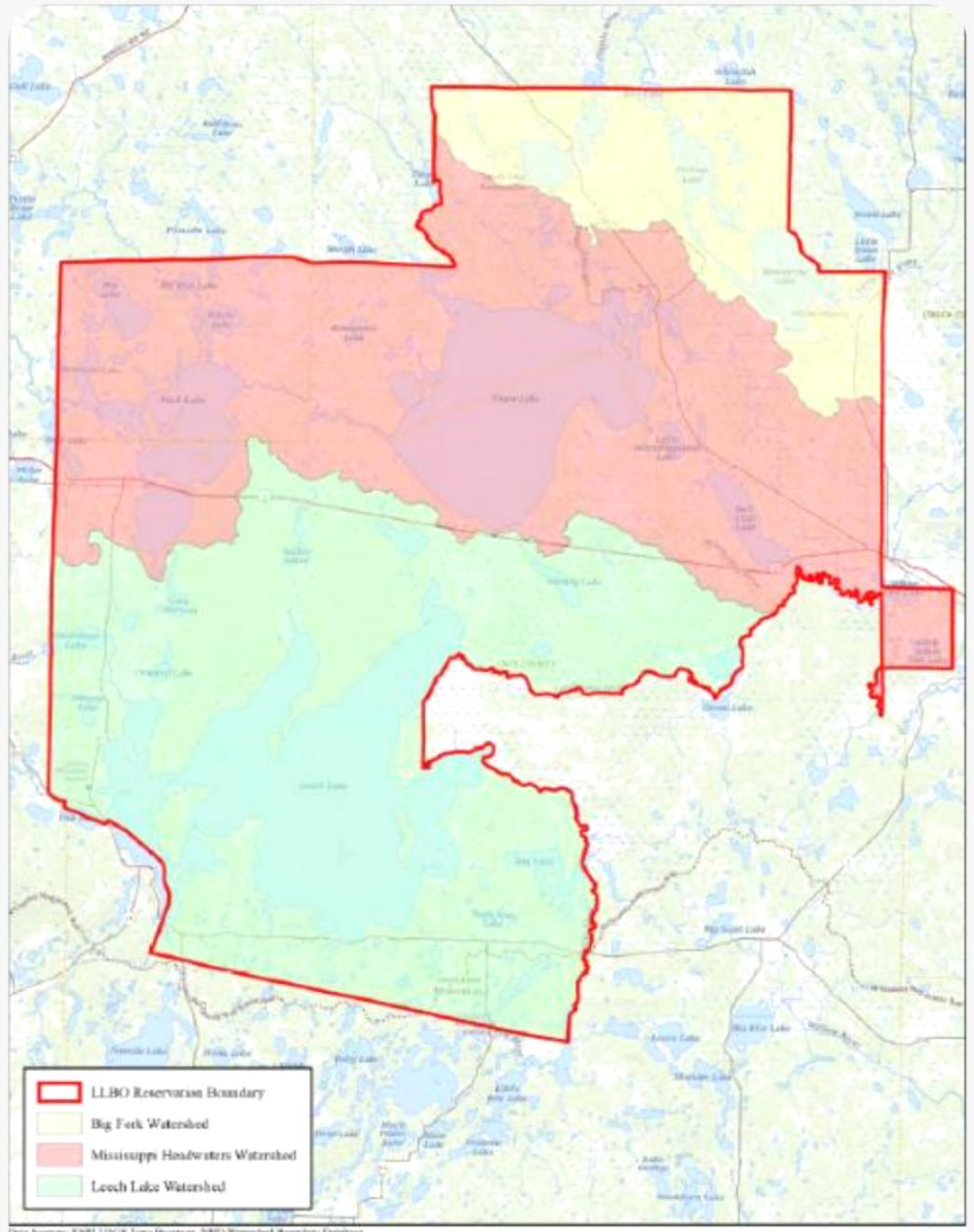


AN ARCGIS-BASED JURISDICTIONAL WETLAND MAPPING ANALYSIS FOR THE LEECH LAKE RESERVATION

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Data Sources: ENR USGS Topo Browser, NHD Watershed Boundary Dataset

Figure 1. Overview of Leech Lake Band of the Ojibwe Reservation Boundary and HUC-8 Watersheds.



