



Gile Flowage Storage Project Wood Turtle Study Report

Northern States Power Company
Gile Flowage Storage Project
Gile Flowage, Wisconsin
GAI Project Number: R220323.01
| FERC No. 15055
September 2022



Prepared by:
GAI Consultants, Inc.
3313 S Packerland Drive, Suite E
De Pere, Wisconsin 54115

Prepared on behalf of:
Mead & Hunt
1702 Lawrence Drive
De Pere, Wisconsin 54115

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Report Authors:

Laura Sass
Senior Project Environmental Specialist

Mary Rohde
Senior Environmental Manager / Associate

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1.0 Project Overview

The Gile Flowage Storage Project (Project/Flowage), Federal Energy Regulatory Commission (FERC) No. 15055, located in the Towns of Pence and Carey and City of Montreal in Iron County, Wisconsin, is owned, operated, and maintained by Northern States Power Company, a Wisconsin corporation (Applicant or NSPW; Figure 1). The Applicant is seeking to obtain an original license for the Project and must submit a Final License Application (FLA) by August 18, 2023. The FLA will include an evaluation of wood turtles (*Glyptemys insculpta*) and availability of suitable wood turtle nesting habitat. As part of licensing process, the Wisconsin Department of Natural Resources (WDNR) requested the Applicant complete a wood turtle study to better understand the abundance and distribution of the species. On the behalf of Mead & Hunt, GAI is pleased to submit the results of a Wood Turtle Study (Study) conducted in June and early July 2022 to fulfill this request. The objective of this Study was to determine if wood turtles, nesting habitat, or evidence of wood turtle nesting was present in three specific areas identified by the WDNR as having suitable habitat for the species (Figure 2).

2.0 Introduction

The Gile Flowage is located in the Montreal River Watershed. Land cover within this watershed is primarily comprised of northern hardwood forests and wetlands. The Flowage is a headwater storage reservoir that empties into the West Fork of the Montreal River (West Fork). The reservoir is essential to the operation of NSPW's two downstream hydropower plants. Water quality here is considered good, and all three study reaches of the Montreal River include trout waters, which are often well suited for wood turtles as well.

The wood turtle is a state threatened species known to be present within the watershed and in rivers near the Project area. Wood turtles prefer flowing rivers and streams with adjacent wetlands and upland deciduous forests. This turtle is unique in that it is more terrestrial than many other turtles of Wisconsin, preferring to forage in open wet meadows and shrub-carr habitats. They overwinter in river areas that are protected from freezing solid such as deep holes and undercut banks. After emerging in the spring, these turtles will forage up to 300 meters (984 feet) from their waterbody. Wood turtles will build nests from late May to early July within 61 meters (200 feet) from their waterbody in open gravel or sandy areas. The young hatch the same summer and do not overwinter in the nest as do some Wisconsin turtle species (WDNR 2015).

While wood turtles are known to be present within the upper portions of the Montreal River and within the West Fork, upstream of the Project, it is unknown whether surveys for, or casual observations of, wood turtles have occurred within the Project. As part of the licensing effort, the WDNR requested a wood turtle study to further the knowledge of wood turtle distribution within the Flowage. This Study identifies areas of suitable wood turtle nesting habitat within 200 feet of the shoreline and outlines the efforts put forth to determine presence/absence of wood turtles within the three areas defined by the WDNR as having suitable habitat for the turtle (Figure 2). This report summarizes the results of the 2022 wood turtle presence/absence and nesting habitat Study completed June 1 through early July 2022.

3.0 Methodology

The Study was conducted over the course of several weeks and consisted of presence/absence and nesting habitat surveys by a two-person team via boat, canoe, and on foot. Prior to performing the field work, GAI mapped a 200-foot buffer of the shoreline within the Project area at three areas where creeks with good flow enter the Flowage: Linnunpuro Creek, an Unnamed Creek, and the West Fork Montreal River (Figure 3). Topography maps and parcel ownership were then reviewed for terrestrial access feasibility, and aerial imagery was reviewed to determine likely nesting areas. Surveys for presence/absence and nesting were conducted concurrently, and each are described below.

3.1 Nesting Habitat Surveys

Suitable wood turtle nesting habitat was mapped using a Trimble R1 GNSS Receiver with a GPS device on June 1, a sunny day when the temperature was 65° Fahrenheit (F). Wisconsin experienced a cooler-than-average spring; therefore, June 1 was one of the first days within the Study timeframe having temperatures over 50 degrees (Figure 4). At each location, the shoreline was observed by driving the boat slowly along the shore with both observers assessing the visible shoreline within 50 feet of waters' edge, using binoculars where necessary to look for suitable nesting habitat. Suitable nesting habitat was defined as sand or gravel substrate that was either unvegetated or sparsely vegetated, receives sun exposure for most of the day during late spring to early summer and is within approximately 200 feet of the waters' edge. During this survey, the shoreline was also reviewed for potential basking areas, and the observers looked for and identified any basking turtles.

Once the boat survey was completed, potentially suitable nesting areas within 200 feet of the Project shoreline, that could not be seen from the water due to topography and vegetation density, were assessed from terrestrial access points. These areas were primarily comprised of gravel roads and road shoulders. Remaining areas within the 200-foot buffer (i.e., private properties) were assessed via desktop using the information gained from the road and boat surveys to approximate the extent of suitable nesting habitat as completely as possible.

3.2 Presence/Absence Surveys

Visual encounter surveys (VES) for the presence/absence of wood turtles were conducted approximating WDNR survey guidelines (WDNR PUB-ER-684) within 200 feet of the shore in the three areas specified by the WDNR and outlined in Figure 2. Surveys were conducted 2 days per week for a period of 4 weeks, mostly on non-consecutive days. Surveys started on June 1, and because suitable nesting habitat was observed in each of the three areas, the remaining presence/absence surveys were completed in conjunction with the nesting habitat surveys conducted June 14 – July 8. Surveys were completed using a boat, a canoe, and on foot as described below.

Surveys completed by boat consisted of visual searches of areas visible within approximately 50 feet of shore from the waters' edge where wood turtles, if present, could be found basking, nesting, or foraging on shore. Binoculars were used to increase visual proficiency and for turtle identification. The presence of basking turtles and evidence of turtle nesting activity within the survey areas was recorded using a Trimble R1 GNSS Receiver with a GPS device (Figure 3).

All basking turtles observed during the Study were identified to species. Species of turtle nests were subjectively differentiated to the best of the surveyors' ability by comparing sizes of nests by known species. Three turtle species were observed actively nesting: snapping turtles (*Chelydra serpentina*), painted turtles (*Chrysemys picta*), and one wood turtle. The wood turtle was observed outside the Project area in the same location previously identified in the Natural Heritage Inventory review completed as part of the Pre-Application Document development.

Snapping turtle nests are more easily differentiated from other turtle nests as the size will be larger than other species' nests, and they will be more noticeable because the adult female does not take the time to hide the evidence of digging like wood and painted turtles do. Snapping turtles will leave some of the dug-up substrate mounded around the nest and do not flatten it down like the smaller turtle species. It is also common to see a drag mark on the ground by the nest from a snapping turtle's long, thick tail. Differentiating other turtle species' nests from one another is not as straightforward. No clearly documented nest range sizes or specific nest characteristics by turtle species could be found in current literature. There is also overlap in adult turtle species' size ranges, further complicating nest differentiation. According to the WDNR (2015), wood turtles range in size from 12-24 cm (carapace length), and painted turtles range from 10-20 cm on average, although larger specimens have been observed.

The remaining areas of NSPW owned property within the WDNR-specific locations, and 200 feet of the water, were meandered on foot. Within these areas, two surveyors walked abreast at approximately 10-15 meters apart along the shoreline, adjusting the intervals to accommodate for topography and vegetation restrictions, which were extensive. During these surveys, the meander routes were recorded, as were visual encounters of turtles and nests, via Trimble R1 GNSS Receiver with a GPS device (Figure 5).

4.0 Results and Discussion

Surveys did not start until June due to a late ice-out and cold spring. Local ice-off records indicate that the ice did not come off area lakes until approximately May 6 (NLT LTER 2022). Spring temperatures remained cool until early June (Figure 4). All basking turtles observed during the Study were identified as painted turtles. Nesting turtles within the Study area were identified as snapping turtles, and painted turtles or turtles of similar size. No wood turtles were observed within the Study area (including the 200-foot buffers). Photos of each area can be seen in Attachment A, and a summary of survey data can be found in Table 1.

Table 1
Summary of Turtle Study Observations Within the Study Area

Date	Weather	Location	Basking Turtles	Nesting Turtles	Wood Turtles Observed
6/1/22	65° F, Clear with no clouds	Linnunpuro Creek	None	None	None
		Unnamed Creek	1 painted turtle	None	None
		West Branch Montreal River	None	None	None
6/14/22	85° F, Partly cloudy and breezy	Linnunpuro Creek	None	None	None
		Unnamed Creek	None	None	None
		West Branch Montreal River	3 painted turtles	None	None
6/15/22	60° F, Evening right after storms (supplemental visit)	Linnunpuro Creek	n/a	2 nesting snapping turtles; 1 painted turtle walking	None
		Unnamed Creek	n/a	None	None
		West Branch Montreal River	n/a	1 painted turtle walking	None
6/17/22	68° F, Sunny	Linnunpuro Creek	None	None	None
		Unnamed Creek	None	None	None
		West Branch Montreal River	None	1 painted turtle walking	None
6/22/22	65° F, Clear	Linnunpuro Creek	None	None	None
		Unnamed Creek	None	None	None

Date	Weather	Location	Basking Turtles	Nesting Turtles	Wood Turtles Observed
		West Branch Montreal River	None	None	None
6/23/22	80° F, Few Clouds	Linnunpuro Creek	None	None	None
		Unnamed Creek	None	None	None
		West Branch Montreal River	None	None	None
6/28/22	72° F, Partly Cloudy	Linnunpuro Creek	None	None	None
		Unnamed Creek	None	None	None
		West Branch Montreal River	None	None	None
6/30/22	67° F, Partly Cloudy, Storms rolled through in the morning	Linnunpuro Creek	None	None	None
		Unnamed Creek	None	None	None
		West Branch Montreal River	7 painted turtles	None	None
7/6/22	77° F, Cloudy, with some sun	Linnunpuro Creek	None	None	None
		Unnamed Creek	None	None	None
		West Branch Montreal River	3 painted turtles	None	None
7/8/22	71° F, Partly Cloudy	Linnunpuro Creek	None	2 predated snapping turtle nests	None
		Unnamed Creek	None	None	None
		West Branch Montreal River	4 painted turtles	None	None

4.1 West Fork Montreal River

Although the West Fork likely presented the most suitable wood turtle foraging habitat, it is likely that wood turtles are not using the land within the Study area for nesting. Suitable turtle nesting habitat within the Study area was mostly restricted to the boat launch and residential yards with sparse vegetation, which is downstream of where the West Fork's flow dissipates. One clearing in the woods was observed with thin vegetation (shown in Appendix A); however, no nests were observed in that area. All suitable nesting areas mapped were toward the north end of the Study area, further away from flowing water, while all wood turtles and wood turtle nests were observed outside of the Study area, upstream where the flow of the creek is faster, and the habitat is more riverine.

