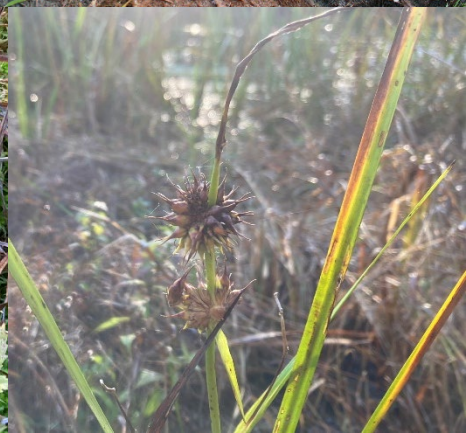
Wetland Function/Value Inventory Update and Groundwater Dependent Wetland Reclassification



Wetland Function/Value Inventory Update and Groundwater Dependent Wetland Reclassification

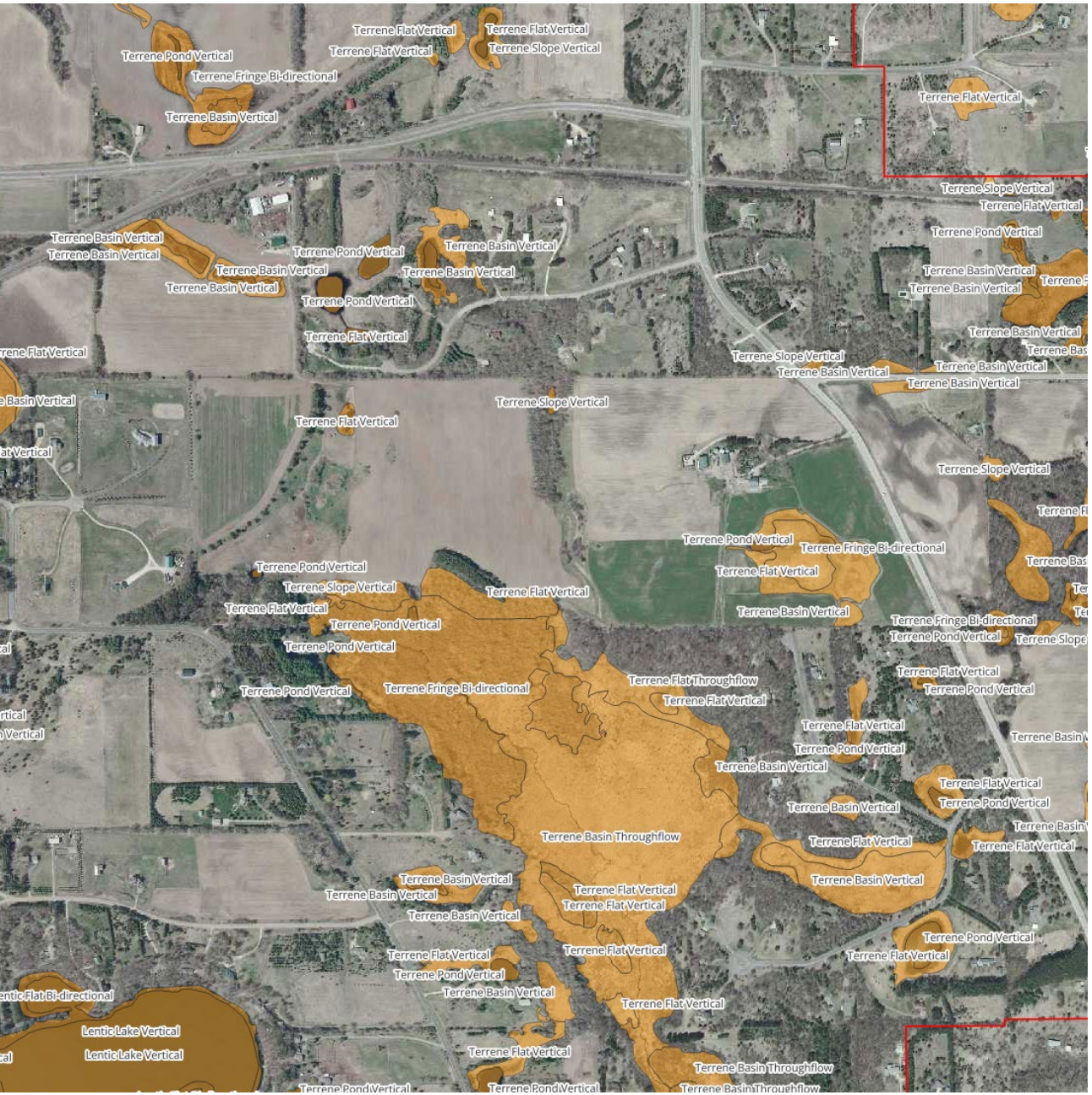
Function and Value Inventory Update

- **Purpose**
  - The environment changes
  - Science and practice change

Groundwater Dependent Wetlands Reclassification

- **Purpose**
  - Create simplified layer
  - Resolve definitional confusion and redefine groundwater dependent natural resources within District rules

Wetland Function/Value Inventory Update - Methods



2013 Updated National Wetland Inventory

- New Polygons
- New Attributes
  - Hydrogeomorphic (HGM)
- Aggregate with old F/V data

Wetland Function/Value Inventory Update – Methods

Functional Group	Specific Function	Definition	MnRAM Equivalent
Hydrology	Surface Water Attenuation (SWA)	The ability of a wetland to store or delay surface water over a period of time to influence the magnitude, frequency, and/or duration of inundation further downstream or within a watershed	Flood Attenuation
	Surface Water Supply (SWS)	The ability of a wetland to supply water to downstream/downslope waters or within a watershed via surface water outflows, saturation overland flow, and/or groundwater discharge.	Not Assessed
	Groundwater Recharge (GR)	The ability of a wetland to recharge groundwater.	Not Assessed
Water Quality	Nitrate Removal (NR)	The ability of a wetland to remove nitrate.	Assesses generalized downstream water quality
	Phosphorus Retention (PR)	The ability of a wetland to serve as a phosphorus sink.	Assesses generalized downstream water quality
	Sediment and Pollutant Retention (SPR)	The ability of a wetland to serve as a sediment and pollutant sink.	Assesses generalized downstream water quality
	Shoreline Stabilization (SS)	The ability of a wetland to stabilize shorelines of adjacent larger water bodies.	Shoreline Protection
	Thermoregulation (TR)	The ability of a wetland to maintain or reduce water temperature.	Assesses generalized downstream water quality
Ecological	Native Plant Habitat (NP)	The ability of a wetland to support the life requirements of native plants and plant communities.	Vegetative Diversity/Integrity
	Wildlife Habitat (WH)	The ability of a wetland to support the life requirements of native wildlife.	Characteristic Wildlife Habitat Structure
	Fish Habitat (FH)	The ability of a wetland to support the life requirements of native fish.	Maintenance of Characteristic Fish Habitat
Climate	Carbon Sequestration (CS)	The ability of a wetland to sequester carbon.	Not Assessed
Anthropogenic	Historic or Cultural Uses (HCU)	The capacity for a wetland to serve as an archaeological, historical, or culturally significant resource.	Assesses generalized aesthetics/recreation/education/cultural
	Scientific or Educational Importance (SEI)	The capacity for a wetland to serve as scientific or educational resource.	Assesses generalized aesthetics/recreation/education/cultural
	Commercial Uses (CU)	The capacity of the wetland to serve as a commercial resource.	Assesses generalized aesthetics/recreation/education/cultural
	Recreational Uses (RU)	The capacity of the wetland to serve as a recreational resource for the public.	Assesses generalized aesthetics/recreation/education/cultural
	Scenic Beauty (SB)	The capacity of the wetland to provide an aesthetic resource for the public.	Assesses generalized aesthetics/recreation/education/cultural

