Pelican River Watershed District Regular Meeting - Agenda

Date:	Wednesday, December 17, 2025
Time:	08:30 AM
Location:	Wells Fargo Building, Second Floor Meeting Room 211 Holmes St. West, Detroit Lakes MN

08:30 AM – Verification of Quorum & Call Meeting to Order

1. Consider Agenda Additions & Approve Agenda
2. Approve Consent Agenda
   2.1. November 19, 2025 Board Meeting Minutes
   2.2. Administrator's Report (including the Ditch Inspector's Report)
3. Public Comment – May address the Board for up to 3 minutes per speaker.
4. Rules/Permitting Report
5. Treasurer Report
   5.1. Approve December 2025 Bills & Fund Transfer
   5.2. January-November 2025 Revenue & Expense Report; Grants Received/Expended
6. Grant Program Funding Requests
   6.1. Best Management Practices (BMP) Applications
   6.2. Education Mini-Grants
7. Project Updates
   7.1. Rice Lake Project
   7.2. Willow Street Pond Feasibility Study
   7.3. Buck's Mill Dam Modification Project
   7.4. Campbell Creek Streambank Restoration Project
8. New Business
   8.1. Final 2026 Budget, Levies, Special Assessments, & Fees
   8.2. PRWD 2025 Year End Interfund Transfers
   8.3. Bid Award – Buck's Mill Dam Modification Project.
9. Reports
   9.1. MN Watersheds Annual Meeting Update
   9.2. Attorney – Lukas Croaker
   9.3. Engineer – Moore Engineering
10. Upcoming meetings and events
    10.1. January 21, 2026, 8:30AM – Regular Managers' Meeting

11:00 AM Adjournment

A meeting link request may be made by contacting the office by 3:30 PM on 12/16/2025 at 218-846-0436 or by emailing info@prwd.org

Pelican River Watershed District Board Members may participate through interactive technology.

Regular Meeting Minutes

Date:	Wednesday, November 19, 2025
Location:	Wells Fargo Building, Second Floor Meeting Room 211 Holmes St. West, Detroit Lakes MN
Managers Present:	Rick Michaelson, Charles Jasken, Laurie Olson, Orrin Okeson, Chris Jasken, Dennis Kral, Scott Busker
Managers Absent:	None
Staff:	Tera Guetter (Administrator), Shanna Bach (Office Coordinator), Josh Beranek
Consultants:	Lukas Croaker (Ohnstad Twichell), Garrett Monson via IT (Moore Engineering)
Others:	Birch Burdick (Melissa-Sallie Lake Improvement Association), Phil Hansen (Becker County Commissioner)

Call to Order – The Regular Managers' meeting was called to order by President Michaelson at 08:30 AM.

1. Consider Agenda Additions & Approve Agenda. Engineer Monson requested to move up the Engineer's Report and MN Flyers Variance Request agenda items to follow after the Public Comment Period.
   Motion to approve the November 19, 2025 Meeting Agenda (Olson, Chris Jasken), carried unanimously.

2. Approve Consent Agenda
   Motion to approve the Consent Agenda including the October 15, 2025 Regular Board Meeting Minutes, October 22, 2025 Special Board Meeting Minutes, and the November 2025 Administrator Report (Busker, Kral), carried unanimously.

3. Public Comment Period. None
4. MN Flyers Gymnastic Site Improvements– Variance Request. Engineer Monson reviewed the permit variance request, applicability granting a variance from District Rules, and recommended approval of the variance based on the special and unique conditions of the property with the elevations of the parking lot and stormwater treatment BMP, the proposed activity will not adversely affect the public health, safety, or welfare, will not create extraordinary public expense, will not adversely affect water quality, water control, or drainage within the District, and the intent of District Rule Chapter 6 is met. Engineer Monson also noted that approximately 1,000 square feet of the newly reconstructed parking lot area on the east side of the gymnastics building will be addressed at a later date by the City of Detroit Lakes during their common plan of development. **Motion to approve the variance for the MN Flyers Gymnastics project (Chris Jasken, Kral), carried unanimously.**
5. Engineer's Report-Garrett Monson, Moore Engineering
   5.1. Buck's Mill Dam Modification Project -The project is out to bid on Quest construction bidding website and advertised in the Detroit Lakes Newspaper, bid

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opening on will be conducted on December 8, at 10:00 AM electronically, and consideration for approval of the award of bid will be at the December 17, 2025 Board meeting.

5.2. Ditch 13 Maintenance. Engineer Monson stated the survey work was not completed after Manager Jasken and Administrator Guetter met with Bill Dillon and reviewed the site. At this time, Guetter recommends to perform the sediment removal ditch maintenance for approximately 800 feet downstream of the Dillon field crossing and at a later date address the reestablishment of record when the culvert crossing is addressed.

5.3. Approval of the Findings of Fact, Conclusion of Law, and Order. **Motion to approve the Findings of Fact, Conclusion of Law, and Order of the Buck's Mill Dam Modification Project (attached hereto), (Chris Jasken, Busker), carried unanimously.**

6. Rules/Permitting Report. Water Resource Coordinator Josh Bernak reviewed the report with the Managers. Commissioner Hansen inquired about the status of the DL Airport and Dunton Park projects.