Painted turtles were the dominant species observed during the study and, to a lesser extent, snapping turtles. Most observed turtles were nesting along the gravel roads while multiple nests were mapped at the Sucker Hole Boat Landing. A painted turtle was observed walking across a residential lawn. No wood turtles or evidence of wood turtle nesting were observed

within the Study area. Approximately 600 feet upstream (south) of the Project area, the West Fork is spanned by West Branch Road. While this is outside of the project area, it is a location of known wood turtles. An actively nesting wood turtle and a road-kill wood turtle were observed at this bridge crossing location on the evening of June 15 during the supplemental nesting survey following a storm. This was the only observation of wood turtles during the Study.

Topography in the West Fork Study Area is varied and dominated by large boulders and uneven topography. On the west shore, the upstream area (southern half) of the West Fork is comprised of tag-alder wetland areas and wet-mesic forest. The west shore downstream of the West Fork, progressing north into the Flowage, is lightly developed with maintained lawns and a public boat launch. This area has moderately steep topography but fewer boulders and more exposed (i.e., less shaded) and upland areas. The east shore riparian area is dominated by mesic/talus forest and large boulders with some tag alders in the upstream area and a more talus forest comprising the northern/downstream area. All along the undeveloped shoreline, on both sides of the Study area, trees and dense vegetation are present to the water's edge; therefore, while basking habitat is present in the protected bay areas and foraging habitat is present in the upstream area of this Study area, suitable nesting habitat is restricted to the developed areas of the west shore (lawns, boat launch, and road shoulders). A total of 33,675 square feet (0.77 acre) of suitable turtle nesting habitat was mapped within 200 feet of the Flowage shoreline within the Study area.

Lack of flowing water likely restricts how far wood turtles travel into the Study area. Flow within the river persists for only a short stretch into the Study area and slows as the river widens and enters the Flowage. The road crossing upstream of the West Fork and outside of the Project area appeared to be a preferred nesting area; a wood turtle and a snapping turtle were observed nesting and several additional turtle nests were noted. While this area is outside of the Project boundary, it does reinforce the knowledge that wood turtles prefer streams with flowing water. No wood turtles or evidence of wood turtle nesting were observed in the Project area where the flow dissipates as it enters the impoundment.

4.2 Unnamed Creek

The riparian area adjacent to the Unnamed Creek Study area was the least developed of the three study areas and was dominated by mesic and wet-mesic forest. While this area featured potentially good foraging habitat, it also had the least amount of suitable nesting habitat among the study areas. The east shore has moderately steep topography and is comprised of dry mixed coniferous/deciduous (mesic) forest with large boulders, steeper topography, and a more open, less vegetated, but still shaded, understory. The water-land interface of this shoreline was shaded and steep, providing limited access points for turtles to travel between the ecotones. Suitable nesting habitat was restricted to a rustic campfire/picnic area along shore at the northeast corner of the Study area buffer.

The west shore of this Study area also featured minimal basking area and no additional nesting area. Dense vegetation along the land-water interface provided shade, with a thick mat of reed canary grass and native emergent species extending out into the water. The riparian area is dominated by wetland/wet-mesic forest with a moderately thick understory of saplings, sedges, and tag-alders. Basking areas were also very limited in this area as only one basking painted turtle was observed throughout this study area. No wood turtles or evidence of wood turtle nesting were observed in this area.

Water flow did not appear to be sufficient to support wood turtles very far into the Project area. A snowmobile trail bridge crosses the creek at the south end of the Study area. Water flow was consistent upstream of the snowmobile trail bridge; however, velocity was barely distinguishable north of the bridge as the creek enters the Flowage. A total of 3,242 square feet

(0.07 acre) of suitable turtle nesting habitat was mapped within 200 feet of the Flowage shoreline within this Study area; however, it is unlikely that wood turtles are using the Unnamed Creek Study Area for nesting.

4.3 Linnunpuro Creek

Linnunpuro Creek presented the most danger for turtles with two roads adjacent to this Study area. State Highway 51 travels adjacent to the east side of the Gile Flowage and Anderson Road is a gravel road that crosses the Creek just south of the Flowage. The gravel areas of these two roads offered the only suitable nesting habitat near the creek. Many turtles were observed along both roads during the Study, including turtles nesting, walking, and as roadkill.

The shoreline of Linnunpuro Creek is dominated by reed canary grass (*Phalaris arundinacea*), common bur-reed (*Sparganium eurycarpum*), and wild rice (*Zizania* spp.) growing out into the water. The land-water interface areas of this Study area are comprised of dense vegetation dominated by tag-alders in the wet areas transitioning to mesic forest in the upland riparian areas. Topography is not as steep as the other two Study areas; however, the vegetative understory is extremely thick. Meander surveys were difficult to conduct due to congested windfall trees and the density of the tag alders.

While water flow is consistent upstream of Anderson Road, velocity was less perceivable north of the bridge as the creek enters the Flowage. However, a defined flow path persists through the vegetation for the majority of this Study area.

Available nesting habitat is restricted to Anderson Road and gravel road shoulders along Highway 51. A total of 22,011 square feet (0.5 acre) of suitable turtle nesting habitat was mapped within 200 feet of the Flowage shoreline within this Study area. No basking turtles were observed. The only turtle species observed in this Study area were snapping and painted turtles along the roads. No wood turtles or evidence of wood turtle nesting were observed in this area.

5.0 Conclusion

The Wood Turtle Study proved successful in documenting multiple species of turtles and actively used turtle habitat. Turtles were observed nesting, basking, and walking throughout all three areas requested for study by the WDNR. An additional visit to the Study areas in the evening after a day of thunderstorms proved the most successful in observing nesting turtles. On June 15, a large system of storms moved through the area. Following the storms, the surveyors inspected the suitable nesting areas. Multiple nesting turtles, including three actively nesting snapping turtles, one actively nesting wood turtle (outside of the Study area), and four painted turtles walking were observed. The wood turtle was observed outside the Project area in the same location previously identified in the Natural Heritage Inventory review completed as part of the Pre-Application Document development. The following day, during the planned Study visits, several additional turtle nests were observed and mapped within the Study areas (Figure 3). The sizes of these additional nests were compared to the sizes of nests completed by the turtles observed the night before. From this analysis, the new nests were all presumed to be from either snapping turtles, or painted turtles or turtles of similar size.

High quality nesting habitat (naturally occurring suitable habitat areas not associated with roadways) was not readily available throughout the Study areas. Most of the shoreline was densely vegetated down to the water's edge. Shoreline areas that did not have steep topography typically featured wetland marsh dominated by bur-reed and reed canary grass. While these types of habitats are likely prime for foraging wood turtles, they do not present suitable nesting opportunities, thereby restricting nesting to roads and road shoulders. Traffic on all roads around the flowage was consistent and therefore, unfortunately, nesting turtles are at particular risk to human induced mortality, though recent science suggests higher success rates of roadside nests than previously assumed, due to lower predation rates of nests located in a linear fashion rather than clumped together (Murphy et al. 2022).

Threats to the persistence of turtles include human perturbation, nest predation, and road deaths. A prime example of a human-related threat was observed while travelling to and from the Study areas. While driving along Highway 51 exactly one week after the most active nesting night recorded during the surveys, it was documented that a section of road was being excavated where turtles had been seen nesting the week prior (Appendix A). Nest predation is also a significant threat to turtles. Nest predation was observed on several turtle nests which had been mapped on Anderson Road as well as at the Flowage Road boat launch area. These nests had clearly been dug into and shell fragments could be seen littered around the area.

Ample foraging habitat for wood turtles was observed at all three study areas. Ground cover included bunch berries, strawberries, raspberries, and a diverse community of small herptiles and invertebrates. While the topography was steep and boulder dominated in some areas, and other areas had vegetation dense with tag alders and windfall trees, making human travel extremely difficult, it is likely this ecotone presents prime foraging habitat for wood turtles.

Although the Gile Flowage shoreline is generally undeveloped, turtle observations were lower than expected. The staff that conducted this Study also conducted the Aquatic and Invasive Species Study and did not observe a large number of turtles throughout the summer. No wood turtles were observed within the Study area. While it is likely that wood turtles are foraging in some of the southern border areas of the Flowage in proximity of the creeks flowing into the Flowage, it is unlikely that wood turtles are nesting in areas other than West Branch Road (outside of the study area and the area inundated by the Project), and possibly Anderson Road.

6.0 References

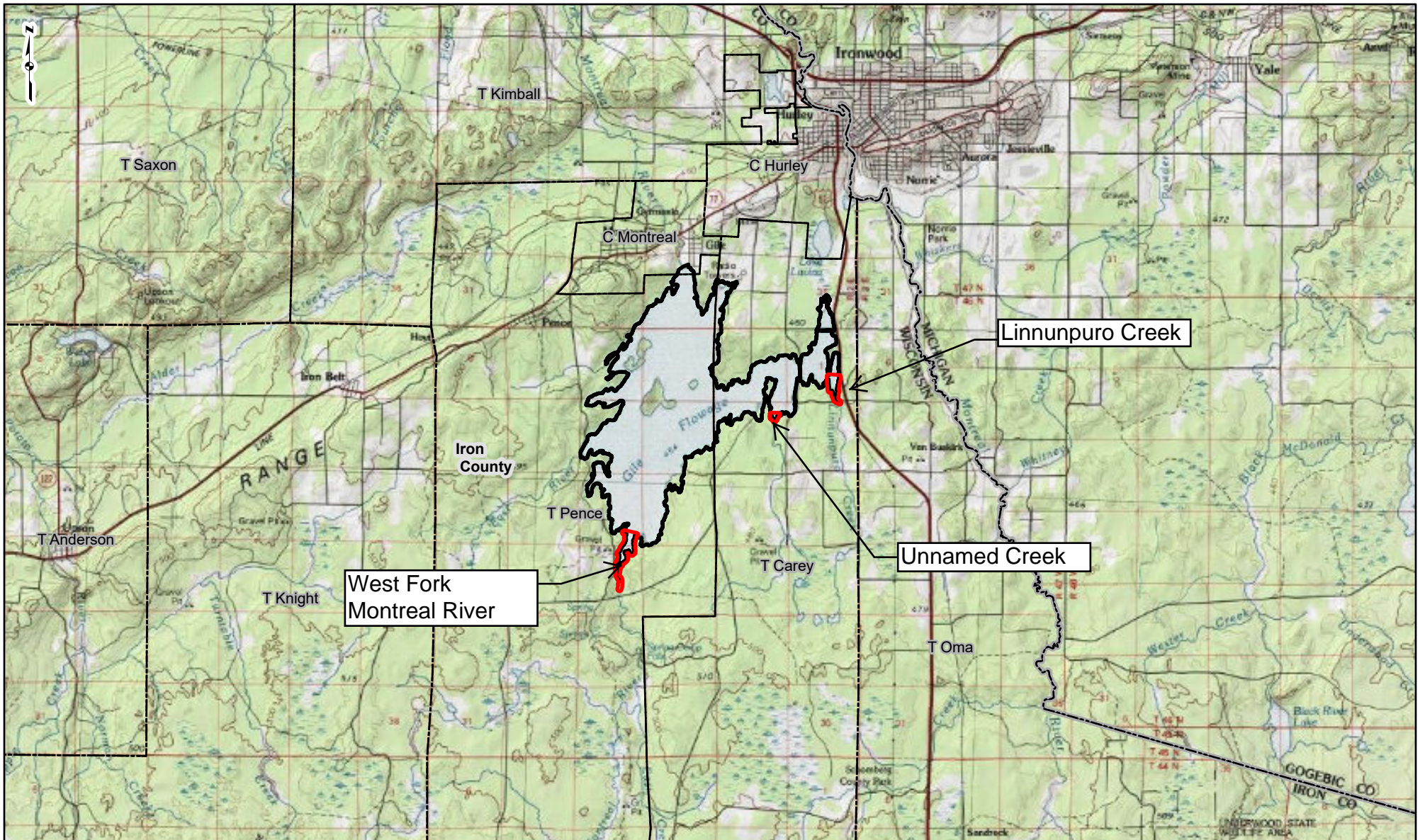
Murphy, Rowan E., Amanda E. Martin, and Lenore Fahrig. 2022. Reduced Predation on Roadside Nests Can Compensate for Road Mortality in Road-Adjacent Turtle Populations." *Ecosphere*13(2): e3946. <https://doi.org/10.1002/ecs2.3946>