BWSR/WDNR Wetland Assessment Tool (WAT)

- **Draft tool released August 1, 2024**
  - Additional functions
  - Latest science (HGM, RFQA, GIS)
  - Improved ability to assess site-specific wetland function and values
- **Field Inventory and Extrapolation**
  - Apply WAT to subset of wetlands
  - Extrapolate results to revise management classes watershed-wide

Wetland Function/Value Inventory Update - Methods

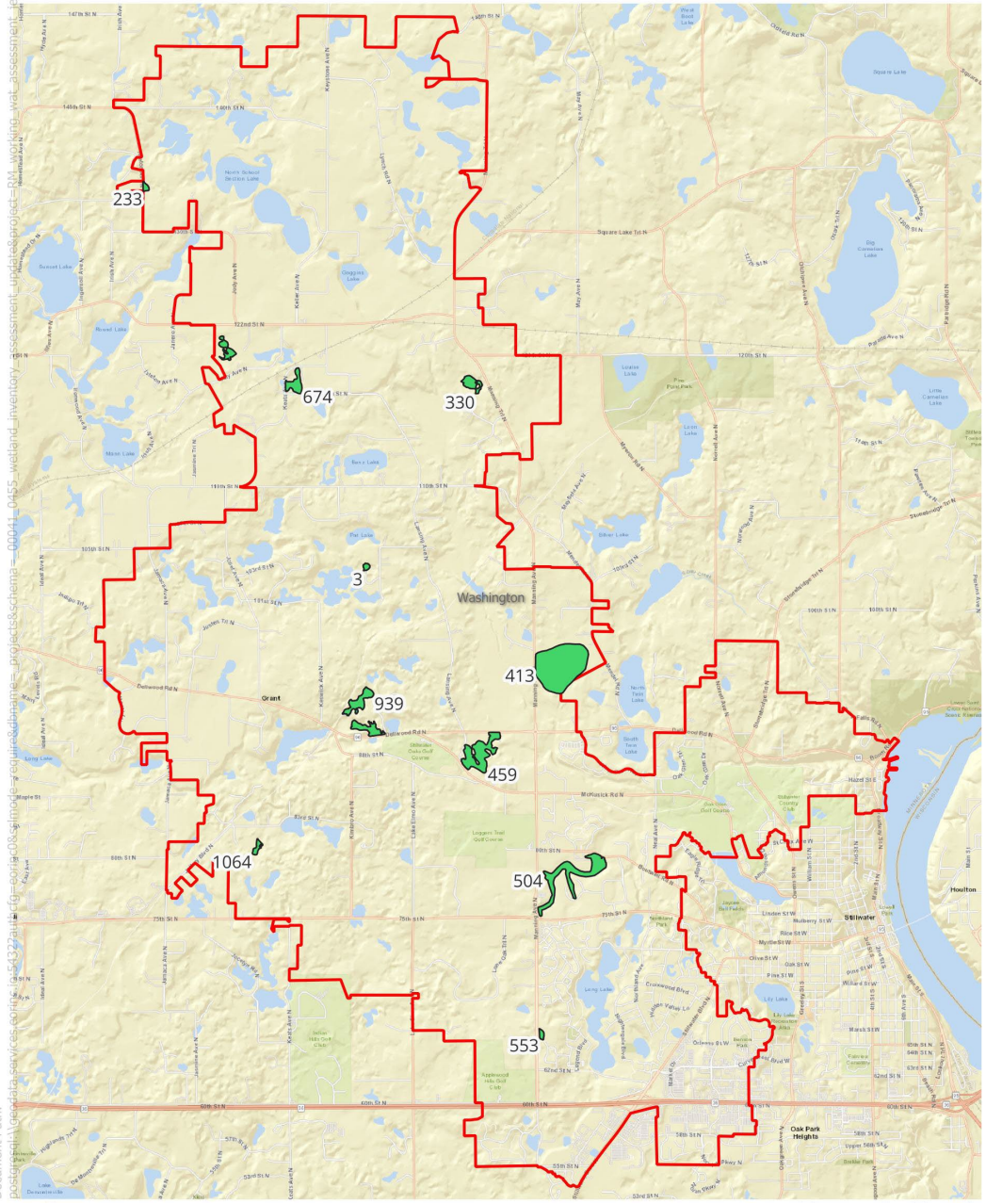
WAT Output

- **Functional Capacity, Opportunity-Value, and Overall Scores**
- **Higher, Moderate, and Lower Scores**
  - Only three ranks (MnRAM has 4)

Functional Group	Functional Capacity Rank	Opportunity-Value Rank	Overall Rank
Hydrology	Moderate	Moderate	Moderate
Water Quality	Higher	Moderate	Higher
Ecological	Higher	Higher	Higher
Climate	Moderate	Not Applicable	Moderate
Anthropogenic	Not Applicable	Lower	Lower

Specific Function	Functional Capacity Rank	Opportunity-Value Rank	Overall Rank
Surface Water Attenuation (SWA)	Moderate	Moderate	Moderate
Surface Water Supply (SWS)	Moderate	Moderate	Moderate
Groundwater Recharge (GR)	Moderate	Moderate	Moderate
Nitrate Removal (NR)	Moderate	Moderate	Moderate
Phosphorus Retention (PR)	Higher	Lower	Moderate
Sediment and Pollutant Retention (SPR)	Higher	Moderate	Higher
Shoreline Stabilization (SS)	Not Applicable	Not Applicable	Not Applicable
Thermoregulation (TR)	Not Applicable	Not Applicable	Not Applicable
Native Plant Habitat (NP)	Higher	Higher	Higher
Wildlife Habitat (WH)	Higher	Higher	Higher
Fish Habitat (FH)	Not Applicable	Not Applicable	Not Applicable
Carbon Sequestration (CS)	Moderate	Not Applicable	Moderate
Historic or Cultural Uses (HCU)	Not Applicable	Not Applicable	Not Applicable
Scientific or Educational Importance (SEI)		Not Applicable	Not Applicable
Commercial Uses (CU)		Lower	Lower
Recreational Uses (RU)		Lower	Lower
Scenic Beauty (SB)		Lower	Lower

Wetland Function/Value Inventory Update - Methods



Site Selection

- **12 sites**
  - Distribution of Preserve, Manage 1, Manage 2, Manage 3 wetlands
  - Small and large
  - Various wetland types
  - Four public waters wetlands
  - Near existing permits or potential development

