



# Leech Lake Band of Ojibwe Wetland Program



US Environmental Protection Agency-  
Region 5

Project Period: 2023-2027

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Forested/Emergent Bog Complex on the Leech Lake Reservation (Photo taken in October 2019)

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## 1.0 Introduction

### 1.1 Background

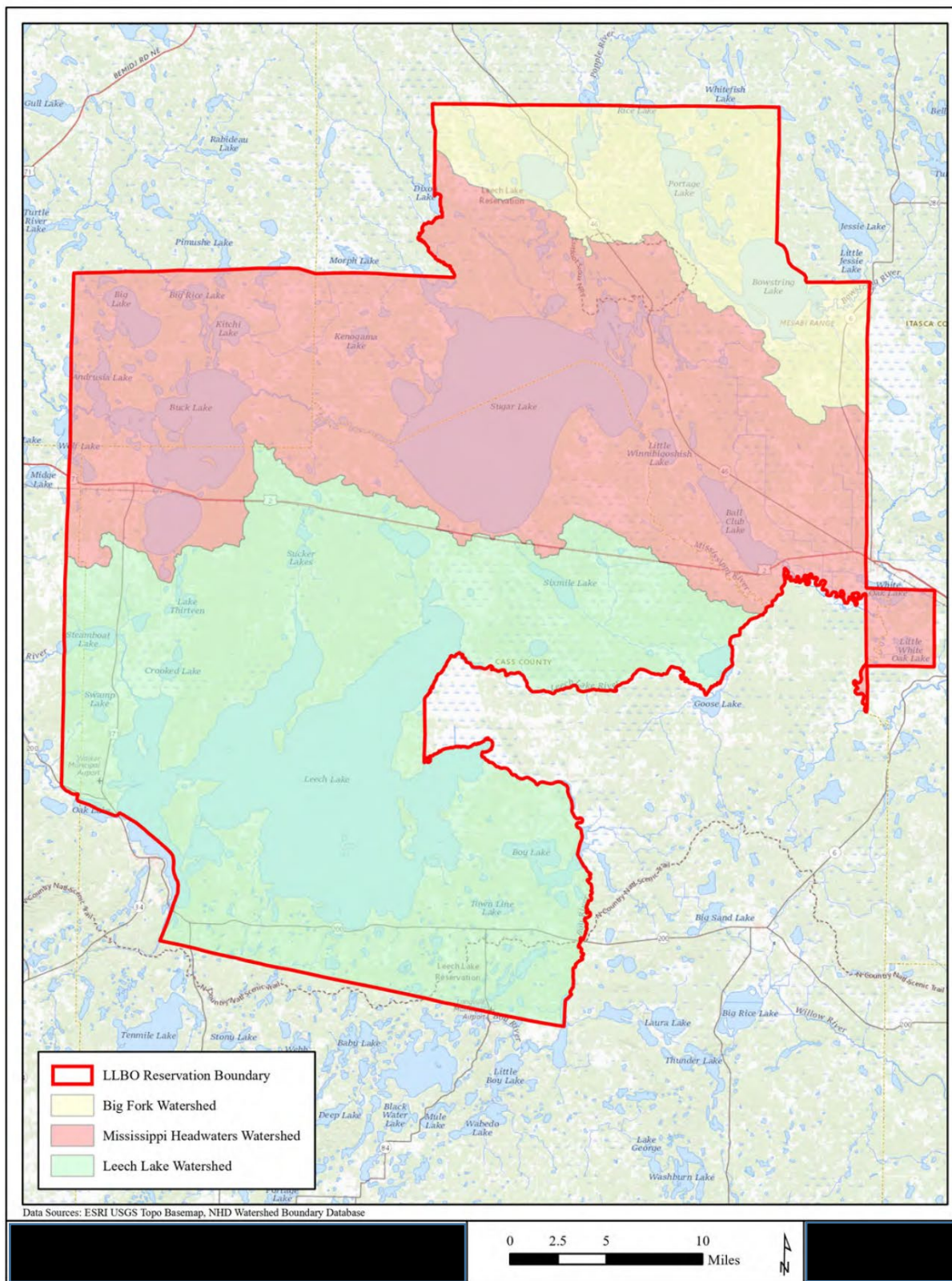
The Leech Lake Reservation (LLR) occupies 869,320 acres in Northwestern Minnesota including portions of Beltrami, Cass, Hubbard and Itasca counties. It is located largely within the Upper Mississippi River Basin and can be further divided into three HUC-8 watersheds: Mississippi Headwaters, Leech Lake River and Big Fork River.

The LLR has an abundance of water resources with about 72% of the surface area within the exterior boundaries covered by lakes, streams or wetlands. The larger lakes include Leech Lake (102,948 acres) Lake Winnibigoshish (58,544 acres), and Cass Lake (15,958 acres), but there are hundreds of other lakes that are navigable, fishable, and contain active wild rice beds. The Mississippi River passes through the Reservation, as well as numerous smaller rivers and streams, nearly all of which act as tributaries to the Mississippi. The bulk of the Reservation is drained by the headwaters of the Mississippi River, eventually emptying into the Gulf of Mexico. However, in the northeastern part of the Reservation, the Big Fork River watershed lies east of the Laurentian Divide and drains northward into Canada and Hudson Bay.

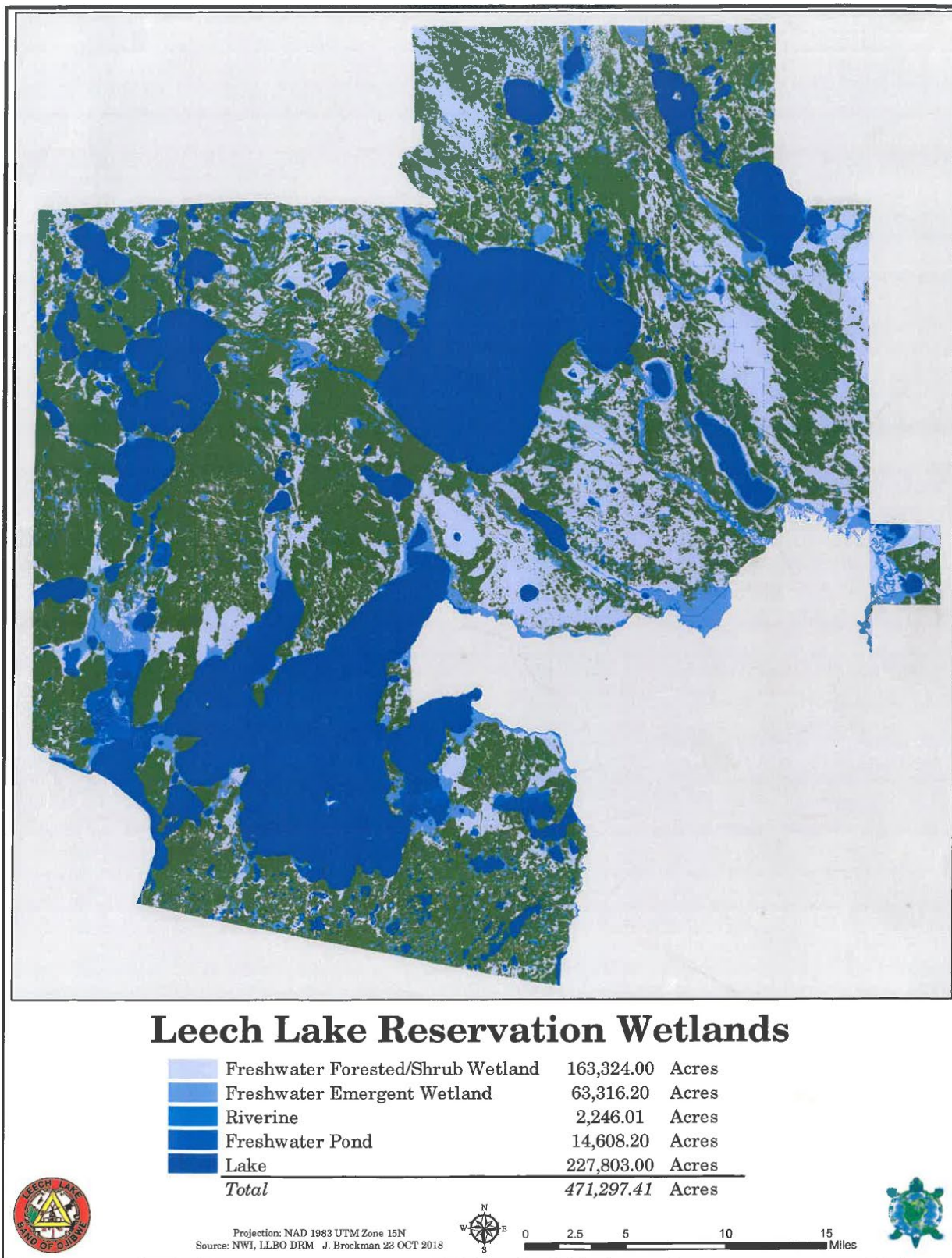
Wetlands within LLR HUC-8 watersheds vary considerably and include riverine/riparian wetlands directly abutting larger rivers, tributaries, and lakes to large wetland complexes meandering across the landscape that include forested, scrub/shrub, and emergent vegetative communities (See Table 1, Figure 1, and Figure 2).

**Table 1. Leech Lake Reservation Wetland Acreage by Type within HUC-8 Watersheds**

| HUC-8 Watershed / National Wetland Inventory Classification | Area (acres)      |
|---|-------------------|
| <b>Mississippi River - Headwaters</b>                       | <b>376,655.63</b> |
| <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          |
| <b>Leech Lake River</b>                                     | <b>389,530.37</b> |
| <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          |
| <b>Big Fork River</b>                                       | <b>103,138.19</b> |
| <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            |



**Figure 1. Leech Lake Reservation HUC-8 Watersheds**



**Figure 2. Leech Lake Reservation Wetland Acreage by Wetland Type**

## 1.2 Leech Lake Reservation Wetland Significance

The waters and wetlands of the Leech Lake Reservation are directly connected to the cultural practices of the Leech Lake Band of Ojibwe (LLBO). Wetlands and other water resources are home to many plant and animal species traditionally harvested by LLBO Tribal members (e.g. wild rice, fish, and waterfowl). Furthermore, wetlands provide plants used for medicinal and ceremonial purposes that are culturally relevant to the Ojibwe.

In addition to their cultural significance, LLR wetlands function to maintain the health of aquatic ecosystems and aid in the protection of LLR communities by:

- 1) Serving as habitat for plants and animals, some of which are endangered, threatened, rare, or sensitive species;
- 2) Acting as natural buffers for surface waters;
- 3) Attenuating contaminants in surface and subsurface waters through biological degradation and chemical oxidation/reduction;
- 4) Providing linkages between aquatic systems;
- 5) Aiding in erosion prevention; and
- 6) Providing flood conveyance and storage, as well as mitigating climate change impacts;

## 1.3 Leech Lake Reservation Wetland Impacts

Since the 17th century, around fifty percent of U.S. wetlands have been destroyed due to human impacts in the lower 48 states. Minnesota has lost around fifty percent of its original pre-settlement wetlands through drainage and development. In some parts of the state, up to ninety percent of the wetlands are gone. Currently in Minnesota, there are estimated to be 10.6 million acres of wetlands remaining. It is unknown how much wetland has been lost or impaired within the 1855 ceded territories let alone within the LLR boundaries, however, given the ratios nationally and state-wide, it is likely that at least 50% have been impacted, impaired or lost due to anthropogenic causes.

The harvest of timber by the lumber industry has historically had a negative impact on wetland resources within the LLR and those impacts continue to the present day. Although clear cutting is no longer the primary practice, today's timber harvest practices still render significant damage to stand adjacent wetland areas. Heavy equipment is used to push roads into timber harvest sites with little to no regard for wetland presence. Ephemeral pools, a critical habitat for forested areas, are frequently decimated and the loss of tree cover adds to the drying up of wet to saturated forest floor areas while loss of tree systems, roots and branches, add to the volume of both overland runoff and sedimentation of waterways.

In addition to destructive forestry practices, other causes of wetland degradation and/or loss of wetland function and extent on the LLR include contaminated stormwater runoff, road and trail construction, invasive species, and residential and commercial development. Residential and commercial development in particular has emerged as a worrisome threat to wetlands on the LLR as more non-Tribal residents and businesses have moved into the area and sought to gain lakeshore access through the filling of wetlands.

## 1.4 Leech Lake Band of Ojibwe Wetland Program Plan Overview

The purpose of this updated wetland program plan is to set a framework for the protection and enhancement of LLR wetlands. The overall goals of the Leech Lake Band of Ojibwe Wetland Program Plan (LLBO WPP) pertaining to all wetlands within, traversing, and immediately adjacent to the exterior boundaries of the LLR are to:

- 1) Ensure no net-loss of wetlands;
- 2) Protect and preserve the quantity, quality, and biological diversity of all wetland resources;
- 3) Ensure access to wetlands and wetland resources for all LLBO Tribal members in perpetuity as set forth in treaty agreements with the United States of America;
- 4) Promote the cultural importance of wetland resources as well as the ecological services that wetlands play in the community.
- 5) Determine wetland quantity and quality and measure changes over time;
- 6) Uphold the current regulations protecting wetlands and identify opportunities for future expansion; and
- 7) Develop wetland-specific water quality standards;
- 8) Develop a better understanding of potential vulnerabilities and adverse impacts of climate change on wetland impacts.

The US EPA Core Elements Framework (CEF) was used as a guide for developing the LLBO WPP. The CEF defines four Core Elements of a comprehensive wetland program:

- 1) Monitoring and Assessment
- 2) Water Quality Standards for Wetlands
- 3) Voluntary Restoration and Protection
- 4) Regulatory Activities

Past and current actions that correspond to each of the four Core Elements as well as goals, tasks, and timelines for potential future actions that align with each of the core elements are detailed in this document below.

## 2.0 Program elements and goals

### 2.1 Monitoring and Assessment

#### 2.1.1 Past Actions



### ***Full Time Wetland Specialist Hire***

Using EPA Wetland Program Development Grant (WPDG) funding, a full time Wetland Specialist was hired by LLBO in July of 2013 and was employed through June of 2015. During that time the Wetland Specialist developed a Quality Assurance Project Plan (QAPP) for the monitoring and assessment of Leech Lake Reservation wetlands, which was submitted to EPA in April of 2014. The Wetland Specialist also completed a wetland delineation course offered by the University of Minnesota and was able to collect baseline data from 20 wetlands of varying types on the Leech Lake Reservation from mid-July through September of 2014.

Unfortunately, since the departure of the Wetland Specialist in June of 2015, LLBO has been unable to retain an employee that can give the Wetland Program the adequate amount of attention that it needs in order to mature due to staff turnover, budget constraints, and insufficient staff time.

LLBO hopes to remedy this situation in the future by requesting EPA WPDG funding that can support a full time Wetland Specialist.

### ***Wetland Monitoring and Assessment QAPP***

The LLBO Wetland Monitoring and Assessment QAPP was submitted to EPA in April of 2014. The purpose of the QAPP was to describe sampling protocols and Quality Control/Quality Assurance procedures used by the LLBO Wetland Program for the implementation of an overall wetland monitoring and assessment strategy.

Many aspects of the Wetland Monitoring and Assessment QAPP submitted in April of 2014 would still be applicable to any monitoring and assessment conducted by the LLBO Wetland Program in the future. However, there are parts of the QAPP that need to be updated to reflect additional monitoring and assessment actions that the LLBO Wetland Program hopes to undertake. Additionally, the QAPP revision should be drafted concurrently with a revised overall LLBO Wetland Monitoring and Assessment Strategy that better reflects the current goals and objectives of the LLBO Wetland Program and sets forth a more feasible monitoring schedule that takes into account any funding and staff time limitations.

Revisions to LLBO's Wetland Monitoring and Assessment QAPP and Wetland Monitoring Strategy have been identified as priority activities for potential future actions under the Monitoring and Assessment Core Element.