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NOAA. 2022. Daily Temperature Data. <https://www.weather.gov/wrh/Climate?wfo=dlh>

WDNR. 2015. Wisconsin Wood Turtle Species Guidance. Bureau of Natural Heritage Conservation, Wisconsin Department of Natural Resources, Madison, Wisconsin. PUB-ER-684.

FIGURE 1
Project Location Map



PROJECT LOCATION

IRON COUNTY, WI

REFERENCE: ESRI USA TOPO Maps
 100k Quadrangles: Ashland (1982), Ironwood (1982), Port Wing (1980), and Solon Springs (1981).
 Accessed 8/29/2022. WDNr Counties, 2011. WISLR Community Boundary 2021.

LEGEND

- Gile Project Area
- Turtle Study Area
- Community Boundary
- County Boundary

0 5,000 10,000 20,000 Feet

FIGURE 1
PROJECT LOCATION

GILE FLOWAGE STORAGE PROJECT
 TURTLE STUDY

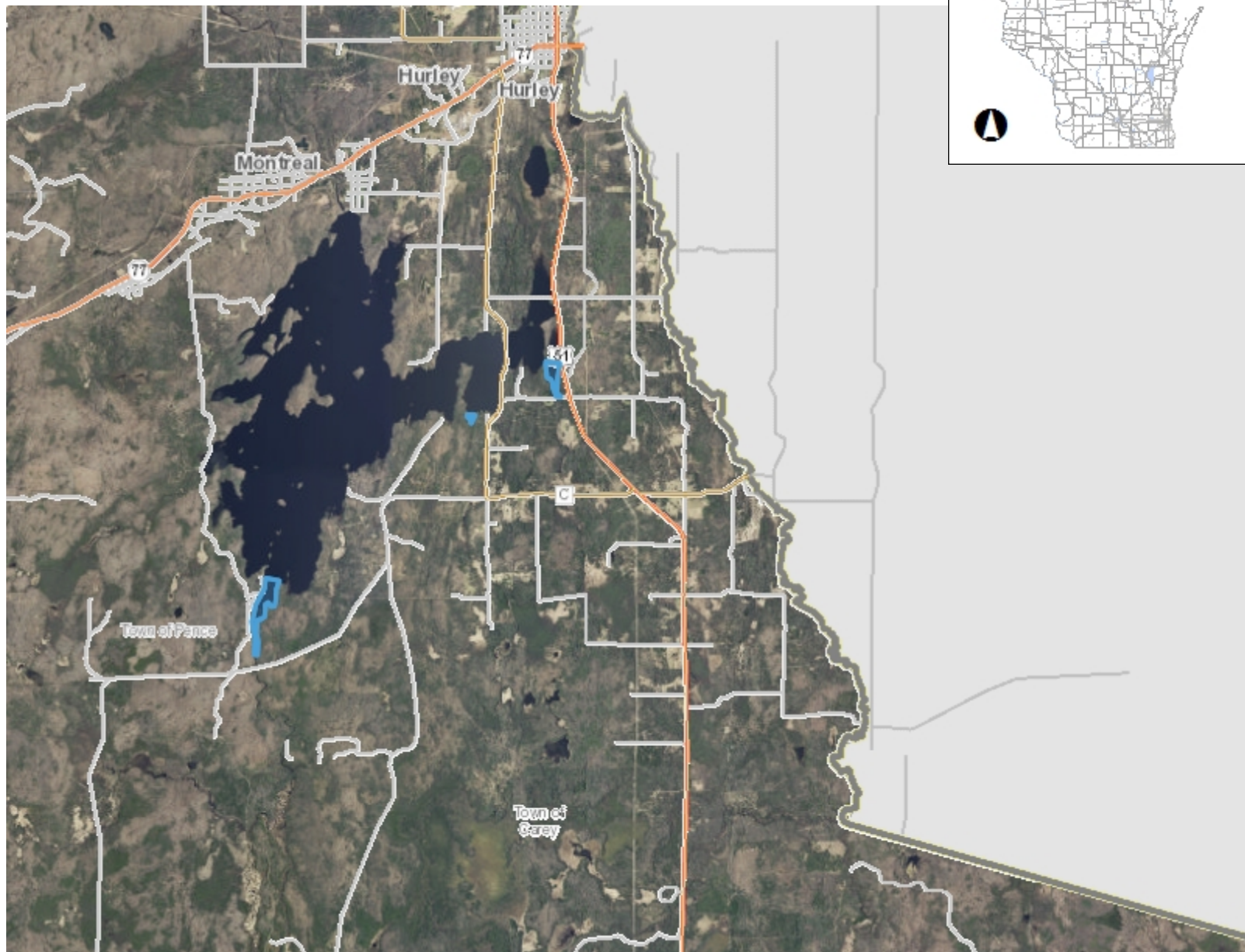
DRAWN BY: EMW DATE: 8/29/2022
 CHECKED: TDB APPROVED: LLS

FIGURE 2

WDNR Requested Areas



Wood Turtle Study Area



Legend

- Municipality
- State Boundaries
- County Boundaries
- Major Roads**
- Interstate Highway
- State Highway
- US Highway
- County and Local Roads**
- County HWY
- Local Road
- Railroads
- Tribal Lands
- Index to EN_Image_Basemap_Leaf_Off

Notes

3.0 0 1.50 3.0 Miles

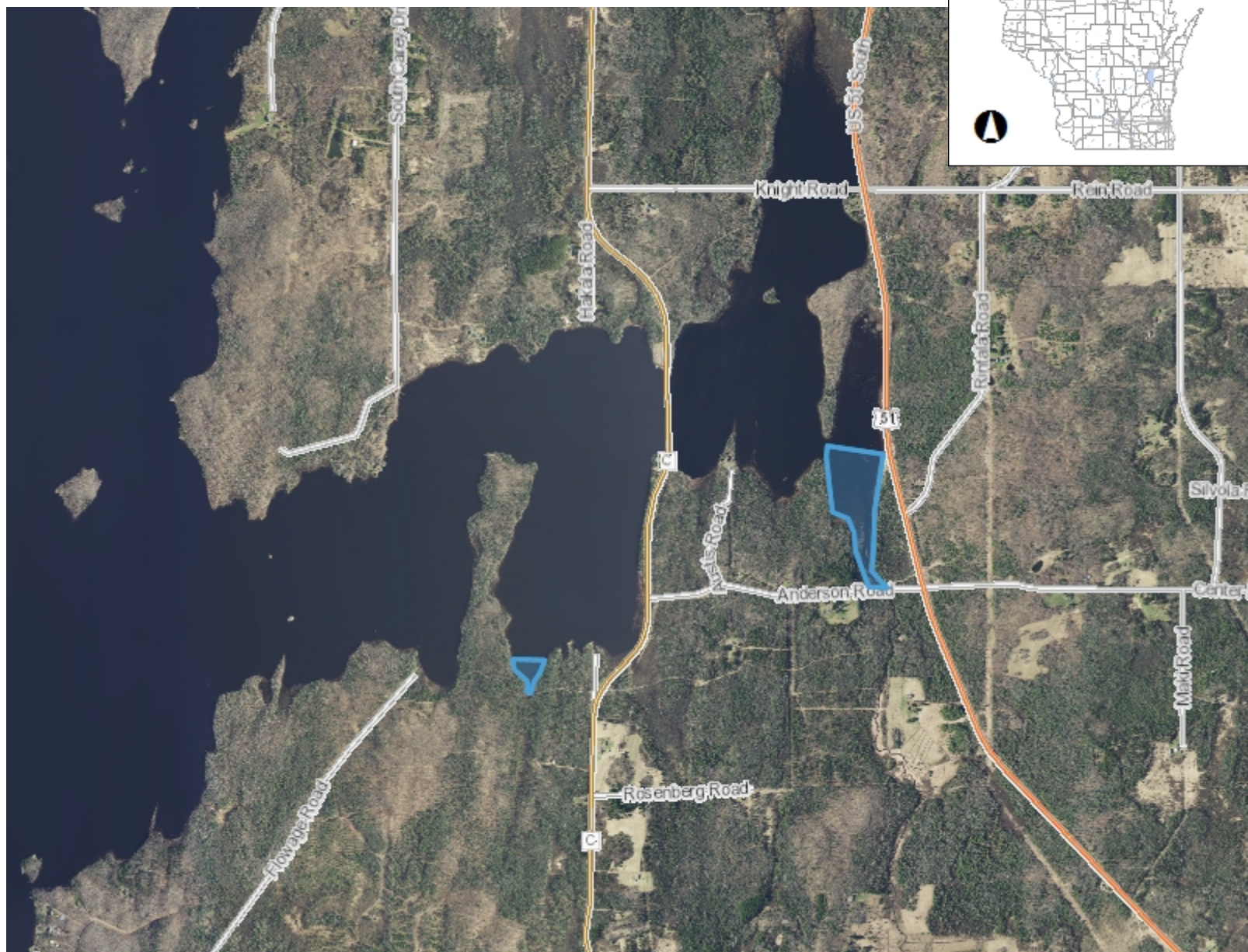
NAD_1983_HARN_Wisconsin_TM

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Wood Turtle Study Area-Linnunpuru Cr. and Unnamed Cr.