Wetland Function/Value Inventory Update - Methods

WAT Implementation

- **Desktop Assessment**
  - GIS analysis conducted prior to field and refined after
- **Field Assessment**
  - Conducted 9/30-10/23/24
  - Hydrogeomorphic classification
  - MPCA Rapid Floristic Quality Assessment (RFQA)
  - Other hydrology, vegetation, habitat, and anthropogenic observations.
- **Input Data into WAT**

Wetland Function/Value Inventory Update – Field Inventory Results

Wetland 939

- Unique soft water aquatic community
- One state-listed and two locally rare species
- Wetland 553 with similar uncommon species

Wetland 949

- Open Bog/Leatherleaf-Sweet Gale Shore Fen
  - "cranberry bog" with sundew, Sphagnum moss
- Southernmost example of plant community

Wetland 413 (Mendel Road)

- Tamarack-dominated Coniferous Bog

Wetlands 459 and 504

- Examples of groundwater-discharge

Wetland Function/Value Inventory Update – Field Inventory Results

Hydrology

- 11 of 12 wetlands “Higher”, 1 “Moderate”

Water Quality

- 10 of 12 wetlands “Higher”, 1 “Moderate”, 1 “Lower”

Ecological

- 7 of 12 wetlands “Higher”, 3 “Moderate”, 2 “Lower”

Climate

- 0 of 12 wetlands “Higher”, 11 “Moderate, 1 “Lower”

Anthropogenic

- 0 of 12 wetlands “Higher”, 9 “Moderate, 2 “Lower”

Wetland Function/Value Inventory Update – Field Inventory Results

MnRAM Function or Value	WAT Function or Value	MnRAM/WAT Crosswalk
Vegetative Diversity	Native Plant Habitat	"Exceptional" OR "High" = "Higher" "Medium" = "Moderate" "Low" = "Lower"
Wildlife Habitat	Wildlife Habitat	"Exceptional" OR "High" = "Higher" "Medium" = "Moderate" "Low" = "Lower"
Fish Habitat	Fish Habitat	"Exceptional" OR "High" = "Higher" "Medium" = "Moderate" "Low" = "Lower"
Aesthetics/Education/Recreation/Cultural	Anthropogenic Overall	"Exceptional" OR "High" = "Higher" "Medium" = "Moderate" "Low" = "Lower"
Maintenance of Hydrologic Regime	Hydrology Overall	"Exceptional" OR "High" = "Higher" "Medium" = "Moderate" "Low" = "Lower"
Stormwater Sensitivity	NA	Original stormwater sensitivity rating is independent of MnRAM and is still valid based on WAT plant community classifications

"Manage 2," as a wetland classification, means a wetland that does not qualify as a "Preserve" or "Manage 1" wetland but that meets one or more of the following rating levels pursuant to the Minnesota Rapid Assessment Method (MnRAM) 3.0 or other method approved by the District:

	Vegetative Diversity	Medium
	Wildlife Habitat	Medium
	Fisheries Habitat	Medium
	Aesthetics/education/recreation/cultural AND Wildlife Habitat	Medium Low

Management Classification

- **Used WAT/MnRAM crosswalk to classify wetlands according to existing District Rules**

"Preserve," as a wetland classification, means a wetland meeting any of the following rating levels pursuant to the Minnesota Rapid Assessment Method (MnRAM) 3.0 or other method approved by the District:

	Function or Value	**Rating**
	Vegetative Diversity	Exceptional
	Wildlife Habitat	Exceptional
	Fish Habitat	Exceptional
	Aesthetics/education/recreation/cultural AND Wildlife Habitat	Exceptional High
	Stormwater Sensitivity AND Vegetative Diversity	Exceptional Medium or greater
	Vegetative Diversity AND Maintenance of hydrologic regime	High High or greater

Wetland Function/Value Inventory Update – Field Inventory Results

Wetland ID	Native Plant Habitat	Wildlife Habitat	Fish Habitat	Anthropogenic Overall	Hydrology Overall	Stormwater Sensitivity	WAT Management Class	Prior Management Class
3	Moderate	Lower	NA	Lower	Higher	B	Manage 2	Manage 1
233	Lower	Lower	NA	Moderate	Higher	B	Manage 2	Manage 1
298	Moderate	Lower	NA	Lower	Higher	Exceptional	Preserve	Preserve
330	Lower	Lower	NA	Moderate	Higher	B	Manage 2	Manage 3
413	Moderate	Higher	NA	Moderate	Higher	Exceptional	Preserve	Manage 3
459	Higher	Higher	NA	Moderate	Higher	Exceptional	Preserve	Manage 1
504	Moderate	Higher	NA	Moderate	Higher	A	Preserve	Manage 2
553	Moderate	Moderate	NA	Moderate	Higher	A	Manage 1	Manage 2
674	Higher	Higher	NA	Moderate	Higher	B	Preserve	Manage 1
939	Higher	Higher	NA	Lower	Moderate	A	Preserve	Preserve
949	Moderate	Higher	NA	Moderate	Higher	Exceptional	Preserve	Manage 1
1064	Moderate	Moderate	NA	Lower	Higher	Exceptional	Preserve	Preserve

Management Classification

- 7 increased classification
- 2 decreased classification
- 3 maintained classification (all preserve)

Wetland Function/Value Inventory Update – Watershed-Wide Methods

Wetland ID	Native Plant Habitat	Wildlife Habitat	Fish Habitat	Anthropogenic Overall	Hydrology Overall	Stormwater Sensitivity	WAT Management Class	Prior Management Class
3	Moderate	Lower	NA	Lower	Higher	B	Manage 2	Manage 1
233	Lower	Lower	NA	Moderate	Higher	B	Manage 2	Manage 1
298	Moderate	Lower	NA	Lower	Higher	Exceptional	Preserve	Preserve
330	Lower	Lower	NA	Moderate	Higher	B	Manage 2	Manage 3
413	Moderate	Higher	NA	Moderate	Higher	Exceptional	Preserve	Manage 3
459	Higher	Higher	NA	Moderate	Higher	Exceptional	Preserve	Manage 1
504	Moderate	Higher	NA	Moderate	Higher	A	Preserve	Manage 2
553	Moderate	Moderate	NA	Moderate	Higher	A	Manage 1	Manage 2
674	Higher	Higher	NA	Moderate	Higher	B	Preserve	Manage 1
939	Higher	Higher	NA	Lower	Moderate	A	Preserve	Preserve
949	Moderate	Higher	NA	Moderate	Higher	Exceptional	Preserve	Manage 1
1064	Moderate	Moderate	NA	Lower	Higher	Exceptional	Preserve	Preserve