Table 1. National Wetland Inventory types by HUC-8 watershed within the Leech Lake Band of Ojibwe Reservation.

HUC-8 Watershed / National Wetland Inventory Classification	Area (acres)
Mississippi River - Headwaters	376,655.63
<i>Non-Wetland</i>	165,055.50
Freshwater Emergent Wetland	25,577.30
Freshwater Forested Wetland	35,406.40
Freshwater Forested/Emergent Wetland	1,178.14
Freshwater Forested/Shrub Wetland	12,397.00
Freshwater Pond	941.73
Freshwater Shrub Wetland	16,374.70
Freshwater Shrub/Emergent Wetland	13,326.40
Lake	103,892.00
Riverine	2,506.46
Leech Lake River	389,530.37
<i>Non-Wetland</i>	172,688.74
Freshwater Emergent Wetland	30,662.30
Freshwater Forested Wetland	34,159.40
Freshwater Forested/Emergent Wetland	678.05
Freshwater Forested/Shrub Wetland	5,716.13
Freshwater Pond	1,054.51
Freshwater Shrub Wetland	15,554.10
Freshwater Shrub/Emergent Wetland	8,069.75
Lake	119,740.00
Riverine	1,207.39
Big Fork River	103,138.19
<i>Non-Wetland</i>	45,991.40
Freshwater Emergent Wetland	7,516.42
Freshwater Forested Wetland	13,419.40
Freshwater Forested/Emergent Wetland	137.40
Freshwater Forested/Shrub Wetland	5,600.83
Freshwater Pond	352.01
Freshwater Shrub Wetland	6,297.62
Freshwater Shrub/Emergent Wetland	2,482.26
Lake	20,989.20
Riverine	351.65



Plate 1. Example wetland types present within the LLBO Reservation: A) scrub/shrub swamp, B) forested palustrine wetland, C) emergent lacustrine fringe wetland, and D) forested/emergent bog complex. Photos taken in October 2019.

PROJECT GOALS

- 1) DEVELOP A WETLAND MAPPING AND ASSESSMENT TOOL THAT CAN REMOTELY DETERMINE THE LIKELY PRESENCE OF JURISDICTIONAL WOTUS WITHIN THE LEECH LAKE RESERVATION.
- 2) PRIORITIZE LOCATIONS FOR FIELD-BASED IMPLEMENTATION.
- 3) CONTINUED REFINEMENT OF A GEOSPATIAL DATABASE THAT REPRESENTS KNOWN OR POTENTIALLY JURISDICTIONAL WATERS WITHIN THE RESERVATION BOUNDARIES.

SHAPEFILES

- ST. PAUL DISTRICT-NAVIGABLE WATERS OF THE US IN MINNESOTA
- MN UPDATED NWI-PLUS
- NATIONAL HYDROGRAPHY DATABASE (NHD)
- SOIL SURVEY GEOGRAPHIC DATABASE (SSURGO)
- CHIPPEWA NATIONAL FOREST AND MNDOT CULVERT AND DITCH LOCATIONS
- USDA/NRCS HYDRIC SOILS

SCENARIOS

- MOST RESTRICTIVE-
 - 2020 WOTUS RULE; GUIDED BY SCALIA DISSENT IN RAPANOS DECISION
 - WETLANDS THAT DIRECTLY ABUT A TNW OR ARE CONNECTED VIA PERENNIAL CONNECTION
- LESS RESTRICTIVE- 2015 CLEAN WATER RULE
 - INTERMITTENT WATERS THAT MEET 2020 WOTUS RULE SPECIFICATIONS
 - 2015 CLEAN WATER RULE; GUIDED BY RAPANOS DECISION (SIGNIFICANT NEXUS)
 - NRCS MAPPED SOIL UNITS WITH A PONDING FREQUENCY OF AT LEAST 50%
- LEAST RESTRICTIVE-
 - EPHEMERAL FEATURES WITH A CONNECTION TO TNW OR JURISDICTIONAL WATERS UNDER LESS RESTRICTIVE SCENARIO
 - NRCS MAPPED SOIL UNITS WITH A PONDING FREQUENCY OF LESS THAN 50%