   6.1. **Motion to approve the November 2025 Rules Report, (Kral, Okeson), carried unanimously.**

7. Treasurer Report

   Approve November 2025 Bills and November 2025 Funds Transfer, January-October 2025 R& E Report. The bills, transfer amount, and R&E report were reviewed.

   7.1. **Motion to approve November 2025 Claims (Checks 015481-015494 & 015496, EFTs 25112101-25112108, 25112401, 25112406-25112407,) in the amount of $93,155.49 (attached hereto) and the November 2025 Fund Transfer from Savings to Checking in the amount of $80,000. (Charles Jasken, Chris Jasken), carried unanimously.**

   7.2. **Motion to approve the January-October 2025 Revenue & Expense Report (Charles Jasken, Busker), carried unanimously.**

8. Grant Program Funding Requests

   8.1. District BMP Cost Share Program – no applications

   8.2. District Education Mini-Grant – no applications received.

9. Unfinished Business

   9.1. Rice Lake Wetland Restoration – HEI and Jason Boyle MN DNR dam safety division met this week to discuss final design modifications. HEI will be sending the design modifications to MN DNR and we are anticipating the MN DNR issuing the permit in the next couple of weeks.

   9.2. Willow Street Pond Feasibility Study – Stantec is getting irrigation and utility information from the City of Detroit Lakes and will have the study completed by

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year-end. The application for the access and construction easement on the MN DNR Wildlife land is under review.

9.3. Buck's Mill Dam Modification Project – covered under Engineer's Report.

9.4. Campbell Creek Streambank Restoration and Water Storage Project. Stantec will provide an update at the December or January 2026 meeting. The drone footage taken by MPCA staff of project areas was reviewed including Campbell Creek, Ditch 13/Dillon area, and lower Rice Lake structure area. Manager Okeson reviewed the Campbell Creek/Ditch 12 photos of the dam and tree/brush removal work he completed.

10. New Business

10.1. LMCIT – Insurance Liability Coverage Limits. Attorney Croaker reviewed the resolution. **Motion to approve the Resolution for League of MN Cities Insurance Trust Insurance Liability Coverage Limits Pursuant to Minnesota State Statute 466.04, (attached hereto) (Michaelson, Kral), carried unanimously.**

10.2. Minnesota Watershed Annual Business Meeting Delegate Selection. Managers Olson and Okeson will serve as delegates and Chris Jasken will serve as the alternate. **Motion to approve MN Watershed Annual Business Meeting delegates and alternate (attached hereto), (Kral, Chris Jasken), carried unanimously.**

10.3. Ditch 13 Maintenance.

10.3.1. Moore Engineering Task Order 8 reestablishment of records for the portion of Ditch 13 surrounding the Dillion culvert. **Motion to rescind Moore Engineering Task Order No 8 – Ditch 13 Dillon Culvert Investigation (Chris Jasken, Olson) carried unanimously.**

10.3.2. **Maintenance Quotes –** Two quotes were received for requested maintenance work on Ditch 13, approximately 800 feet downstream of the Dillon field crossing culvert: Boit Excavating in the amount of $18,000 and Feldt Excavating in the amount of $9,000. It was noted Feldt will be using a long arm excavator. **Motion to award the quote/bid for Ditch 13 800 linear feet of maintenance work to Feldt Plumbing in the amount of $9,000 (attached hereto) (Kral, Busker), carried unanimously.**

10.4. **Personnel Policy Manual Updates.** Guetter reviewed the policy manual updates for MN Paid leave and other sections noting the proposed changes reflect compliance with MN State Statutes. The District used the League of MN Cities Insurance Trust model personnel policy language for the proposed updates which were also reviewed by Attorney Croaker. **Motion to approve updates: Article IV - 4.0 Attendance & Absences; Article IX- 9.02 Improper Deduction and Overpayment, and Article XIII Leaves of Absence – 13.01 MN Paid Leave, 13.02 Earned Sick and Safe Leave, 13.04 Unpaid Leave, 13.05 Funeral Leave, 13.11 MN Pregnancy and Parenting Leave, 13.13 Adoptive Parents; 13.14 Work time for**

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Nursing Mothers and Lactating Employees, 13.15 School Conference Leave, 13.16 Elections/Voting, 13.17 Delegates to Party Conventions, 13.18 Light Duty/Modified Duty Assignment and, 13.19 Accommodations for Health Conditions Relating to Pregnancy, as presented (Busker, Olson), carried unanimously.

11. Reports
    - 11.1. District Attorney – Lukas Croaker.
        - 11.1.1. Work covered in previous meeting discussions. Managers briefly discussed the MPCA letter regarding their decline to permit drainage projects.
    - 11.2. District Engineer-Garrett Monson. Covered above.

12. Upcoming meetings and events
    - 12.1. MN Watersheds Annual Conference and Business Meeting, December 3-5. 2025, Grandview Lodge, Brainerd, MN
    - 12.2. December 17, 2025 –Regular Meeting, 08:30 AM

Meeting Adjournment at 11:15 AM (Kral, Busker), carried unanimously.