Watershed-wide Extrapolation

- Reduce to Manage 2
  - Existing Manage 1 wetlands smaller than 2 acres and not overlapping mapped high quality MLCCS/NWI/NPC vegetation classes, previously scored moderate or below for vegetation quality, or not overlapping a mapped habitat core area.
- Increase to Preserve
  - Existing Manage 1 wetlands greater than 2 acres overlapping high quality MLCCS/NWI/NPC vegetation classes or previously scored high for vegetation or habitat diversity.
- Increase to Manage 2
  - Existing Manage 3 wetlands within 250 feet of an arterial road and unobstructed.
- Additional Analysis
  - Excavated Ponds classification
  - Lakes/Ponds reclassification

Wetland Function/Value Inventory Update – Watershed-Wide Results

Classification	Number of Wetlands	Net Change (Reclassification-Old)
Preserve (Old)	36	+56
Preserve (Reclassification)	92	
Manage 1 (Old)	143	-100
Manage 1 (Reclassification)	43	
Manage 2 (Old)	73	+23
Manage 2 (Reclassification)	96	
Manage 3 (Old)	50	-13
Manage 3 (Reclassification)	37	
Needs Assessment (Old)	1	+24
Needs Assessment (Reclassification)	25	
Below Threshold (Old)	367	-41
Below Threshold (Reclassification)	326	
Lakes (Old)	7	+33
Lakes/Ponds (Reclassification)	40	
Stormwater Management Ponds (Old)	9	+18
Excavated Ponds (Reclassification)	27	

