?		Desktop; Field
Drop down menu			
Auto-calculated			

Table 1. Qualitative scale used in RAM wetland function rankings

Tier	Description
Higher	Functional capacity or opportunity-value to provide a function is at a higher level relative to other wetlands for a specific function.
Moderate	Functional capacity or opportunity-value to provide a function is at a moderate level relative to other wetlands for a specific function.
Lower	Functional capacity or opportunity-value to provide a function is at a lower level relative to other wetlands for a specific function.

Field Assessment

- Field observations are required to answer some of the questions
- Verification of desktop-derived data
- Field equipment and forms:
 - Field assessment form, Rapid Assessment form, paper copy of RAM, field map of AA, HGM flow chart
 - Soil auger and typical delineation equipment
- Take photos

Wetland Assessment Field Form			See User Guide for instructions, definitions, and processes.		
Assessment Information					
Assessment Details					
1	Site Name:				
2	Assessor Name:				
4	Date of Field Assessment:				
15	What is the dominant HGM class of the AA?				
43	Does the AA have a permanent, semi-permanent, or seasonal surface water connection to a lake or perennial stream reach?	Yes	No		
Hydrology					
What is the percent of the AA with each water regime listed below? (field confirm)					
21	NWI Water Regime	Percent Cover		Information for User Water regimes are defined in general terms and refer to the typical hydrologic characteristics. Seasonally saturated - Saturated to the surface for much of growing season but unsaturated by the end. Temporarily flooded - Inundated for brief periods; water table typically well below surface. Continuously saturated - Substrate saturated throughout most of the year with rare inundation. Seasonally flooded - Inundated for extended periods, absent by end of season with variable saturation depth. Seasonally saturated/flooded - Inundated for extended periods, absent by end of season with near surface saturation.	
	TOTAL				
24	Does the AA have a surface water outlet to another waterbody?	No, isolated Yes, wetland Yes, river, stream, or ditch Yes, lake	26	What is the predominant surface water flow within the AA?	Natural overland flow across the soil surface, no constructed channels, ditches, or streams that significantly facilitate flow. AA predominately standing open water. Natural channels or streams facilitate flow. Constructed ditches, channels, or straightened stream facilitate flow.
25	What is the primary source of surface water input into the AA?	Overland flow from surrounding upland/wetland. Flooding from stream or lake. Stream input (e.g., a stream into a depressional basin). Directed input from constructed conveyances (e.g., constructed ditches, swales, stormwater and tile outlets).	27	What is the average, overall density of live or dead, rooted vegetation material capable of intercepting surface water flowing through the AA?	High stem density, stems occupy >75% of the soil surface. Moderate stem density, stems occupy 50-75% of the soil surface. Low stem density, stems occupy <50% of the soil surface.
Soils					
Use the NRCS Web Soil Survey to determine the predominate surface soil texture (0-18 inches) within the AA. Select the general texture class corresponding to the Web Soil Survey texture class per the crosswalk in the User Notes to the right. Enter the corresponding percent of ADI for each Map Unit.					
37	Map Unit	General Texture Class	Percent	Screenshots required: Web Soil Survey map and soil texture table. <u>General Texture Class Crosswalk with Web Soil Survey Texture Classes</u> Peat Mucky Peat Muck Mucky Sandy - the following textures that also include a mucky modifier: sand and sandy loam. Mucky Loamy - the following textures that also include a mucky modifier: sandy loam, loam, clay loam, sandy clay loam, silty clay loam, and silt loam.	
	Predominant surface soil texture:				

Field Map

- Map with AA identified, contours, and aerial photo
- Identify plant communities
- Map HGM class
- Map hydrology features



Rapid FQA

- Identify plant communities within AA
- Timed meander for each community
 - 30 minutes for first community, 20 for additional
 - Stop if <3 new species last 10 minutes
- Use rapid species plant list
- Make areal cover estimates
- Input data into calculator (in class)
- Overall AA condition ranking from FQA calculator tool

Minnesota Pollution Control Agency
1221 Lafayette Road North
St. Paul, MN 55115-4104

Rapid FQA Data Form

Biological Monitoring

Floristic Quality Assessment (FQA)

General Information

Site/AA name: _____ Date: _____ Surveyor's name: _____

Remarks: _____

Community Information

Species #	Community Type	% of AA	Start Time	End Time	Total Time	Cover Class
#1)						7 >95 - 100%
#2)						6 >75 - 95%
#3)						5 >50 - 75%
						4 >25 - 50%
						3 >5 - 25%
						2 >1 - 5%
						1 >0 - 1%

Species Checklist (circle community space when species is present in community, record cover class in circle following meander)

Aquatic Stratum (true aquatic plants that are submerged or have floating leaves)

Community #	1	2	3	Community #	1	2	3
1	☐	☐	☐	1	☐	☐	☐
2	☐	☐	☐	2	☐	☐	☐
3	☐	☐	☐	3	☐	☐	☐

Tree Stratum (woody plants with typical max. growth > 3" DBH and > 1m tall)

Community #	1	2	3	Community #	1	2	3
1	☐	☐	☐	1	☐	☐	☐
2	☐	☐	☐	2	☐	☐	☐
3	☐	☐	☐	3	☐	☐	☐

Shrub Stratum (woody plants with typical max. growth > 3" DBH and > 1m tall)

Community #	1	2	3	Community #	1	2	3
1	☐	☐	☐	1	☐	☐	☐
2	☐	☐	☐	2	☐	☐	☐
3	☐	☐	☐	3	☐	☐	☐

Woody Vine Stratum (all woody vines)

Community #	1	2	3	Community #	1	2	3
1	☐	☐	☐	1	☐	☐	☐
2	☐	☐	☐	2	☐	☐	☐
3	☐	☐	☐	3	☐	☐	☐

Herb Stratum (all non-aquatic herbaceous plants and woody plants with typical max. growth > 3" DBH and > 1m tall)

Community #	1	2	3	Community #	1	2	3
1	☐	☐	☐	1	☐	☐	☐
2	☐	☐	☐	2	☐	☐	☐
3	☐	☐	☐	3	☐	☐	☐

Appendix 1-Rapid Species List

The Rapid Species List with selected attributes. Species nomenclature (i.e., scientific and common names) is consistent with the US Army Corps of Engineers [National Wetland Plant List](#). The National Wetland Indicator (NWI) status for each species is included by Corps regions in Minnesota: Great Plains (GP), Mid-West (MW), and North Central-Northeast (NCNE). The Minnesota Native status and C-value from each species is from Milburn et al. 2007. The Rapid FQA Stratum is the typical Corps vertical stratum at full growth and is used to generally organize groups of species on the Rapid FQA data form.