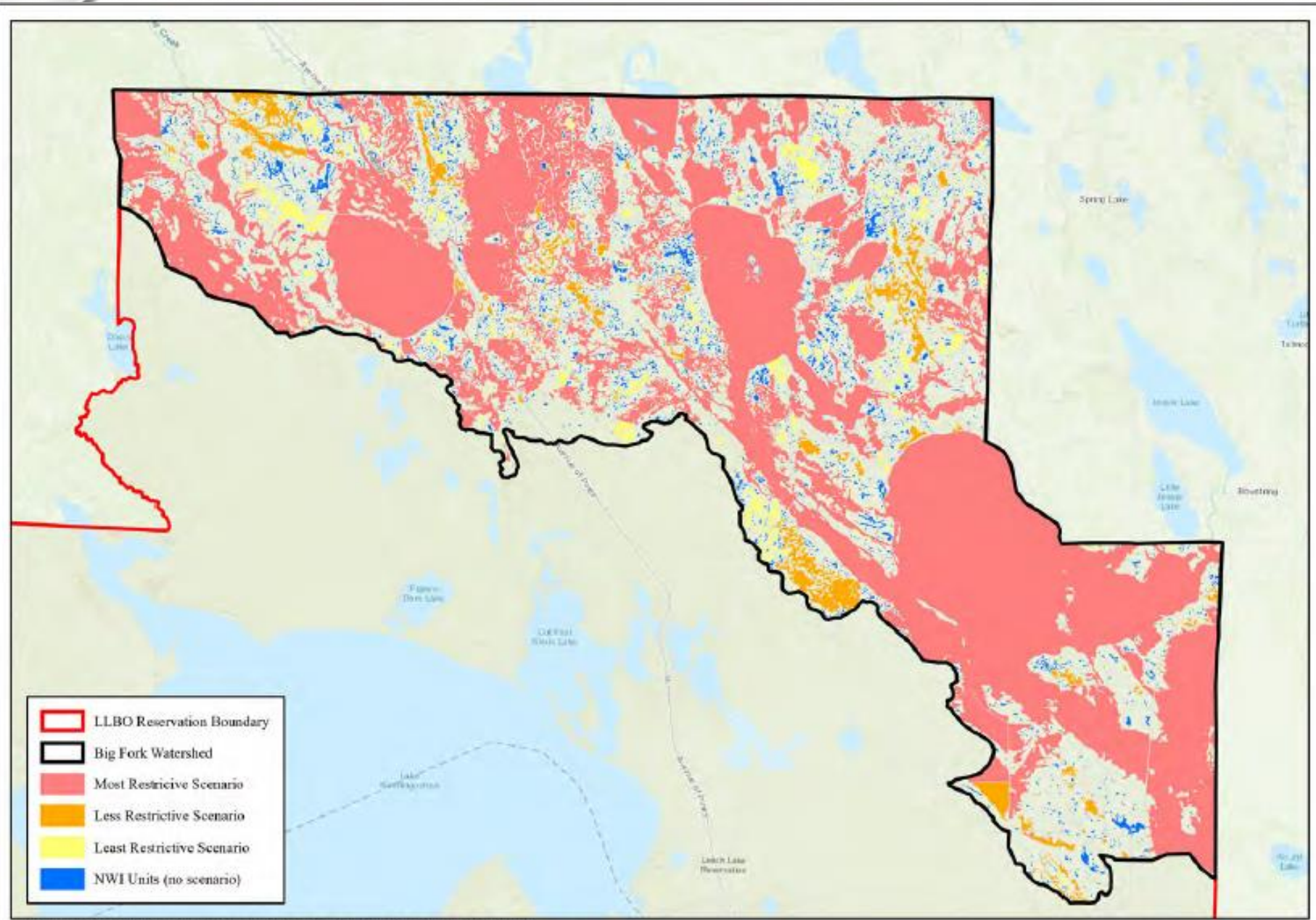


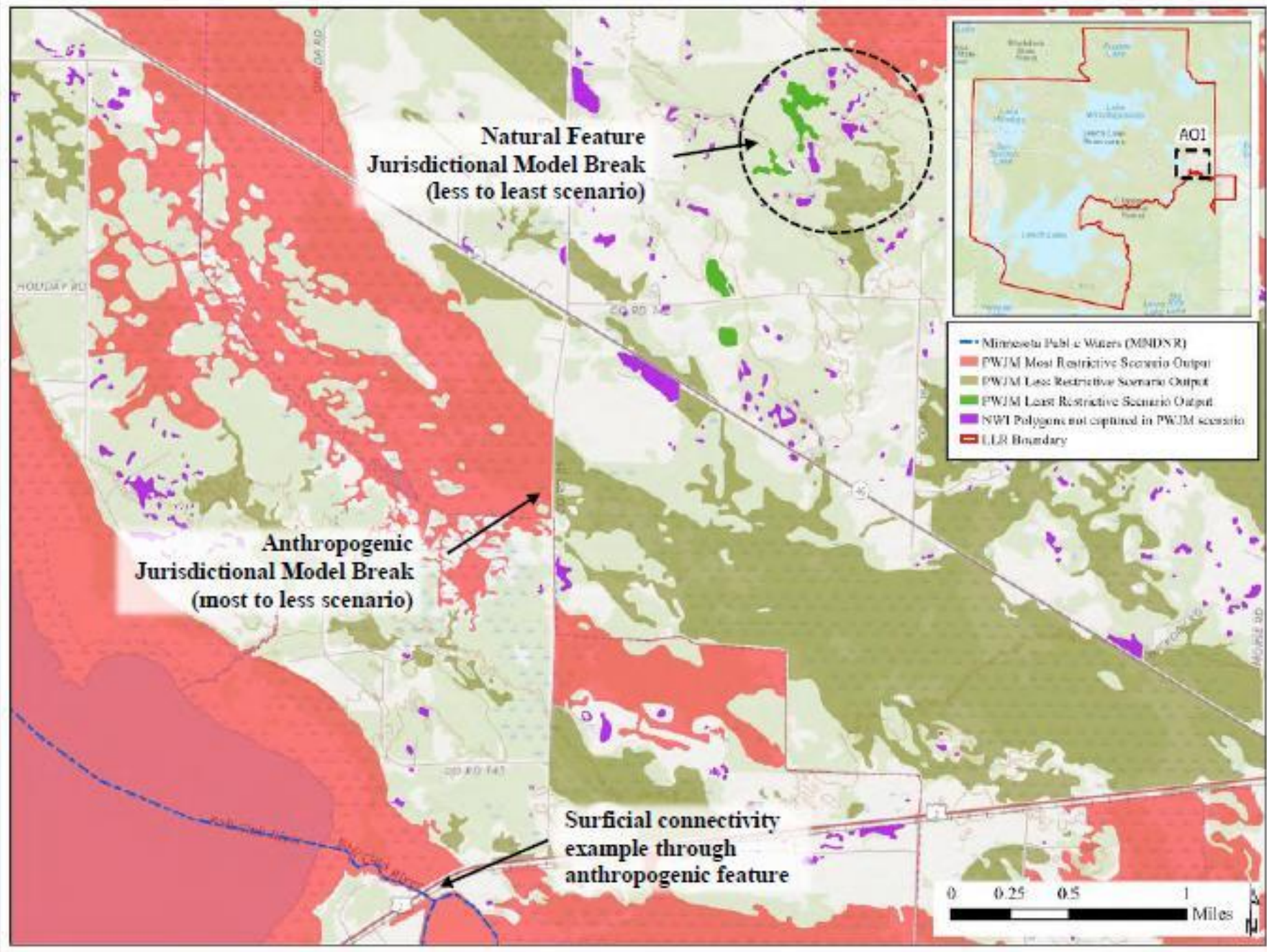
Figure 5. Jurisdictional Wetland Modeling Results for the Big Fork HUC-8 Watershed within the LLBO Reservation Boundary.