Watershed-wide Extrapolation

- Reduce to Manage 2
  - Existing Manage 1 wetlands smaller than 2 acres and not overlapping mapped high quality MLCCS/NWI/NPC vegetation classes, previously scored moderate or below for vegetation quality, or not overlapping a mapped habitat core area.
- Increase to Preserve
  - Existing Manage 1 wetlands greater than 2 acres overlapping high quality MLCCS/NWI/NPC vegetation classes or previously scored high for vegetation or habitat diversity.
- Increase to Manage 2
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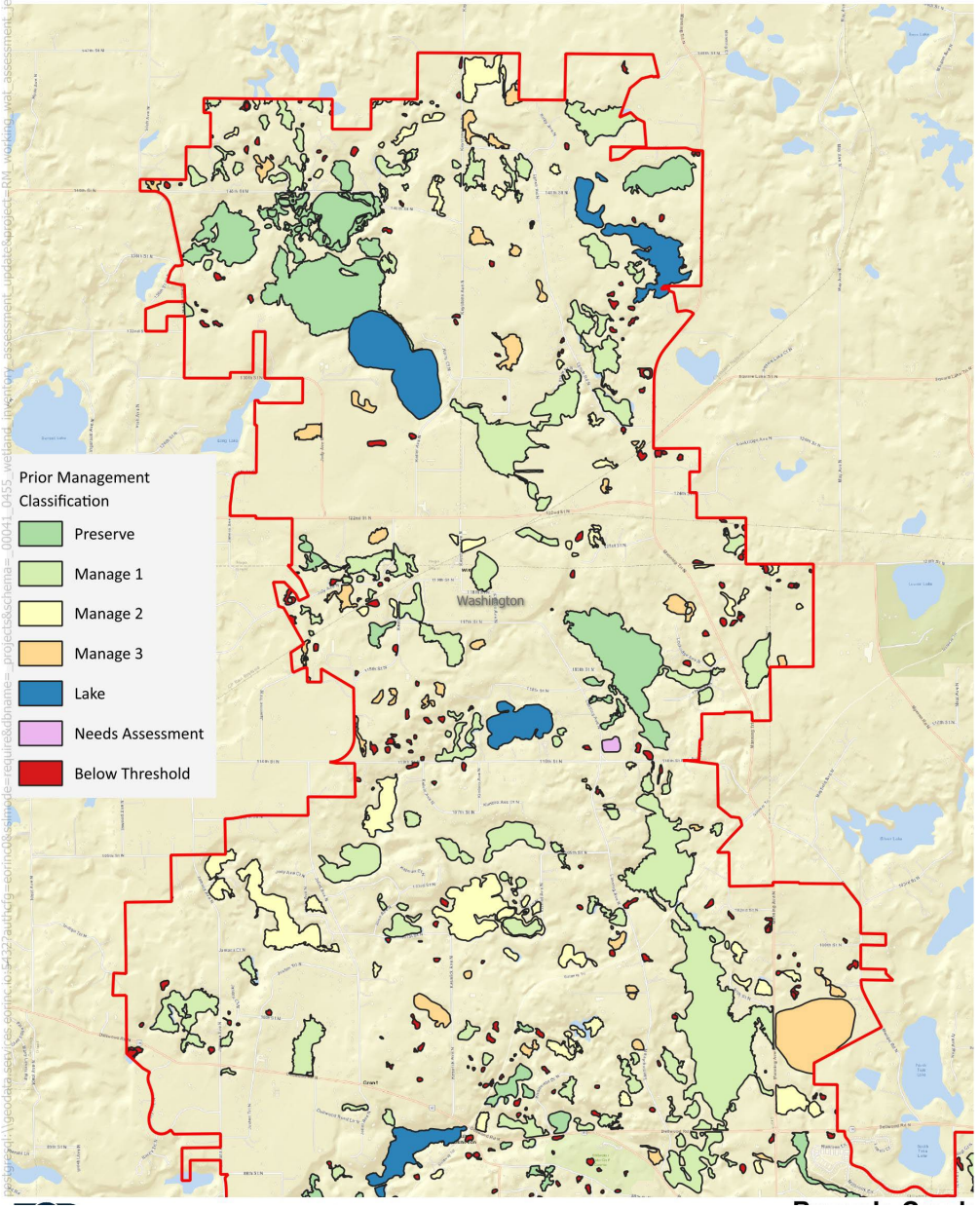
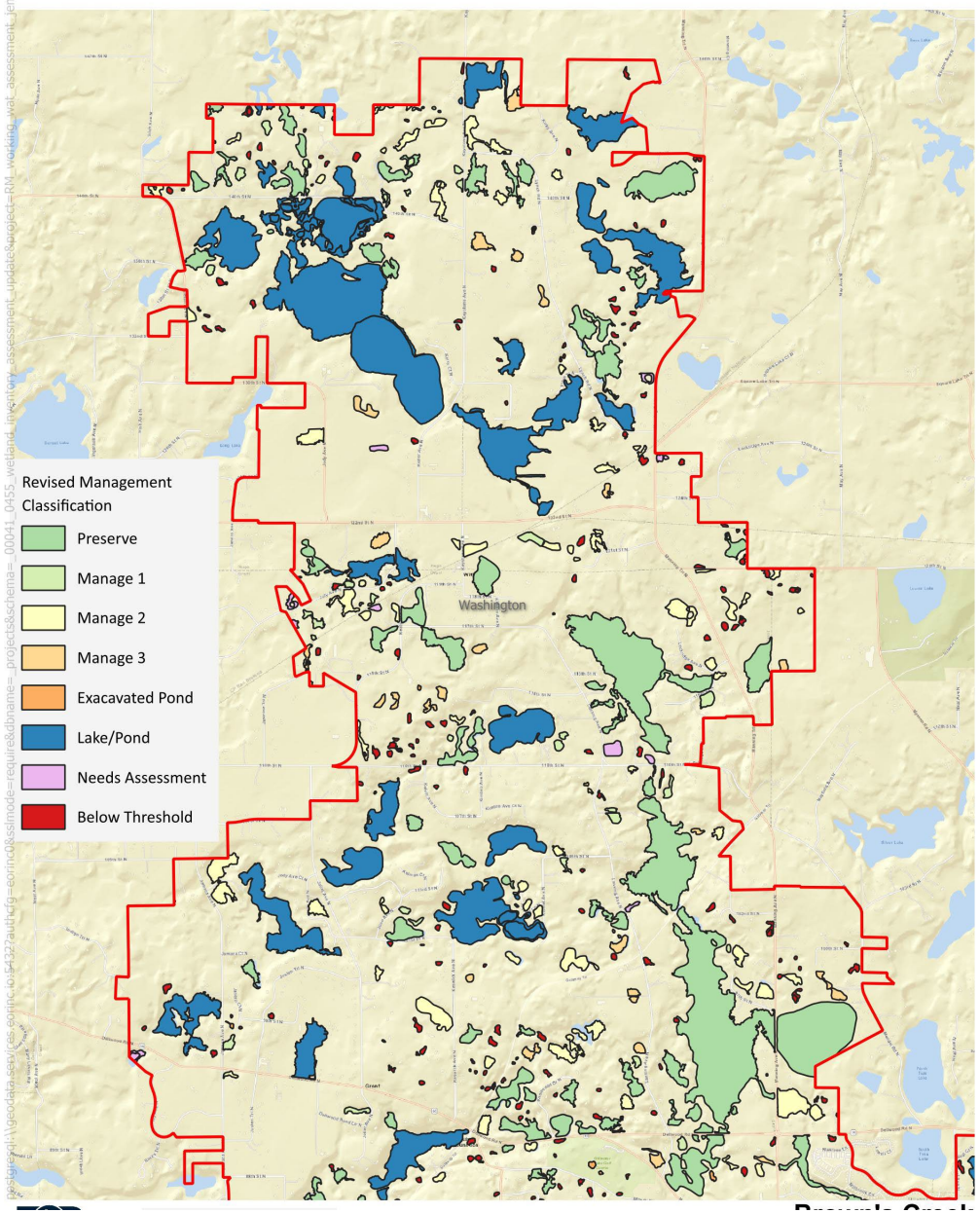
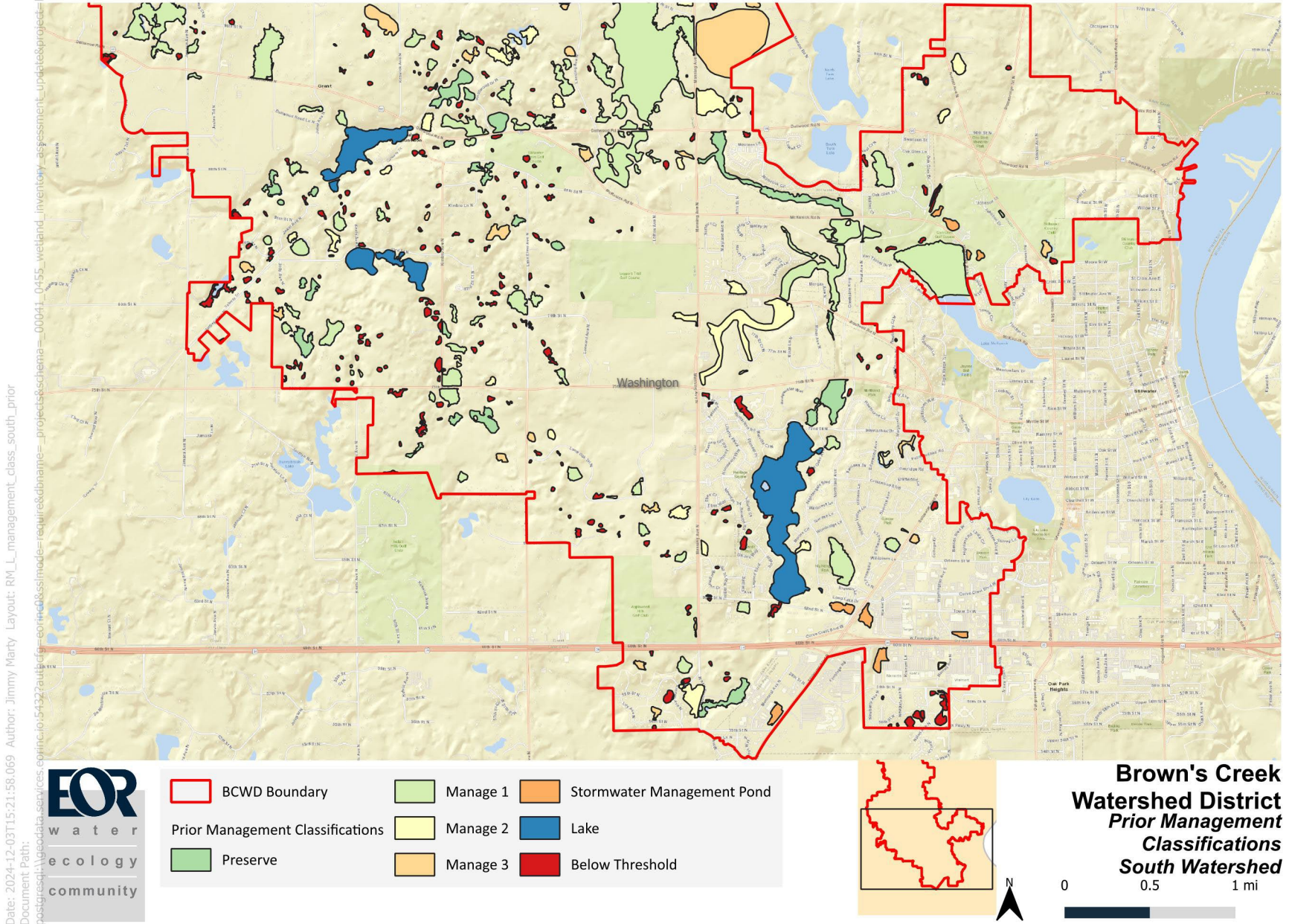
Wetland Function/Value Inventory Update – Watershed-Wide Results