- Legend**
- Municipality
 - State Boundaries
 - County Boundaries
 - Major Roads**
 - Interstate Highway
 - State Highway
 - US Highway
 - County and Local Roads**
 - County HWY
 - Local Road
 - Railroads
 - Tribal Lands
 - Index to EN_Image_Basemap_Leaf_Off



NAD_1983_HARN_Wisconsin_TM

1: 23,760

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Notes



Wood Turtle Study Area-W Fork Montreal R



Legend

- Municipality
- State Boundaries
- County Boundaries
- Major Roads**
- Interstate Highway
- State Highway
- US Highway
- County and Local Roads**
- County HWY
- Local Road
- Railroads
- Tribal Lands
- Index to EN_Image_Basemap_Leaf_Off

0.8 0 0.38 0.8 Miles

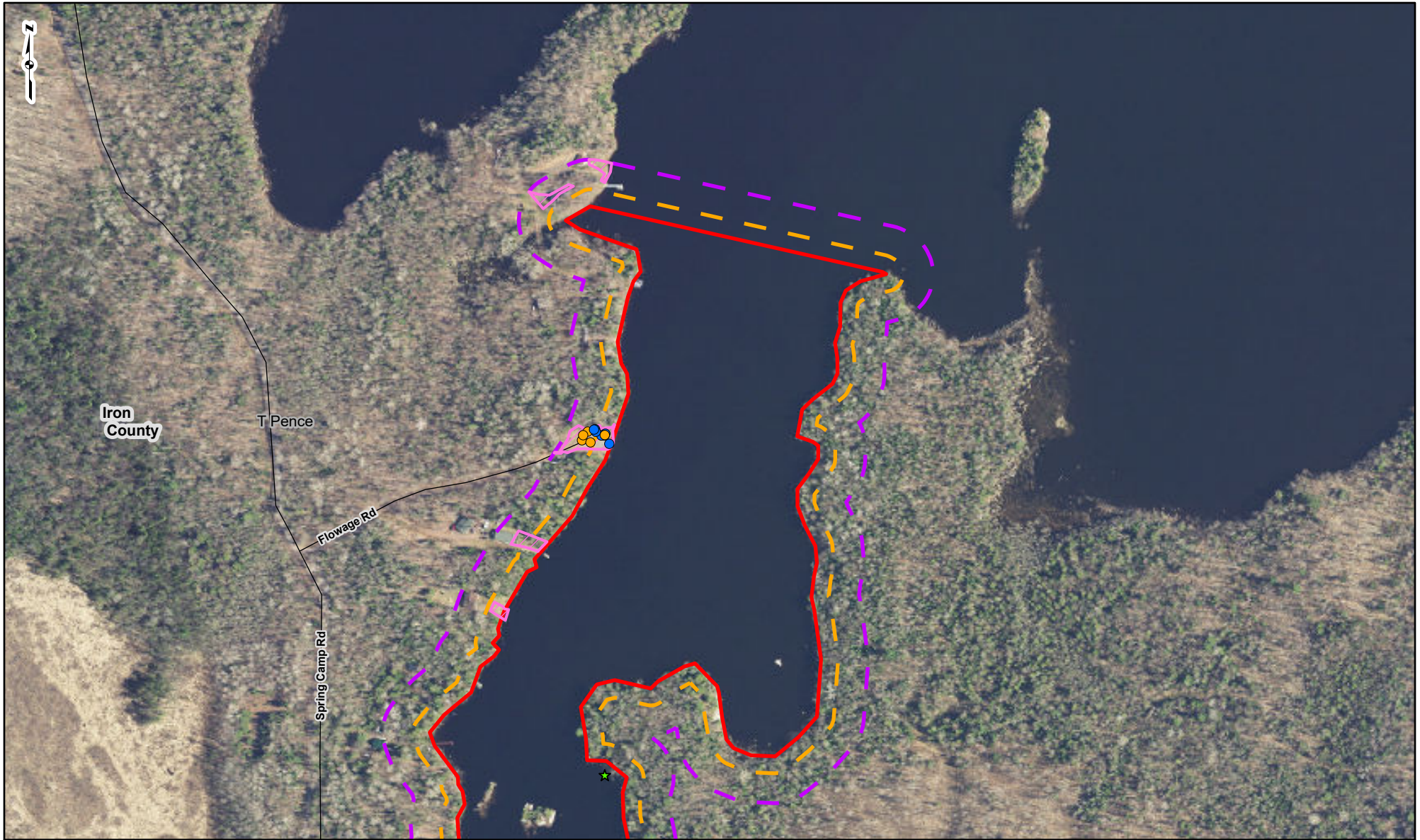
NAD_1983_HARN_Wisconsin_TM

1: 23,760

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Notes

FIGURE 3
Available Turtle Nesting Habitat



PROJECT LOCATION

IRON COUNTY, WI

REFERENCE: WI DNR Leaf Off Imagery, Accessed 8/29/2022. WDNR Counties, 2011. WISLR Community Boundary 2021. WISDOT Road Centerlines, 2021.

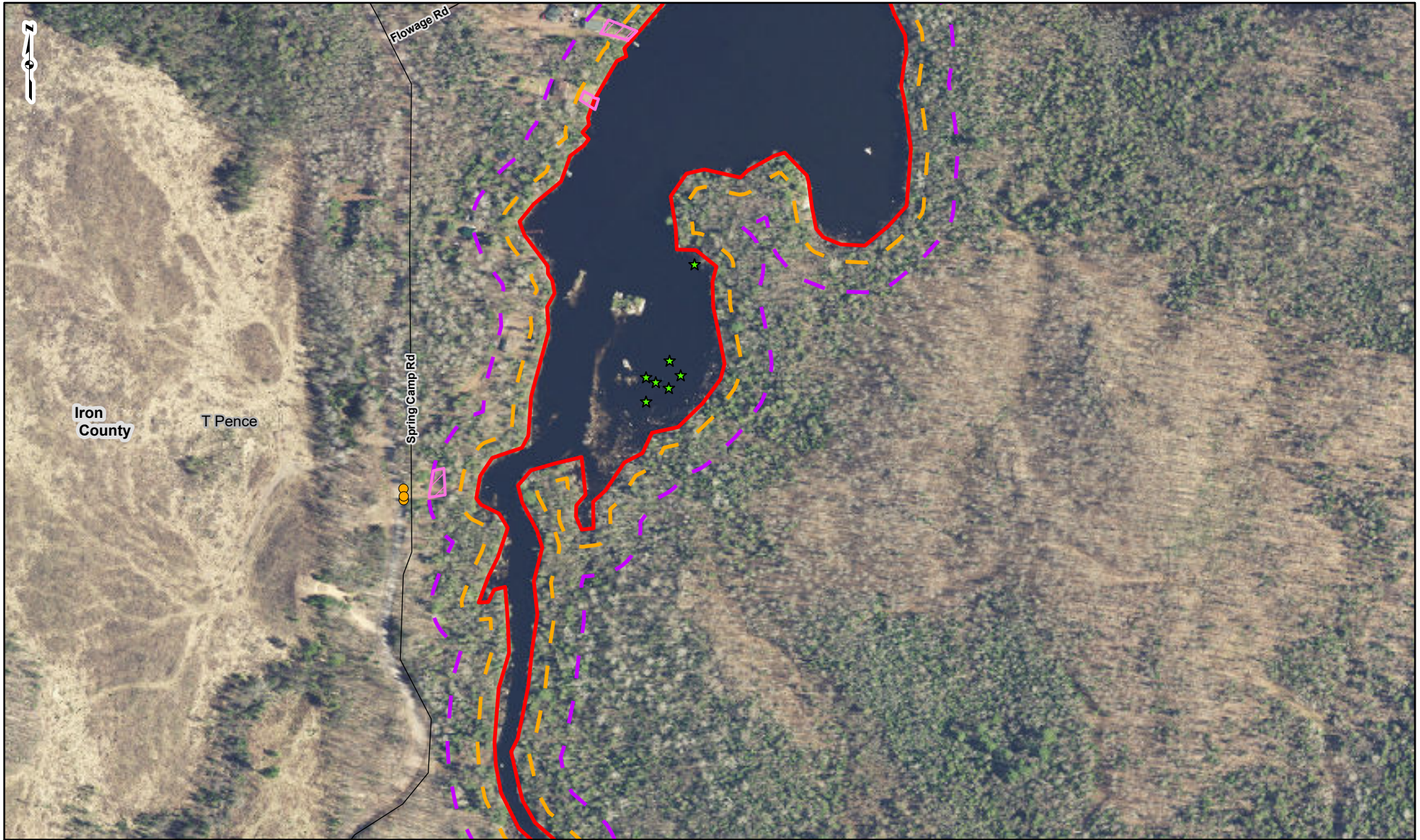
Snapping Turtle Nest	Turtle Nesting Habitat
Wood Turtle Nest	50' Turtle Buffer
Turtle Nest (Painted or Similar Size Sp.)	200' Turtle Buffer
Turtle Basking Location	Shoreline Within Study Area
Road Centerline	Community Boundary
County Boundary	

0 200 400 800 Feet

**FIGURE 3
AVAILABLE TURTLE NESTING HABITAT
SHEET 1 of 6**

GILE FLOWAGE STORAGE PROJECT
TURTLE STUDY

DRAWN BY: EMW DATE: 8/29/2022
CHECKED: TDB APPROVED: LLS



PROJECT LOCATION

IRON COUNTY, WI

REFERENCE: WI DNR Leaf Off Imagery, Accessed 8/29/2022. WDNR Counties, 2011. WISLR Community Boundary 2021. WISDOT Road Centerlines, 2021.