### ***Wetland Delineation Training***

Nine LLBO Division of Resource Management (DRM) staff members from various disciplines, including Water Resources, Forestry, and GIS, completed a 2017 wetland delineation course offered by the University of Minnesota. As of 2022, only 3 of those staff members still work for the LLBO DRM, but 8 additional staff members have since completed a wetland delineation course under the fiscal year 2019/2020 EPA WPDG.

### ***2014 Baseline Wetland Monitoring***

Baseline wetland data, including water quality measurements, soil characteristics, and vegetative conditions (vegetative conditions were assessed using Minnesota Pollution Control Agency's Rapid Floristic Quality Assessment Methodology) was collected from 20 wetlands of varying types in mid-July through September of 2014. The LLBO Wetland Program hopes to make use of that data to inform wetland specific water quality standards and wetland restoration

prioritization activities, but the data is almost 10 years old at this point and further monitoring is needed to establish wetland conditions at the 2014 wetland sites.

## 2.1.2 Current Actions

### ***Potential Jurisdictional Wetland Model***

Given the unique landscape characteristics and density of water resources within the LLR, as well as the identified need for a tool to assist in the evaluation of water resource connectivity, the LLBO Water Resources Program developed a Potential Jurisdictional Wetland Model (PJWM) in ESRI's ArcGIS software platform. The model utilizes publicly available, federally and state surveyed geospatial data of hydrographic features, soils, and wetland coverage to spatially derive connectivity relationships between publicly available geospatial datasets. The PJWM was developed to assess the connectivity of potential Waters of the United States (WotUS) to "Traditional Navigable Waters" across the Reservation under differing Clean Water Act (CWA) interpretation scenarios in an attempt to encompass a range of regulatory interpretations regarding jurisdictional definitions of WotUS.

Three scenarios, designated as MOST, LESS, and LEAST restrictive, were established in the model framework in an effort to encompass a range of regulatory interpretations regarding jurisdictional definitions of WotUS (See Appendix A "Draft Jurisdictional Wetland Mapping Strategy: ArcGIS-Based Recommendations for Future Field Mapping Investigations" for further details regarding the inputs and parameters of the PJWM). Model scenarios were run independently for each of the three HUC-8 watersheds located within the external boundaries of the LLR: 1) Big Fork (HUC 09030006), 2) Mississippi Headwaters (HUC 07010101), and 3) Leech Lake (HUC 07010102). HUC-8 model output summary statistics are provided in Appendix A.

The PJWM was finalized in September of 2020 and model outputs were used to develop a Jurisdictional Wetland Mapping Strategy. See ***Jurisdictional Wetland Mapping Strategy*** below for further information.

### ***Jurisdictional Wetland Mapping Strategy***

Based upon a review of the outputs of the PJWM, a Jurisdictional Wetland Mapping Strategy was developed (Appendix A). While the PJWM incorporated all available geospatial data to provide scenario-based jurisdictional assessments, there are likely existing unmapped features that could result in significant changes to scenario-specific outputs. In many cases, breaks between model output jurisdictional waters occurred primarily along roads, railroad beds, and dikes.

The components of the Jurisdictional Wetland Mapping Strategy are intended to prioritize the type and location of field-based assessments of selected water resource features as well as to establish protocols and data collection templates that can be seamlessly incorporated back into the PJWM to both verify the accuracy of the model and refine the extent of potentially jurisdictional waters present within the LLR. The Jurisdictional Wetland Mapping Strategy should be considered a living document, whereas adaptive updates and prioritizations continue to be incorporated based upon the needs of the LLBO.

The Jurisdictional Wetland Mapping Strategy was submitted to EPA on September 30, 2022, but will continue to be refined based on future changes to the Waters of the U.S. (WotUS) rule and data collected on the hydrologic connectivity of wetlands separated by man-made barriers.

### ***Culvert Assessment***

After reviewing the output generated by the PJWM it became apparent that roadways and other man-made structures were one of the most frequent causes of severance of wetland surface water connectivity on the LLR. In some instances, culverts were identified that could serve as connections between wetlands on opposite sides of a roadway or other man-made barrier, but the flows through these culverts were labeled as intermittent and the PJWM could not determine if certain wetland acreage was jurisdictional under the 2020 WotUS rule. The 2020 WotUS rule allows for the inclusion of intermittent waters as jurisdictional if they have a consistent seasonal connection to a WotUS during a normal water year based on a 30 year rolling average, but it is unknown if the identified culverts' flows meet that criteria. In other cases, no culverts were identified on roadways with wetland acreage on either side, which caused a connection severance. However, it is unknown whether there are truly no culverts present at these sites or if they are present but were not inventoried under the publicly available ArcGIS culvert layers used in the PJWM.

This project proposes to carry out a field-based culvert inventory and hydrologic connectivity investigation to locate culverts that drain wetlands and identify surficial connections via culvert to particular wetland acreage that could not be confirmed as jurisdictional by the PJWM. The culvert inventory and connectivity investigation will focus on identifying and assessing the connectivity status of culverts separated by a roadway or another man-made structure that could potentially link wetlands of an unknown jurisdictional status to wetlands determined to be jurisdictional by the PJWM under the 2020 revision of the definition of WotUS.

In addition to the culvert inventory and connectivity investigation, a concurrent visual culvert condition assessment will be conducted to ascertain whether a previously or newly identified culvert was designed properly (e.g. adequate size, positioned correctly in relation to the channel, etc.) and allows adequate aquatic organism passage.

The field work for this project is tentatively scheduled to take place from April-September of 2023. Collected culvert inventory and connectivity investigation data will be used to inform the PJWM and aid LLBO in decisions related to Clean Water Act Sections 401 and 404. The visual culvert condition assessment data that is collected will be uploaded into an online database of culvert locations and conditions that can assist LLBO and local partners in the identification and replacement of problem culverts.

### ***Wetland prioritization model***

With nearly 40% of the landscape on the Leech Lake Reservation cited as wetland, there is an undeniable need for Reservation wetlands to be mapped and prioritized for future monitoring, assessment, and protection. LLBO proposes a GIS-based Wetland Prioritization model that would be used to prioritize wetlands that are of unique value, have important value to the Leech Lake Band of Ojibwe, and provide a multitude of ecosystems services. Under the proposed model, wetlands would be analyzed for different factors based on categories selected from various GIS layers and assigned a score for each category based on the threshold in which they fell.

Model categories used to prioritize Reservation wetlands would include such factors as wetland size, uniqueness, buffer capacity, and resiliency to climate change. This model would also utilize GIS layers to identify potential reference wetland sites and gain insight into environmental justice concerns that may affect the protection and restoration of Leech Lake Reservation wetlands.

LLBO Water Resources staff is currently exploring the ideal categories to include in the proposed monitoring prioritization model. However, the model and an associated secondary data QAPP would be completed under a subsequent Wetland Program Development Grant (WPDG), potentially the 2022 Tribal National Wetland Program Development Grant.

### 2.1.3 Potential Future Actions

**Goal 1:** Determine wetland quantity, quality, and measure changes over time.

**Objective:** Build capacity of Leech Lake Wetland Program to maximize the assessment and monitoring of wetland health across the Reservation.

#### General Strategy:

| Table 2. Action a: Ensure adequate funding and staff time for program sustainability                        |      |      |      |      |      |
|---|------|------|------|------|------|
| Activity  | 2023 | 2024 | 2025 | 2026 | 2027 |
| Seek and apply for funding opportunities to implement, sustain and expand wetland monitoring and assessment | X    | X    | X    | X    | X    |
| Hire a full time Wetland Specialist to carry out wetland monitoring and build the wetland program           | X    | X    | X    | X    | X    |

#### General Strategy

| Table 3. Action b: Develop a wetland monitoring prioritization model, Monitoring and Assessment QAPP, and Monitoring and Assessment Strategy in anticipation of the resumption of Leech Lake Reservation wetland monitoring and assessment activities |      |      |      |      |      |
|---|------|------|------|------|------|
| Activity  | 2023 | 2024 | 2025 | 2026 | 2027 |
| Develop a wetland monitoring prioritization model   | X    | X    |      |      |      |
| Update Wetland Monitoring and Assessment QAPP   | X    | X    |      |      |      |
| Update Wetland Monitoring and Assessment Strategy and develop a rotating monitoring schedule  | X    | X    |      |      |      |
| Begin monitoring and assessment of wetlands selected by the wetland monitoring prioritization model and identified in the Revised Wetland Monitoring and Assessment Strategy  |      |      | X    | X    | X    |
| Identify and map potential reference wetlands for all wetland types represented within and overlapping Leech Lake Reservation boundaries  |      |      | X    |      |      |
| Collect data at potential reference wetlands and select a subset of wetlands to serve as reference sites for each wetland type  |      |      | X    | X    | X    |

|  |  |  |  |  |   |
|--|--|--|--|--|---|
| Begin to consider how monitoring and assessment data can be used to examine the potential effects of climate change on wetlands. |  |  |  |  | X |
|--|--|--|--|--|---|

## 2.2 Water Quality Standards for Wetlands

### 2.2.1 Past Actions

The LLBO Wetland Program did not conduct any past projects that related to wetland specific water quality standards, but the wetland data collected in 2014 may serve to inform such standards in the future.

### 2.2.2 Current Actions

The LLBO Wetland Program does not have any current projects that relate to wetland specific water quality standards.

### 2.2.3 Potential Future Actions

**Goal 1:** Develop wetland specific water quality standards.

**Objective:** Begin the process of developing a basis for wetland-specific water quality standards.

**General Strategy:**

Table 4. Action a: Collect and analyze data that will be used to inform the development of wetland specific water quality standards

| Activity  | 2023 | 2024 | 2025 | 2026 | 2027 |
|---|------|------|------|------|------|
| Develop reference conditions for each wetland type                      |      |      |      |      | X    |
| Examine feasibility of setting wetland specific water quality standards |      |      |      |      | X    |

## 2.3 Voluntary Restoration and Protection

### 2.3.1 Past Actions

LLBO has used community functions such as their Earth Day Event to communicate the importance of wetland protection and restoration to Leech Lake Reservation community members.

### 2.3.2 Current Actions

LLBO will continue to use community functions such as their Earth Day Event to communicate the importance of wetland protection and restoration to Leech Lake Reservation community members.

The LLBO Water Resources Program will also make its staff available to recommend BMPs to any private landowners that may be interested in voluntary wetland restoration and protection activities on their land.

### 2.3.3 Potential Future Actions

**Goal 1:** Ensure access to wetlands and wetland resources for all LLBO Tribal members in perpetuity as set forth in treaty agreements with the United States of America.

**Objective:** Protect Reservation and 1855 Ceded Territory wetlands and promote Tribal member access to culturally important wetlands and their resources.

**General Strategy:**

| Table 5. Action a: Build relationships with private landowners, private businesses, and governmental entities that operate within Reservation boundaries and in the 1855 Ceded Territory to protect wetland resources on non-Tribally held lands  |      |      |      |      |      |
|---|------|------|------|------|------|
| Activity  | 2023 | 2024 | 2025 | 2026 | 2027 |
| Work with the U.S. Corps of Engineers and the Minnesota Department of Natural Resources to incorporate Tribal input when 404 permits, public water work permits, or aquatic plant management permits threaten wetlands and treaty resources on privately held land within Reservation boundaries or outside of Reservation boundaries | X    | X    | X    | X    | X    |
| Work with local Soil and Water Conservation Districts and surrounding counties to develop construction BMP's that protect wetlands on privately held lands within Reservation boundaries  | X    | X    | X    | X    | X    |
| Public outreach to non-Tribal land owners within Reservation boundaries communicating the importance of wetland protection  | X    | X    | X    | X    | X    |

**Goal 2:** Ensure no net loss of wetlands.

**Objective:** Prevent loss of Reservation wetlands, and protect wetland function and restore impacted wetlands within Reservation boundaries.

**General Strategy:**

| Table 6. Action b: Identify culturally and ecologically important wetlands on the Leech Lake Reservation             |      |      |      |      |      |
|--|------|------|------|------|------|
| Activity   | 2023 | 2024 | 2025 | 2026 | 2027 |
| Use monitoring data and interviews with Tribal community members to inform wetland restoration decisions and methods |      |      | X    | X    | X    |
| Identify wetlands to be targeted for restoration projects  |      |      |      |      | X    |
| Collaborate with local Soil and Water Conservation Districts on voluntary wetland restoration efforts                | X    | X    | X    | X    | X    |

## 2.4 Regulatory Activities

### 2.4.1 Past Actions

#### *Tribal Wetland Ordinance*

The Tribal Wetland Ordinance (TWO) was set forth to ensure the protection, preservation, and conservation of all wetlands that fall within the Leech Lake Reservation boundaries, traverse the Leech Lake Reservation boundaries or are immediately adjacent to the Leech Lake Reservation boundaries. The last two wetlands described fall within the purview of the 1855 ceded territory, land on which the Leech Lake Band of Ojibwe are guaranteed the right to hunt fish and gather in perpetuity. Protection and preservation of the resources within those territories are a direct and necessary component of ensuring those guaranteed rights are executable in perpetuity.

All proposed sites for construction activity of any kind within the Leech Lake Reservation boundaries (e.g. residential, commercial, roads, trails, pipelines, railbeds and tracks, power lines, public use, new, reconstructive, reparative, maintenance or demolition) must be submitted to the Leech Lake Division of Resource Management for review and site assessment. Each site will be assessed for wetland presence or absence; if wetlands are determined to be present, the proposed site activity will be assessed for potential impact to said wetlands. The entity that proposes the construction activity will be advised to include a clear plan utilizing current BMPs to ensure no impairment or damage to the wetland occurs.

### 2.4.2 Current Actions

The LLBO received treatment as a state for Clean Water Act Sections 303c and 401 in November of 2021. Since that time, LLBO has reviewed and set conditions for a handful of individual Clean Water Act Section 404 permits issued within Leech Lake Reservation boundaries to assure that the permitted actions wouldn't adversely affect wetland extent and function. LLBO will continue to review all individual and general permits issued within Reservation boundaries in the future and set any necessary conditions on such permits to ensure the protection of wetland extent and function.

Additionally, LLBO has developed a Potential Jurisdictional Mapping Strategy that will help to determine the feasibility of applying for treatment as a state under Clean Water Act 404 and implementing Clean Water Act 404 assumption of wetland permitting within Leech Lake Reservation boundaries.

### 2.4.3 Potential Future Actions

**Goal 1:** Protect and preserve the quantity, quality, and biological diversity of all wetland resources.

**Objective:** Protect important wetlands and wetland resources as provided by Tribal and Federal Law.

**General Strategy:**

| <b>Table 7. Action a: Continue to uphold the Leech Lake Tribal Wetland Ordinance</b>   |             |             |             |             |             |
|--|-------------|-------------|-------------|-------------|-------------|
| <b>Activity</b>  | <b>2023</b> | <b>2024</b> | <b>2025</b> | <b>2026</b> | <b>2027</b> |
| Work with LLBO Land department to ensure all construction activities on Tribally owned or leased land are following Tribal law and adopted BMP's to minimize impacts to wetlands and waterbodies | X           | X           | X           | X           | X           |
| Collaborate with Leech Lake Conservation officers to prevent illegal activities that impact wetlands   | X           | X           | X           | X           | X           |

**Goal 1:** Uphold the current federal and Tribal regulations protecting wetlands and identify opportunities for future expansion of regulatory authority

**Objective:** Maintain Leech Lake's jurisdiction as a sovereign Tribal Nation with Clean Water Act Section 401 certification review and examine feasibility of applying for treatment as a state approval under Sections 402 and 404 of the Clean Water Act and implementing their associated permitting programs.