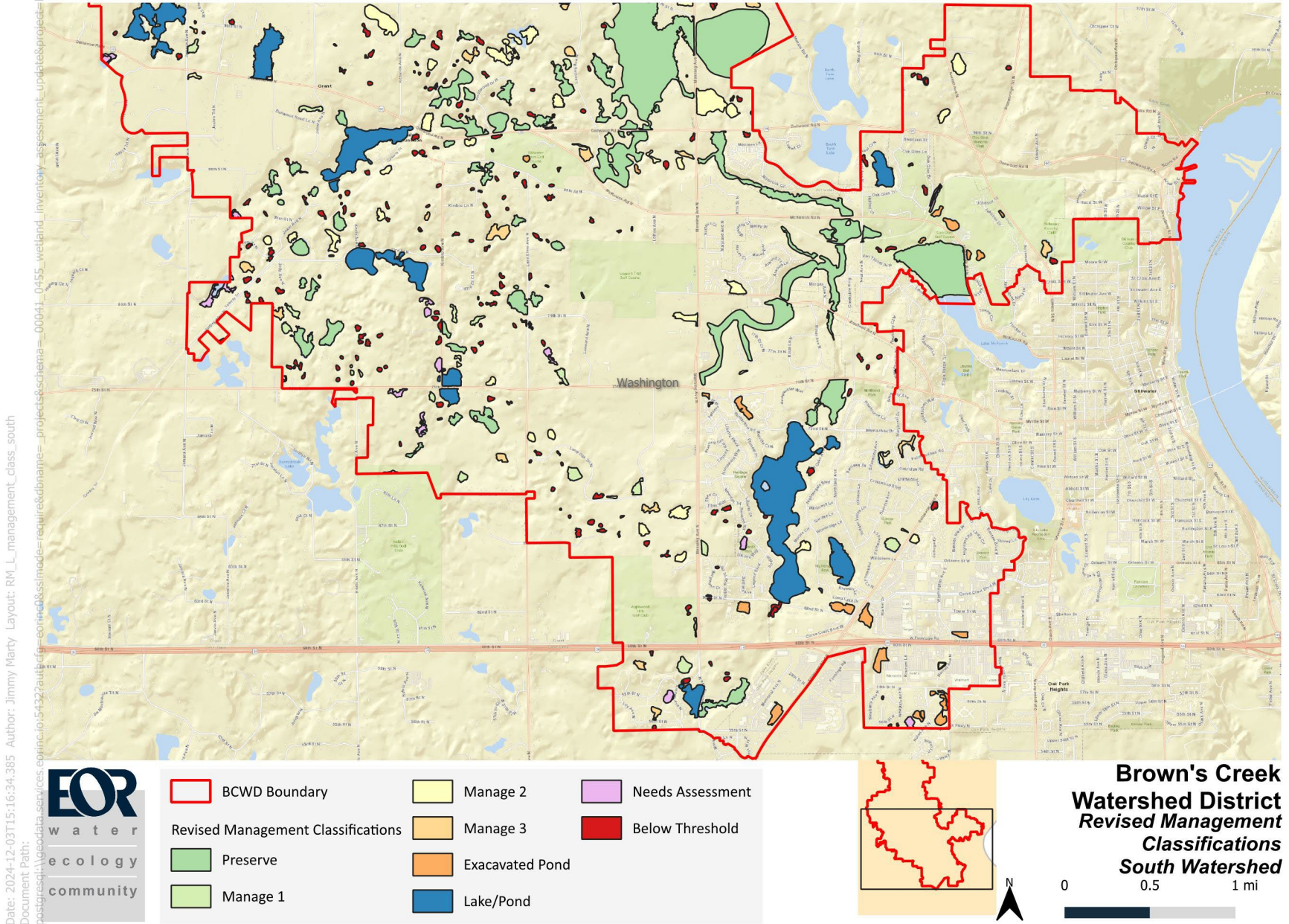




Wetland Function/Value Inventory Update – Watershed-Wide Results



Wetland Function/Value Inventory Update – Watershed-Wide Results



Wetland Function/Value Inventory Update –Recommendations

1. **The revised watershed-wide management classifications should be used as base layer for assessing wetland management classifications.**

2. **The District could consider rule revisions to protect locally important functions. For example, thermoregulation may be a locally important function for maintaining stream temperatures.**

3. **The District should consider assessment of a subset of wetlands on an annual basis.**

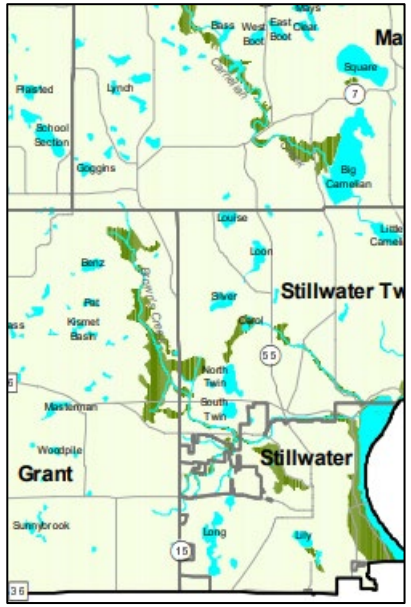
GW-Dependent Wetland Function

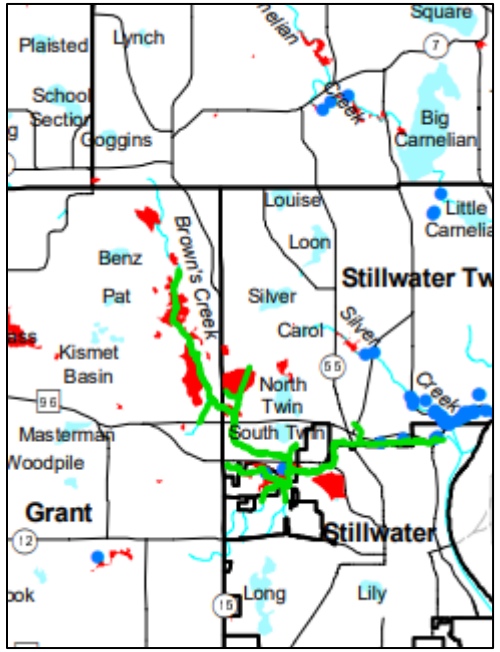
- **Current rules based just on plant community reflection – only 9 mapped by MLCCS**
- **Other GW-dependent wetlands may still include remnant plant community inclusions or isolated groundwater dependent species, and offer opportunities for restoration (e.g. Brown's Creek Park)**
- **GW-dependent wetlands contribute to other functions such as surface water supply and thermoregulation**