Scientific Name	Common Name	MN Native Status	C	NWI-GP	NWI-MW	NWI-NCNE	Rapid FQA Stratum
<i>Abies balsamea</i>	Balsam Fir	Native	4	FAC	FACW	FAC	Tree
<i>Acer negundo</i>	Ash-Leaf Maple	Native	1	FAC	FAC	FAC	Tree
<i>Acer rubrum</i>	Red Maple	Native	3	FAC	FAC	FAC	Tree
<i>Acer saccharinum</i>	Silver Maple	Native	3	FAC	FACW	FACW	Tree
<i>Acer spicatum</i>	Mountain Maple	Native	5	FACU	FACU	FACU	Shrub
<i>Achillea millefolium</i>	Common Yarrow	Native	1	FACU	FACU	FACU	Herb
<i>Acorus americanus</i>	Severed-Vein Sweetflag	Native	7	OBL	OBL	OBL	Herb
<i>Adiantum pedatum</i>	Northern Maidenhair	Native	7	FAC	FACU	FACU	Herb
<i>Agrostis gigantea</i>	Black Bent	Introduced	0	FACW	FACW	FACW	Herb
<i>Alisma subcordatum</i>	American Water-Plantain	Native	4	OBL	OBL	OBL	Herb
<i>Alisma triviale</i>	Northern Water-Plantain	Native	4	OBL	OBL	OBL	Herb
<i>Alliaria petiolata</i>	Garlic-Mustard	Introduced	0	FACU	FACU	FACU	Herb
<i>Ailanthus altissima</i>	Tree of Heaven	Native	3	FACW	FACW	FACW	Shrub
<i>Ambrosia artemisiifolia</i>	Annual Ragweed	Native	0	FACU	FACU	FACU	Herb
<i>Ambrosia trifida</i>	Great Ragweed	Native	0	FAC	FAC	FAC	Herb
<i>Amorpha fruticosa</i>	False Indigo-Bush	Native	4	FACW	FACW	FACW	Shrub
<i>Amphicarpaea bracteata</i>	American Hog-Peanut	Native	2	FACU	FAC	FAC	Herb
<i>Andromeda polifolia</i>	Bog-Rosemary	Native	9	OBL	OBL	OBL	Herb
<i>Andropogon gerardii</i>	Big Bluestem	Native	4	FACU	FAC	FACU	Herb
<i>Anemone canadensis</i>	Round-Leaf Thimbleweed	Native	3	FACW	FACW	FACW	Herb
<i>Anemone quinquefolia</i>	Nightcaps	Native	5	FAC	FAC	FACU	Herb
<i>Angelica atropurpurea</i>	Purple-Stem Angelica	Native	6	FAC	OBL	OBL	Herb
<i>Apocynum cannabinum</i>	Indian-Hemp	Native	3	FAC	FAC	FAC	Herb
<i>Aralia nudicaulis</i>	Wild Sarsaparilla	Native	4	FACU	FACU	FACU	Herb
<i>Arisaema triphyllum</i>	Jack-in-the-Pulpit	Native	4	FAC	FACW	FAC	Herb
<i>Asclepias incarnata</i>	Swamp Milkweed	Native	4	FACW	OBL	OBL	Herb



Results Summary

Function Rankings			
Functional Group	Specific Function	Functional Capacity Rank	Opportunity-Value Rank
Hydrology	Surface Water Attenuation	Higher	Moderate
	Surface Water Supply	Lower	Lower
	Groundwater Recharge	Moderate	Moderate
Water Quality	Nitrate Removal	Higher	Moderate
	Phosphorus Retention	Higher	Moderate
	Sediment and Pollutant Retention	Higher	Moderate
	Shoreline Stabilization	Not Applicable	Not Scored For This Function
	Thermoregulation	Not Applicable	Not Applicable
Ecological	Native Plant Habitat	Moderate	Moderate
	Wildlife Habitat	Moderate	Higher
	Fish Habitat	Not Applicable	Not Applicable
Climate	Carbon Sequestration	Lower	Not Scored For This Function
Anthropogenic	Historic or Cultural Uses	Not Scored For These Functions	Not Applicable
	Scientific or Educational Importance		Higher
	Recreational Uses		Higher
	Scenic Beauty		Higher
	Commercial Uses		Lower

Functions Organized by Ranking					
	Higher	Moderate	Lower	Not Applicable	
	Surface Water Attenuation	Groundwater Recharge	Surface Water Supply	Shoreline Stabilization	
	Nitrate Removal	Native Plant Habitat	Carbon Sequestration	Thermoregulation	
	Phosphorus Retention		Commercial Uses	Fish Habitat	
	Sediment and Pollutant Retention			Historic or Cultural Uses	
	Wildlife Habitat				
	Scientific or Educational Importance				
	Recreational Uses				
	Scenic Beauty				

Hydrological Functional Values

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

Surface Water Attenuation Function						
Q#	Question Applied	Response	Score	Points Possible	Scoring Summary	
	Surface Water Attenuation Functional Capacity Indicators					
15	HGM class.	Depressional	50	50	Depressional OR Depressional-Floodplain SCORE = 50, Riverine-Upper Perennial OR Riverine-Lower Perennial OR Lacustrine Fringe SCORE = 30, Mineral Soil Flat OR Organic Soil Flat SCORE = 10, Slope-Groundwater OR Slope-Surface Water SCORE = 5	
24, 28	Surface water outflow from the AA.	No, isolated	25	25	When Q24 = No, Isolated SCORE = 25, When Q28 = Highly restricted SCORE = 20, Moderately restricted SCORE = 10, No restriction SCORE = 0, Expedited via ditching SCORE = (-10)	
26	Water flow through the AA.	Natural overland flow across the soil surface. There are no constructed channels, ditches,	10	10	Overland flow across the soil surface SCORE = 10, Natural channels SCORE = 5, Open water OR Ditching SCORE = 0	
21	Predominant Cowardin water regime.	Semi-permanently flooded (F)	-10	10	Temporarily Flooded (A) OR Seasonally Saturated (B) SCORE = 10, Continuously Saturated (D) SCORE = 5, Seasonally Flooded (C) OR Seasonally Saturated - Flooded (E) SCORE = 0, Semi-permanently Flooded (F), Intermittently Exposed (G) OR Permanently Flooded (H) = (-10)	
21, 37	Predominant surface soil texture.	Muck	10	10	ONLY APPLIES WHEN Q21 = Temporarily Flooded (A) OR Seasonally Saturated (B) OR Continuously Saturated (D) OR Seasonally Flooded (C) If NO, SCORE = NA; If YES, When Q37 = Peat OR Mucky Peat OR Muck OR Mucky-Sandy OR Sandy SCORE = 10, Mucky-Loamy SCORE = 5, Loamy/Clayey SCORE = 0	
15, 34	For a Riverine HGM class, predominant type of floodplain vegetation and woody debris.	Not Applicable	-	10	ONLY APPLIES WHEN Q15 = Riverine-Upper Perennial OR Riverine-Lower Perennial, IF FALSE SCORE = NA, IF TRUE WHEN 34 = Mature trees/shrub understory SCORE = 10, Spaced trees/open understory OR Tall Shrub SCORE = 5, Emergent SCORE = 0	
		Total	85	100	Max points = 100.	
		Rank	Higher			