**General Strategy:**

| <b>Table 8. Action b: Protect Reservation wetlands and wetland resources through LLBO's Clean Water Act regulatory authority</b>                                 |             |             |             |             |             |
|--|-------------|-------------|-------------|-------------|-------------|
| <b>Activity</b>  | <b>2023</b> | <b>2024</b> | <b>2025</b> | <b>2026</b> | <b>2027</b> |
| Provide adequate review of federal permits that may affect Leech Lake Reservation wetlands under LLBO's Clean Water Act Section 401 certification authority      | X           | X           | X           | X           | X           |
| Examine feasibility of applying for treatment as a state under Sections 402 and 404 of the Clean Water Act and implementing their associated permitting programs |             |             | X           | X           | X           |



**APPENDIX A**  
**Potential Jurisdictional Wetland Mapping Strategy**

# Leech Lake Band of Ojibwe Water Resources Program



EPA Grant Number: CD-00E02738

Draft Jurisdictional Wetland Mapping Strategy:

ArcGIS-Based Recommendations for Future Field Mapping Investigations

Part of a Leech Lake Band of Ojibwe Tribal Wetland Program Plan Revision

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## 1.0 Introduction

The Leech Lake Reservation (LLR) is 869,320 acres, of which approximately 494,697 acres are surface water. Many of the lakes and much of the 622 known miles of streams are associated with adjacent riparian wetlands. However, there are also numerous seasonal wetlands, alluvial floodplains, river deltas and confluences, peat bogs, and vast stretches of swamp. Wetlands provide critical cultural resources (foods, medicines, raw materials) for the Ojibwe people. Additionally, properly functioning wetlands can reduce flooding, prevent bank and shoreline erosion, and recharge ground and surface water supplies. They also help to regulate water clarity, temperature, pH, nutrient cycling and dissolved oxygen in fishable/swimmable water-bodies and provide fish, wildlife and aquatic plant habitat. Protection and, when possible, restoration of wetlands is key to the well-being of LLR Tribal citizens as well as to the overall health and water quality of area lakes, rivers, and streams.

The Clean Water Act (CWA) (33 U.S.C. §1251 et seq. (1972) serves to protect waters and wetlands, like those present on the LLR as well as across the United States, through the regulation of discharges of pollutants into these waters and quality standards for surface waters. Federal definitions and the scope of CWA regulation across the United States have been influenced by regular federal updates, as well as Supreme Court rulings, since its inception in 1972. The most recent definition of Waters of the United States (WotUS) under the CWA is provided in the Navigable Waters Protection Rule (NWPR) which became effective on June 22, 2020. While the specific definitions of “wetlands” and “tributaries” have remained relatively static over the course of CWA implementation, the criteria for determining if these water bodies are regulated by the CWA (i.e. jurisdictional) have varied considerably. Based upon current guidance provided in the NWPR, jurisdiction is largely contingent on the presence and periodicity of surficial connectivity between wetlands and tributaries to Traditional Navigable Waters (TNW).

Given the large size of the LLR coupled with unique geomorphology characteristics of the region, the extent of surficial wetland connectivity and thus the extent of jurisdiction within the LLR is unknown. As a precursor to proposed revisions of the Leech Lake Band of Ojibwe’s (LLBO) Tribal Wetland Program Plan (TWPP), a wetland mapping strategy was developed to assist the Tribe in prioritizing locations within the Reservation for which to focus field-based assessment efforts. Subsequent revisions to the LLBO TWPP can then serve to inform wetland management decisions on monitoring, restoration, and regulatory objectives.

The purpose of this document is to provide the LLBO with a Wetland Mapping Strategy to assist in development of TWPP revisions and provide preliminary evaluations of the extent of CWA jurisdiction within the Reservation and prioritized locations for additional field-based assessment.

Strategy development should include the identification of clear and achievable goals and objectives. Further, the objectives identified should take into consideration the resources (financial and personnel) available to the LLBO, long-term planning and implementation schedules, and regulatory implications to ensure that the end product meets the goals identified as a part of Strategy development and the TWPP. The final list of goals and objectives should then be prioritized based on the considerations included above, as well as others.

The LLBO water resources team has developed the following list of goals and objectives that were used to develop the preliminary Wetland Mapping Strategy:

- Goal #1: Develop a wetland mapping and assessment tool that can be used to remotely determine the likelihood of the presence of jurisdictional WotUS within the Reservation;
- Goal #2: Prioritize locations within the Reservation for field-based implementation;
- Goal #3: Establish standardized practices and data collection templates to ensure consistency between personnel and geospatial databases; and
- Goal #4: Continued refinement of a geospatial database that represents known and/or potentially jurisdictional waters within the Reservation boundary.

## 2.0 Study Area Description

To help guide the development of the Mapping Strategy and Reservation-specific considerations that are critical to Strategy implementation, a characterization of the regional landscape conditions, water resources, and environmental characteristics of the LLR is provided. While abbreviated, the LLR characterization provides context in regard to the Mapping Strategy development and critical implementation objectives. Given that this Strategy hinges upon an evaluation of potential jurisdiction of LLR waters and wetlands, the focus of the landscape and water resource characterization is centered on technical details that effect and support a determination of connectivity between tributaries, wetland, and lakes to Traditional Navigable Waters.

### 2.1 Landscape description

The LLR encompasses 869,320 acres in northern Minnesota which has a topography that was significantly influenced by the historic advance and retreat of glacial lobes. These glaciers formed glacial moraines that melted and carried sand and gravel to form a sand cap. Over time, the result of these glacial activities left a wide variety of soils in the Leech Lake watershed. The soils are a mixture of glacial till, loamy and silty loam, as well as some organic peat, clay till and fine wet sand.

The LLR lies wholly within the Northern Lakes and Forests (50) Level III Ecoregion with the largest spatial area within the Chippewa Plains (50r) Level IV Ecoregion. Small areas of the northern and southern portions of the Reservation lie within the Nashwauk/Marcell Moraines and Uplands (50s) and Itasca and St. Louis Moraines (50q) Level IV Ecoregions, respectively.

The Chippewa Plains has a geomorphology that was highly influenced by historic glaciation which is described below and adapted from White (2020). The terrain varies from level to rolling to undulating to hummocky. There are several large lakes, and the upper reaches of the Mississippi River flow through the center of the ecoregion in the sandy outwash areas. The density of lakes by area is among the highest in the state. Pre-settlement vegetation was a complex mixture of aspen and birch, jack pine barrens, white and red pine, hardwoods, and conifer bogs and swamps. Land use is primarily a mosaic of forest and wetland with some hay and alfalfa agriculture at the western edge and in a small area just east of Bemidji.

## 2.2 Hydrology, Watersheds, and Wetlands

The LLR is underlain by igneous and metaphoric, undifferentiated, Precambrian bedrock. These formations are not considered aquifers because they lack the primary porosity to hold any significant amounts of water. The 200 to 400 feet of sand, gravel, silt, clay, rocks and organic material overlying this bedrock forms an unconfined upper aquifer 0-130 feet in depth. This aquifer flows toward Leech Lake in general from the northwest; the first confining layer below this aquifer thins or completely disappears in some places, allowing surface water and water of the upper aquifer to interact with the deeper confined aquifers. Groundwater movement in the Upper Mississippi Headwaters area is from sites of local recharge toward local surface waters (USGS, 2003). Regional flows are maintained during periods of no precipitation by the continuing movement of the groundwater toward the surface water bodies.

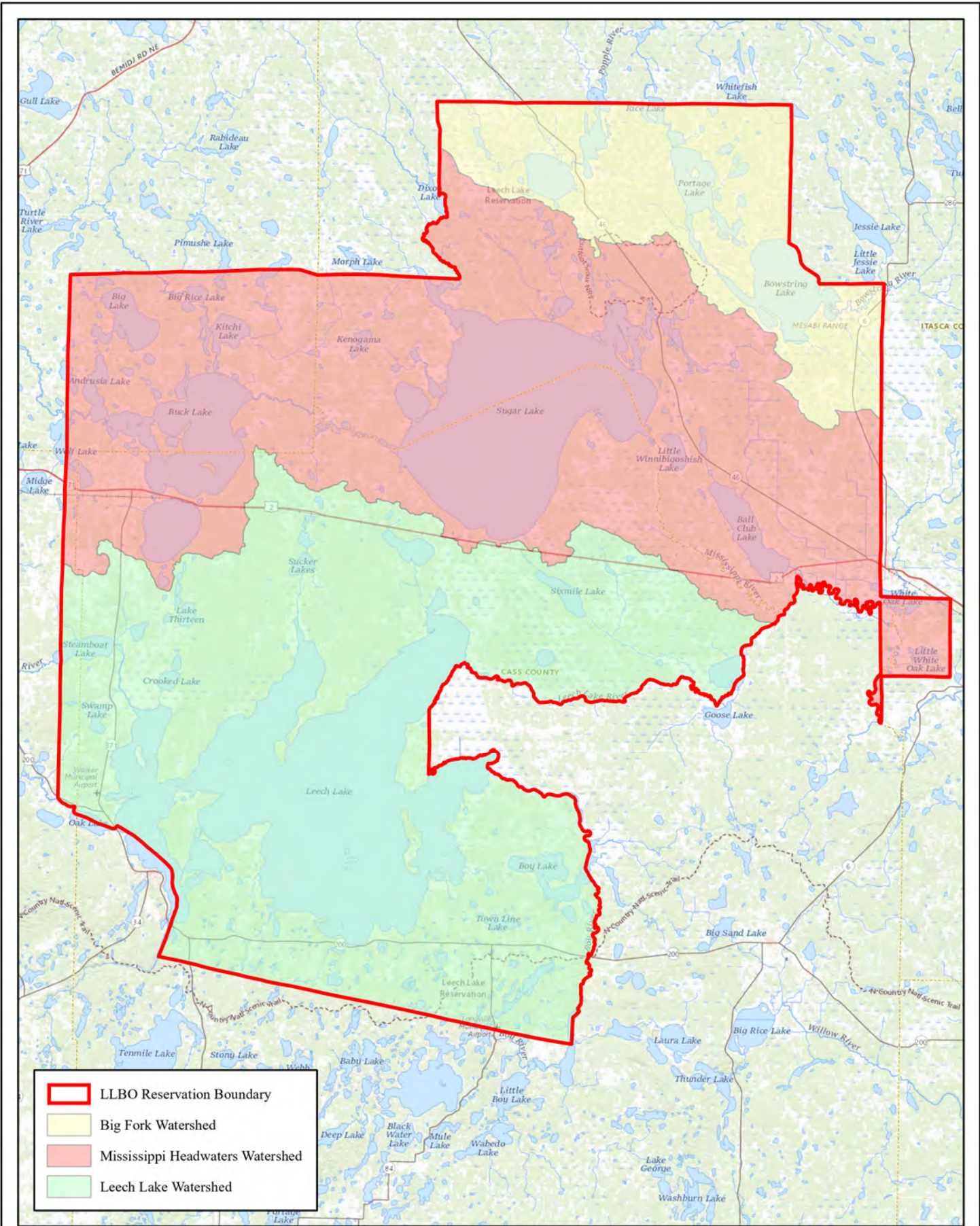
Three 8-digit Hydrologic Unit Code (HUC-8) watersheds are present within the Reservation boundaries and include, moving from north to south: 1) Big Fork (HUC 09030006), 2) Mississippi Headwaters (HUC 07010101), and 3) Leech Lake (HUC 07010102) (Figure 1). The Mississippi Headwaters and Leech Lake HUC-8 watersheds are located in the headwaters of the Upper Mississippi watershed which flows south to the Gulf of Mexico while the Big Fork HUC-8 watershed is located within the Souris-Red-Rainy River system which flows north into Canada.

As described above, the Northern Lakes and Forests Ecoregion, which includes the LLR, has a large percentage of the overall land area classified as palustrine and/or lacustrine landcover types. As detailed in Table 1, the three HUC-8 watersheds within the LLR contain between 55% and 56% of the total drainage area classified by the U.S. Fish and Wildlife Service National Wetland Inventory as either wetland, lake, or riverine features.

Wetlands within the LLR vary considerably within the LLR and include riverine/riparian wetlands directly abutting larger rivers, tributaries, and lakes to large wetland complexes meandering across the landscape that include forested, scrub/shrub, and emergent vegetative



communities (Table 1). Coincidentally, hydrologic sources, dynamics, and surficial hydrologic characteristics vary considerably across the LLR. Example photographs of representative wetland types within the LLR are presented in Plate 1.



Data Sources: ESRI USGS Topo Basemap, NHD Watershed Boundary Database

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

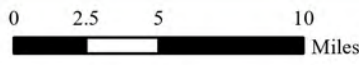


Table 1. National Wetland Inventory types by HUC-8 watershed within the Leech Lake Band of Ojibwe Reservation.

| <b>HUC-8 Watershed / National Wetland Inventory Classification</b> |                                      | <b>Area (acres)</b> |
|--|--------------------------------------|---------------------|
| <b>Mississippi River - Headwaters</b>                              |                                      | <b>376,655.63</b>   |
|  | <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            |
| <b>Leech Lake River</b>  |                                      | <b>389,530.37</b>   |
|  | <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            |
| <b>Big Fork River</b>  |                                      | <b>103,138.19</b>   |
|  | <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              |

### 2.3 Traditional Navigable Waters and State Waters

The U.S. Army Corps of Engineers (USACE) – St. Paul District has developed a list of *Navigable Waters of the United States in Minnesota* ([https://www.mvp.usace.army.mil/Portals/57/docs/regulatory/RegulatoryDocs/mn\\_nav\\_waters.pdf](https://www.mvp.usace.army.mil/Portals/57/docs/regulatory/RegulatoryDocs/mn_nav_waters.pdf)) that include several named waterbodies within the Big Fork River, Mississippi River, and Mississippi River Headwaters Reservoirs regions. Additionally, the Minnesota Department of Natural Resources (MN DNR) has developed a Public Water Inventory, as specified in Minnesota Statute 103G.201. The locations of USACE Navigable Waters of the United States as well as MN DNR Public Waters are depicted in Figure 2. Example photographs of USACE TNWs and MN DNR Public Waters are provided in Plate 2.

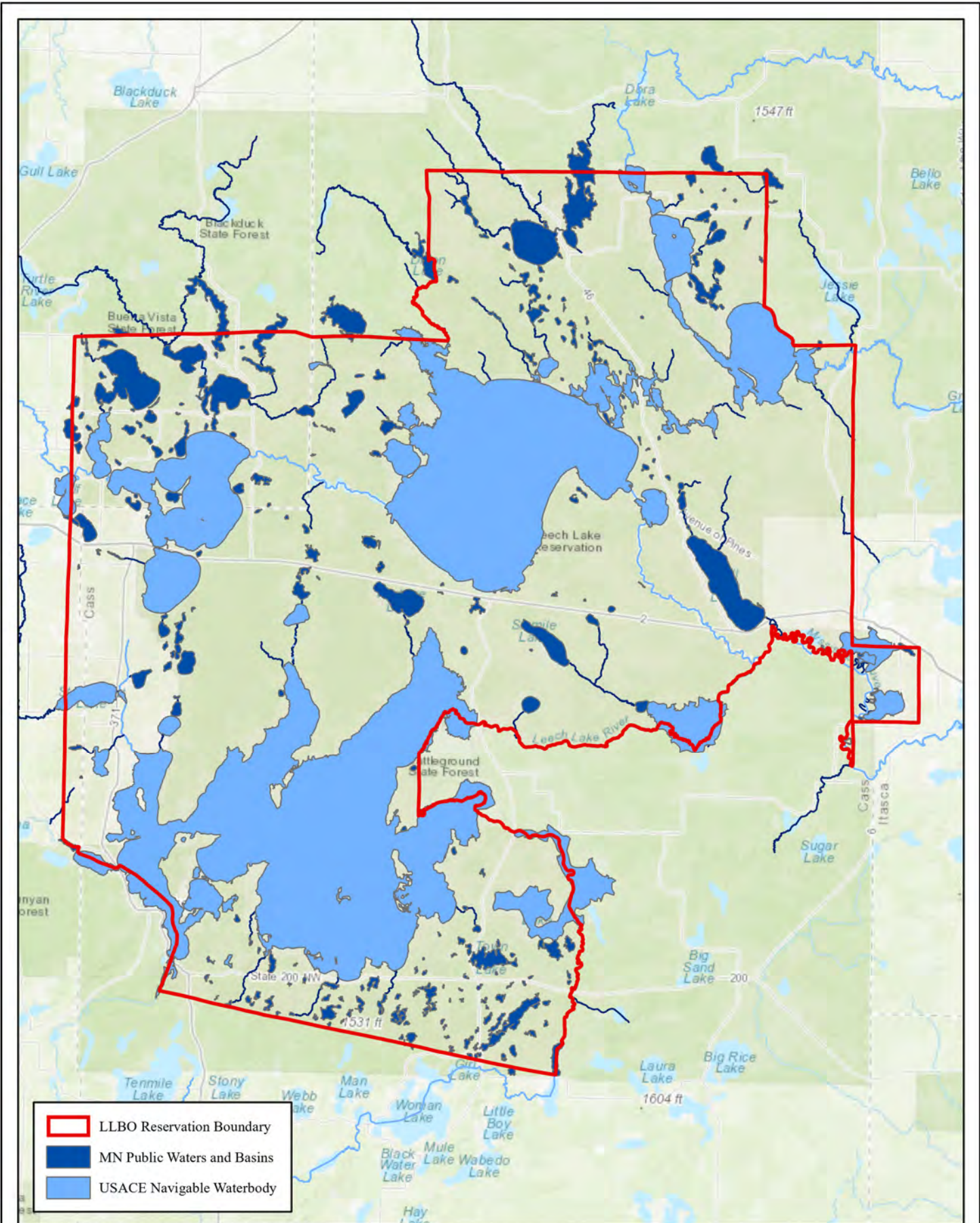


Figure 2. US Army Corps of Engineers (USACE) Navigable Waters and Minnesota Public Waters and Basins.