Groundwater-Dependent Wetlands- Methods

GIS-Analysis

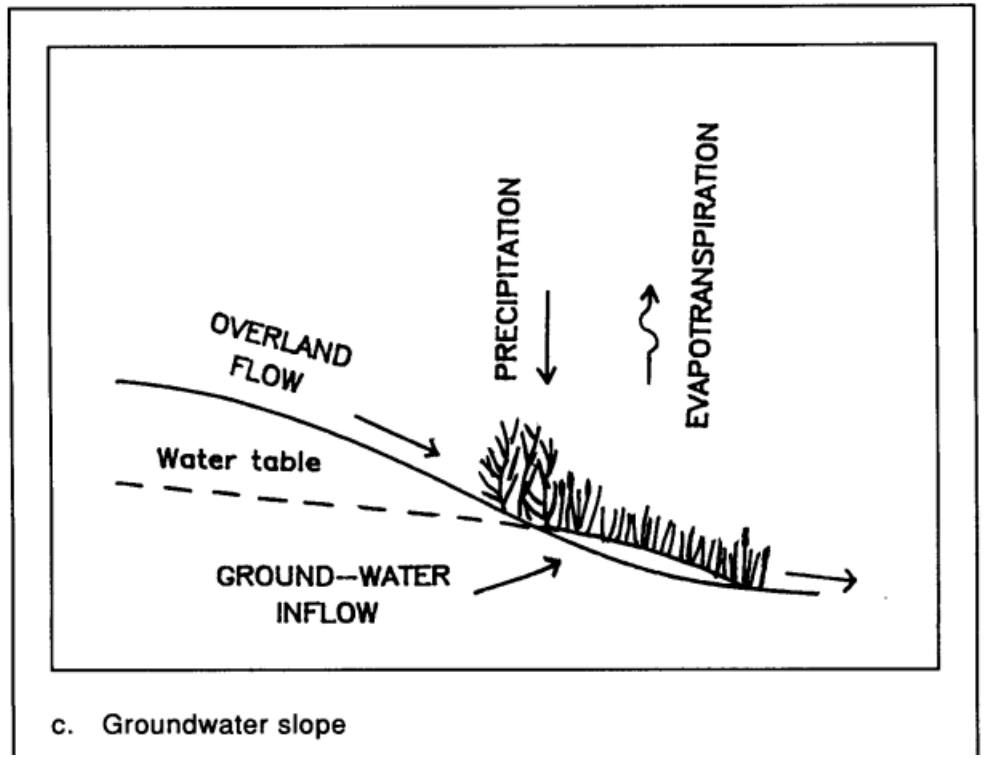
- **Prior function and value assessment**
- **NWI Hydrogeomorphic (HGM) Classification**
- **DNR Native Plant Communities**
- **MLCCS**
- **2003 North Washington County Groundwater Study**





Classification of Wetlands based on Groundwater Dependence

DEPARTMENT OF NATURAL RESOURCES



c. Groundwater slope

Groundwater-Dependent Natural Resource Types
(Following Minnesota Land Cover Classification System protocol)