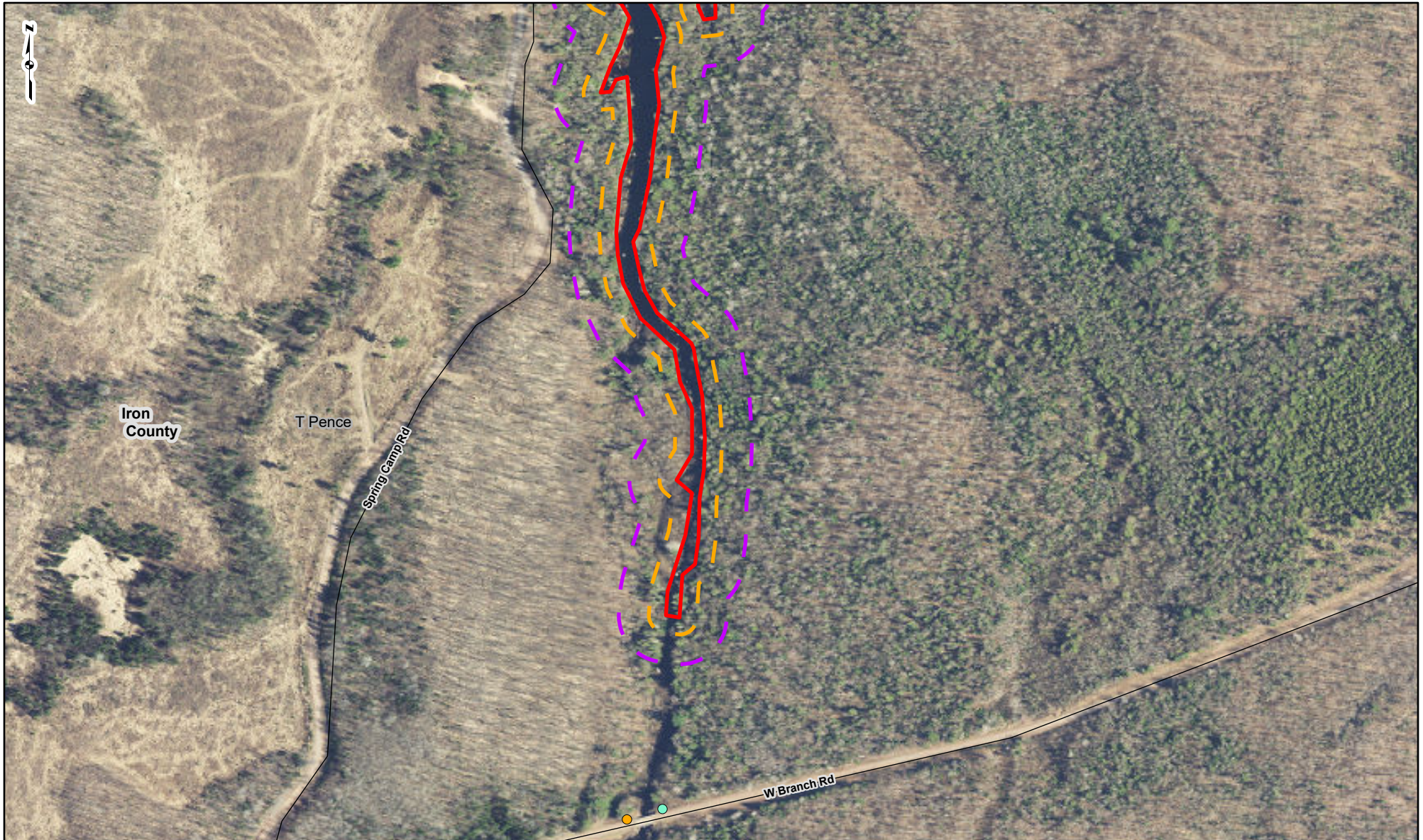
Snapping Turtle Nest	Turtle Nesting Habitat
Wood Turtle Nest	50' Turtle Buffer
Turtle Nest (Painted or Similar Size Sp.)	200' Turtle Buffer
Turtle Basking Location	Shoreline Within Study Area
Road Centerline	Community Boundary
County Boundary	

0 200 400 800 Feet

**FIGURE 3
AVAILABLE TURTLE NESTING HABITAT
SHEET 2 of 6**

GILE FLOWAGE STORAGE PROJECT
TURTLE STUDY

DRAWN BY: EMW DATE: 8/29/2022
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PROJECT LOCATION

IRON COUNTY, WI



REFERENCE: WI DNR Leaf Off Imagery, Accessed 8/29/2022. WDNR Counties, 2011. WISLR Community Boundary 2021. WISDOT Road Centerlines, 2021.

Snapping Turtle Nest	Turtle Nesting Habitat
Wood Turtle Nest	50' Turtle Buffer
Turtle Nest (Painted or Similar Size Sp.)	200' Turtle Buffer
Turtle Basking Location	Shoreline Within Study Area
Road Centerline	Community Boundary
County Boundary	County Boundary

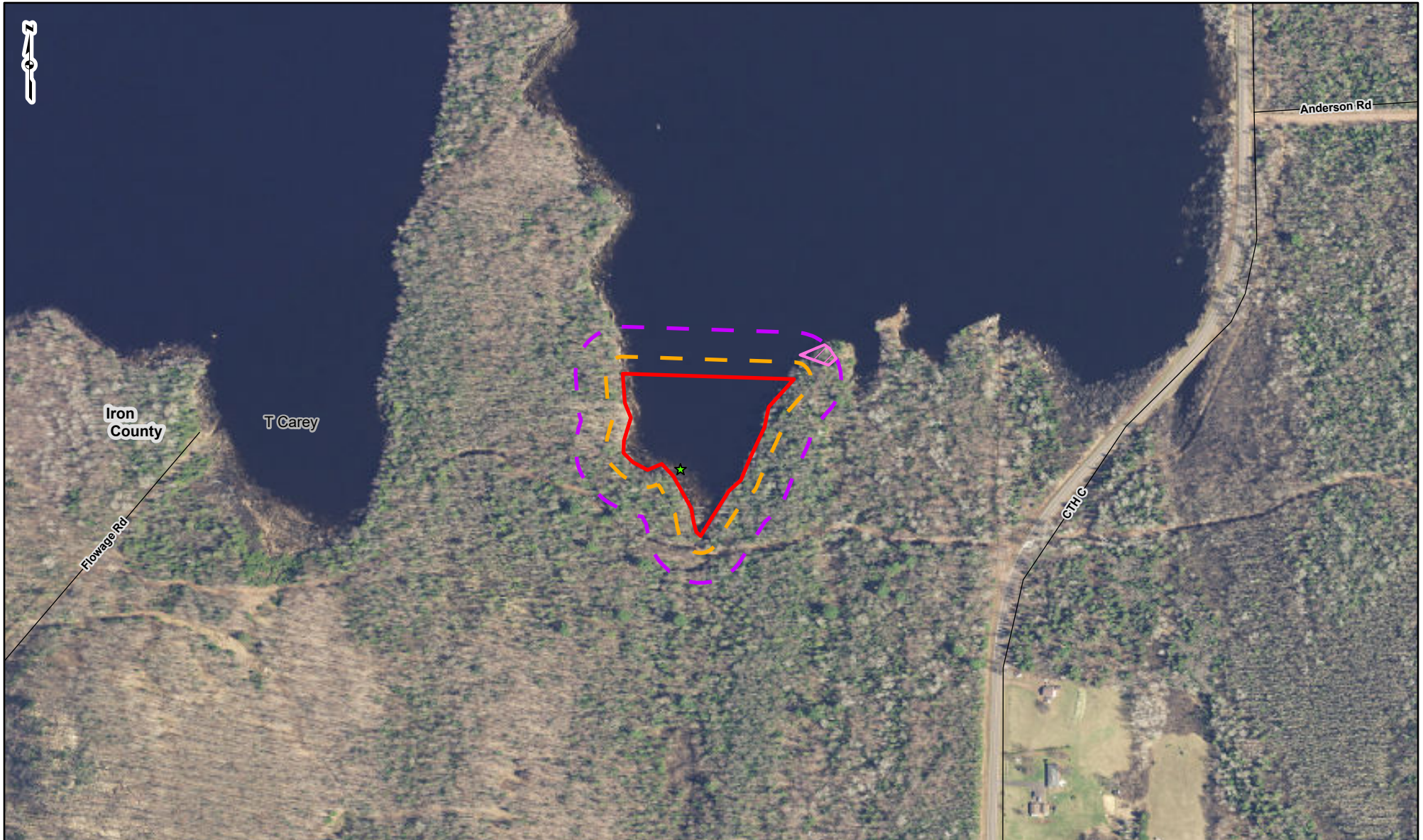
0 200 400 800 Feet

**FIGURE 3
AVAILABLE TURTLE NESTING HABITAT
SHEET 3 of 6**

GILE FLOWAGE STORAGE PROJECT
TURTLE STUDY

DRAWN BY: EMW DATE: 8/29/2022
CHECKED: TDB APPROVED: LLS



PROJECT LOCATION

IRON COUNTY, WI

REFERENCE: WI DNR Leaf Off Imagery, Accessed 8/29/2022. WDNR Counties, 2011. WISLR Community Boundary 2021. WISDOT Road Centerlines, 2021.

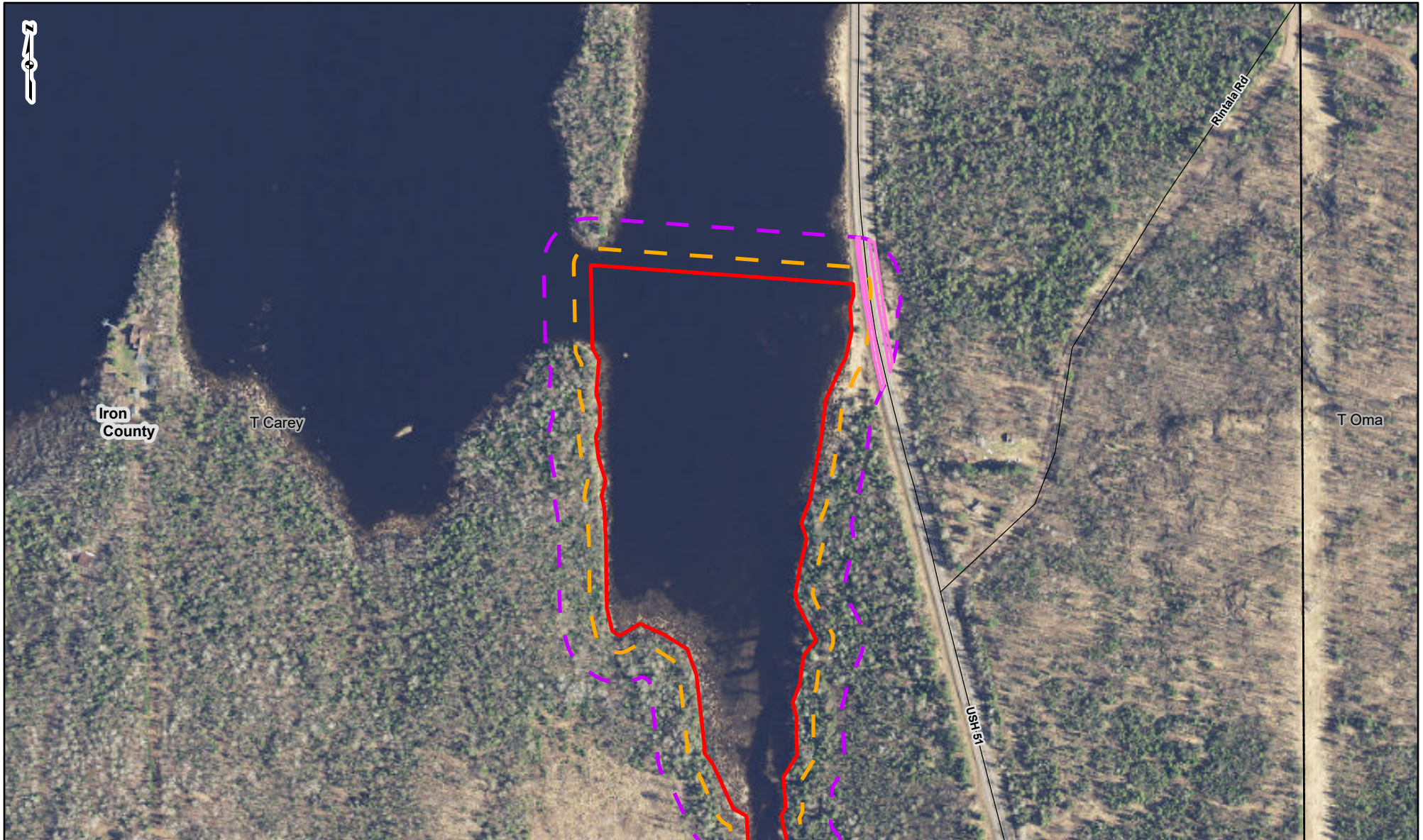
Snapping Turtle Nest	Turtle Nesting Habitat
Wood Turtle Nest	50' Turtle Buffer
Turtle Nest (Painted or Similar Size Sp.)	200' Turtle Buffer
Turtle Basking Location	Shoreline Within Study Area
Road Centerline	Community Boundary
County Boundary	