## 3.0 Potential Jurisdictional Wetland Model (PJWM)

Given the unique landscape characteristics and density of water resources within the LLR, as well as the identified need for a tool to assist in the evaluation of water resource connectivity, the LLBO water resource team developed a Potential Jurisdictional Wetland Model (PJWM) to help inform development of the Mapping Strategy. The LLBO team constructed a PJWM toolbox for ESRI's ArcGIS software platform to achieve the aforementioned goals and objectives. The model utilizes publicly available, federally and state surveyed geospatial data of hydrographic features, soils, and wetland coverage to spatially derive connectivity relationships between publicly available geospatial datasets. The PJWM tool was developed to assess the connectivity of potential WotUS to "Traditional Navigable Waters" across the Reservation under differing CWA interpretation scenarios in an attempt to encompass a range of regulatory interpretations regarding jurisdictional definitions of WotUS. Three scenarios, designated as MOST, LESS, and LEAST restrictive, were established in the model framework and attempt to encompass a range of regulatory interpretations regarding jurisdictional definitions of WotUS.

The results of this model, including connectivity determinations and wetland boundaries, are not intended to be actual jurisdictional determinations, but will be used to develop broader mapping strategies and ongoing field delineation efforts by LLBO.

### 3.1 Model Description and Methodology

Specific details associated with GIS data source, use, and quality assurance and quality control (QA/QC) as well as model framework and development methods are provided in the *Leech Lake Reservation Jurisdictional Wetland Modeling Tool Development Quality Assurance Plan*, December 2020 (Appendix A).

#### 3.1.1 Geospatial Data Sources and Description

A variety of secondary data sources from existing state and federal databases for developing the wetland jurisdictional modeling toolbox were utilized and provided 1) publicly accessible and spatially comprehensive source datasets for modeling input and 2) data sources that are subject to existing quality assurance practices, metadata documentation, and periodic updates by the administering government agency. No modification to secondary source data from these databases was required for executing modeling scenarios, allowing for a standardized and repeatable process by the user once the processing framework and modeling workflows were established. The only adjustments to model outputs will be based upon additional data collection efforts provided by the user. The secondary data sources utilized for the initial model development are described below.

##### 3.1.1.1 Navigable Waters

The USACE - St. Paul District has published a list of *Navigable Waters of the United States in Minnesota*, which includes defined segments in the Big Fork and Mississippi River Headwaters

HUC6 watersheds. Additionally, the Minnesota Department of Natural Resources (MN DNR) has developed a Public Water Inventory, as specified in Minnesota Statute 103G.201. Both datasets were used to identify the location of known jurisdictional waters. The locations of USACE Navigable Waters of the United States as well as MN DNR Public Waters are depicted in Figure 2.

#### *3.1.1.2 National Wetland Inventory (NWI)*

Large-scale wetland mapping efforts by the US Fish and Wildlife Service (USFWS) using combined historical records, topographic maps, aerial imagery interpretation, and underlying soil characteristics have been compiled into the federal NWI database for the Reservation. The NWI has additionally been updated by the MN DNR through further GIS-based interpretation efforts designated as NWI-Plus. While the NWI database provides a good generalization of wetland type and extent across the landscape, it does not determine actual jurisdictional boundaries under current interpretations of the CWA that are utilized by federal regulatory agencies such as the USACE and the U.S. Environmental Protection Agency (US EPA).

#### *3.1.1.3 National Hydrography Dataset (NHD)*

The U.S. Geologic Service (USGS) maintains the NHD, NHD High Resolution, and Water Boundary Dataset (WBD) related to surface water features of the United States for mapping and modeling applications. Despite the variability and accuracy of NHD stream classifications, it has been selected as the best nationally available hydrography dataset for the purposes of modeling input. NHD feature data is available at medium (1:100,000 scale) and high (1:24,000 scale) resolution based on watershed Hydrologic Unit Codes (HUC) boundaries with accompanying metadata on classification scale and date. The FGDB contains vector points, lines, and polygons that represent surface water features recorded by the USGS, along with relevant attribute information (length/acreage, waterbody type, etc) and content metadata.

#### *3.1.1.4 Soil Survey Geographic Database (SSURGO)*

The U.S. Department of Agriculture's National Resource Conservation Service (NRCS) maintains the SSURGO database of soil map unit polygons and related soil attribute information at the county-wide level for all of Minnesota. This database contains relevant soil characteristics such as hydric condition, flood frequency, and geomorphic description which are used as scenario inputs for the modeling toolbox. The vector polygons represent mapped soil units in addition to accompanying tabular data and metadata.

#### *3.1.1.5 Additional Data Sources*

Local, state, and federal geodata that is relative to modeling scenario inputs, including but not limited to culvert/ditch locations, stream flow classifications, existing mapped wetland units or waterbodies, and state hydric soil listings, were utilized as applicable for refining the accuracy of modeling spatial analysis functions from the three previously mentioned databases. Best efforts

were made to verify the authenticity and suitability of such data, which will additionally be subject to source documentation and metadata standards if included in the final model delivery product. U.S. Forest Service and MN DNR spatial data is available upon request to local and state GIS personnel within the agency and is generally disseminated in a shapefile or ESRI FGDB format.

### 3.1.2 Jurisdictional Wetland Model Development

The general framework and workflow for the PJWM was adapted from Meyer and Robertson (2019). Utilizing the geospatial selection capabilities of the ‘Model Builder’ component of ArcGIS and user selectable inputs from public geodatabases, three potential jurisdictional scenarios were codified that attempt to capture various CWA regulatory interpretations into scripted selections of NWI mapped units using spatial analysis tools within ArcGIS. The strengths of this model are exhibited not only in the results of the scenarios for comparison and interpretation by environmental managers, but also in its usage of easily accessible, continually updated source geodatabases and the industry standard ArcGIS software platform.

### 3.1.3 Model Framework

As a part of the LLBO PJWM, potential jurisdictional scenarios are encoded into a series of select-by-attribute and select-by-location geoprocessing functions to identify individual NWI wetland units for each scenario (Figure 3). Rather than target individual NWI units at this step, a series of ‘wetland complexes’ are generated by dissolving adjacent and bordering NWI units into single, larger units for selection (Figure 4). These complexes, which are dissolved based upon the Cowardian (1979) classification as Palustrine and/or Lacustrine, are selected by intersection with the scenario mask feature. This jurisdictional selection is then shifted to the NWI polygons contained within the wetland complex, which are output as NWI wetland polygon features under the scenario label (MOST\_RESTRICTIVE, etc.).



Figure 3. Example of Least Restrictive Scenario Model user interface.

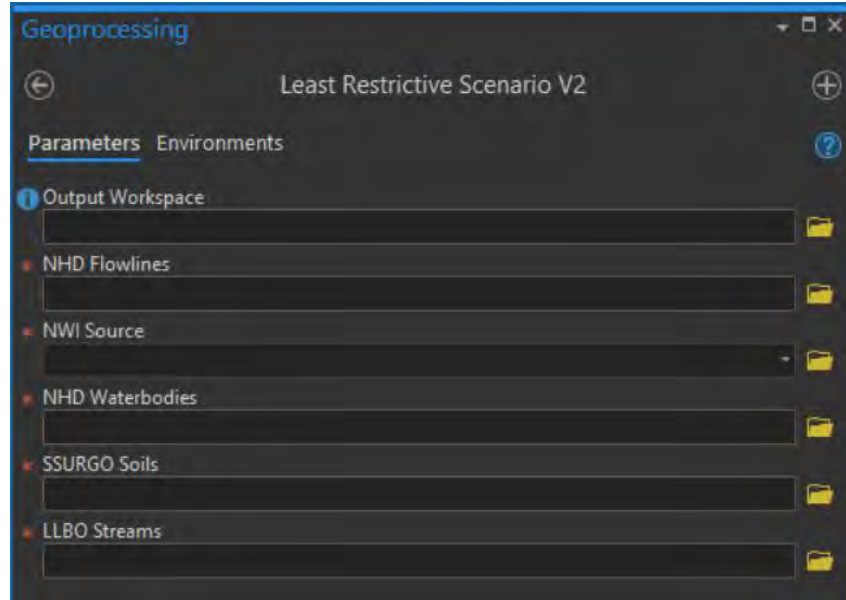
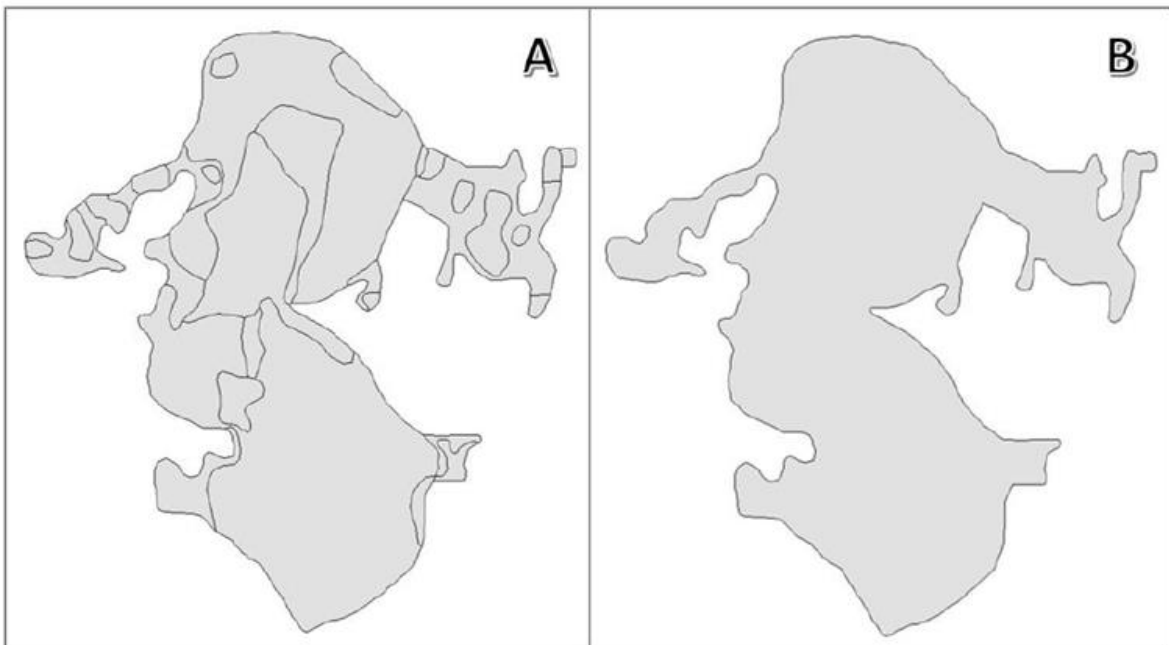


Figure 4. Example of undissolved palustrine polygons (A) and a dissolved palustrine complex (B).



For each model run, assumed jurisdictional waters were defined and included all waters identified on the USACE *Navigable Waters of the United States in Minnesota* AND all waters defined by the MN DNR as “Public Waters”, per Minnesota Statute 103G.201. Upon determination of assumed jurisdiction, the selection of surficial flowlines, waterbodies, and soil units that meet the scenario-specific classification criteria are evaluated for their connectivity to

these waterbodies. These features are then merged into one selection mask/feature layer that is used to query flow-connected intersections with NWI wetland units.

Given the large size of the modelling area, discrete model segments were developed individually for each of the HUC-8 watersheds located within the LLBO Reservation boundary, and included:

1. Big Fork (HUC 09030006)
2. Mississippi Headwaters (HUC 07010101)
3. Leech Lake (HUC 07010102)

### 3.1.4 Model Scenarios

#### *3.1.4.1 Most Restrictive Scenario*

The most restrictive interpretation of federally regulated wetlands under the CWA was guided by the 2020 Navigable Waters Protection Rule. Under this scenario only those wetland units that directly abut or exhibit a direct hydrological surface connection to a traditionally navigable water, either directly or via indirect connection to a traditionally navigable water through jurisdictional tributaries (i.e. those wetlands and/or tributaries with a defined “perennial” surface water hydrologic attribute), as based on available geospatial data were selected. Most restrictive scenario selection criteria, including geospatial data attribute specifications, are provided in Appendix B. All NWI polygons identified as a part of the Most Restrictive Scenario have a high probability of being jurisdictional under the current 2020 Navigable Waters Protection Rule.

#### *3.1.4.2 Less Restrictive Scenario*

The less restrictive scenario expands upon the most restrictive scenario selection criteria in that NWI wetland polygons are selected via intermittent (i.e. seasonal) surficial hydrologic connection as defined in geospatial data source attributes. Potential jurisdictional connections between each NWI polygon or complex and a traditional navigable water or indirect connection to a traditionally navigable water through jurisdictional tributaries include intermittent classified waterbodies and stream networks, and additional intersection with NRCS mapped soil units that include a “ponding” frequently attribute with a frequency of at least 50%. NWI polygons identified as a part of the Less Restrictive Scenario have a moderate probability of being jurisdictional under the current 2020 Navigable Waters Protection Rule and additional field-based surveys would be needed to confirm their connectivity to downstream traditionally navigable waters.

#### *3.1.4.3 Least Restrictive Scenario*

The least restrictive scenario encompasses the NWI selections from the most and less restrictive scenarios with the additional selection criteria of waterbodies and stream networks that have a geospatially derived ephemeral flow connection to either traditionally navigable waters or waterbodies and wetlands identified in previous scenario outputs. Potential jurisdictional connections between each NWI polygon or complex and a traditional navigable water or indirect

connection to a traditionally navigable water through jurisdictional tributaries include ephemeral classified waterbodies and stream networks, and additional intersection with NRCS mapped soil units that include a “ponding” frequently attribute with a frequency of less than 50%. NWI polygons identified as a part of the Least Restrictive Scenario have an unknown probability of being jurisdictional under the current 2020 Navigable Waters Protection Rule and additional field-based surveys would be needed to confirm their connectivity to downstream traditionally navigable waters.