Hydrological Functional Values

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

Surface Water Attenuation Opportunity-Value Indicators

% Total developed/ag landcover in the catchment area.	>75%	50	50	Developed/Agricultural cover >75% SCORE = 50, Developed/Agricultural cover >50- 75% SCORE = 40, Developed/Agricultural cover 25- 50% SCORE = 30, Developed/Agricultural cover < 25% SCORE = 20	
Primary source of surface water input.	Overland flow from surrounding upland/wetland.	10	25	Flooding from stream/lake OR Directed input from constructed conveyance SCORE = 25, Stream input SCORE = 20, Overland flow from surrounding upland/wetland SCORE = 10	
Percent of catchment area occupied by the AA.	10% to <100%	10	25	ONLY APPLIES WHEN Q15 = Depressional OR Depressional-Floodplain OR Lacustrine Fringe OR Slope-Groundwater OR Slope-Surface water OR Organic Soil Flat OR Mineral Soil Flat, IF FALSE SCORE = NA, IF TRUE WHEN Q14 AA < 1% of catchment SCORE = 25, AA 1 to < 10% of catchment SCORE = 20, AA 10 to < 100% of catchment SCORE = 10, AA > 100% of catchment SCORE = 0	
	Total	70	100		
	Rank	Moderate			

Surface Water Attenuation Overall Rank

	Opportunity	Higher	Moderate	Lower
Capacity	Higher	Higher	Higher	Moderate
	Moderate	Higher	Moderate	Lower
	Lower	Moderate	Lower	Lower
	Surface Water Attenuation Overall Rank	Higher		

Hydrological Functional Values

Functional Group	Specific Function							
Hydrology	Surface Water Attenuation	Surface Water Supply Function						
	Surface Water Supply	Q#	Question Applied	Response	Score	Points Possible	Scoring Summary	
	Groundwater Recharge	Surface Water Supply Functional Capacity Indicators						
Water Quality	Nitrate Removal	24, 28	Surface water outflow from the AA.	No, isolated	10	50	When Q28 = No restriction OR Expedited via ditching SCORE = 50, Outlet moderately restricted SCORE = 40, Outlet highly restricted SCORE = 20, When Q24 = No, isolated SCORE = 10	
	Phosphorus Retention	15	HGM class.	Depressional	0	25	Slope-Groundwater SCORE = 25, Organic Soil Flat OR Riverine-Upper Perennial OR Slope-Surface Water SCORE = 20, Mineral Flat OR Depressional-Floodplain SCORE = 10, Depressional SCORE = 0, Riverine-Lower Perennial OR Lacustrine Fringe SCORE = -10	
	Sediment and Pollutant Retention	21	Predominant Cowardin water regime.	Semi-permanently flooded (F)	10	10	Semi-permanently Flooded (F) OR Permanently Flooded (H) OR Intermittently Exposed (G) = 10, Seasonally Flooded (C) OR Continuously Saturated (D) OR Seasonally Saturated -Flooded (E) SCORE = 5, Temporarily Flooded (A) OR Seasonally Saturated (B) SCORE = (-10)	
	Shoreline Stabilization							
	Thermoregulation							
Ecological	Native Plant Habitat	26	Water flow through the AA.	Natural overland flow across the soil surface. There are no constructed	0	10	Natural channels OR Constructed ditches/channels OR Open Water SCORE = 10, Overland flow SCORE = 0	
	Wildlife Habitat	21, 37	Predominant surface soil texture.	Muck	5	10	INDICATOR ONLY APPLIES WHEN Q21 = Temporarily Flooded (A) OR Seasonally Saturated (B) OR Continuously Saturated (D) OR Seasonally Flooded (C) IF NO SCORE = "NA", IF YES When Q37 = Mucky-Loamy OR Loamy/Clayey SCORE = 10, Mucky Peat OR Muck Or Mucky-Sandy SCORE = 5, Peat OR Sandy SCORE = 0	
	Fish Habitat							
Climate	Carbon Sequestration							
Anthropogenic	Historic or Cultural Uses			Total	25	100	IF AA HGM IS DEPRESSIONAL AND NO SURFACE OUTLET AND THE GROUNDWATER RECHARGE IS RATED AS "HIGHER", SURFACE WATER SUPPLY FUNCTIONAL CAPACITY SCORE = 50, GROUNDWATER RECHARGE CAPACITY IS RATED AS "MODERATE" OR "LOWER" SCORE = 25	
	Scientific or Educational Importance			Rank	Lower			
	Recreational Uses							
	Scenic Beauty							
	Commercial Uses							

Hydrological Functional Values

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

Surface Water Supply Opportunity-Value Indicators					
24, 29	Stream order when AA discharges to a river, stream, or ditch.	Not applicable because not river, stream, or ditch	-	75	1st OR 2nd order SCORE = 75, 3rd order SCORE = 50, 4th order or greater SCORE = 25, Isolated SCORE = 0
24, 33	When AA outlets to a lake or wetland, ratio of the area of the AA to the area of the receiving lake or wetland.	Not applicable because not lake or wetland	-	75	> 60% SCORE = 75, 20 - 60% SCORE = 50, < 20% SCORE = 25
12, 13, 15	Percent of catchment area occupied by the AA.	10% to <100%	15	25	ONLY APPLIES WHEN Q15 = Depressional OR Depressional-Floodplain OR Lacustrine Fringe OR Slope-Groundwater OR Slope-Surface water OR Organic Soil Flat OR Mineral Soil Flat, IF FALSE SCORE = NA, IF TRUE WHEN Q14 AA ≥ 100% of catchment SCORE = 25, AA 10 to < 100% of catchment SCORE = 15, AA 1 to < 10% of catchment SCORE = 0, AA < 1% of catchment SCORE = (-15)
15, 24		Total	25	100	IF AA HGM IS DEPRESSIONAL AND NO SURFACE OUTLET AND THE GROUNDWATER RECHARGE IS RATED AS "HIGHER", SURFACE WATER SUPPLY OPPORTUNITY-VALUE SCORE = 50, GROUNDWATER RECHARGE CAPACITY IS RATED AS "MODERATE" OR "LOWER" SCORE = 25
		Rank	Lower		