0 200 400 800 Feet

**FIGURE 3
AVAILABLE TURTLE NESTING HABITAT
SHEET 4 of 6**

GILE FLOWAGE STORAGE PROJECT
TURTLE STUDY

DRAWN BY: EMW DATE: 8/29/2022
CHECKED: TDB APPROVED: LLS



PROJECT LOCATION

IRON COUNTY, WI



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**FIGURE 3
AVAILABLE TURTLE NESTING HABITAT
SHEET 5 of 6**

GILE FLOWAGE STORAGE PROJECT
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0 200 400 800 Feet

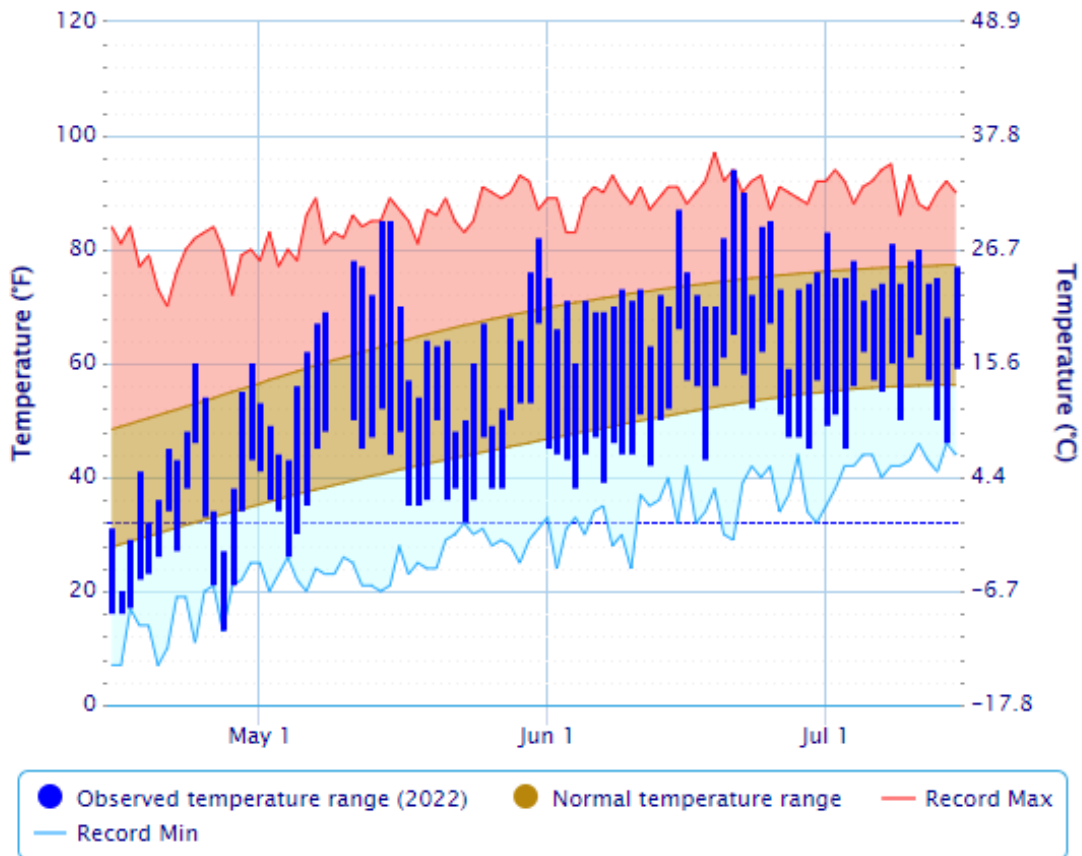
**FIGURE 3
AVAILABLE TURTLE NESTING HABITAT
SHEET 6 of 6**

GILE FLOWAGE STORAGE PROJECT
TURTLE STUDY

DRAWN BY: EMW DATE: 8/29/2022
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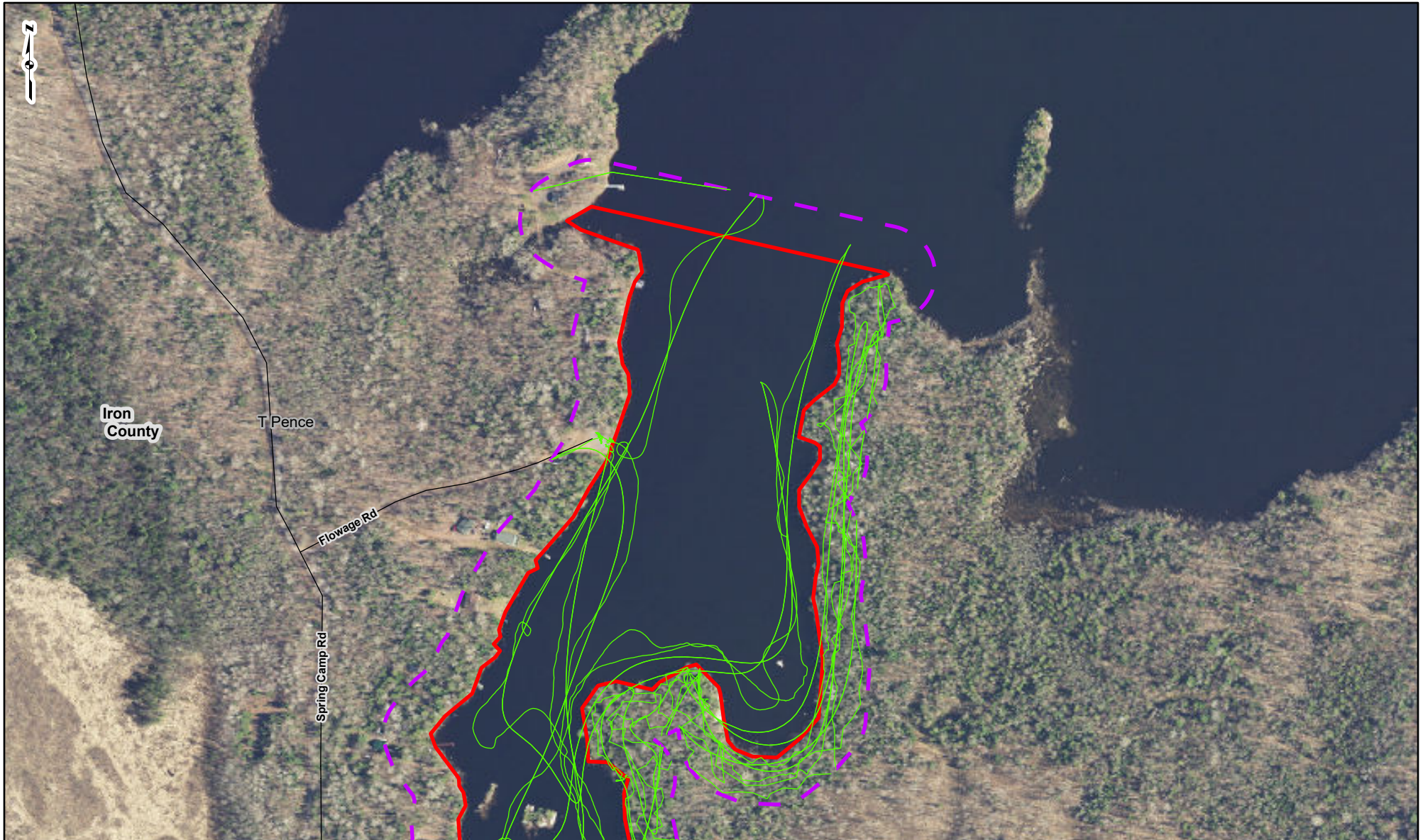
FIGURE 4
NOAA Weather in Hurley, WI

Daily Temperature Data – HURLEY, WI



Powered by ACIS

FIGURE 5
Meander Routes Within 200 Feet of Requested Area
Shorelines



PROJECT LOCATION

IRON COUNTY, WI

REFERENCE: WI DNR Leaf Off Imagery, Accessed 8/30/2022. WDNR Counties, 2011. WISLR Community Boundary 2021. WISDOT Road Centerlines, 2021.