### 3.1.5 Model Limitations and Considerations

The PJWM was developed as a tool to assist the LLBO in implementation of a larger Wetland Mapping Strategy to formally define the location and extent of WotUS within the Reservation boundary. The PJWM only provides an approximation of the location and extent of potentially jurisdictional waters and should not be used to establish the exact location of CWA regulated waters. Further, the model input geospatial data layers and associated attributes were developed and meant to be used at relatively large scales (1:24,000 or greater) and lack the resolution to evaluate the highly precise, small scale requirements of jurisdictional determinations. As a result, the exact location and extent of wetlands and hydric soils and flow periodicity determinations of tributaries and channels could differ significantly from those included in the model input geospatial data. As a part of on-going model verifications, future mapping should include Quality Assurance / Quality Control (QA/QC) procedures targeted at evaluating the accuracy of the PJWM.

## 3.2 Model Results by HUC-8 Watershed within LLBO boundaries

As described above, model scenarios were run independently for each of the three HUC-8 watersheds located within the LLBO Reservation boundary: 1) Big Fork (HUC 09030006), 2) Mississippi Headwaters (HUC 07010101), and 3) Leech Lake (HUC 07010102). HUC-8 model output summary statistics are provided below for each watershed and depicted in Figures 5, 6, and 7.

### 3.2.1 Big Fork Scenario Results

The Big Fork HUC-8 watershed drains an area of approximately 103,138 acres within the LLBO Reservation and contains 57,147 acres of NWI mapped wetlands or 55% of the total watershed area. Based upon model outputs, it was estimated that between 87% (49,769 acres) under the most restrictive scenario and 95% (54,389 acres) under the least restrictive scenario of the mapped NWI polygons possessed a geospatially derived connection to a traditionally navigable water.

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

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

### 3.2.2 Mississippi Headwaters Scenario Results

The Mississippi Headwaters HUC-8 watershed drains an area of approximately 376,656 acres within the LLBO Reservation and contains 57,147 acres of NWI mapped wetlands or 56% of the total watershed area. Based upon model outputs, it was estimated that between 91% (191,792 acres) under the most restrictive scenario and 98% (206,803 acres) under the least restrictive scenario of the mapped NWI polygons possessed a geospatially derived connection to a traditionally navigable water.

Table 3. Mississippi Headwaters HUC-8 model scenario summary statistics.

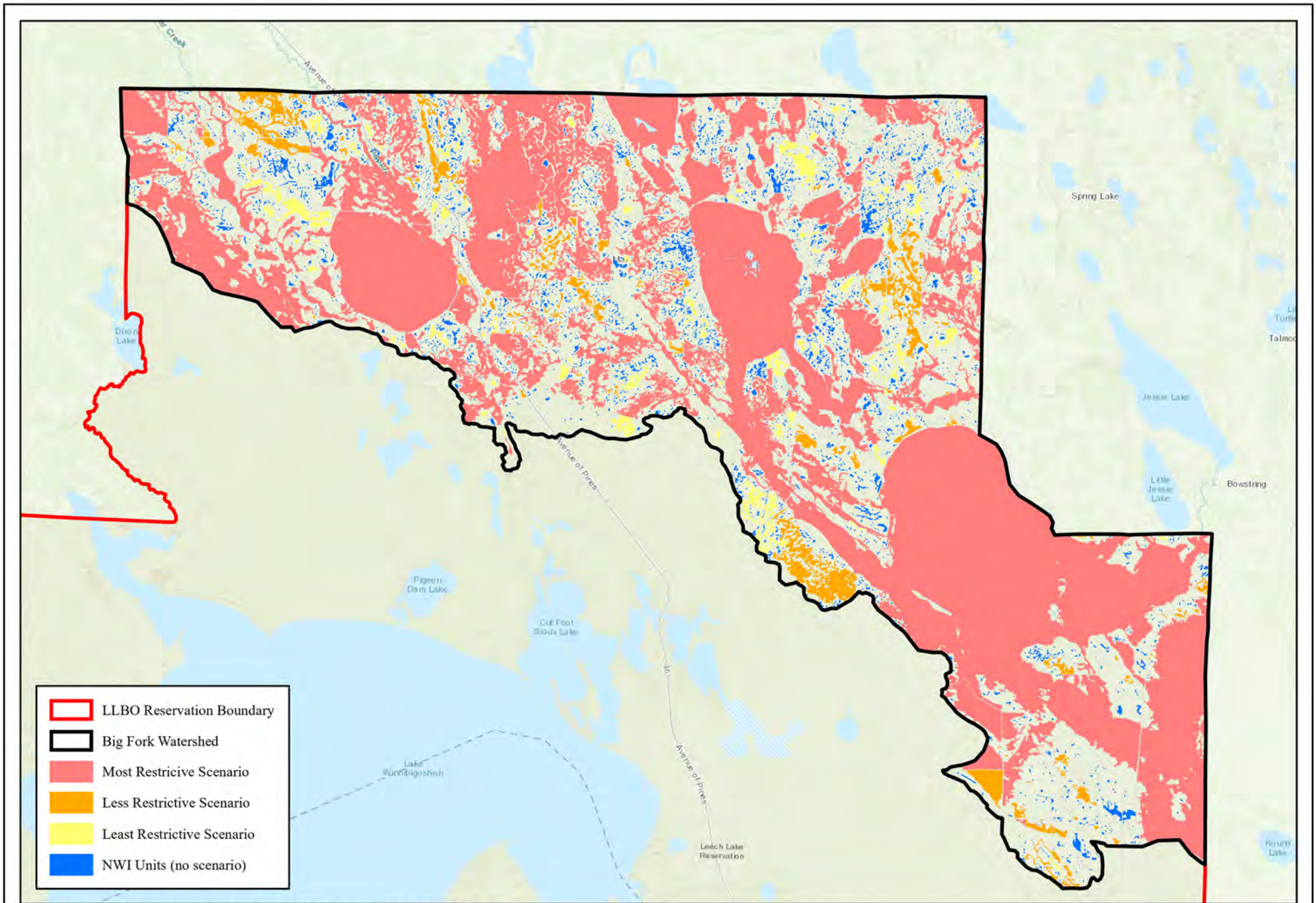
| Big Fork HUC-8<br>Parameter                      | NWI Units       | Area    | Percent of Total<br>NWI Units | Percent of<br>Watershed Area |
|--|-----------------|---------|-------------------------------|------------------------------|
|  | No. of polygons | acres   | %                             |                              |
| HUC-8 Watershed                                  | --              | 376,656 | --                            | --                           |
| Total NWI Areas                                  | 18,486          | 211,600 | 100                           | 56                           |
| Most Restrictive Model<br>Output: Wetland Areas  | 8,394           | 191,792 | 91                            | 51                           |
| Less Restrictive Model<br>Output: Wetland Areas  | 11,212          | 204,627 | 97                            | 54                           |
| Least Restrictive Model<br>Output: Wetland Areas | 11,809          | 206,803 | 98                            | 55                           |

### 3.2.3 Leech Lake Scenario Results

The Leech Lake HUC-8 watershed drains an area of approximately 389,530 acres within the LLBO Reservation and contains 216,841 acres of NWI mapped wetlands or 56% of the total watershed area. Based upon model outputs, it was estimated that between 93% (200,913 acres) under the most restrictive scenario and 97% (210,489 acres) under the least restrictive scenario of the mapped NWI polygons possessed a geospatially derived connection to a traditionally navigable water.

Table 4. Leech Lake HUC-8 model scenario summary statistics.

| <b>Big Fork HUC-8<br/>Parameter</b>              | <b>NWI Units</b> | <b>Area</b> | <b>Percent of Total<br/>NWI Units</b> | <b>Percent of<br/>Watershed Area</b> |
|--|------------------|-------------|---------------------------------------|--------------------------------------|
|  | No. of polygons  | acres       | %                                     |                                      |
| HUC-8 Watershed                                  | --               | 389,530     | --                                    | --                                   |
| Total NWI Areas                                  | 25,828           | 216,841     | 100                                   | 56                                   |
| Most Restrictive Model<br>Output: Wetland Areas  | 7,867            | 200,913     | 93                                    | 52                                   |
| Less Restrictive Model<br>Output: Wetland Areas  | 10,807           | 210,053     | 97                                    | 54                                   |
| Least Restrictive Model<br>Output: Wetland Areas | 11,539           | 210,489     | 97                                    | 54                                   |

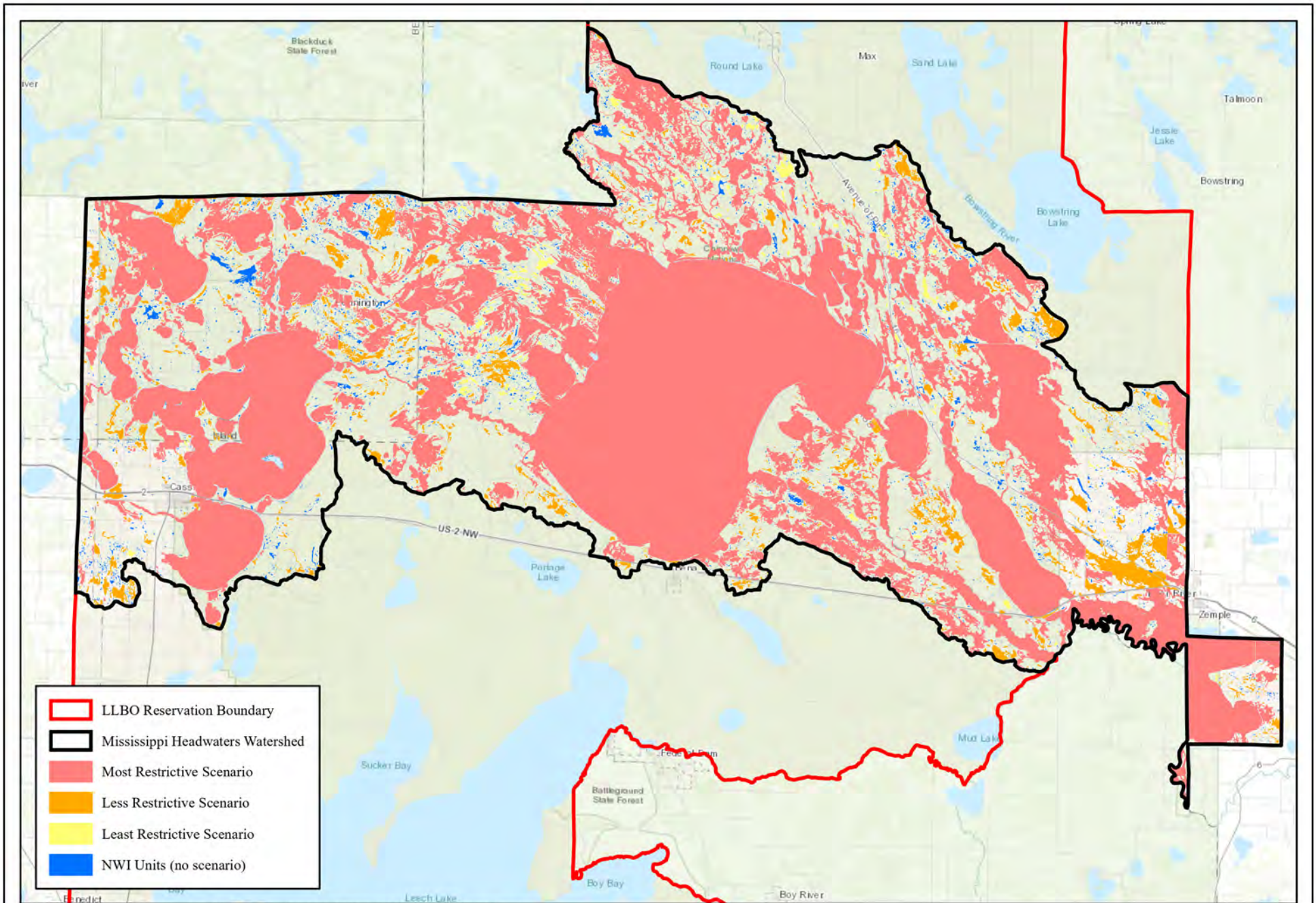


Data Sources: ESRI USGS Topo Basemap, NHD Watershed Boundary Database, USFWS National Wetland Inventory

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

0 2 4 8 Miles





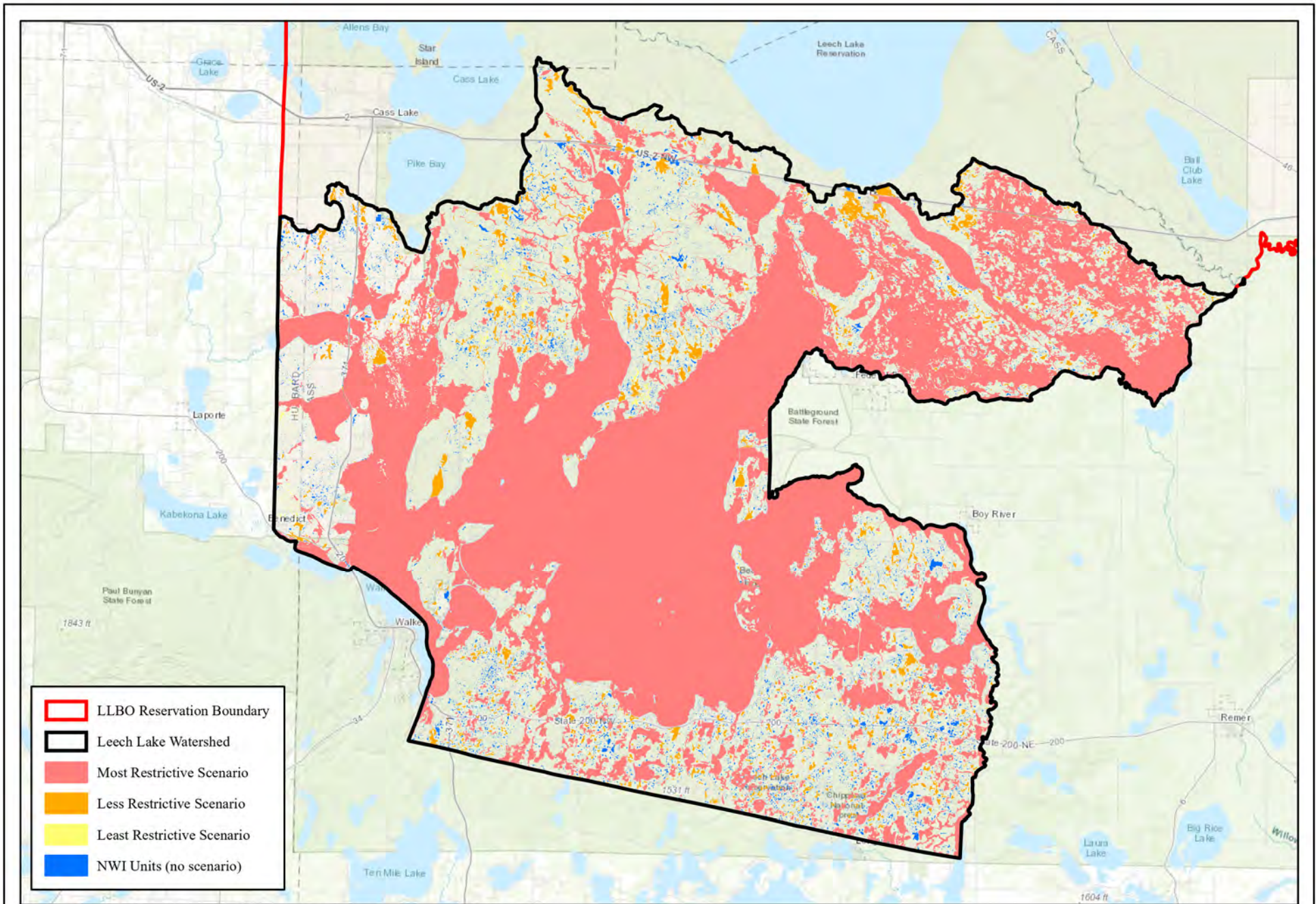
Data Sources: ESRI USGS Topo Basemap, NHD Watershed Boundary Database, USFWS National Wetland Inventory

Figure 6. Jurisdictional Wetland Modeling Results for the Mississippi Headwaters HUC-8 Watershed within the LLBO Reservation Boundary.