0 2 4 8 Miles



Table 2. Big Fork HUC-8 model scenario summary statistics.

Big Fork HUC-8 Parameter	NWI Units	Area	Percent of Total NWI Units	Percent of Watershed Area
	No. of polygons	acres	%	
HUC-8 Watershed	--	103,138	--	--
Total NWI Areas	7,394	57,147	100	55
Most Restrictive Model Output: Wetland Areas	2,710	49,769	87	48
Less Restrictive Model Output: Wetland Areas	3,239	52,783	92	51
Least Restrictive Model Output: Wetland Areas	3,554	54,389	95	53



Priority Assessment Variable	Priority Sub-category Score		
	3	2	1
PJWM Scenario Break	Most to less	Less to least	Least to none
Area of wetland area affected by connectivity determination	Large	Moderate	Small
Field assessment intensity requirement	Low	Moderate	High

Table 6. Example field assessment prioritization and rationale for a selected region of the LLR. Example wetland assessment locations and priority assignments are provided in Figure 10.

Location Priority Ranking	Priority Score	Rationale
1	9	<ul style="list-style-type: none"> Model break occurred between wetland areas with a high likelihood of being jurisdictional (most to less restrictive scenario) Jurisdictional connection would result in a large wetland area having a increased PJWM jurisdictional scenario likelihood Low intensity assessment as connection could potentially be established via the direct observation of culverts or bridges through an existing roadbed
2	8	<ul style="list-style-type: none"> Model break occurred between wetland areas with a high likelihood of being jurisdictional (most to less restrictive scenario) Jurisdictional connection would result in a moderately sized wetland area having a increased PJWM jurisdictional scenario likelihood Low intensity assessment as connection could potentially be established via the direct observation of culverts or bridges through an existing roadbed
3	7	<ul style="list-style-type: none"> Model break occurred between wetland areas with a high likelihood of being jurisdictional (most to less restrictive scenario) Jurisdictional connection would result in a small wetland area having a increased PJWM jurisdictional scenario likelihood Low intensity assessment as connection could potentially be established via the direct observation of culverts or bridges through an existing roadbed
4	6	<ul style="list-style-type: none"> Model break occurred between wetland areas with a lower likelihood of being jurisdictional (less restrictive scenario to not captured in PJWM) Jurisdictional connection would result in a small wetland area having a increased PJWM jurisdictional scenario likelihood Low intensity assessment as connection could potentially be established via the direct observation of culverts or bridges through an existing roadbed
5	5	<ul style="list-style-type: none"> Model break occurred between wetland areas with a lower likelihood of being jurisdictional (less to least restrictive scenario and less restrictive scenario to not captured in PJWM) Jurisdictional connection would result in a moderate wetland area having a increased PJWM jurisdictional scenario likelihood Moderate intensity assessment as connection appears to be due to a topographic break although the distance between features is small
6	3	<ul style="list-style-type: none"> Model break occurred between wetland areas with a lower likelihood of being jurisdictional (less restrictive scenario to not captured in PJWM) Jurisdictional connection would result in a small wetland area having a increased PJWM jurisdictional scenario likelihood High intensity assessment as connection appears to be due to a topographic break and the distance between features is large