Surface Water Supply Overall Rank

		Opportunity	Higher	Moderate	Lower
Capacity	Higher		Higher	Higher	Moderate
	Moderate		Higher	Moderate	Lower
	Lower		Moderate	Lower	Lower
		Surface Water Supply Overall Rank	Lower		

Hydrological Functional Values

Functional Group	Specific Function	Groundwater Recharge Function						
Hydrology	Surface Water Attenuation	Q#	Question Applied	Response	Score	Points Possible	Scoring Summary	
	Surface Water Supply		Groundwater Recharge Functional Capacity Indicators					
	Groundwater Recharge	15	HGM class.	Depressional	45	45	Depressional SCORE = 45, Depressional-Floodplain SCORE = 40 Mineral Flat OR Organic Flat = 20, Riverine-Upper Perennial OR Riverine-Lower Perennial OR Lacustrine Fringe OR Slope-Groundwater OR Slope-Surface Water = 15	
Water Quality	Nitrate Removal	21	Predominant Cowardin water regime.	Semi-permanently flooded (F)	-15	15	(A) Temporarily Flooded OR (B) Seasonally Saturated SCORE = 15, (D) Continuously Saturated SCORE = 5, (C) Seasonally Flooded SCORE = 0, (F) Semi-permanently Flooded OR (E) Seasonally saturated - Flooded OR (H) Permanently Flooded OR (G) Intermitently Exposed = (-15)	
	Phosphorus Retention							
	Sediment and Pollutant Retention							
	Shoreline Stabilization	24, 28	Surface water outflow from the AA.	No, Isolated	10	10	When Q24 = No, Isolated SCORE = 10, Highly restricted SCORE = 5, Moderately restricted SCORE = 0 No restrictions SCORE = -5, Expedited via ditching. SCORE = (-10)	
	Thermoregulation							
Ecological	Native Plant Habitat	21, 37	Predominant surface soil texture.	Muck	10	10	ONLY APPLIES WHEN Q21 = Temporarily Flooded (A) OR Seasonally Saturated (B) OR Continuously Saturated (D) OR Seasonally Flooded (C) IF NO SCORE = NA, IF YES When Q37 = Peat OR Mucky Peat OR Muck OR Mucky-Sandy OR Sandy SCORE = 10, Mucky-Loamy SCORE = 5, Loamy/Clayey SCORE = 0	
	Wildlife Habitat							
	Fish Habitat							
Climate	Carbon Sequestration	15, 20	Relative elevation of the AA in relation to the HUC 12 watershed elevation.	In between local high and local low	0	10	For AAs that are Depressional, Organic or Mineral Flat HGM class, Local high SCORE = 10, In between local high and local low OR flat landscape SCORE = 0, Local low SCORE = (-10). Slope, Riverine, and Lacustrine Fringe HGM class AAs are assumed Local low with SCORE = (-10).	
Anthropogenic	Historic or Cultural Uses	14, 15	Percent of catchment area occupied by the AA.	10% to <100%	5	10	ONLY APPLIES WHEN Q15 = Depressional OR Depressional-Floodplain OR Lacustrine Fringe OR Slope-Groundwater OR Slope-Surface water OR Organic Soil Flat OR Mineral Soil Flat, IF FALSE SCORE = NA, IF TRUE WHEN Q14 AA < 10% of catchment SCORE = 10, AA 10 to 100% of catchment SCORE = 5, AA > 100% of catchment SCORE = 0	
	Scientific or Educational Importance							
	Recreational Uses							
	Scenic Beauty			Total	55	100		
	Commercial Uses			Rank	Moderate			

Hydrological Functional Values

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

Groundwater Recharge Opportunity-Value Indicators				
Watershed Baseflow Maintenance	20	20	20 POINTS automatically applied regardless of setting as the opportunity-value for wetlands to provided watershed baseflow maintenance via GW recharge is assumed to be equal throughout WI and MN	
% Total developed/ag landcover in the catchment area.	>75%	40	40	Developed/Agricultural cover 75-100% SCORE = 40, Developed/Agricultural cover 50-75% SCORE = 30, Developed/Agricultural cover 25-50% SCORE = 20, Developed/Agricultural cover < 25% SCORE = 10
Is the AA located in an area with notable groundwater use?	No	0	40	Yes SCORE = 40, No SCORE = 0
	Total	60	100	
		Moderate		

Groundwater Recharge Overall Rank				
	Opportunity	Higher	Moderate	Lower
Capacity	Higher	Higher	Higher	Moderate
	Moderate	Higher	Moderate	Lower
	Lower	Moderate	Lower	Lower
	Groundwater Recharge Overall Rank	Moderate		

Water Quality Functional Values

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

Water Quality Protection Functional Value

Nitrate Removal Function (**greater anoxic conditions - the greater the denitrification)