0 3.75 7.5 15 Miles



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ENVIRONMENTAL CONSULTANTS



Data Sources: ESRI USGS Topo Basemap, NHD Watershed Boundary Database, USFWS National Wetland Inventory

Figure 7. Jurisdictional Wetland Modeling Results for the Leech Lake HUC-8 Watershed within the LLBO Reservation Boundary.

0 3.75 7.5 15 Miles



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### 3.3 PJDM Conclusions

As evidenced by the scenario specific outputs, it is evident that a large majority of the NWI mapped wetlands within the LLBO Reservation boundary would likely be regulated under the 2020 Navigable Waters Protection Rule (Most Restrictive Scenario. While less restrictive surficial hydrologic connection criteria do not result in tremendous increases in the overall percentage of potentially jurisdictional areas within each HUC-8 watershed, the overall difference between the most and least restrictive scenario jurisdictional area estimates is approximately 7,931 acres. Further, the three model scenarios capture a relatively small portion of the total number of mapped NWI polygons present within each HUC-8 watershed although each scenario captures a high percentage of the total NWI acreage. Thus, it appears that many of the modelled NWI polygons that do not abut or do not have a remotely sensed surficial hydrologic connection, are small and potentially isolated wetlands.

## 4.0 Jurisdictional Wetland Mapping Strategy

Based upon a review of the outputs of the PJWM, a Wetland Mapping Strategy (herein referred to as “Strategy” has been developed and is detailed below. The components of the Strategy are intended to prioritize the type and location of field-based assessments of selected water resource features as well as to establish protocols and data collection templates that can be seamlessly incorporated back into the PJWM to both verify the accuracy of the model and refine the extent of potentially jurisdictional waters present within the LLR. The Strategy should be considered a living document, whereas adaptive updates and prioritizations continue to be incorporated based upon the needs of the LLBO. In addition to Strategy development, a prioritization example for field based assessment is provided.

### 4.1 Mapping Strategy Approach and Prioritization

Current and historic interpretations of jurisdiction and WotUS determination guidance hinge on the connection of wetlands and tributaries to downstream Traditionally Navigable Waters (TNW. Connections that have been interpreted to establish jurisdiction of non-TNW waters currently include waters directly abutting a TNW and waters that have an at least seasonal surficial connection to a TNW via tributary, wetland, and/or lacustrine (lake flow.

Based upon the current interpretation of the CWA, a watershed approach to the mapping and jurisdictional evaluation should be implemented. At the watershed-scale, this approach should be implemented such that assessments are initiated at the upstream extent of known jurisdictional waters (TNWs and then are systematically extended upstream through the watershed. The extent at which jurisdiction extends upstream is contingent upon regulatory definitions of connectivity (i.e. abutting, adjacent, isolated. While the 2020 Navigable Waters Protection Rule specifies that jurisdictional connectivity must include at least a seasonal surficial connection, previous CWA interpretations have determined that connection could be established via a significant nexus,

ephemeral tributary flow, and/or shallow groundwater flow. As a result, it is important that a large-scale mapping assessment identifies and accurately characterizes connections and breaks, whether anthropogenic or natural, given the fluidity of CWA interpretation.

As described above, the jurisdictional status of any given waterbody may change over time as CWA guidance is issued and/or revised. The purpose of the PJWM is to provide the LLBO with a remotely sensed, initial assessment of where jurisdictional breaks may occur based upon different jurisdictional connection definitions. While the PJWM incorporated all available geospatial data to provide scenario-based jurisdictional assessments, there are likely existing unmapped features that could result in significant changes to scenario-specific outputs. In many cases, breaks between model output jurisdictional waters occurred primarily along roads, railroad beds, and dikes (Figure 8). An example evaluation of jurisdictional breaks between these feature types are provided in Plate 3.

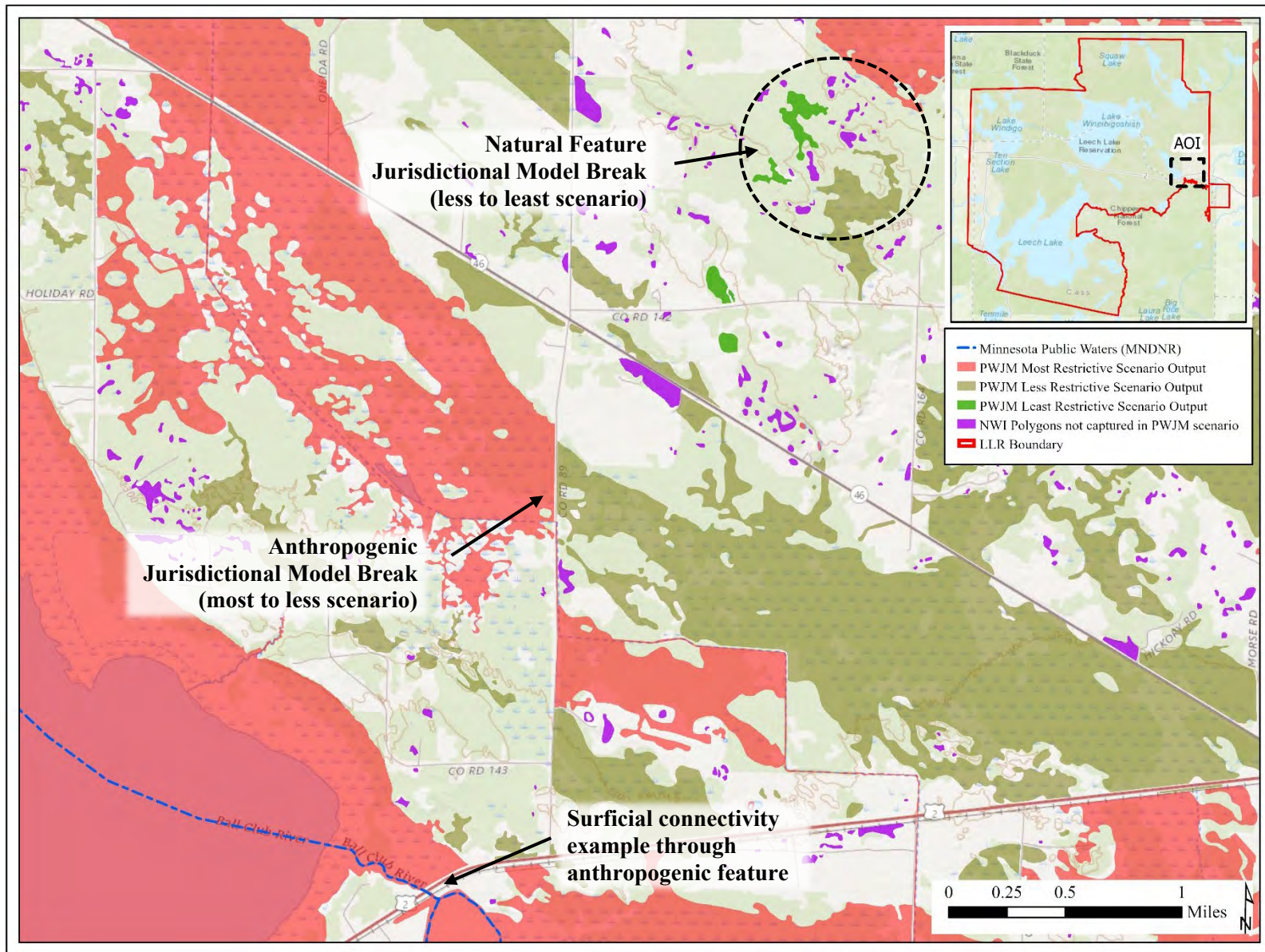


Figure 8. Example Potential Jurisdictional Wetland Model (PJWM) outputs depicting examples of model scenario connections and breaks within the LLBO Reservation.

An approach and strategy to determine how assessments should be implemented for PJWM breaks between differing scenario runs is provided below.

***Objective 1: Identify where and why jurisdictional breaks occur within the PJWM output***

- Objective(s):
1. Conduct a desktop assessment of the PJWM model output to determine the locations where modelled scenario breaks occur
  2. Identify the reason(s) for which the PJWM model break occurred; examples include:
    - a. Anthropogenic flow impediment (roads, rail beds, dikes, etc.)
    - b. Natural topographic or upland break
    - c. Lack of geospatial data resolution
  3. Create a geodatabase that identifies the location and remotely assessed type of impediment to surficial connectivity between NWI polygons

Considerations: The PJWM model utilized a weight of evidence approach to define the likelihood that any given mapped NWI polygon would be considered jurisdictional under the CWA. As a result, the identification of jurisdictional breaks should include an assessment of the probability that the jurisdictional break is real or simply the result of insufficient data. This assessment will assist with the prioritization (Step 2) of specific locations for additional field-based assessments.

***Objective 2: Prioritize locations for field assessment of connectivity***

- Objective(s):
1. Group potential field assessments locations geographically
  2. Prioritize locations for field assessments using a multi-metric matrix (see Figure 9). Prioritization and the weighting of priority assignment could potentially include several factors such as:
    - a. Geographic density of assessment locations
    - b. LLBO priority areas or areas where known assessments will be needed
    - c. Resource intensiveness of anticipated assessment type
    - d. Net gain/loss in potentially jurisdictional waters following connectivity determination

e. Land ownership considerations (i.e. public or private lands)

Considerations:

The rationale and metrics selected for prioritizing field assessments may shift over time or may change based upon not yet identified needed areas of focus. Level of effort and resource intensiveness of anticipated field collection methods is an important consideration. For example, determining surficial connection through an existing road bed via the identification of culverts is less resource intensive than conducting wetland delineations, hydric soil evaluations, and surficial flow characterization when NWI polygons appear isolated due to natural topographic breaks.

Figure 9. Potential Wetland Mapping Strategy prioritization matrix. Ranking along the matrix axes may be driven by multiple environmental and/or logistical consideration.

| Field Assessment<br>Prioritization Matrix              |      | Field Assessment Logistical Priority Score |                   |                   |
|--|------|--|-------------------|-------------------|
|  |      | Low  |                   | High              |
| Environmental<br>/ Water<br>Resource<br>Priority Score | High | Highest Priority                           | High Priority     | Moderate Priority |
|  |      | High Priority                              | Moderate Priority | Low Priority      |
|  | Low  | Moderate Priority                          | Low Priority      | Lowest Priority   |

***Objective 3: Develop a field assessment protocol***

- Objective(s):
1. Identify the specific methods that will be utilized during field assessments; potential water resource types that may be encountered for which protocols should be established include:
    - a. Wetlands
    - b. Tributaries
    - c. Infrastructure (i.e. culverts, dams, flow control structures, etc.)
  2. Train all field assessment staff to ensure an adequate understanding of the protocols prior to conducting field assessments.

Considerations: To the greatest extent practicable, field assessments should rely upon existing and future updates to regulatory guidance documents developed by the USACE, MN DNR, and/or other Federal and State agencies. Existing guidance includes:

1. U.S. Army Corps of Engineers Wetlands Delineation Manual, Technical Report Y-87-1, January 1987.
2. U.S. Army Corps of Engineers Regional Supplement to the Corps of Engineers Wetland Delineation Manual: Northcentral and Northeast Region (Version 2.0), ERDC/EL TR-12-1, January 2012.
3. U.S. Army Corps of Engineers Integrating Hydrologic Modelling, Hydraulic Modeling, and Field Data for Ordinary High Water Mark Delineation, ERDC/CRREL TR-16-3, February 2016.
4. U.S. Army Corps of Engineers, Regulatory Guidance Letter No. 05-05, Ordinary High Water Mark Identification, December 7, 2005.
5. Natural Resources Conservation Service, Field Indicators of Hydric Soils in the United States (Version 8.2), 2018.
6. Minnesota Routine Assessment Method (MnRAM), Evaluating Wetland Function (Version 3.4), September, 2010.

#### ***Objective 4: Conduct field assessment***

- Objective(s):
1. Field assessment should target boundaries and extent of waters and wetlands at a given assessment location
  2. Connectivity, including both surface and subsurface, assessments should be made between remotely determined discontinuous wetland/water areas.

Considerations: Formal wetland and/or connectivity determinations are contingent upon a variety of environmental conditions, including:

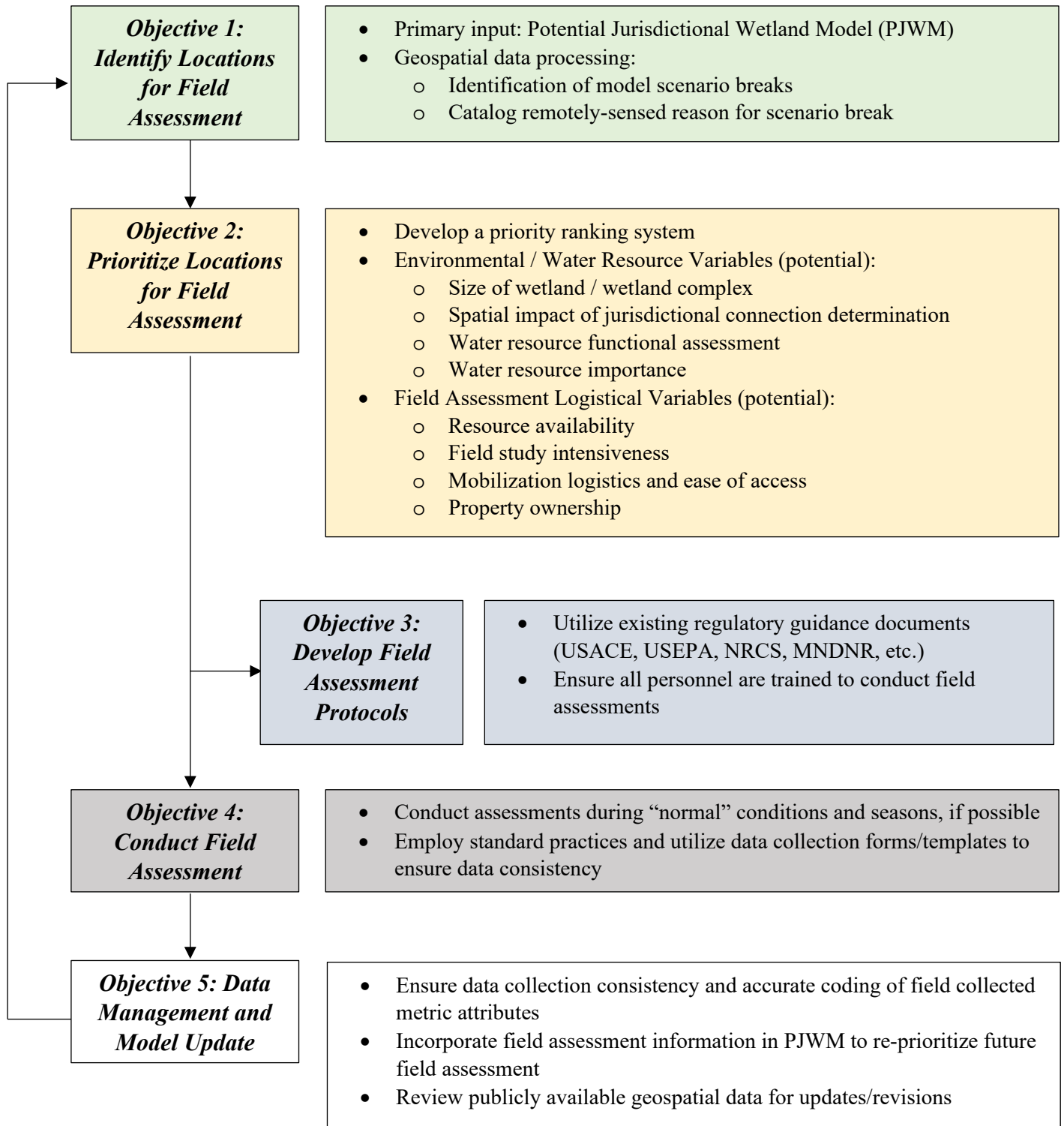
1. Growing season
2. Antecedent climatic conditions
3. Connection periodicity evaluation

#### ***Objective 5: Data Management***

- Objective(s):
1. Develop geodatabase and/or geospatial data collection file templates to ensure data collection consistency
  2. Develop a Standard Operating Procedure for field assessments and data management
  3. Continue to update the PJWM using field assessment data
  4. Conduct routine (e.g. annual) public geospatial data review for updates

Considerations: Data management and data collection consistency is essential. Standardizing both aspects will allow the LLBO to ensure all necessary data is collected in the field and that field assessment metrics are input/coded such that they can be seamlessly incorporated into the PWJM model.