Respectfully Submitted,

Chris Jasken, Secretary

Meeting Approved

PELICAN RIVER WATERSHED DISTRICT

Claims Paid

November 2025

Date	Num	Vendor		Amount
11/21/2025	25112101	*Guetter,Tera	$	75.00
11/21/2025	25112102	*Beranek, Josh	$	313.12
		Employee Expenses Total:	**$**	**388.12**
11/24/2025	25112406	Loffler Companies, Inc.	$	176.91
11/24/2025	25112407	Old National/Bremer Bank National Assoc.	$	20.00
		Vendor Expenses - Autopay Total:	**$**	**196.91**
11/21/2025	25112103	Ohnstad Twichell, P.C.	$	2,943.00
11/21/2025	25112104	RMB Environmental Labs, Inc.	$	477.00
11/21/2025	25112106	Stantec Consulting Services Inc.	$	4,621.75
11/21/2025	25112108	Wells Fargo-Office Lease	$	1,338.57
11/21/2025	25112107	Lakes Computer, Inc.	$	536.25
11/21/2025	25112105	Moore Engineering, Inc	$	15,195.00
11/24/2025	25112401	Bank of America	$	6,333.60
		Vendor Expenses - EFT Total:	**$**	**31,445.17**
11/20/2025	015482	Premium Waters, Inc.	$	23.46
11/20/2025	015483	Braun Intertec	$	1,704.00
11/20/2025	015484	Arvig	$	69.95
11/20/2025	015485	Campbell, Joshua	$	1,940.00
11/20/2025	015486	Verizon	$	38.41
11/20/2025	015488	Becker SWCD	$	301.50
11/20/2025	015489	MN Watersheds	$	5,000.00
11/20/2025	015490	Corporate Technologies	$	2,397.53
11/20/2025	015491	Houston Engineering Inc.	$	30,642.33
11/20/2025	015491	Boit Excavating	$	600.00
11/20/2025	015492	Loffler	$	258.64
11/20/2025	015493	Hough, Inc	$	5,313.88
11/20/2025	015494	J & K Marine, Inc.	$	300.94
11/24/2025	015496	Office of MNIT Services	$	64.65
		Vendor Expenses - Check Total:	**$**	**48,655.29**
11/12/2025	015483	City of Detroit Lakes	$	10,950.00
		BMP Grant - Check Total:	**$**	**10,950.00**
11/20/2025	015481	Detroit Lakes Public Schools	$	1,520.00
		Education Grant - Check Total:		**1,520.00**
		Claims Paid Total:	**$**	**93,155.49**
		Staff Payroll, Taxes, & Benefits Total:	$	25,732.43

PELICAN RIVER WATERSHED DISTRICT
RESOLUTION FOR LMCIT LIABILITY COVERAGE LIMITS
PURSUANT TO MN STATUE 466.04

On November 20, 2025 Richard Michaelson, President of the Board of Managers, offered the following resolution and moved its adoption.

WHEREAS the District obtains liability coverage from the League of Minnesota Cities Insurance Trust and must decide whether or not to waive the statutory tort liability limits to the extent of the coverage purchased;

WHEREAS if the District does not waive the statutory tort limits, an individual claimant would be able to recover no more $500,000.00 on any claim to which the statutory tort limits apply. The total which all claimants would be able to recover for a single occurrence to the statutory tort limits apply is limited to $1,500,000.00;

NOW, THEREFORE, BE IT RESOLVED THAT the Pelican River Watershed District Board of Managers have agreed to accept liability coverage limits of $1,500,000.00 from the League of Minnesota Cities Insurance Trust and that the District does not waive the monetary limits on municipal tort liability established by Minnesota Statutes 466.04.

Manager Kral seconded the adoption of the resolution, and it was adopted on the following vote:

Ayes 7
Nays 0

DATE: November 19, 2025

Signed _____
Richard Michaelson, President
Pelican River Watershed District

MINNESOTA WATERSHEDS
Connecting People. Protecting Water.

Minnesota Watersheds
www.mnwatersheds.com

Minnesota Watersheds
2025 Delegate Appointment Form

The Pelican River Watershed District **hereby certifies that it is**
name of watershed organization
a watershed district or watershed management organization duly established and in good standing pursuant to Minnesota Statutes 103B or 103D and is a member of Minnesota Watersheds for the year 2025.

The Pelican River Watershed District **hereby further certifies**
name of watershed organization
the following individuals have been appointed as delegates, or as an alternate delegate, all of whom are managers in good standing with their respective watershed district or watershed management organization.

Delegate #1: Laurie Olson

Delegate #2: Orrin Okeson

Alternate: Chris Jasken

Authorized by: [signature] 11-19-2025
Signature **Date**

Administrator
Title

** Please return this form to jvoit@mnwatersheds.com at your earliest convenience. **

Feldt Plumbing & Excavating, LLP
28442 State Hwy 34
Detroit Lakes, MN 56501
ph. 218.847.5390 fax. 218.847.3309
FeldtPlumbing@gmail.com

Estimate

Date	Estimate #
11/18/2025	2540

Name / Address
Pelican River Watershed District

Project

Item	Description	Qty	Rate	Total
Misc	Silt removal approx 800 feet Ditch 13 Dillon FIeld		9,000.00	9,000.00

Total $9,000.00

STATE OF MINNESOTA
Before the
PELICAN RIVER WATERSHED DISTRICT

In the Matter of: **Establishment of the Buck's Mill Dam Modification Project**	**FINDINGS OF FACT, CONCLUSIONS OF LAW, AND ORDER**