Q#	Question Applied	Response	Score	Points Possible	Scoring Summary
Nitrate Removal Functional Capacity Indicators					
24, 28	Surface water outflow from the AA.	No, Isolated	50	50	When Q24 = No, Isolated SCORE = 50, When Q28 = Highly restricted SCORE = 40, Moderately restricted SCORE = 30, No restriction SCORE = 20, Expedited via ditching SCORE = 0
21	Predominant Cowardin water regime in the AA?	Semi-permanently flooded (F)	20	20	Continuously Saturated (D) OR Seasonally Flooded (C) OR Semi-permanently Flooded (F) SCORE = 20, Temporarily Flooded (A) OR Seasonally Saturated (B) SCORE = 10, Permanently Flooded (H) OR Intermittently Exposed (G) OR Seasonally Saturated-Flooded (E) OR Intermittently Flooded SCORE = 0
37	Predominant surface soil texture.	Muck	20	20	Peat OR Mucky Peat OR Muck SCORE = 20, Mucky-Sandy OR Mucky-Loamy SCORE = 10, Sandy OR Loamy/Clayey SCORE = 0
26	Water flow through the AA.	Natural overland flow across the soil surface. There are no constructed channels, ditches, or streams that significantly facilitate flow.	10	10	Overland flow across the soil surface SCORE = 10, Natural channels SCORE = 5, Open water OR Ditching SCORE = 0
27	Average, overall density of live or dead, <u>rooted</u> vegetation material intercepting water flowing through the AA.	High stem density, stems occupy >75% of the soil surface	10	10	Rooted material occupy > 75% SCORE = 10, Rooted material occupy 50-75% SCORE = 5, Rooted material occupy < 50% SCORE = 0
		Total Score	110	100	
		Rank	Higher		
Nitrate Removal Opportunity-Value Indicators					
16	% Total developed/ag landcover in the catchment area.	>75%	50	50	Developed/Agricultural cover 75- 100% SCORE = 50. Developed/Agricultural cover 50- 75% SCORE = 40. Developed/Agricultural cover 25- 50% SCORE = 30. Developed/Agricultural cover < 25% SCORE = 20.
25	Primary source of surface water input.	Overland flow from surrounding upland/wetland.	10	25	Flooding from a stream/lake OR Directed input from constructed conveyance SCORE = 25, Stream input SCORE = 20, Overland flow from surrounding upland/wetland SCORE = 10
14, 15	Percent of catchment area occupied by the AA for depressional, slope, lacustrine fringe, organic flat, or mineral flat HGM classes.	10% to <100%	10	25	AA < 1% of catchment SCORE = 25, AA 1 to < 10% of catchment SCORE = 20, AA 10 to < 100% of catchment SCORE = 10, AA ≥ 100% of catchment SCORE = 0
15, 35	Is any portion of the AA located in a mapped floodplain?	Not Applicable	-	25	Yes SCORE = 25, No SCORE = 0
		Total Score	70	100	
		Rank	Moderate		
Nitrate Removal Overall Rank					
		Opportunity	Higher	Moderate	Lower
	Capacity	Higher	Higher	Higher	Moderate
		Moderate	Higher	Moderate	Lower
		Lower	Moderate	Lower	Lower
		Nitrate Removal Overall Rank	Higher		

Water Quality Functional Values

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

Phosphorus Retention Function (anoxic or altenating oxic/anoxic conditions promote phosphorus release)						
Q#	Question Applied	Response	Score	Points Possible	Scoring Summary	
	Phosphorus Retention Functional Capacity Indicators					
24, 28	Surface water outflow from the AA.	No, Isolated	100	100	When Q24 = No, Isolated SCORE = 100, When Q28 = Highly restricted SCORE = 50, Moderately restricted SCORE = 30, No restriction SCORE = 15, Expedited via ditching SCORE = 0	
21	Predominant Cowardin water regime in the AA.	Semi-permanently flooded (F)	-10	10	Seasonally Saturated (B) OR Permanently Flooded (H) OR Intermittently Exposed (G) = 10, Temporarily Flooded (A) SCORE = 0, Continuously Saturated (D) OR Seasonally Flooded (C) OR Seasonally Saturated - Flooded (E) OR Semi-permanently Flooded (F) = (-10)	
37	Predominant surface soil texture.	Muck	0	10	Loamy/Clayey SCORE = 10, Sandy OR Mucky-Sandy OR Mucky-Loamy SCORE = 5, Peat OR Mucky Peat OR Muck SCORE = 0	
26	Predominant water flow through the AA.	Natural overland flow across the soil surface. There are no constructed channels, ditches, or streams that significantly facilitate flow.	10	10	Overland flow across the soil surface SCORE = 10, Natural channels OR Open Water SCORE = 0, Ditching SCORE = (-10)	
27	Density of live or dead, <u>rooted</u> vegetation material intercepting water flowing through theAA.	High stem density, stems occupy >75% of the soil surface	10	10	Rooted materials occupy > 75% SCORE = 10, Rooted materials occupy 50-75% SCORE = 5, Rooted materials occupy < 50% SCORE = 0	
15, 20	Relative elevation of the AA in relation to the HUC 12 watershed elevation.	In between local high and local low	0	10	Local Higher SCORE = 10, In between local high and local low OR In a flat landscape SCORE = 0, Local Low SCORE = (-10). Slope, riverine, and lacustrine fringe HGM classes are assumed to be low SCORE = (-10).	
23	Are there springs or seeps in the AA?	No	10	10	No SCORE = 10, Yes SCORE = (-10)	
		Total Score	100	100		
		Rank	Higher			
	Phosphorus Retention Opportunity-Value Indicators					
16	% Total developed/ag landcover in the catchment area.	>75%	50	50	Developed/Agricultural cover >75% SCORE = 50. Developed/Agricultural cover >50- 75% SCORE = 40. Developed/Agricultural cover 25- 50% SCORE = 30. Developed/Agricultural cover < 25% SCORE = 20.	
25	Primary source of surface water input.	Overland flow from surrounding upland/wetland.	10	25	Flooding from a stream/lake OR Directed input from constructed conveyance SCORE = 25, Stream input SCORE = 20, Overland flow from surrounding upland/wetland SCORE = 10	
14, 15	Percent of catchment area occupied by AA.	10% to <100%	10	25	ONLY APPLIES WHEN Q14 is depressional, slope, lacustrine fringe, organic flat, or mineral flat. IF TRUE, AA < 1% of catchment SCORE = 25, AA 1 to < 10% of catchment SCORE = 20, AA 10 to < 100% of catchment SCORE = 10, AA > 100% of catchment SCORE = 0. IF FALSE, SCORE = N/A.	
15, 35	Is any portion of the AA located in a mapped floodplain?	Not applicable	0	25	Yes SCORE = 25, No SCORE = 0	
		Total Score	70	100		
		Rank	Moderate			
	Phosphorus Retention Overall Rank					
		Opportunity	Higher	Moderate	Lower	
	Capacity	Higher	Higher	Higher	Moderate	
		Moderate	Higher	Moderate	Lower	
		Lower	Moderate	Lower	Lower	
		Phosphorus Retention Overall Rank	Higher			