Figure 10. Wetland Mapping Strategy flow chart and considerations.





## 4.2 Mapping Strategy Implementation Example

An example prioritization of field assessment locations within the LLR is provided in Figure 10 to provide a preliminary review of considerations for implementing field assessments. A prioritization matrix and rationale for the priority assignments for each of the identified field assessment locations are provided below in Tables 5 and 6. It is anticipated that future field assessment priority assessments conducted as a part of Strategy implementation across the entire LLR may utilize different priority variables and/or rankings to meet the objectives of the larger Strategy.

Table 5. Example priority matrix used to develop the example field assessment prioritization included in Table 6 and Figure 10.

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

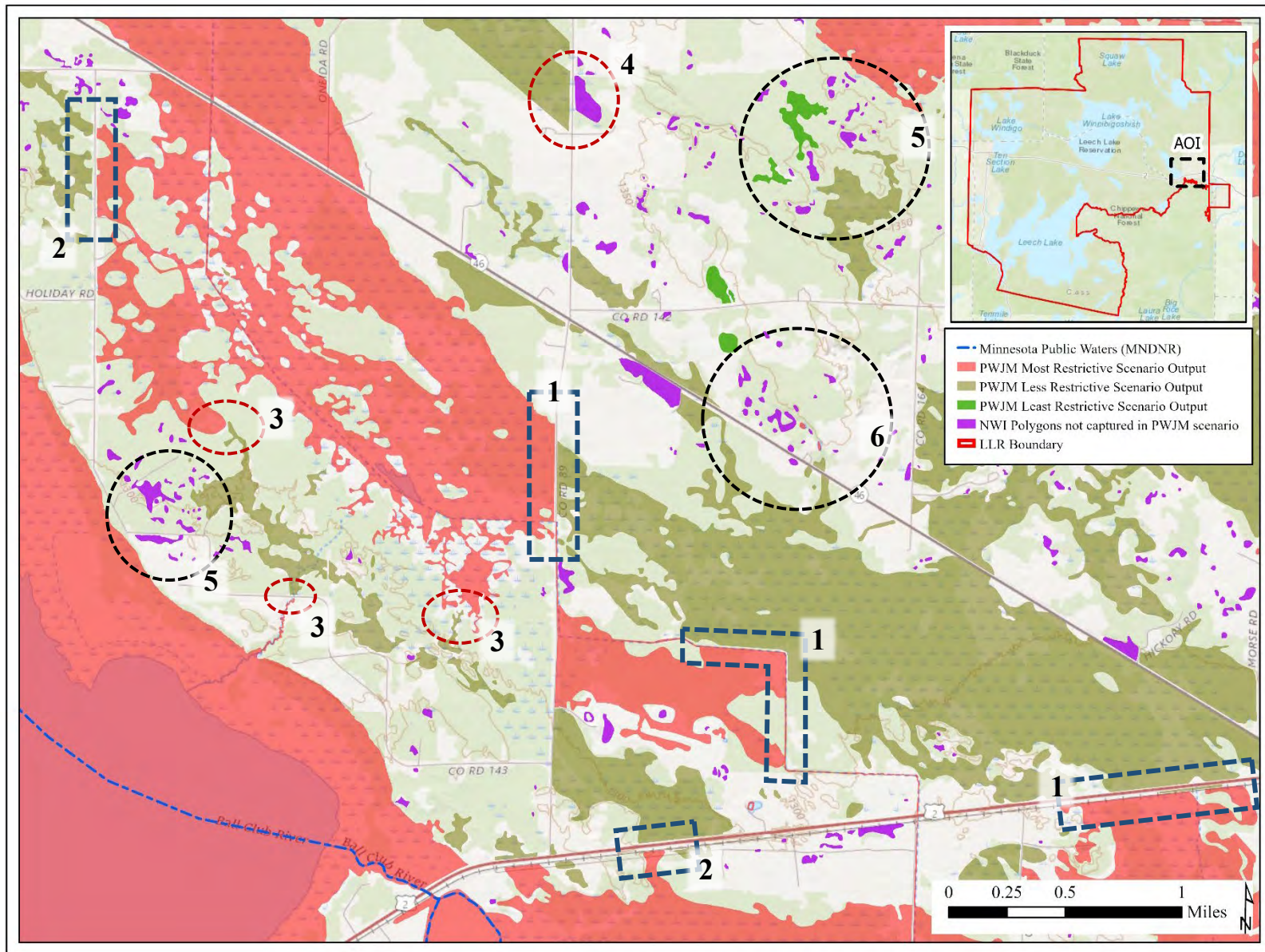


Figure 11. Example field assessment prioritization within the LLBO Reservation.

## 5.0 Conclusions

In conclusion, a Potential Jurisdictional Wetland Model and Wetland Mapping Strategy was developed for three HUC-8 watersheds located within the Leech Lake Band of the Ojibwe Reservation. This model provides the Tribe with an adaptable tool that incorporates federally and state developed geospatial data layers, methods of determining and prioritizing future field assessments, and the ability to interpret Reservation-specific and future field-based data sets to continue to refine the location and extent of WotUS even under changing regulatory interpretations. Further, future refinement and updates of publicly produced secondary data can be incorporated as it becomes available, maximizing the utility of the tool.

## 6.0 References

- Cowardin, L.M., V. Carter, F.C. Golet, and E.T. LaRoe. 1979. Classification of Wetlands and Deepwater Habitats of the United States. U.S. Department of the Interior, Fish and Wildlife Service FWS/OBS-79-31, December 1979.
- Meyer, R., and A. Robertson. 2019. Clean Water Rule spatial analysis: A GIS-based scenario model for comparative analysis of the potential spatial extent of jurisdictional and non-jurisdictional wetlands. Saint Mary's University of Minnesota, Winona, Minnesota.
- United States Geological Survey. 2003. Water-Data Report MN-03-1. *Water Resources Data in Minnesota. Water Year 2003: Annual Report*. <https://pubs.usgs.gov/wdr/WDR-MN-03-1/pdf/2003AnnualReport.pdf>
- White, D. 2020. Ecological Regions of Minnesota: Level III and IV maps and descriptions. March, 2020.



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.



Plate 2. Example USACE Traditional Navigable Waters and MN DNR Public Waters present within the LLBO Reservation: A) Mississippi River and B) Lake Winnibigoshish. Photos taken in October 2019.



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.

**APPENDIX B**  
**Leech Lake Band of Ojibwe Tribal Wetland Ordinance**





**LEECH LAKE RESERVATION BUSINESS COMMITTEE**

**RESOLUTION NO. 2018 - 54**

**RESOLUTION TO ADOPT A NEW TRIBAL WETLAND ORDINANCE**

**WHEREAS,** The Leech Lake Band of Ojibwe ("Band") is a Federally recognized Indian Tribe organized under the Indian Reorganization Act of 1934, and operating under the Revised Constitution and Bylaws of the Minnesota Chippewa Tribe; and

**WHEREAS,** Pursuant to its inherent sovereign authority and its By-Laws, the Band's Reservation Business Committee ("RBC"), made up of duly elected representatives, is the governing body of the Band, having all the legislative powers and responsibilities of the tribal government; and

**WHEREAS,** The RBC is charged with the responsibility of protecting and advocating for the health and welfare of Leech Lake Band members within the exterior boundaries of the Leech Lake Indian Reservation; and

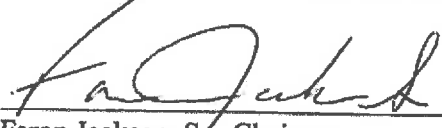
**WHEREAS,** the RBC previously adopted and ratified a land use ordinance including a wetland ordinance section preserving and protecting wetlands within the exterior boundaries of the Leech Lake Reservation

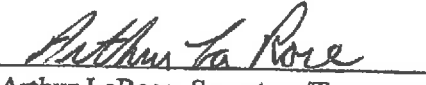
**NOW THEREFORE BE IT RESOLVED,** That the Leech Lake RBC at a duly called meeting with a quorum present, does hereby replace the previous Wetland Ordinance April 2000 with the Tribal Wetland Ordinance 2017

**BE IT FINALLY RESOLVED,** That this Resolution is effective October 26, 2017.

**CERTIFICATION**

**WE DO HEREBY CERTIFY** that the foregoing Resolution was duly presented and acted on by a vote of 3 for, 0 against and 0 silent at a Special Meeting of the Leech Lake Reservation Business Committee, a quorum being present, held on October 26, 2017 at Cass Lake, Minnesota. Accordingly, this Resolution is duly adopted by the Reservation Business Committee for the Leech Lake Band of Ojibwe, and the Reservation Business Committee further certifies that this Resolution is in full force and has not been amended or rescinded in any way.

  
Faron Jackson, Sr., Chairman  
Leech Lake Band of Ojibwe

  
Arthur LaRose, Secretary/Treasurer  
Leech Lake Band of Ojibwe

**Leech Lake Band of Ojibwe**

**Tribal Wetland Ordinance**

**2018 - 02**



**October 26, 2017**

**Leech Lake Band of Ojibwe  
Tribal Wetland Ordinance**

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**Leech Lake Band of Ojibwe Land Stewardship Statement:**

A sovereign nation, the Leech Lake Band of Ojibwe Indians retains the inherent authority to protect and manage the use of the lands, waters, and resources within the exterior boundaries of the Leech Lake Reservation.

The Leech Lake Band believes in the inherent responsibility of perpetual stewardship of the land and the ancestral ties that link the people with past generations. Land use management under the jurisdiction of the Leech Lake Band of Ojibwe shall reflect these continuing Ojibwe values.

**Leech Lake Band of Ojibwe Tribal Mission Statement:**

The Leech Lake Band of Ojibwe is committed to the responsible operation of our government, preserving our heritage, protecting our sovereign rights, spiritual beliefs, and natural resources for our Elders and present and future generations, while enhancing the health, economic well-being, education and our inherent right to live as Ojibwe people.

**Leech Lake Band of Ojibwe Division of Resource Management Mission Statement:**

The Division of Resource Management is committed to the protection, conservation, and enhancement of the Reservation's natural resources in a sustainable manner for the present and future benefit of the Leech Lake Band of Ojibwe.

**Acronym List**

|      |                                 |        |                                       |
|------|---------------------------------|--------|---------------------------------------|
| DRM  | Division of Resource Management | MCT    | Minnesota Chippewa Tribe              |
| EPA  | Environmental Protection Agency | RTC    | Leech Lake Reservation Tribal Council |
| LLBO | Leech Lake Band of Ojibwe       | USACoE | United States Army Corps of Engineers |
| LLR  | Leech Lake Reservation          | US     | United States (of America)            |

**Section 1--Definitions :**

**Definition of a Wetland: (EPA and USACoE)**

**Wetlands are those areas that are inundated or saturated by surface or ground water at a frequency and duration sufficient to support, and that under normal circumstances do support, a prevalence of vegetation typically adapted for life in saturated soil conditions. Wetlands generally include swamps, marshes, bogs, and similar areas.**

**The Leech Lake Band of Ojibwe define a wetland as:**

Wetlands are those areas that are covered by water or have waterlogged soils for long periods during the growing season. Wetlands include seasonally saturated areas, bottomland forests, ephemeral pools, pine savannahs, bogs, wet meadows, and potholes. All wetlands, regardless of seasonality, size or type, are areas that: have wet to saturated soils currently or in the past for long periods of the growing season; have wet to saturated soil seeking plants growing during any part of the growing season; provide habitat for species dependent upon those plants; have species dependent upon open water to wet soil to saturated conditions for survival; show historic evidence of saturated soil conditions (hydric soils; see Appendix A). All such areas described will be considered wetlands.

**Section 2: Finding of Fact:**

**The Leech Lake Reservation Tribal Council determines that:**

- 1) Many of the wetlands within the Leech Lake Reservation boundary and within the 1855 ceded territories have already been lost or impaired due to drainage and fill activities, flow alteration by road construction and forest road use, construction of commercial rice paddies and encroaching urban development.
- 2) Wetlands and associated buffers function to provide a variety of goods and services including:
  - Provide flood conveyance and storage
  - Provide stormwater detention and stormwater filtration
  - Maintain potable water supplies through natural filtration,
  - Provide natural treatment for surface and subsurface waters through biological degradation and chemical oxidation/reduction
  - Provide additional non-point source pollution prevention by acting as natural buffers to surface waters
  - Provide linkages between aquatic systems
  - Provide living, breeding, nesting, and feeding habitats for numerous wildlife including waterfowl, shorebirds, deer, and many water dependent biota
  - Provide nurseries and sanctuaries for fish
  - Provide areas for fishing, hunting, and gathering as guaranteed in perpetuity under numerous treaties.

All these aspects combine to ensure the health, safety and general welfare of the Leech Lake Band of Ojibwe.

- 3) Activities in wetlands and associated buffers are often subject to flood, erosion and subsidence and exacerbate hazards on adjoining lands. Further loss of wetlands and wetland buffers in quality and quantity is contrary to the continued public health, safety and general welfare of the Leech Lake Band of Ojibwe specifically and other local residents in general.
- 4) In order to ensure no further degradation, loss, misuse or impairment to Reservation wetlands , their designated buffers and the multiple functions which these all serve, a Tribal Wetland Ordinance governing the allowable and appropriate uses of Reservation wetlands and their designated buffers must be established.

This ordinance has been adopted to conserve and protect the remaining wetlands within LLR and in the 1855 ceded territories immediately adjacent to or traversing the Reservation boundaries.

**Section 3: Purposes: (Purposes, Goals)**

**Section 3.01 Purpose**

The purposes of this ordinance are:

- to protect the health, safety and general welfare of the Leech Lake Band of Ojibwe;
- to protect the health and continued natural function of wetlands and wetland buffers both within the Leech Lake Reservation boundaries and in the lands immediately adjacent to those boundaries;
- to protect the rights of the Leech Lake Band of Ojibwe to continue to fish, hunt and gather as guaranteed in perpetuity under Treaties with the Federal government in those wetlands and wetland buffers;

**Section 3.02 Goals**

Specific goals of this Ordinance are:

- To protect the quality and quantity of all wetlands and wetland buffers within and adjacent to LLR;

To achieve no net loss in the quantity, quality and biological diversity of wetlands and associated wetland buffers, to include wetland functions and natural goods and services inherent in and associated with wetlands within and adjacent to LLR;

To avoid direct and indirect impacts that destroy or diminish the quantity, quality and biological diversity of wetlands and associated wetland buffers, to include wetland functions and natural goods and services inherent in and associated with wetlands within and adjacent to LLR;

To reduce expenses incurred due to flooded homes, roads, septic and other waste water treatment systems;

To replace wetlands and wetland buffer functions, values and acreage within or adjacent to the LLR whenever impacts to same have occurred within or adjacent to the LLR;

To minimize impacts to existing land uses and lots by preventing increases in flooding, erosion and other natural hazards due to destruction of wetlands and wetland buffer areas;

To incorporate wetland and wetland buffer protection into the Leech Lake Band of Ojibwe land use ordinance, specifically in the planning, management and development approval procedures.