The Pelican River Watershed District (the "District") Board of Managers (the "Managers") hereby orders the establishment of the Buck's Mill Dam Modification Project (the "Project") pursuant to Minn. Stat. § 103D.605, having noticed and conducted a public hearing on August 20, 2025, on the project plan, the District's Comprehensive Watershed Management Plan, advisory reports from the Minnesota Department of Natural Resources ("MnDNR") and the Minnesota Board of Water and Soil Resources ("BWSR"), and based on the record and proceedings, Manager Chris Jasken moved, seconded by Manager Kral, and carried unanimously to order establishment of the Project on August 20, 2025. The following Findings of Fact, Conclusions of Law, and Order summarizes the proceedings to establish the Project:

FINDINGS OF FACT:

1. The District, in cooperation with MnDNR, proposes to modify the Buck's Mill Dam to improve fish passage and ecological health, supporting the MnDNR "Reconnect the Red" initiative. Modifications include replacing the box culvert under Bucksmill Drive, raising the road elevation, removing the walkway and Kingsbury Lock for safety, and enhancing the spillway with rock riffles.

2. The purpose of the Project is to address public safety improvements, enhance ecological functions, and facilitate fish passage by modifying the existing dam structure. Key upgrades include modifying the dam's existing spillway with a series of rock and riffle structures and removing the structural remains of Kingsbury Lock, a navigational lock built in 1908. Additional modifications to Buck's Mill Dam, last reconstructed in 1937, involve removing the catwalk and its concrete support piers. Bucksmill Drive will be raised to accommodate resized culverts and the newly constructed riffle structure, which will provide fish passage. Bucksmill Drive has been identified as a barrier to the Project at its current elevation. The Project is part of the MnDNR "Reconnect the Red" fish passage initiative and aims to enhance fish passage, aquatic ecology, and public safety. It also supports the restoration and improvement of natural stream characteristics within the Pelican River Watershed.

3. The Project was incorporated into the Otter Tail River One Watershed One Plan (the "1W1P"), and as a result, the District is able to establish the Project pursuant to Minn. Stat. § 103D.605 – Project Constructed with Government Aid or as Part of Plan.[1] In the 1W1P,

[1] The Project was initiated prior to Minn. Stat. § 103D.605 being repealed by the Minnesota Legislature. The District adopted a motion to utilize the process under Minn. Stat. § 103D.605 to establish the Project prior to it being repealed.

Buck's Mill Dam is identified as a fish passage project with the primary goal of aquatic connectivity with a secondary goal of stream stability. The Project is referenced more frequently in the District's Watershed Management Plan: March 25, 2020 – March 25, 2030, which was adopted by the District's Board of Managers on March 25, 2020.

4. The Watershed Management Plan describes the importance of Fish Communities, specifically, to "[p]rotect, enhance, and restore fish habitat, especially when projects have multiple benefits that meet District objectives." Section 4.3.3, Objective B(9) provides that the District will, "[a]ssist the MDNR in replacing Bucks Mill Dam with rock rapids." The Project Plan provides reasoning for removal/modification of the Buck's Mill Dam under Section 2.3.3:

> [M]ultiple species are currently impacted by the 2 major fish passage barriers in the District, Bucks Mill Dam and Little Floyd Lake Dam. Fish populations can also be threatened by impairments to habitat, spawning areas, and water quality. Although none of these threats are imminent in the District, climate change may change this. For example, warmer air temperatures could increase water temperatures to non-optimal conditions for trout and other cool-water fishes, such as walleye and northern pike. Drought could also impair fish migration by causing streams to dry up and impact valuable spawning areas. Finally, climate change could increase competition for resources between invasive and native fish species.

5. The Project will have three main construction elements: (1) removal of the remaining sections of the Kingsbury Lock and excavation of existing ground to be graded and prepared for construction of the rock riffles; (2) construction of the rock riffle structures within the channel of the Pelican River from the existing Buck's Mill Dam to downstream of the Bucksmill Drive crossing; and (3) culvert modification and road raise of Bucksmill Drive.

   a. Removal of the Kingsbury Lock and modification of the Buck's Mill Dam will consist of demolition of the concrete sections of the existing lock. This will likely be completed with an excavator to break apart the concrete and rebar then haul out the pieces with a dump truck. There will be site grading, including excavation of existing ground to widen the channel adjacent to the lock. Additional excavation will be completed south of the existing weir, widening the crest. This will most likely be completed with an excavator, skid steer, and dump trucks.

   b. Construction of the rock riffle structures will include physical manipulation of the riverbed of the Pelican River. Once the subgrade is prepared, fill will be brought in to build up the channel bed and a berm on the south bank. This fill will be hauled with trucks and then placed with equipment such as excavators, loaders, and dozers. Within the channel, fill will be placed to the bottom of the riprap. The weir boulders will be placed with an excavator, followed by the riprap, chinking rock, and cobble (also placed with an excavator). These smaller rocks will be placed to fill voids and ensure water runs over the structure, not through it.