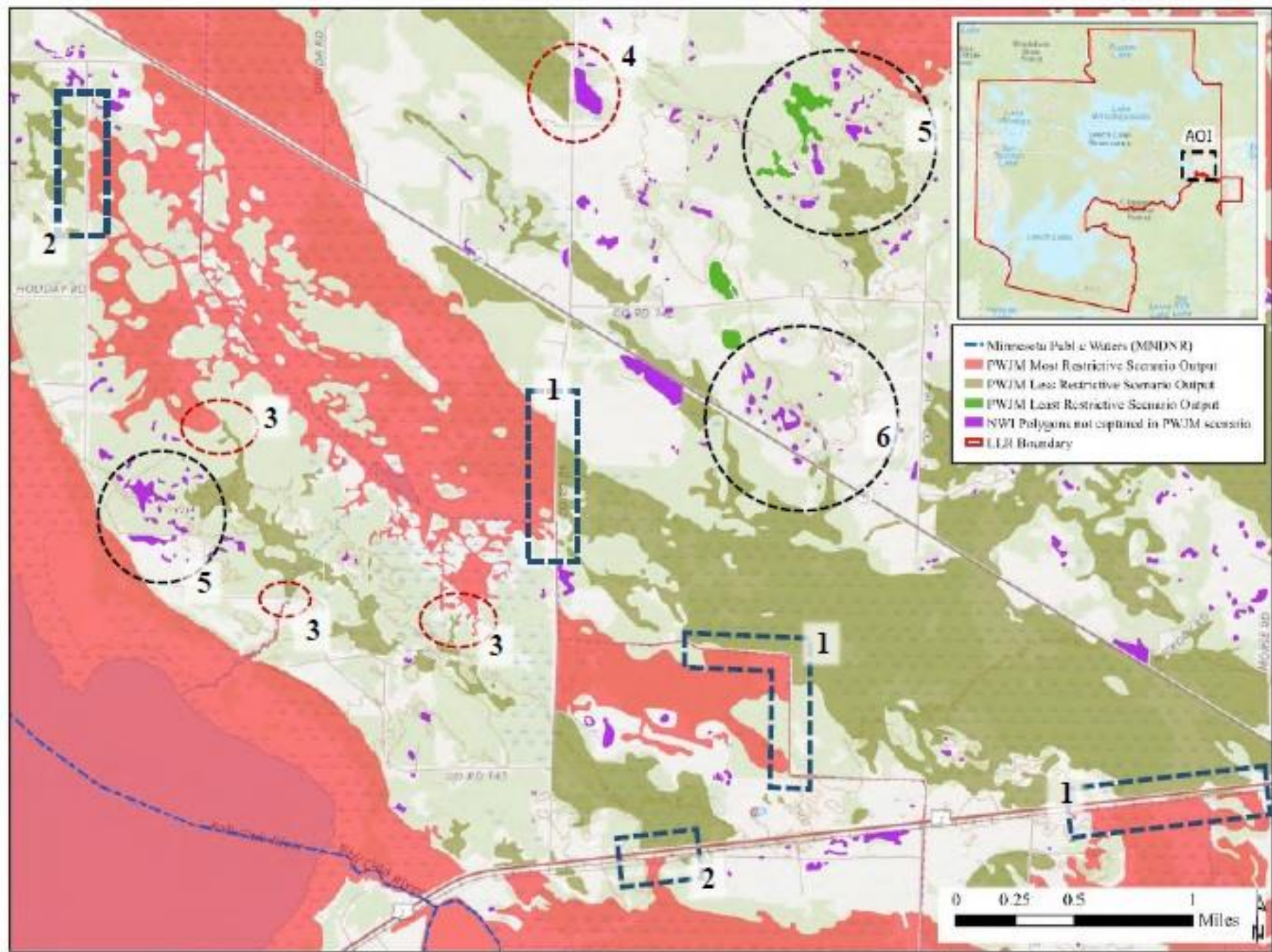




Plate 3. Example jurisdictional break evaluation depicting A) a roadway culvert that exhibits characteristics of at least seasonal surficial flow (ordinary high water marks (OHWM), vegetation preclusion, scour, etc.), and B) a roadway culvert that does not exhibit characteristics of at least seasonal surficial flow. Photos taken by LLBO staff in April 2020.

QUESTIONS



Hole in the Bog Peatland; Picture taken by Kelly Randall (MN DNR)



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