LEGEND

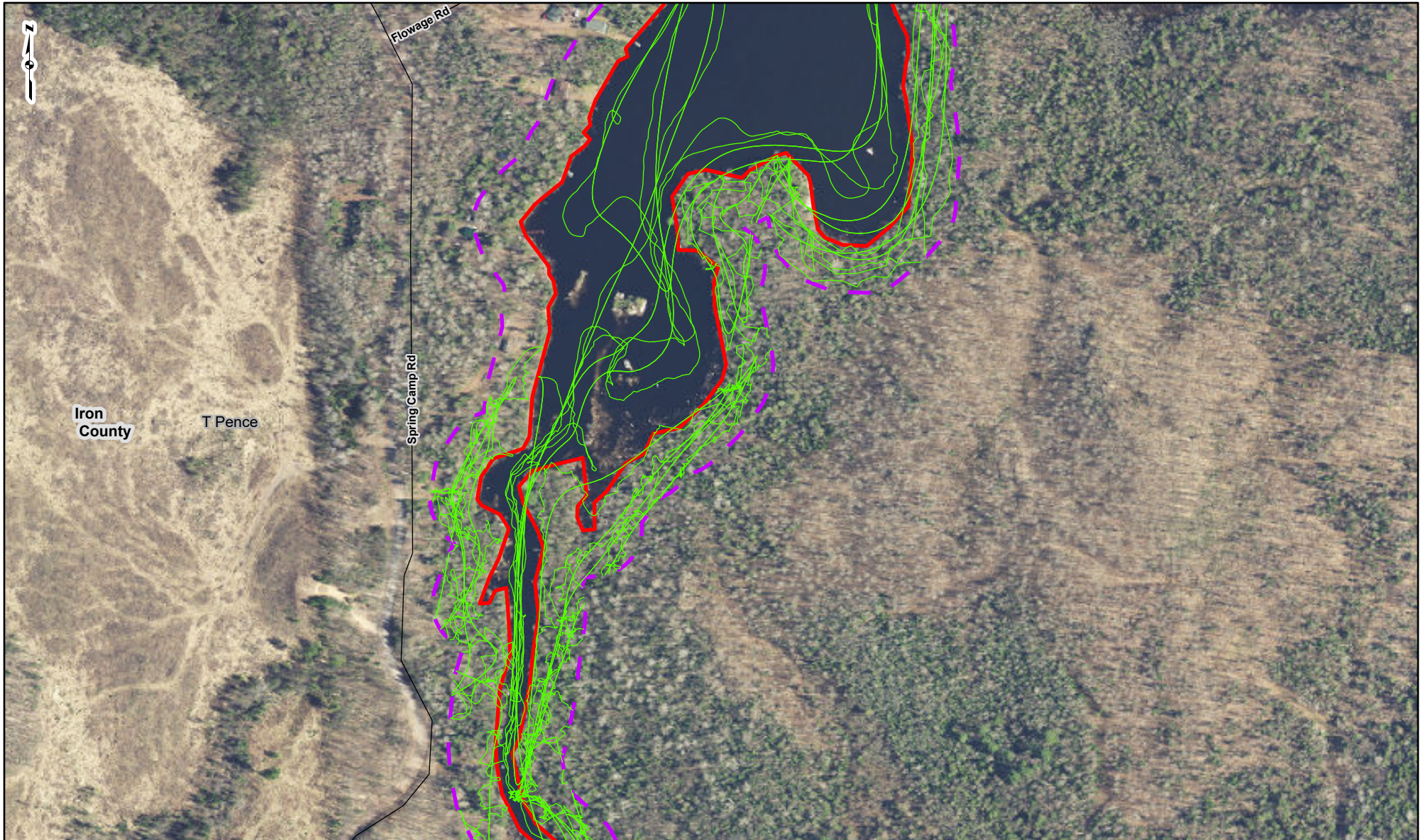
Turtle Meander Routes	Road Centerline
200' Turtle Buffer	Community Boundary
Shoreline Within Study Area	County Boundary

0 200 400 800 Feet

FIGURE 5
MEANDER ROUTES WITHIN 200 FT OF REQUESTED AREA SHORELINES
SHEET 1 of 6

GILE FLOWAGE STORAGE PROJECT
 TURTLE STUDY

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LEGEND

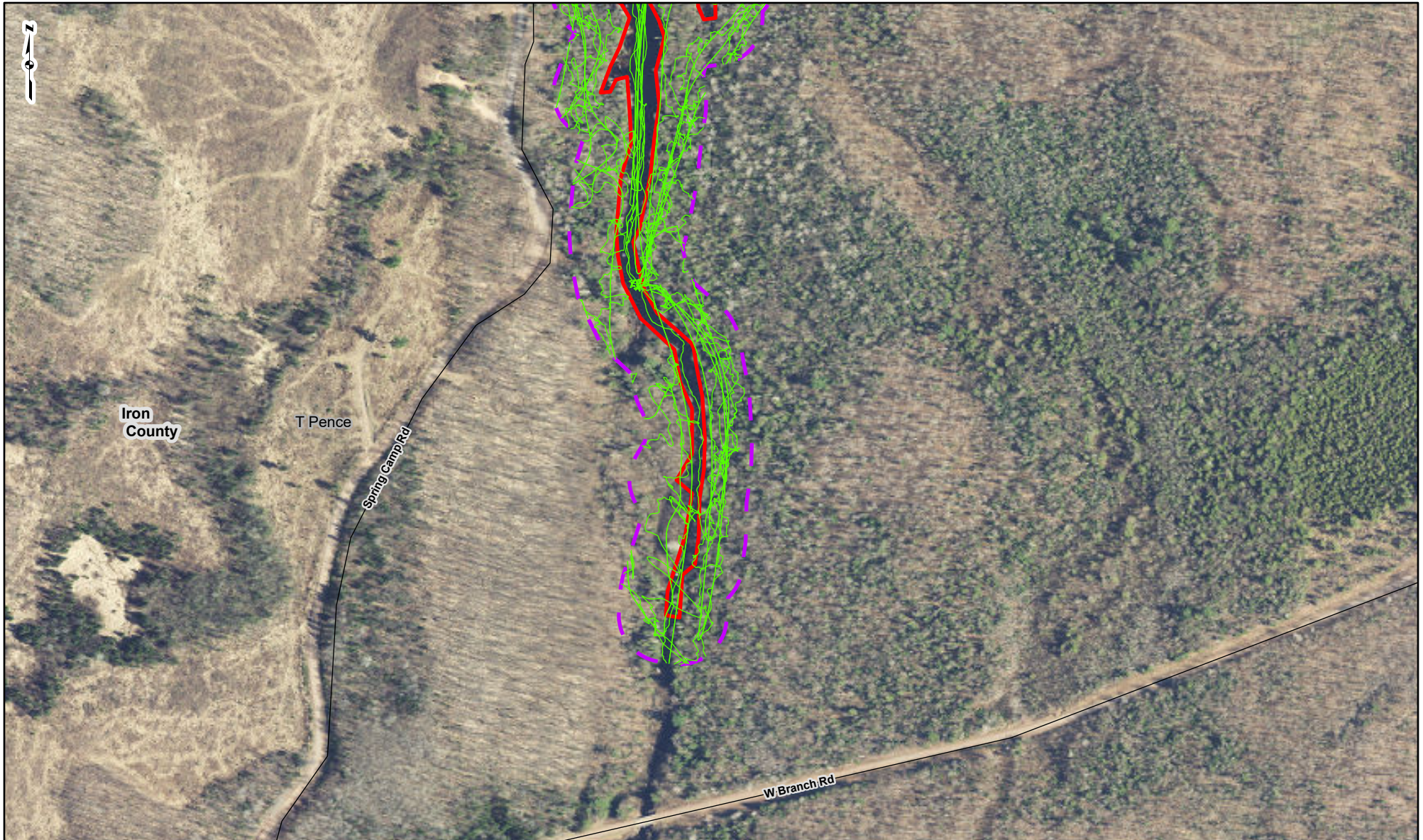
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0 200 400 800 Feet

FIGURE 5
MEANDER ROUTES WITHIN 200 FT OF REQUESTED AREA SHORELINES
SHEET 2 of 6

GILE FLOWAGE STORAGE PROJECT
 TURTLE STUDY

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LEGEND

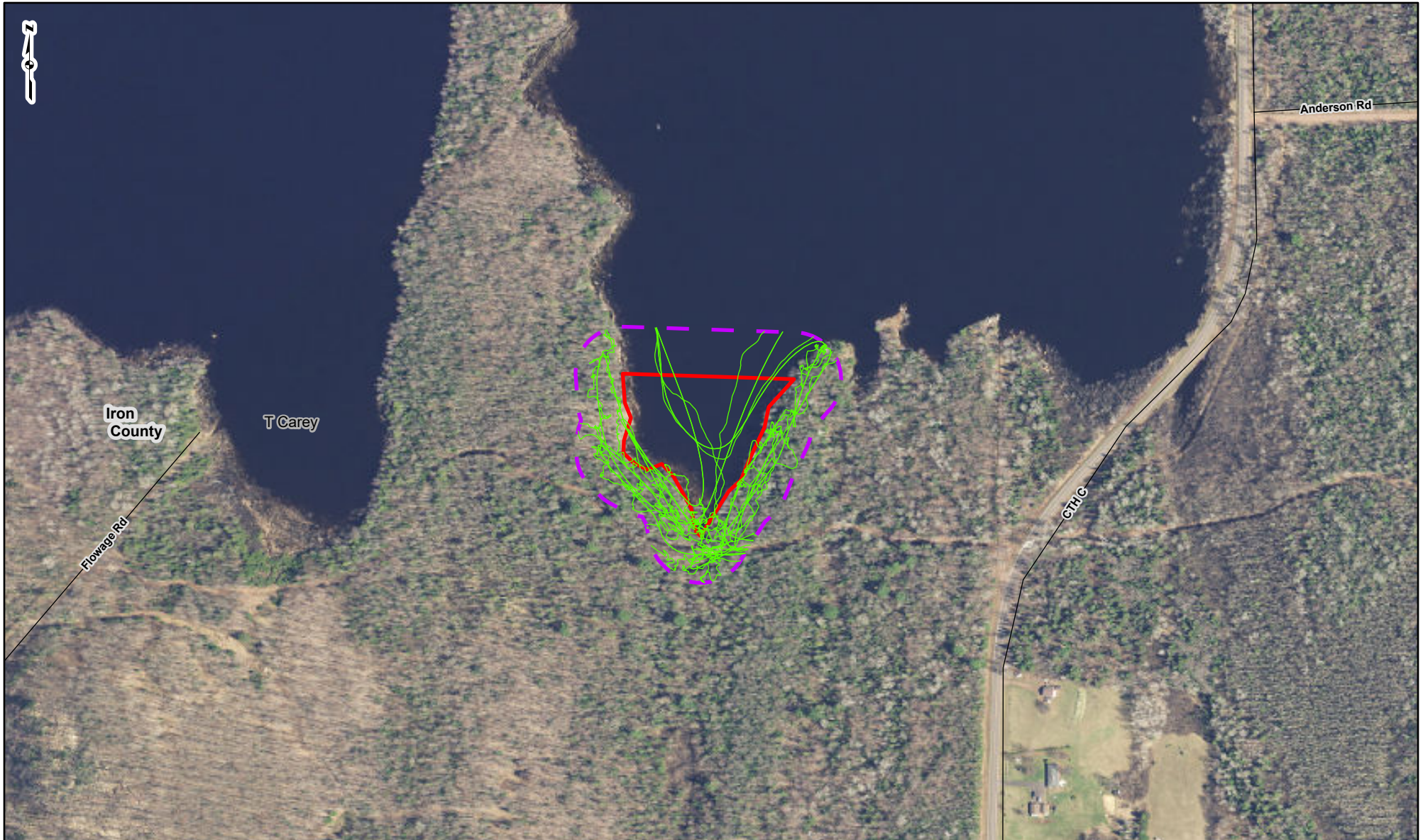
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200' Turtle Buffer	Community Boundary
Shoreline Within Study Area	County Boundary

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FIGURE 5
MEANDER ROUTES WITHIN 200 FT OF REQUESTED AREA SHORELINES
SHEET 3 of 6