c. The culvert modification and road raise of Buck's Mill Dam will be completed by closing Bucksmill Drive, while an excavator removes the fill above the existing culverts. The existing culverts will be removed section by section and salvaged, if possible. An excavator will remove unsalvageable material from the site by loading it onto trucks. Once the material is removed, fill will be brought in, placed, and compacted with a sheepsfoot roller to fill the voids left by the culverts and up to the new culvert inverts. The new culverts will be placed with an excavator and laborers in the trench. Backfill around the new culverts will be placed and compacted up to finished grade and aggregate will top off the road. The aggregate will be graded with a grader. Upon completion of the road, a guard rail will be installed by laborers with a skid steer and post hole digger. Culverts will be replaced following guidance from the MnDNR.

d. The existing walkway along the dam crest is unsafe for public access and is currently facilitating trespassing. Following construction, public access will be available along a berm on the south bank.

e. The existing lock downstream of Buck's Mill Dam is non-operational and in a deteriorated state, posing a public safety risk. As part of the project, the lock will be removed entirely to facilitate the installation of the new rock riffle structure and ensure site safety. The removal of this structure will reduce velocities by providing a larger cross-sectional area for water to pass as it moves over the riffle structures. The non-organic material will be removed and disposed of offsite.

6. Construction activities are anticipated to begin in the fall of 2025, following the necessary permitting and preparatory phases. The work will span an estimated 3-6 months of active work, including site preparation, demolition, structural modifications, and site restoration.

7. The estimated cost of the Project is $3,200,000. The ENGINEER'S OPINION OF PROBABLE COST is attached as **Exhibit A**. An estimated $2,200,000 will be provided from the Lessard-Sams Outdoor Heritage Fund and $1,000,000 from the State of Minnesota – Get Out MORE fund.

8. MnDNR required a public comment period on the mandatory Environmental Assessment Worksheet (EAW). The EAW was filed with the EQB and a NOTICE OF AVAILABILITY was published in the *EQB Monitor* on April 8, 2025. A copy of the EAW was sent to all persons on the EQB distribution list, to those persons known by the District to be interested in the Project, and to those persons requesting a copy of the EAW. A press release announcing the availability of the EAW was sent to the *Detroit Lakes Tribune*, the newspaper of general circulation in Becker County, Minnesota, and posted on the District's website.

9. The thirty (30) day EAW public review and comment period commenced on April 8, 2025, and expired on May 8, 2025, in compliance with Minn. R. 4410.1600. During the thirty (30) day public review and comment period, the District received two (2) comment letters. The comments, and responses thereto, were incorporated into the FINDINGS OF FACT AND RECORD OF DECISION ON THE DETERMINATION OF NEED FOR AN ENVIRONMENTAL IMPACT STATEMENT, which is available for inspection in the District's office.

10. The record of decision found that the Project, as proposed, did not have the potential for significant environmental effects and did not warrant preparation of an Environmental Impact Statement (EIS).

11. A list of anticipated permits and current status is included in the PERMITTING TABLE attached as **Exhibit B**.

12. The MnDNR and the District acquired lands for the Project concurrent with other development tasks such as engineering and Project establishment proceedings.

13. On July 16, 2025, the District adopted a RESOLUTION SETTING PROJECT HEARING, attached as **Exhibit C**, on the establishment of the Project pursuant to Minn. Stat. § 103D.605, subd. 3. The Project hearing was scheduled for August 20, 2025, contingent on receipt of the Advisory Reports.

14. On August 1, 2025, the District Engineer filed the Project Plan with the MnDNR and BWSR pursuant to Minn. Stat. § 103D.605, subd. 2. These entities provided their respective advisory reports to the District.[2] The MnDNR ADVISORY REPORT, dated August 28, 2025,[3] is attached as **Exhibit D**, the BWSR ADVISORY REPORT,[4] dated October 30, 2025, is attached as **Exhibit E**, and collectively, referred to as the "Advisory Reports." The Advisory Reports gave advisory approval for the District to establish and construct the Project.

    a. The MnDNR Advisory Report provided:

    MN DNR has reviewed the report based on the MN Statute [§] 103D.711 Subp. 5 criteria:

    1) MN DNR finds the Engineer's Report is complete and in accordance with Chapter 103D.
    2) MN DNR finds the project to be a practical plan.
    3) A soil survey is not required.

    Please consider the following technical comments as project plans are finalized:

    - Check for footings where the sheetpile will abut the existing spillway. The sheetpile may not be able to be driven flush against the concrete.
    - Consider adding grout to the concrete cap on the top of the pier to protect the exposed rebar.
    - Consider if loading the WPA slab foundation may cause settlement or rotation.
    - Care should be taken when constructing near the existing structures. Consider having geotechnical personnel on site during excavation.

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[2] MnDNR and BWSR provided their Advisory Reports in accordance with Minn. Stat. § 103D.711; however, the District indicated that it was following the process outlined under Minn. Stat. § 103D.605 which was repealed after the Project was initiated.

[3] The MnDNR and BWSR Advisory Reports were delayed (received August 28, 2025, and October 30, 2025, respectively); however, the Advisory Reports indicated that the Project was acceptable and did not change the outcome of the establishment proceedings.

[4] See previous footnote.