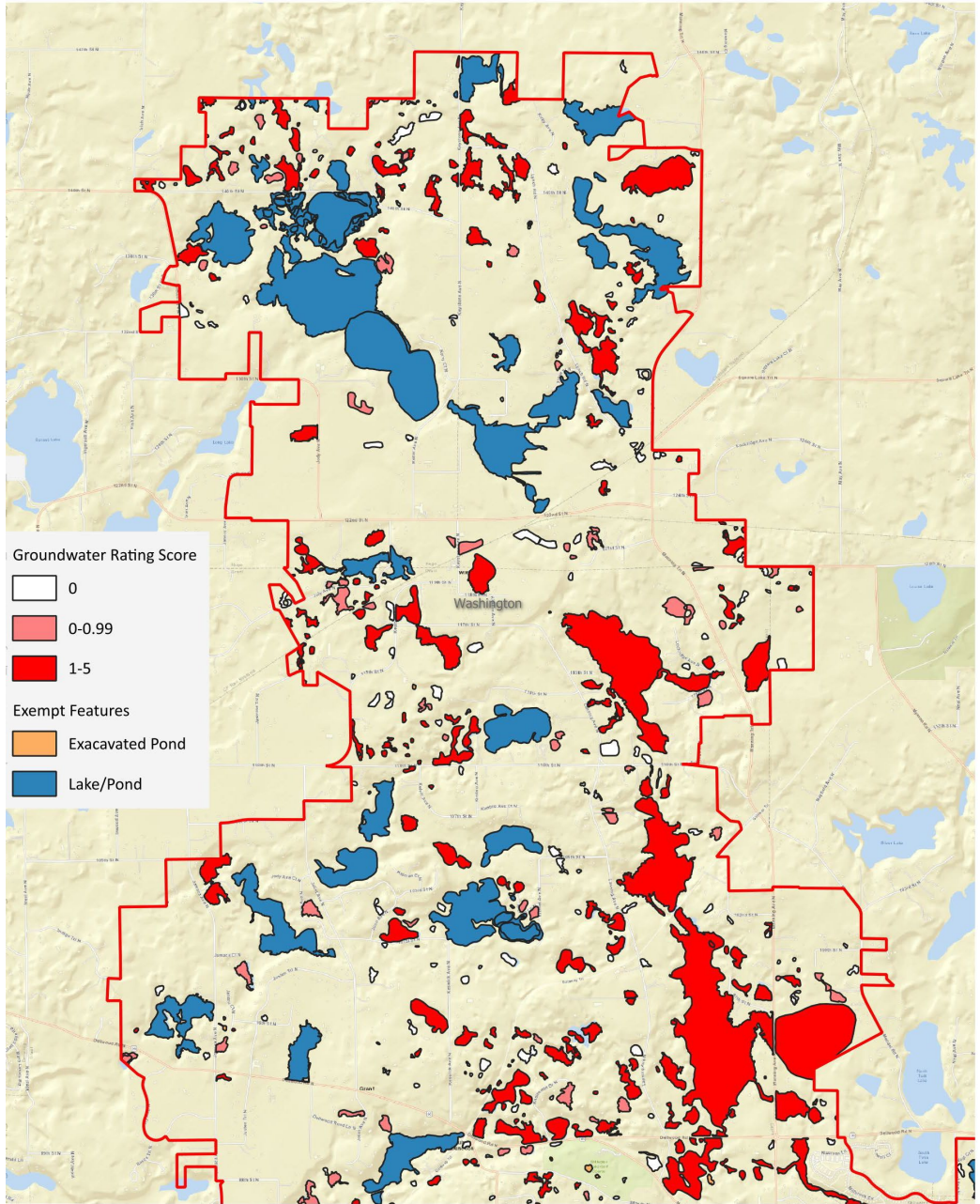
Groundwater-Dependent Wetlands- Methods

GIS-Analysis

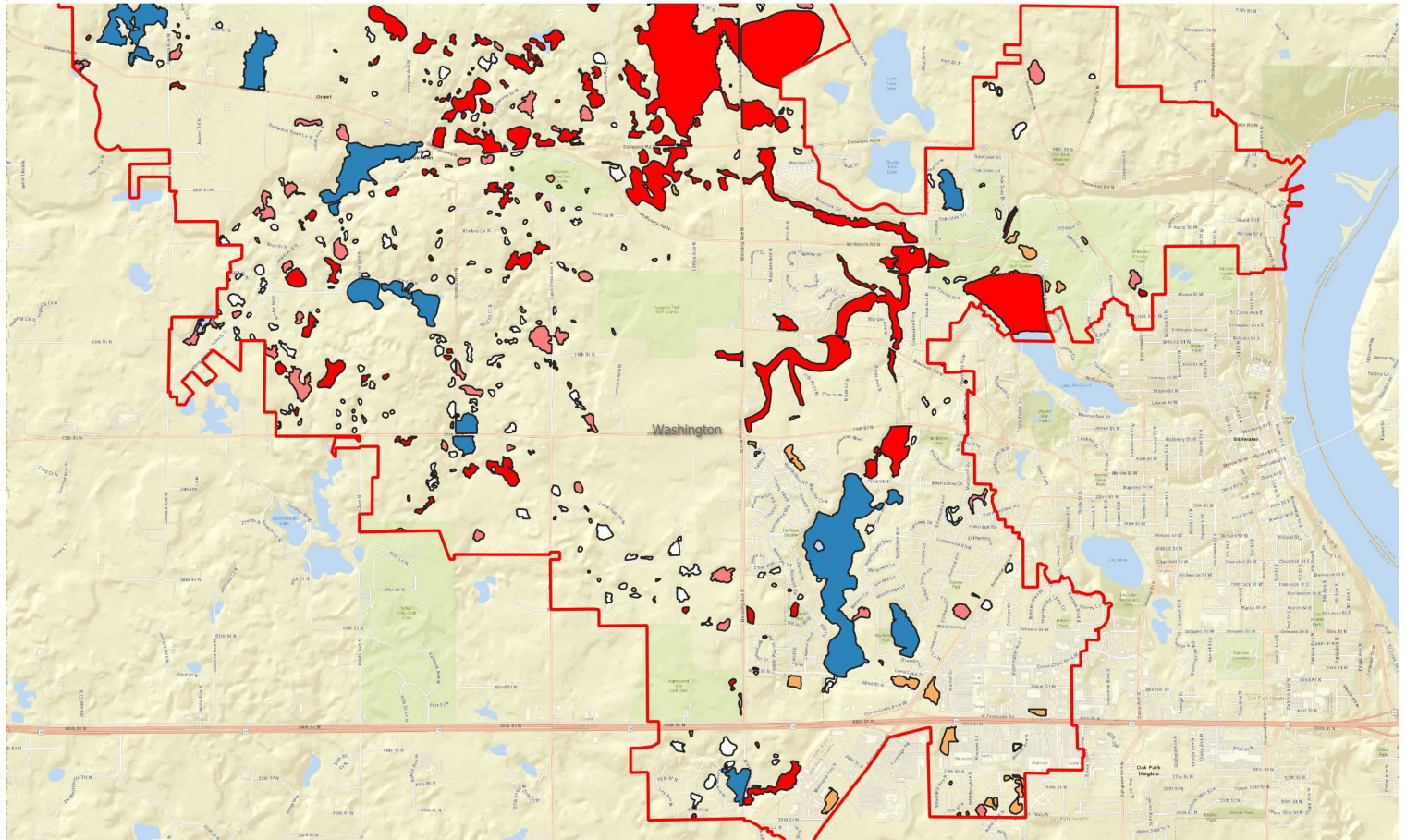
- **Prior function and value assessment**
- **NWI Hydrogeomorphic (HGM) Classification**
- **DNR Native Plant Communities**
- **MLCCS**
- **2003 North Washington County Groundwater Study**

Layer	Class	Score
Prior Function and Value Assessment	No	0
	Both	0.5
	Groundwater Dependent	1
2003 Mapped Groundwater Discharge Area	No	0
	Yes	1
NWI Slope Wetland	No	0
	Yes	1
MLCCS Groundwater Dependent Plant Community	No	0
	Yes	1
DNR NPC	No	0
	Partially	0.33
	Highly	0.67
	Fully	1

Groundwater-Dependent Wetlands- Results

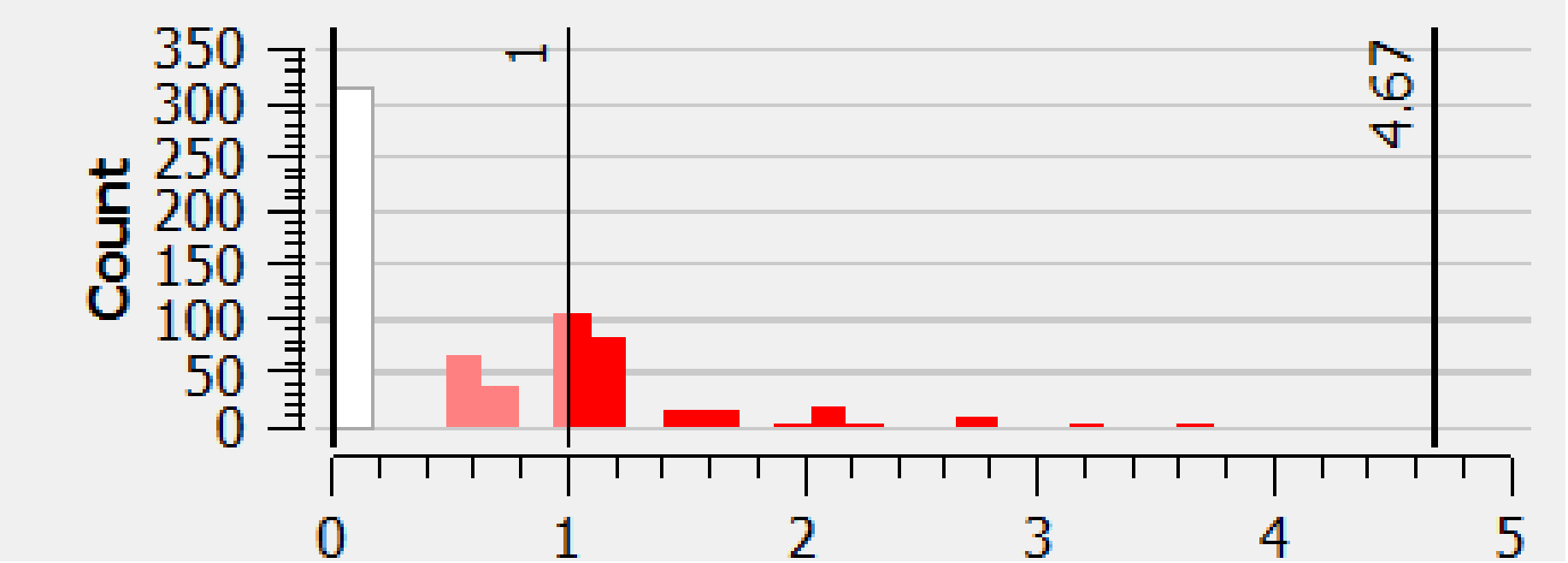


	Prior Groundwater Dependency Classification	Reclassified Groundwater Dependency Classification (score of 1 or greater)
Groundwater Dependent Wetlands	179	235
Not Groundwater Dependent Wetlands	440	384



GIS-Analysis

- **Threshold groundwater-dependency score of 1 appears to capture good tipping point**
- **Scores of 1-1.17 generally consist of NWI slope wetlands OR a combination of soft indicators**



Groundwater-Dependent Wetlands- Recommendations

1. **Adopt the new classification layer as the base layer for assessing wetland groundwater dependency. Site-specific assessment should supplement GIS-based determinations for proposed projects.**

2. **Revise the District's rule language to define groundwater dependent wetlands as wetlands with groundwater dependent hydrology and/or a plant community that reflects groundwater hydrology.**

3. **Specify that field assessment criteria for determining groundwater dependency should include field and/or GIS indicators of plant communities, springs/seeps, geomorphic position, soils, and discharge field indicators (cold water, mineral deposits, surface water film, indicator plants)**

Questions?

Big thank you to Hannah Peterson for landowner coordination, photography, and endurance in tough conditions