Water Quality Functional Values

			Sediment and General Pollutant Retention (**purely physical retention and includes pollutants not associated with oxic/anoxic conditions, essentially this is the same as the Surface Water Attenuation function)					
		Q#	Question Applied	Response	Score	Points Possible	Scoring Summary	
Functional Group		Sediment and General Pollutant Retention Functional Capacity Indicators						
Hydrology	Specific Function	24, 28	Surface water outflow from the AA.	No, isolated	100	100	When Q24 = No, Isolated SCORE = 100, When Q28 = Highly restricted SCORE = 40, Moderately restricted SCORE = 30, No restriction SCORE = 20, Expedited via ditching SCORE = 0	
	Surface Water Attenuation	27	Density of live or dead, rooted vegetation material intercepting water flowing through the AA.	High stem density, stems occupy >75% of the soil surface	20	20	Rooted material occupy > 75% SCORE = 20, Rooted material occupy 50-75% SCORE = 10, Rooted material occupy < 50% SCORE = 0	
	Surface Water Supply	26	Predominant water flow through the AA.	Natural overland flow across the soil surface. There are no constructed channels, ditches, or streams that significantly facilitate flow.	20	20	Overland flow across the soil surface SCORE = 20, Natural channels OR Open Water SCORE = 10, Ditching SCORE = 0	
	Groundwater Recharge	15, 34	For Riverine HGM class only, predominant floodplain vegetation and woody debris.	Not Applicable	-	10	Mature trees, shrub understory, large woody debris SCORE = 10, Spaced trees, open understory, large woody debris SCORE = 5, Tall shrub SCORE = 5, Emergent SCORE = 0	
Water Quality	Nitrate Removal	15, 20	Relative elevation of the AA in relation to the HUC 12 watershed elevation.	In between local high and local low	5	10	Local high = 10, In between local high/low OR Flat Landscape = 5, Local Low = 0. slope, riverine, and lacustrine fringe HGM classes are assumed to be Local Low SCORE = 0.	
	Phosphorus Retention	37	Predominant surface soil texture.	Muck	5	10	Loamy/Clayey OR Mucky-Loamy SCORE = 10, Peat OR Mucky Peat OR Muck OR Mucky-Sandy SCORE = 5, Sandy SCORE = 0	
	Sediment and Pollutant Retention			Total Score	150	100		
	Shoreline Stabilization			Rank	Higher			
	Thermoregulation							
		Sediment and General Pollutant Retention Opportunity-Value Indicators						
Ecological	Native Plant Habitat	16	% Total developed/ag landcover in the catchment area.	>75%	50	50	Developed/Agricultural cover 75- 100% SCORE = 50. Developed/Agricultural cover 50- 75% SCORE = 40. Developed/Agricultural cover 25- 50% SCORE = 30. Developed/Agricultural cover = < 25% SCORE = 20.	
	Wildlife Habitat	25	Primary source of surface water input.	Overland flow from surrounding upland/wetland.	10	25	Flooding from a stream/lake OR Directed input from constructed conveyance SCORE = 25, Stream input SCORE = 20, Overland flow from surrounding upland/wetland SCORE = 10	
	Fish Habitat	14, 15	Percent of catchment area occupied by AA.	10% to <100%	10	25	Only applicable to depressional, slope, lacustrine fringe, organic flat, or mineral flat HGM classes. AA < 1% of catchment SCORE = 25, AA 1 to < 10% of catchment SCORE = 20, AA 10 to < 100% of catchment SCORE = 10, AA > 100% of catchment SCORE = 0.☐	
Climate	Carbon Sequestration	15, 35	Is any portion of the AA located in a mapped floodplain?	Not Applicable	-	25	Yes SCORE = 25, No SCORE = 0	
Anthropogenic	Historic or Cultural Uses			Total Score	70	100		
	Scientific or Educational Importance			Rank	Moderate			
	Recreational Uses			Sediment and General Pollutant Retention Overall Rank				
	Scenic Beauty			Opportunity	Higher	Moderate	Lower	
	Commercial Uses	Capacity	Higher	Higher	Higher	Moderate		
			Moderate	Higher	Moderate	Lower		
	Lower	Moderate	Lower	Lower				
			Sediment and General Pollutant Retention Overall Rank	Higher				

Water Quality Functional Values

Functional Group	Specific Function											
Hydrology	Surface Water Attenuation	Shoreline Stabilization Function										
	Surface Water Supply	Q#	Question Applied	Response	Score	Points Possible	Scoring Summary					
	Groundwater Recharge		Shoreline Stabilization Functional Capacity Indicators									
	15	HGM class.	Depressional	Stop	QUALIFYING QUESTION	Only Riverine or Lacustrine Fringe HGM classes are associated with streams/lakes (hence a shoreline), Shoreline Stabilization function does not apply for other HGM classes.						
Water Quality	Nitrate Removal	30						<30%/hard armored SCORE = 50, 30-59% SCORE = 30, 60-90% SCORE = 10, >90% SCORE = 0				
	Phosphorus Retention	31						0-20% SCORE = 50, 21-60% SCORE = 30, 61-80% SCORE = 10, 81-90% SCORE = 5, >90% SCORE = 0				
	Sediment and Pollutant Retention			Total	-	100						
			Rank	Not Applicable								
	Shoreline Stabilization											
	Thermoregulation											
Ecological	Native Plant Habitat	Thermoregulation Function										
	Wildlife Habitat	Q#	Question Applied	Response	Score	Points Possible	Scoring Summary					
	Fish Habitat	24	Qualifying question here (must outlet to river, stream, or ditch).	No, isolated	Stop	QUALIFYING QUESTION	Only AA's that outlet to a river,stream, or ditch apply.					
	Climate	Carbon Sequestration	15						Slope-Groundwater SCORE = 25, Riverine-Upper Perennial OR Organic Soil Flat SCORE 20, Riverine-Lower Perennial OR Slope-Surface Water SCORE = 10, Depressional OR Depressional - floodplain OR Mineral Soil Flat SCORE = 5, Lacustrine Fringe SCORE = NA			
Anthropogenic	Historic or Cultural Uses	29						1st or 2nd order SCORE = 25, 3rd order SCORE = 15, 4th order or greater SCORE = 0				
	Scientific or Educational Importance	38						Forested + Scrub/Shrub Cover: >=70% SCORE = 25, 50- 70% SCORE = 10, <50% SCORE = 0				
	Recreational Uses	23						Yes SCORE = 25, No SCORE = 0				
	Scenic Beauty			Total Score	Not Applicable	100						
	Commercial Uses			Rank	Not Applicable							