- Please explain the need for the sheet pile extension to the south and how the extension distance was chosen? Page 6 of the report indicates sheet pile to "extend the Dam's influence"; please clarify the intent of this.
- The lake runout elevation must be surveyed. Do not use only the reported runout elevation or conversion from Lake Melissa elevation. Please survey the benchmark on the right upstream abutment and each stoplog bay. Note that some bays have steel channel for stoplogs. Also note that over time, three different elevation datums have been used.
- Please clarify if the top of the rock matches the runout elevation or if it will be higher than the runout.
- Please add south berm soil type to the plan set legend.
- Please consult with MN DNR regarding the berm subgrade fabric wrapped around 1 to 3 inch rock.
- Plans indicate berm fill 95% with +/- 3% recommended. For dams, we recommend -1 to +3.

b. The BWSR Advisory Report provided:

The focus of this advisory report includes:

- A statement about the completeness of the report in relation to statutory requirements;
- A statement as to whether or not the report presents a practical plan;
- Recommendations for changes, if considered advisable, and;
- A recommendation as to whether a soil survey appears advisable.

The engineer's report is complete in accordance with the Minnesota Statute 103D.711, Subdivision 2, and I do believe that this project will accomplish the objectives of enhanced fish passage, improving biodiversity, and improving public safety. I appreciate that floodplain culverts will be added underneath Bucksmill Drive to maintain flood flows as much as possible. There is no need for a soil survey for this project.

The only concern I have with this project is that there is not enough information presented on the erosion along the house on the north side of the Pelican River to determine if this project will correct that issue. If Riffles 13-16 are along the house, the report shows that the velocities at Riffle 13 are higher than those under existing conditions. The water surface area in this area is also higher under proposed conditions. While the cross-section information on pages C-801 and C-802 do show some riprap placed up the side slope of the channel, there is no information provided to show the current extent of the erosion to determine if the rip rap placement is adequate. I suggest that the watershed district staff discuss this area with their engineers to ensure that the project addresses the existing erosion or at a minimum, ensures the erosion will not continue to worsen during high flow events.

15. At the Project establishment hearing on August 20, 2025, the District's Attorney explained the Minn. Stat. § 103D.605 project establishment hearing. The District Engineer provided an overview of the scope of the Project and answered specific questions related to the construction of the Project.

16. All interested parties were given the opportunity to present their testimony regarding the Project Plan, the Comprehensive Plan, and recommendations of the District Engineer, District staff, and District Attorney.

    a. A question was asked whether the Project's footprint will encumber private land?

        i. No, the necessary property interests were acquired, or the land is owned by MnDNR.

    b. Birch Burdick, President of the Melissa-Sallie Lake Association thanked the District for the public engagement opportunities offered throughout the Project establishment process and for addressing concerns with the lake level – which will not be changed by the Project.

    c. The District Engineer summarized ten (10) comments provided by Mn Dam Safety.

    d. The District's Attorney read an email from Kathleen Nelson which expressed her concern of the Project.

        i. The District Engineer addressed these concerns by explaining the variables in this watershed basin which may change lake levels, that the District is not changing the "red line," that the District cannot control the climate or weather changes, explained the flow pattern of the lake systems in this area, and explained the characteristics of each lake.

    e. Engineer Chad Engels stated that MnDNR dictates the outlet elevation and MnDNR's stance is that manipulation of the stop logs will not be allowed.

    f. Manager Charlie Jasken asked about the bidding timeline and President Michaelson asked about the design of the Project being at sixty percent (60%) completion and when it will get to one hundred percent (100%)?

        i. The District Engineer said once the Project is established, they will meet with property owners in this area.

    g. There were no further comments provided.

17. The District Engineer further explained the timeline after approval of the Findings, Conclusions of Law, and Order to bid the Project, award the contract, and commence construction. The District desires to bid the Project in November 2025 and award the construction contract in December 2025.

CONCLUSIONS OF LAW:

1. Because the Project was incorporated into the Comprehensive Plan, the District is authorized to establish the Project pursuant to Minn. Stat. § 103D.605. The District is utilizing Minn. Stat. § 103D.605 as the Project was initiated while this statutory section was still in effect.

2. The Project Plan has been reviewed by MnDNR and BWSR. These entities provided the Advisory Reports in support of the Project.

3. Several Managers, as well as the District Engineer, have inspected the Project area and determined that establishment of the Project is conducive to public health, promotes general welfare, and is in compliance with the Comprehensive Plan and the provisions of Minn. Stat. Ch. 103D.

4. The District held several formal and informal meetings and hearings on the various phases of the Project and has the support of landowners within the area.

5. Pursuant to Minn. Stat. § 103D.605, subd. 3, the District set a public hearing for August 20, 2025, to discuss the Project Plan and the Comprehensive Plan.

6. Pursuant to Minn. Stat. § 103D.605, subd. 3(d), the public hearing on the establishment of the Project was noticed by mail to the MnDNR and municipalities entirely or partly within the Project area.

7. The public hearing commenced on August 20, 2025, at the time and location set forth in the RESOLUTION SETTING PROJECT HEARING. The Board, the District Engineer, District staff, and the District Attorney were present at the hearing.

8. At the hearing, the District Attorney explained the reasoning for establishing the Project under Minn. Stat. § 103D.605. The District Engineer explained the need for the Project, including plans and specifications, the estimated cost, and Project funding.

9. Upon completion of testimony, the Board made the following order.

ORDER:

NOW, THEREFORE, the Pelican River Watershed District Board of Managers hereby orders as follows:

1. The Project Plan, the Comprehensive Plan, and all other reports or submissions necessary as a part of these proceedings have been undertaken pursuant to and in conformance with Minn. Stat. § 103D.605.