GILE FLOWAGE STORAGE PROJECT
 TURTLE STUDY

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LEGEND

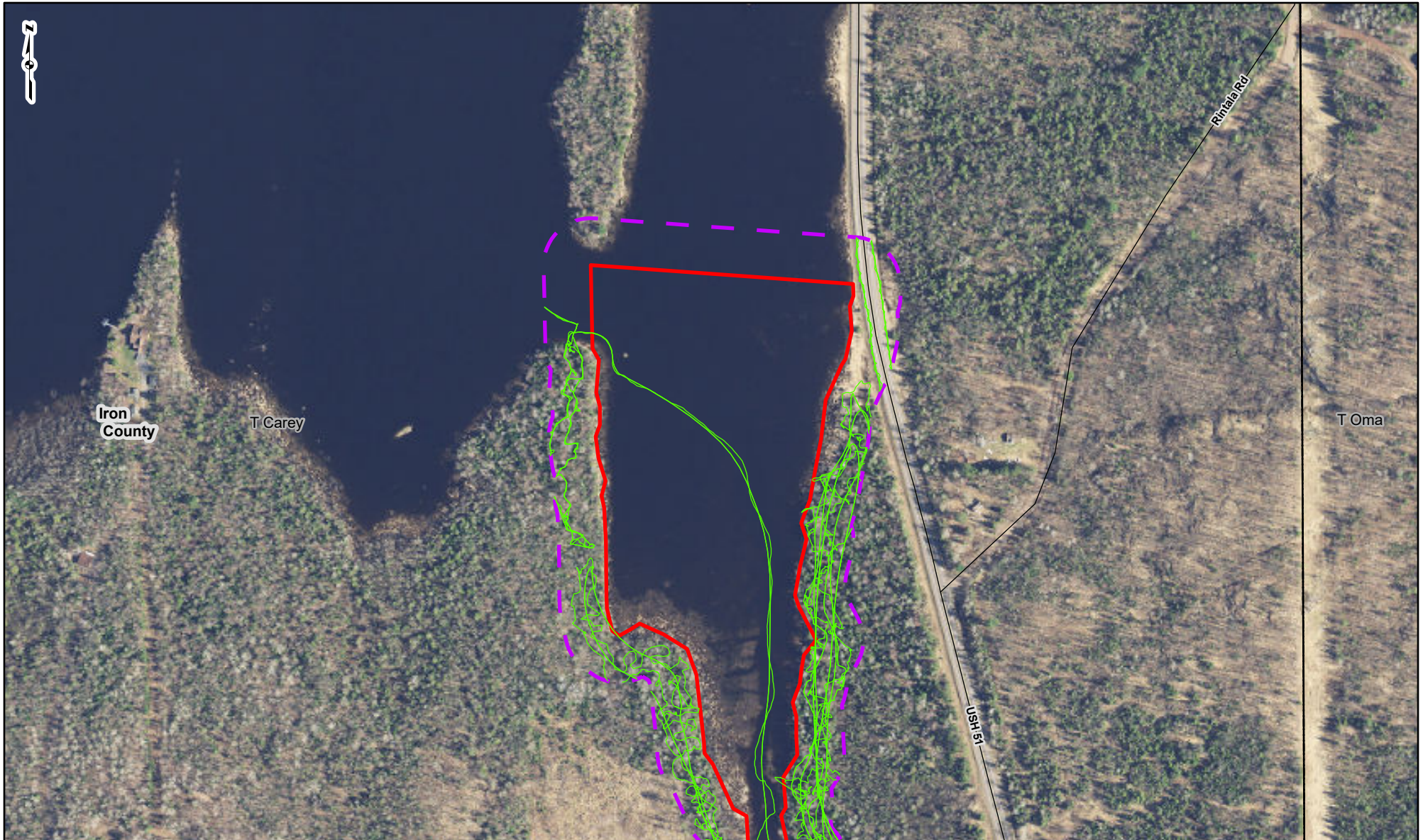
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FIGURE 5
MEANDER ROUTES WITHIN 200 FT OF REQUESTED AREA SHORELINES
SHEET 4 of 6

GILE FLOWAGE STORAGE PROJECT
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LEGEND

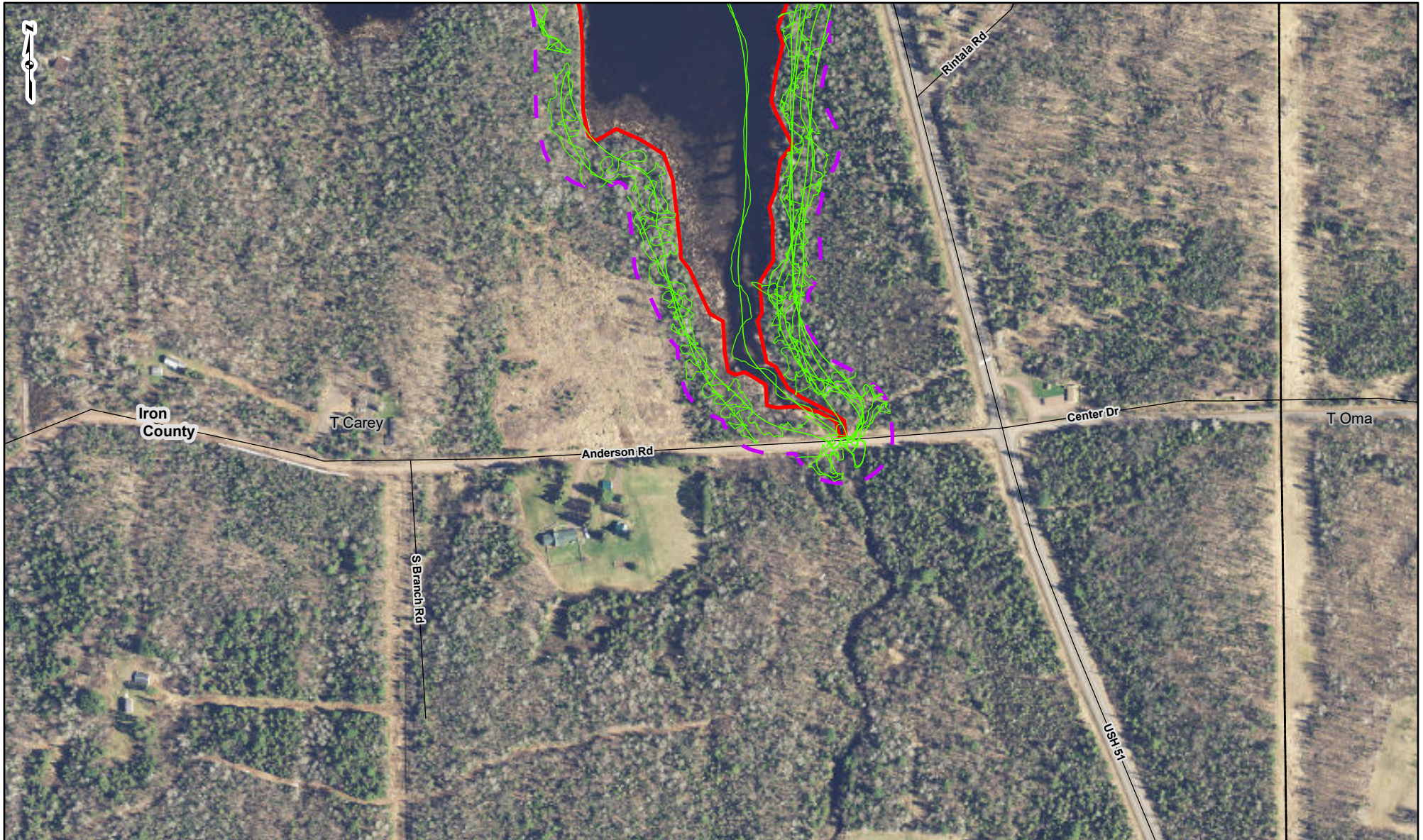
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SHEET 5 of 6

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 TURTLE STUDY

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LEGEND

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SHEET 6 of 6

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 TURTLE STUDY

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ATTACHMENT A

Photo Log

Gile Flowage Wood Turtle Study Report Photo Log

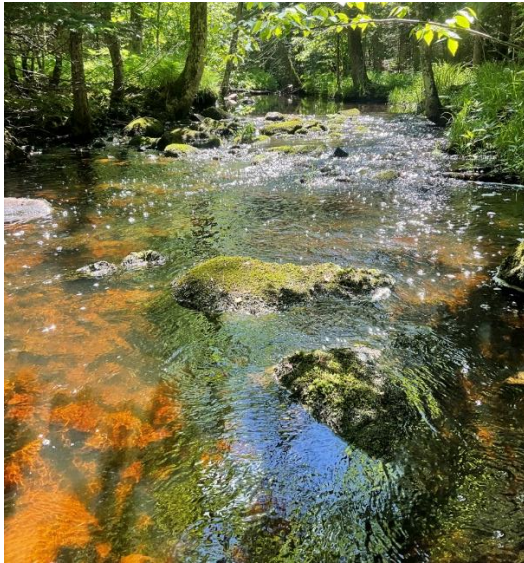
	
<p>Linnunpuro Creek Study Area 46.40408114, -90.18112012 June 1, 2022</p>	<p>West Fork Montreal River Study Area 46.36779023, -90.2434935 June 1, 2022</p>
	
<p>Linnunpuro Creek Study Area 46.39895, -90.1813722 June 14, 2022</p>	<p>West Fork Montreal River Study Area 46.361691, -90.244775 June 17, 2022</p>



Unnamed Creek Study Area
 46.39514225, -90.19988395
 June 6, 2022



An example of the thick brush encountered at the Linnunpuro Creek during some of the terrestrial meanders.
 46.403133, -90.184311
 June 23, 2022



Unnamed Creek Study Area
 46.39517, -90.19980
 June 16, 2022



An example of the thick brush encountered at the unnamed creek during some of the terrestrial meanders; surveyor in background.
 46.398880, -90.1815638
 June 23, 2022



Snapping turtle nest within Project area by Linnunpuro Creek,
46.398664, -90.181107,
June 16, 2022



Predated turtle nest by the Anderson Rd. bridge over Linnunpuro Creek,
46.398716, -90.181013
June 28, 2022



Suitable nesting habitat at the boat launch parking area on Flowage Rd. Many turtle nests were observed here.
46.37054, -90.24380,
June 1, 2022



Nesting wood turtle; outside of the Project area in the same location previously identified in the Natural Heritage Inventory review completed as part of the Pre-Application Document development (photo is cropped; we kept our distance).
46.359359, -90.245325
June 15, 2022



One of the areas turtles were observed basking within the Project area near the West Fork Montreal River, 46.366585, -90.243770, July 6, 2022



Beginning of construction on Hwy 51 where turtles were observed nesting prior; location borders the flowage, 46.406001, -90.181273 (coordinates approximate), June 22, 2022



Suitable nesting habitat that is not associated with a road.
46.366083, -90.24625169
June 28, 2022



Shoreline development was not extensive.
46.36947766, -90.24409024
July 25, 2022