Ecological Use Functional Values

Functional Group	Specific Function	Ecological Use Functional Value						
Hydrology	Surface Water Attenuation	Q#	Question Applied			Response	Scoring	
	Surface Water Supply		Native Plant Communities Capacity and Opportunity					
	Groundwater Recharge	39	Floristic Quality Assessment (FQA) condition category.			Fair		
Water Quality	Nitrate Removal							
	Phosphorus Retention							
	Sediment and Pollutant Retention		Native Plant Habitats Capacity and Opportunity Rank					
	Shoreline Stabilization		Floristic Quality Assessment		Exceptional	Higher	FQA condition category corresponds to overall native plant habitat rank.	
	Thermoregulation				Good	Higher		
Ecological	Native Plant Habitat				Fair	Moderate		
	Wildlife Habitat				Poor	Lower		
	Fish Habitat				Absent	Lower		

Ecological Use Functional Values

Functional Group	Specific Function	Wildlife Habitat Capacity			
Hydrology	Surface Water Attenuation	Floristic Quality Assessment (FQA) condition category.		Fair	
	Surface Water Supply	Number of different wetland structural types in the AA.		2	>1
	Groundwater Recharge				
Water Quality	Nitrate Removal	Percent of the AA with standing dead and/or downed trees.		<1%	
	Phosphorus Retention				
	Sediment and Pollutant Retention				
	Shoreline Stabilization				
	Thermoregulation	Average level of interspersions of wetland structural types across the entire AA.		Low	
Ecological	Native Plant Habitat	Wildlife Habitat Opportunity			
	Wildlife Habitat	Percent total natural land cover within 0.1 miles buffer from the edge of the AA.		>50%	
		Is the AA in a core area?		Yes	
		Percent area the core occupies within a 2-mile radius.		<25%	
Ecological	Fish Habitat				
Climate	Carbon Sequestration				
Anthropogenic	Historic or Cultural Uses				
	Scientific or Educational Importance				
	Recreational Uses				
	Scenic Beauty				
	Commercial Uses				
Wildlife Habitat Overall Rank					
		Opportunity	Higher	Moderate	Lower
		Higher	Higher	Higher	Higher
		Moderate	Higher	Moderate	Moderate
		Lower	Higher	Lower	Lower
		Wildlife Habitat Overall Rank	Higher		

Ecological Use Functional Values

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

Fisheries Habitat Capacity

Percent of permanently, semi-permanently, or seasonally-flooded water regimes that have live or dead woody debris.

Not Applicable

Percent of permanently, semi-permanently, and seasonally-flooded water regimes that are unvegetated.

Not Applicable

Fisheries Habitat Opportunity

Level of aquatic barriers to fish movement.

Not Applicable

Fisheries Habitat Opportunity Rank

Aquatic Barriers

No Barriers

Higher

Some barriers but movement possible

Moderate

Significant barriers

Lower

Fisheries Habitat Opportunity Rank

Not Applicable

Fisheries Habitat Overall Rank

Capacity

Higher

Higher

Moderate

Higher

Moderate

Moderate

Higher

Moderate

Lower

Moderate

Lower

Fisheries Habitat Overall Rank

Not Applicable

Carbon Sequestration Functional Value

Functional Group	Specific Function	Existing Carbon Storage Capacity Indicator										
Hydrology	Surface Water Attenuation	Average percent soil organic matter content by weight.						High (>5%)	35	35	Low SCORE = 10 Low = 10, Medium SCORE = 25, High SCORE = 35	
	Surface Water Supply	Combined percent cover of forested and scrub-shrub wetland classes.						20%	7	35	Points allocated according to total percent cover.	
	Groundwater Recharge	Percent cover of sphagnum.						Not present	0	30	Not present SCORE = 0, <50% SCORE = 5, 5075% SCORE = 15, >75% SCORE = 30	
Water Quality	Nitrate Removal							Total	42	100		
	Phosphorus Retention							Rank	Moderate			
	Sediment and Pollutant Retention	Carbon Deposition Capacity Indicators										
	Shoreline Stabilization	Percent of catchment occupied by the AA.						13%	20	40	> or = 20% SCORE = 40, < or = 20% SCORE = 20	
	Thermoregulation	What is the Catchment Area slope?						<2%	0	20	<2% slope SCORE = 0, 2-6% SCORE = 10, >6% SCORE = 20	
Ecological	Native Plant Habitat	Percent natural land cover in the catchment area.						<33%	40	40	<33% SCORE = 40, 33-50% SCORE = 25, >50% SCORE = 10	
	Wildlife Habitat							Total	60	100		
	Fish Habitat							Rank	Moderate			
Climate	Carbon Sequestration	Methane Limitation Capacity Indicators										
Anthropogenic	Historic or Cultural Uses	FQA condition category.						Fair	15	30	Exceptional or Good SCORE = 30, Fair SCORE = 15, Poor SCORE = 5, Absent SCORE = 0	
	Scientific or Educational Importance	Percent of the AA with a continuously saturated water regime.						0%	0.0	70	Points allocated according to total percent cover.	
	Recreational Uses							Total	15	100		
	Scenic Beauty							Rank	Lower			
	Commercial Uses							Functional Group Rank	Lower			

Anthropogenic Importance Functional Values

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

Anthropogenic Importance Functional Value				
Q#	Question Applied		Response	Scoring
	Historic or Cultural Use Rank			
47	Is any portion of the AA part of an identified historic, archaeological or culturally important resource or property?	No	Not Applicable	If "Yes, then considered as Higher value. Otherwise not applicable.
	Scientific or Educational Importance Rank			
48	Is any portion of the AA part of an identified educational or scientific research property?	Yes	Higher	If "Yes, then considered as Higher value. Otherwise not applicable.
	Recreational Uses			
49	Is any portion of the AA part of an identified public recreational/use area?	Yes		
50	Does any portion of the AA contain or is a part of an area that contains public recreation-oriented infrastructure such as designated parking lot/area, signage (interpretative, trail map, etc.), constructed trails, boardwalks, or other infrastructure that supports and facilitates public recreation use?	Yes		
	Recreational Uses Rank			
		Q49	Yes	No
		Q50	Yes	Higher
			No	Moderate
			Recreational Uses Rank	Higher