2. The Buck's Mill Dam Modification Project is conducive to public health, promotes general welfare, and is in compliance with Pelican River Watershed District's Comprehensive Plan, and the provisions of Minn. Stat. Ch. 103D. As such, the Project is hereby established on August 20, 2025.

3. The District and MnDNR acquired necessary property interests for the construction of the Project.

4. The Project will be funded through the Lessard-Sams Outdoor Heritage Fund and the State of Minnesota – Get Out MORE fund.

5. The District Attorney will file these Findings of Fact, Conclusions of Law, and Order with the District Administrator upon signing by the District President.

6. The District Administrator will file these Findings of Fact, Conclusions of Law, and Order in the District office.

7. The District Administrator and the District Engineer shall proceed to prepare the construction contract for the Project and advertise for bids.

8. The District Administrator and District consultants are authorized to proceed with any additional steps necessary to construct the Project.

(Remainder of page intentionally left blank.)

At the Managers' regular meeting on November 19, 2025, the President called the question on the adoption of the foregoing Findings of Fact, Conclusions of Law, and Order, and there were 7 yeas, 0 nays, 0 absent, and 0 abstentions as follows:

	Yea	Nay	Absent	Abstain
Michaelson	☒	☐	☐	☐
Chris Jasken	☒	☐	☐	☐
Charlie Jasken	☒	☐	☐	☐
Kral	☒	☐	☐	☐
Olson	☒	☐	☐	☐
Busker	☒	☐	☐	☐
Okeson	☒	☐	☐	☐

Upon vote, the President declared the motion passed and the Findings of Fact, Conclusions of Law, and Order adopted.

Date: November 19, 2025, 2025

Rick Michaelson, President

Date: November 19,2025, 2025

Tera Guetter, Administrator

* * * * * * * * * * * *

I, Tera Guetter, Pelican River Watershed District Administrator, do hereby certify that I have compared the above motion, findings, conclusions, and order with the original thereof as the same appears of record and on file with the Pelican River Watershed District and find the same to be a true and correct transcript thereof. The above order was filed with me, Tera Guetter, Pelican River Watershed District Administrator, on November 19, 2025.

IN TESTIMONY WHEREOF, I hereunto set my hand this 19 day of November, 2025.

Tera Guetter, Administrator

EXHIBIT A

ENGINEER'S OPINION OF PROBABLE COST

Project #: 24327
Date Updated: 10/26/2025

Volume 1: Buck's Mill Dam - Dam Improvements
Pelican River Watershed District
Becker County, MN

Engineer's Opinion of Cost

						FUNDING		
						$1,000,000.00	$1,000,000.00	$0.00
BID ITEM NO. & DESCRIPTION		*UNIT*	*QUANTITY*	*UNIT PRICE*	*TOTAL*	*LS24*	*GOM*	*OTHER*
Removals								
311000	Clearing and Grubbing	L SUM	1	$25,000.00	$25,000.00	$12,500.00	$12,500.00	$0.00
024116	Dam Modification	L SUM	1	$30,000.00	$30,000.00	$15,000.00	$15,000.00	$0.00
024116	Lock Removal	L SUM	1	$20,000.00	$20,000.00	$10,000.00	$10,000.00	$0.00
Earthwork Items								
312213	Common Excavation (CV)	CY	1,296	$10.00	$12,960.00	$6,480.00	$6,480.00	$0.00
312213	Common Embankment (CV) Type S5	CY	1,154	$15.00	$17,310.00	$8,655.00	$8,655.00	$0.00
321123	Berm Aggregate Surface Course (CV)	CY	130	$20.00	$2,600.00	$0.00	$2,600.00	$0.00
312213	Granular Fill Type A3 (CV)	CY	490	$60.00	$29,400.00	$14,700.00	$14,700.00	$0.00
2108.604/01005	Geotextile Fabric Type 5	SY	1,445	$1.50	$2,167.50	$1,083.75	$1,083.75	$0.00
329119	Topsoil Import	SY	2,380	$20.00	$47,600.00	$23,800.00	$23,800.00	$0.00
Rock Riffle Items								
313716.13	Boulders - Fishing	EA	18	$900.00	$16,200.00	$8,100.00	$8,100.00	$0.00
313716.13	Boulders - 4' to 6' Dia.	EA	337	$500.00	$168,500.00	$84,250.00	$84,250.00	$0.00
313716.13	Random Riprap Class IV with Aggregate Mix	CY	2,940	$110.00	$323,400.00	$161,700.00	$161,700.00	$0.00
313716.13	Random Riprap Class V with Aggregate Mix	CY	1,810	$110.00	$199,100.00	$99,550.00	$99,550.00	$0.00
313716.13	Random Riprap Class II with Aggregate Mix	CY	1,910	$110.00	$210,100.00	$105,050.00	$105,050.00	$0.00
314116	Steel Sheet Piling	SF	800	$100.00	$80,000.00	$40,000.00	$40,000.00	$0.00
Landscaping Items								
329219	Seeding Type III	SY	2,380	$1.50	$3,570.00	$1,785.00	$1,785.00	$0.00
312500	Erosion Control Blanket	SY	2,380	$4.00	$9,520.00	$4,760.00	$4,760.00	$0.00
323323	Trash Receptacle	EA	2	$2,500.00	$5,000.00	$2,500.00	$2,500.00	$0.00
Remaining Construction Items								
012000	Testing Allowance	ALLOWANCE	1	$30,000.00	$30,000.00	$15,000.00	$15,000.00	$0.00
312500	Floating Silt Curtain	LF	100	$25.00	$2,500.00	$1,250.00	$1,250.00	$0.00
PLAN	Site Restoration on Private Land	L SUM	1	$20,000.00	$20,000.00	$0.00	$20,000.00	$0.00
				Construction Subtotal	$1,254,927.50	$616,163.75	$638,763.75	$0.00
				Design & Construction Engineering (18%)	$226,000.00	$113,000.00	$113,000.00	$0.00
				Project Contingencies (10%)	$149,072.50	$74,536.25	$74,536.25	$0.00
				TOTAL PROJECT COST	$1,630,000.00	TOTAL BUDGET	$803,700.00	$826,300.00	$0.00
						FUNDING RMAINING	$196,300.00	$173,700.00	$0.00