#### **Section 4—Authority:**

##### **Regulatory Authority**

The Leech Lake Band of Chippewa Indians a/k/a Leech Lake Band of Ojibwe, which is a member of the Minnesota Chippewa Tribe, a federally recognized tribe of Indians organized pursuant to Section 16 of the Indian Reorganization Act of June 18, 1934, (48 Stat. 984) enacts this Tribal Wetland Ordinance as an exercise of its inherent sovereign powers and under the authority of the Constitution of the Minnesota Chippewa Tribe for the promotion and protection of the public health, safety, peace, prosperity, comfort and general welfare of all residents of the Leech Lake Reservation.

#### **Section 5—Wetlands Regulated by this Ordinance:**

##### **Wetlands of the Reservation**

The Leech Lake Band of Ojibwe shall designate all lands to be known as wetlands within the Leech Lake Reservation exterior boundary, that are other than waters of the US as defined by the USACoE. These are the wetlands that shall be regulated under this ordinance. Wetlands are those lands as described and identified in the tribal definition of wetlands as cited above.

#### **Section 6—Delineation of Wetlands and Buffers:**

##### **Delineated Wetlands and Buffers**

Delineated wetlands are those wetlands of the Reservation as described above that have been formally delineated and identified by type.

Delineated wetland buffers are those lands surrounding wetlands of the Reservation as described above that have been formally delineated, including measured dimensions. Buffer dimension requirements vary based on type of wetland the buffers are protecting. A minimum buffer or set-back for any activity surrounding a wetland, to include ephemeral pools and other seasonal wetlands is 25 feet from all edges of the delineated wetland.

Wetlands of higher sensitivity or wetlands that have been identified as containing any endangered or threatened species or have particular spiritual or cultural significance will have buffers or set-backs of greater

dimension, starting with a minimum of 50 feet on all sides of the wetland in question. Wetland buffer or set-back dimensions will be determined based on current wetland Best Management Practices (BMPs); recommended buffer dimensions will not be lessened though they may well be increased to be more protective of critical wetland habitats and resources.

### **Section 7—Permitted Uses:**

#### **Authorized uses, wetlands and wetland buffers**

Tribal members, lessees, or any person acting under tribal member or lessee employment, contract or authorization must abide by the following:

#### **Authorized uses—No permits required:**

- 1) Trapping, Gathering, Fishing, Hunting —including building and maintaining duck blinds, in a manner that is not injurious to the natural resources of the wetland, does not include any alterations to the wetlands and does not include any permanent structures;
- 2) Hiking, Camping, Swimming, Snowmobiling in a manner that is not injurious to the natural resources of the wetland, does not include any alterations to the wetland and does not include any permanent structures;
- 3) Gathering dead and down timber for the express use as firewood in a manner that is not injurious to the natural resources of the wetland, does not include any alterations to the wetland and does not include any permanent structures.
- 4) Designation of a wetland as: a public park, recreation area, outdoor education area, historic and/or culturally significant area, natural study area, game refuge, wildlife preserve, or closed area— provided that said designation does not include use of designated area in a manner that is injurious to the natural resources of the wetland, does not include any alterations to the wetland and does not include any permanent structures.  
(though these activities do not require a permit, plans for the above designations and set-aside wetland areas must be reviewed by the LLBO-DRM and approved by the RTC before receiving authorized designation)

#### **Authorized uses—Permits required:**

- 1) Silviculture—including planting, thinning and harvesting of timber, especially when any alteration to the wetland is involved, whether temporary or permanent, such as but not limited to road construction and water level stabilization;
- 2) Construction and maintenance of residential and/or non-residential buildings, whether seasonal or year round use;
- 3) Construction and maintenance of walkways, observation decks, trails and trail bridges whether seasonal or year round use;
- 4) Construction and maintenance of piers and docks whether wholly within a wetland or through a shoreline wetland to an open body of water, whether seasonal or year round use;

- 5) Designation and development of a wetland as: a private park, public park, recreation area, outdoor education area, historic and/or culturally significant area, natural study area, game refuge, wildlife preserve, closed area, fish and/or wildlife improvement project—when said designation includes any alterations to the wetland, permanent or temporary, to include construction of road or pathways and/or any of the types of structures cited above in lines 2, 3 and 4.

#### **Section 8—Activities Requiring Permits:**

Every activity requiring a permit that is planned in a wetland or wetland buffer zone must first go through the LLBO DRM for plan review and permit application.

If any wetlands are to be directly impacted a permit application must be submitted that includes lost acreage replacement (within reservation boundaries), mitigation to prevent further or additional impacts to wetlands, long term maintenance plans, full and complete disclosure of all activities intended.

If any types of permanent structures are included in the activity plan, the permit request must include a cohesive sustainable operations and maintenance plan for said structures.

All plans for wetland set-aside designations as listed in line 4 under Authorized uses—No Permit required, as well as listed in line 5 under Authorized uses—Permits required above must first be reviewed by the DRM and approved by the RTC to receive authorized set-aside designation.

#### **Section 9—Coordination with other regulatory agencies:**

Upon receipt of a permit application where jurisdictional authorities overlap, the LLBO DRM, acting as the authorized designee for the RTC, will coordinate with the other regulatory agency (agencies) with whom regulatory jurisdiction overlaps to ensure full disclosure of wetland activity plans as well as to ensure mutual approval of activity and plans.

Permit applicants may be required to obtain other permits as required by the regulatory agency (agencies) with whom jurisdictional authority overlaps. Any additional fees or costs associated with obtaining and complying with other regulatory agency requirements will be wholly the responsibility of the permit applicant and are not included in any fees incurred for the permit application submitted to the LLBO DRM.

#### **Section 10—Information to be provided by the permit Applicant:**

The following information must be provided by any permit applicant:

- 1) Name, address, telephone number and e-mail address (if any) of property owner or lessee;
- 2) Name, Title, telephone number and e-mail address of permit applicant if different than above;
- 3) Engineer's or Land Surveyor's stamp, if one has been used by the applicant;
- 4) Location of planned activity (township and range, map coordinates, if residential, fire emergency number);
- 5) Property disposition (trust, fee, Band owned, privately owned, public, or other status (detailed));
- 6) Property zoning classification and restrictions (when applicable) of proposed activity site;
- 7) Date of current property disposition, if purchased—date and amount paid, if leased—lease terms and dates;
- 8) Map showing the full property boundaries and complete dimensions, including any known wetlands;
- 9) Drawing showing the proposed activity site location within those boundaries, including known wetlands;
- 10) Description of current use(s) of the property;
- 11) Description or to scale drawing showing: all existing structures, fills, grading, drainage or culverts; existing waste disposal (septic tank/system, soil absorption field); existing water supply (well with well i.d. number if known);



- 12) Description of vegetative cover of proposed project site, including dominant species (if known);
- 13) Photographs of the proposed project site, showing current conditions;
- 14) Full description of all proposed activities, including when and how activity will be performed;
- 15) Full scale drawing to include: location and measurements of any proposed drainage, fill or dredge area; exact measurements of any structures proposed; exact measurements, location and set-backs of any proposed waste disposal (septic tank/system, soil absorption field); location and set-backs for any proposed water supply installation (well); location and measurements for any proposed culvert, to include planned depth of culvert installation and volume capacity of said culvert;
- 16) Full description of all construction sequencing and timetable, including planned future phases.
- 17) Operations and Maintenance plan for any structures, permanent or temporary;
- 18) Wetland impact mitigation plan, complete with proposed replacement wetland acreage site.  
(note: all proposed replacement wetland acreage sites are subject to DRM approval)

The permit applicant may be required to submit additional information if the LLBO DRM, acting as the authorized designee for the RTC, deems it necessary to determine compliance with the standards and criteria set forth in this ordinance. If an application incurs additional expense for a community or organization for the technical assistance and/or legal assistance in the review of an application, the applicant shall pay the reasonable additional expenses incurred by that community or organization. The permit applicant shall be notified of the expenses and shall deposit the funds prior to the expenses being incurred.

#### **Section 11—Standards and Criteria for Issuance of Wetland/Buffer Area Permits:**

The LLBO DRM, acting as the authorized designee for the RTC, shall not issue a permit unless it finds that the proposed activity:

- 1) will result in no net loss of wetland acreage or wetland function;
- 2) expressly upholds tribal wetland preservation and conservation priorities;
- 3) has been planned to the extent practical to avoid wetland and buffer areas;
- 4) has been planned in a manner to reduce impacts to wetlands and wetland buffer areas;
- 5) includes all appropriate set-backs;
- 6) avoids to every extent possible fragmentation or blocking of hydrologic connectivity of wetlands;
- 7) neither increases flood, erosion, or subsidence hazard on other lands nor itself be subject to flood or erosion;
- 8) neither results in adverse modification of habitat for nor directly jeopardizes any plant or animal listed as an endangered or threatened species;
- 9) does not violate any other applicable Tribal, federal, state, county or local environmental or land use statutes, regulations or ordinances.

The LLBO DRM, acting as the authorized designee for the RTC, shall consider all relevant facts in making any decision on all permit applications, including but not limited to:

- 1) the goals and purposes of this ordinance;
- 2) the environmental impact of the proposed activity;
- 3) threats to the proposed activity from flooding, erosion, high winds, subsidence, and soil limitations;
- 4) adequacy of water supply and waste disposal for the proposed activity;
- 5) whether all reasonable and practical measures have been taken to minimize impacts of proposed activities;
- 6) consistency of proposed activity with local, state and federal comprehensive land use and watershed plans.

The LLBO DRM, acting as the authorized designee for the RTC, shall make written findings on any permit application decision, stating the reasons the permit application is issued or denied. The following may be considered in making a permit application decision:

- 1) the application and supporting documentation;
- 2) public comments, evidence and testimony;
- 3) reports or comments from other local, state, Tribal or federal agencies and commissions;
- 4) comments on the application from regional planning agencies, soil and water conservation districts or other regional organizations.

**Section 12—Conditions which May Be attached to Permits:**

The LLBO DRM, acting as the authorized designee for the RTC, shall issue no conditional permits. Permits shall only be issued on those permit applications that fully address all required aspects for consideration. Proposed activity permit applicant shall be notified in writing as to what amendments or modifications to their proposed activity must be undertaken in order for their permit application to result in a permit being issued. Once those modifications have been incorporated and the proposed activity plan appropriately amended, the permit application will be reconsidered.

No conditional permits shall be issued.

**Section 13—Compensatory Mitigation:**

Wetland acreage impacted, impaired or lost due to permitted uses or to an unplanned accidental event will be replaced at a minimum ratio in accordance with the replacement ratios established in the LLR-WFAM.

The LLBO DRM, acting as the authorized designee for the RTC, retains the right to increase the replacement acreage ratios at anytime in support of Tribal priorities; this provision allows for case-by-case site specific variations within area wetlands and recognizes that some wetlands may hold a greater Tribal significance than reflected in the WFAM criteria. (Attachment A)

**Section 14—Public Notice, Hearings:**

Any person filing a permit application shall be give written notice thereof, by certified mail (return receipt requested) or hand delivered, to all abutters at their mailing addresses shown on the most recent applicable tax list of the assessors. The notice to abutters shall include a copy of the permit application or shall state where copies may be examined and obtained by abutters.

No sooner than 30 days and no later than 60 days after receipt of a permit application and after notice the permit application has been published in one newspaper having general circulation in the area, a public hearing may be held on the application unless it is determined that the activity is so minor as to not affect wetland functions, values, or acreage or have impact upon public properties or the public at large. All hearings shall be open to the public.

**Section 15—Variances (none):**

**Section 16—Nonconforming Uses (not allowed):**

### **Section 17—Bonds and Insurance:**

Upon approval of the application and prior to issuance of a permit, the permit applicant may be required to file a bond with such surety and in such amount and in a form approved by the LLBO DRM, acting as the authorized designee for the RTC,

Release of the bond or surety shall be conditioned on compliance with all provisions of these regulations and the terms, conditions and limitations established in the permit.

Permit applicant may be required to certify that it has public liability insurance against liability which might result from the proposed activity covering any and all damages which might occur within 10 years of completion of such operations, in an amount commensurate with the regulated activity.

### **Section 18—Inspection, Display of Permit, Revocation of Permit:**

- 1) All permits issued pursuant to this ordinance shall allow designated LLBO DRM personnel the right to inspect a project to determine compliance with conditions and the provisions of this ordinance.
- 2) Permit applicant shall notify the LLBO DRM at least five days before the project is to begin; the issued permit shall be displayed prominently at the project site during the undertaking of the activities authorized by the issued permit.
- 3) All permits shall be valid for one year from the date of issuance unless indicated otherwise at the time of permit approval; such change shall be indicated in writing as part of the permit approval.
- 4) If it is found that the permittee is violating provisions of the permit or of other applicable laws, ordinances or regulations, a Stop Work Order (Cease and Desist) will be issued.
- 5) An issued permit may be suspended or revoked by written notice if the permittee has not complied with any term or condition of the permit or has failed to undertake the project in the manner set forth in the permit application.

### **Section 19—Enforcement and Penalties:**

Any person who violates any provision of this wetland ordinance or of a wetland permit issued under the auspices of this ordinance shall be deemed guilty of an offense and upon conviction thereof shall be sentenced to payment of a fine of no less than \$ 25 dollars and no more than \$2500 dollars , revocation of any permit issued, and shall bear the full expense of any and all costs associated with and resulting from all corrective actions to repair any damage that has been incurred by the violation of either this wetland ordinance or the violation of the terms of the issued permit.

Further, if the violation has caused any loss of wetland acres, loss or impairment of wetland function, permanent or temporary, in addition to the above fine, the person guilty of the violation shall replace wetland acreage in accordance with the ratios promulgated under the LLR WFAM; they shall incur and pay all expenses associated with said acreage mitigation; if a natural resource loss claim is filed, the person guilty of the violation shall also be held fiscally responsible for compensation to the LLBO for the full amount of said natural resource loss claim, to include all court costs and fees.

If any person who violates any provision of this wetland ordinance or of a wetland permit issued under the auspices of this ordinance shall be deemed guilty of an offense and upon conviction thereof shall be sentenced to payment of a fine of no less than \$ 25 dollars and no more than \$2500 dollars cannot pay the fine or refuses to pay the fine, they can instead be sentenced to a jail term of up to 180 per offense. A jail term does not alleviate the fiscal responsibility for any and all corrective actions necessary to correct or repair the results of the violation; nor does it alleviate the person from providing compensatory mitigation acres when same are determined to be part of the penalty.

**Section 20—Appeals:**

Appeal on actions, decisions or wording of the LLBO DRM, acting as the authorized designee for the RTC, taken under this ordinance shall be made first to the LLBO Wetland Coordinator, then to the Director of the LLBO DRM. Appeal shall be in writing and shall include:

- 1) the specific action, decision or wording that is being appealed;
- 2) grounds and /or justification for the appeal;
- 3) proposed alternative action, decision or wording to replace those being appealed;
- 4) evidence supporting the benefit of the proposed alternatives;
- 5) any subsequent amendments needed to the original permit application and proposed project plan if such would be necessary in order to accommodate the appeal.

**Section 21—Conflict and Severance:**

This ordinance shall be construed as not to conflict with any provision of local, state or federal law; however the provisions of this ordinance shall control if more restrictive than other local, state or federal laws.

If any portion of this ordinance is held invalid or unconstitutional by a court of competent jurisdiction, all remaining provisions of the ordinance shall continue to be of full force and effect.

**Section 22—Application Fees:**

At the time of permit application the following filing fees shall be paid by the permit applicant:

|           |               |                                    |
|-----------|---------------|------------------------------------|
| \$15.00   | <5000         | square feet of wetland disturbance |
| \$30.00   | 5000-20,000   | square feet of wetland disturbance |
| \$45.00   | 20,000-43,560 | square feet of wetland disturbance |
| \$45.00 + | >43,560       | square feet of wetland disturbance |

NOTE: 43,560 sq ft = 1 acre; for any permit application over 1 acre in total wetland disturbance, the filing fee will be assessed at the rate for 43,560 sq. ft (1 acre) of disturbance plus the additional square footage of disturbance per the fee schedule above. eg: 54,450 sq feet ( 1.25 acres)disturbance total = \$45.00 + \$30.00 = \$75.00