Anthropogenic Importance Functional Values

Functional Group		Specific Function	Scenic Beauty					
Hydrology	Surface Water Attenuation Surface Water Supply Groundwater Recharge	Is a significant portion of the AA viewable by the public from a public road, trail, stream, lake, etc.?	Yes	Continue to table		If question 51 is "No" then rank is lower.		
		Is the public viewable portion of the AA free of unnatural trash, debris, and other materials that detract from the natural character of the wetland?	Yes					
		Are there viewing platforms, benches, and/or other infrastructure accessible to the public that promotes viewing some or all of the AA?	Yes					
Water Quality	Nitrate Removal Phosphorus Retention Sediment and Pollutant Retention Shoreline Stabilization Thermoregulation	Scenic Beauty Rank						
				Q53	Yes	No		
		Q52	Yes	Higher	Moderate			
			No	Higher	Lower			
				Scenic Beauty Rank		Higher		
Ecological	Native Plant Habitat Wildlife Habitat Fish Habitat							
Climate	Carbon Sequestration							
Anthropogenic	Historic or Cultural Uses Scientific or Educational Importance Recreational Uses Scenic Beauty Commercial Uses							

Commercial Uses					
Is any portion of the AA used for a wetland-dependent commercial activity?	No	Continue to table		If question 55 is "Yes" then rank is higher.	
Is the AA within two miles of a wetland-dependent commercial activity?	No				
Is any portion of the AA owned by an entity that operates a wetland-dependent commercial activity in the area?	No				
Does the AA have similar characteristics (landscape setting, hydrology, vegetative structure, soils, etc.) as other wetlands being used for wetland-dependent commercial activities in the immediate area?	No				
Commercial Uses Rank					
	Q56	Yes	Yes	No	No
	Q58	Yes	No	Yes	No
Q57	Yes	Higher	Lower	Moderate	Lower
	No	Moderate	Lower	Lower	Lower
		Commercial Uses Rank		Lower	

Results Summary

Function Rankings				
Functional Group	Specific Function	Functional Capacity Rank	Opportunity-Value Rank	Overall Rank
Hydrology	Surface Water Attenuation	Higher	Moderate	Higher
	Surface Water Supply	Lower	Lower	Lower
	Groundwater Recharge	Moderate	Moderate	Moderate
Water Quality	Nitrate Removal	Higher	Moderate	Higher
	Phosphorus Retention	Higher	Moderate	Higher
	Sediment and Pollutant Retention	Higher	Moderate	Higher
	Shoreline Stabilization	Not Applicable	Not Scored For This Function	Not Applicable
	Thermoregulation	Not Applicable	Not Applicable	Not Applicable
Ecological	Native Plant Habitat	Moderate	Moderate	Moderate
	Wildlife Habitat	Moderate	Higher	Higher
	Fish Habitat	Not Applicable	Not Applicable	Not Applicable
Climate	Carbon Sequestration	Lower	Not Scored For This Function	Lower
Anthropogenic	Historic or Cultural Uses	Not Scored For These Functions	Not Applicable	Not Applicable
	Scientific or Educational Importance		Higher	Higher
	Recreational Uses		Higher	Higher
	Scenic Beauty		Higher	Higher
	Commercial Uses		Lower	Lower

Step Back and Think About Results



Functions Organized by Ranking				
	Higher	Moderate	Lower	Not Applicable
	Surface Water Attenuation	Groundwater Recharge	Surface Water Supply	Shoreline Stabilization
	Nitrate Removal	Native Plant Habitat	Carbon Sequestration	Thermoregulation
	Phosphorus Retention		Commercial Uses	Fish Habitat
	Sediment and Pollutant Retention			Historic or Cultural Uses
	Wildlife Habitat			
	Scientific or Educational Importance			
	Recreational Uses			
	Scenic Beauty			

Tier	Description
Higher	Functional capacity or opportunity-value to provide a function is at a higher level relative to other wetlands for a specific function.
Moderate	Functional capacity or opportunity-value to provide a function is at a moderate level relative to other wetlands for a specific function.
Lower	Functional capacity or opportunity-value to provide a function is at a lower level relative to other wetlands for a specific function.

Learning Objectives – Wetland Rapid Assessment Method

Upon completion of this course, participants will be able to:

- Explain the purpose, scientific foundation, and appropriate applications of the Wetland Rapid Assessment Method (RAM) in wetland regulation, restoration, conservation, and mitigation.
- Describe the hydrologic, water quality, ecological, climate, and anthropogenic functional groups assessed by the RAM.
- Accurately complete the RAM assessment tool, including data entry, documentation, required screenshots, and supporting information.
- Conduct field assessments to verify desktop information and collect vegetation, hydrology, soils, habitat, and other site characteristics required for the RAM.
- Interpret RAM outputs to evaluate wetland functions, identify functional strengths and limitations, and support wetland regulatory, restoration, mitigation, and management decisions.

Assessment Information

Assessment Details				Information Source(s)	Information for User
1	Site Name:			User	
2	Assessor Name:			User	
3	Date of Desktop Assessment:			User	
4	Date of Field Assessment:			User	
5	If delineated, file reference number (if known):			User	

Location Details				Information Source(s)	Information for User
6	Nearest Town:			Desktop	
7	County:			Desktop	
8	State:			Desktop	
9	Latitude (decimal degrees):			Desktop	
10	Longitude (decimal degrees):			Desktop	
11	PLSS, quarter/quarter section or tax lot(s) reference:			Desktop	
12	Size of the Assessment Area (AA, in acres):			Desktop	See Assessment Area Establishment in ☒ Screenshot required: Outline of AA
13	Size of the catchment area draining into the AA (in acres):			Desktop	Use GIS software or EnviroAtlas rainfall and determine its size. ☒ Screenshot required: Outline of the
14	What percent of the catchment area is occupied by the AA? (AA divided by catchment area multiplied by 100).			Desktop	Auto-populated from questions 12 and 13
15	What is the dominant HGM class of the AA?			Desktop; Field	A dichotomous key to HGM classes is

Land Cover and Connectivity				Information Source(s)	Information for User
16	Use the <i>Summarize by Area</i> tool in EPA's EnviroAtlas or a GIS software program with the latest National Land Cover Database map layer to determine the following land cover percentages:			Desktop	Use EnviroAtlas' Summarize My Area tool for specified areas. ☒ Screenshots required: NLCD cover by
	Percent of the catchment area (excluding the AA) that is developed and agricultural cover classes combined.				
	Percent of the catchment area (excluding the AA) that is natural cover classes (deciduous, evergreen and mixed forest; shrub/scrub; grassland/herbaceous; and emergent herbaceous wetlands).				
	Percent of the land area within 0.1 miles (0.161 km) from the edge of the AA (excluding the AA) that is natural cover classes (deciduous, evergreen and mixed forest; shrub/scrub; and emergent herbaceous wetlands).				

WI/MN Wetland Rapid Assessment Method User Guide

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Questions?