moore engineering, inc.

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Project #: 24327
Date Updated: 10/27/2025

Volume 2: Buck's Mill Dam - Road Improvements
Pelican River Watershed District
Becker County, MN

Engineer's Opinion of Cost

BID ITEM NO.	*& DESCRIPTION*	*UNIT*	*QUANTITY*	*UNIT PRICE*	*TOTAL*	FUNDING $766,000.00 *LS21*	FUNDING $400,000.00 *F&W*	*OTHER*
General								
012000	Mobilization	L SUM	1	$60,000.00	$60,000.00	$30,000.00	$30,000.00	$0.00
015000	Traffic Control	L SUM	1	$20,000.00	$20,000.00	$10,000.00	$10,000.00	$0.00
015000	Dust Control	L SUM	1	$10,000.00	$10,000.00	$5,000.00	$5,000.00	$0.00
312319.13	Dewatering / Control of Water	L SUM	1	$30,000.00	$30,000.00	$15,000.00	$15,000.00	$0.00
312500	Storm Water Management	L SUM	1	$20,000.00	$20,000.00	$10,000.00	$10,000.00	$0.00
312213	Common Excavation (CV)	CY	75	$10.00	$750.00	$375.00	$375.00	$0.00
312213	Common Embankment (CV) Type S2	CY	169	$25.00	$4,225.00	$2,112.50	$2,112.50	$0.00
Removals								
2104.503/00880	Remove Box Culvert	LF	175	$185.00	$32,375.00	$16,187.50	$16,187.50	$0.00
2104.507/00450	Remove Aggregate	CY	300	$25.00	$7,500.00	$3,750.00	$3,750.00	$0.00
Installations								
2412.502/14060	14x6 Precast Concrete Box Culv End Sect	EA	4	$70,000.00	$280,000.00	$140,000.00	$140,000.00	$0.00
2412.502/04040	4x4 Precast Concrete Box Culv End Sect	EA	4	$30,000.00	$120,000.00	$60,000.00	$60,000.00	$0.00
2412.503/14060	14x6 Precast Concrete Box Culvert	LF	114	$2,500.00	$285,000.00	$142,500.00	$142,500.00	$0.00
2412.503/04040	4x4 Precast Concrete Box Culvert	LF	134	$1,400.00	$187,600.00	$93,800.00	$93,800.00	$0.00
2451.507/00150	Granular Bedding (CV) Type A1	CY	518	$20.00	$10,360.00	$5,180.00	$5,180.00	$0.00
313716.13	Crushed 2" Granite	SY	340	$100.00	$34,000.00	$17,000.00	$17,000.00	$0.00
2211.507/00170	Aggregate Base (CV) Class 5	CY	310	$55.00	$17,050.00	$8,525.00	$8,525.00	$0.00
2475.503/00455	Ornamental Metal Railing Design T-5 PC	LF	140	$350.00	$49,000.00	$24,500.00	$24,500.00	$0.00
2564.518/00010	Sign	SF	42.25	$250.00	$10,562.50	$5,281.25	$5,281.25	$0.00
Remaining Construction Items								
012000	Testing Allowance	ALLOWANCE	1	$20,000.00	$20,000.00	$10,000.00	$10,000.00	$0.00
312500	Stabilized Construction Entrance	EA	2	$2,000.00	$4,000.00	$2,000.00	$2,000.00	$0.00
312500	Wattle	LF	200	$10.00	$2,000.00	$1,000.00	$1,000.00	$0.00
				Construction Subtotal	$1,204,422.50	$602,211.25	$602,211.25	$0.00
				Design & Construction Engineering (18%)	$217,000.00	$108,500.00	$108,500.00	$0.00
				Project Contingencies (10%)	$143,577.50	$71,788.75	$71,788.75	$0.00
				TOTAL PROJECT COST	$1,565,000.00	TOTAL BUDGET $782,500.00	$782,500.00	$0.00
						FUNDING REMAINING ($16,500.00)	($382,500.00)	$0.00

moore engineering, inc.

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EXHIBIT B

TABLE 3: PERMITTING

Table 3: Permitting

Agency	Permit	Description/Purpose
Minnesota Rules 4410.4300	Environmental Assessment Worksheet (EAW)	Finding of Facts and Record of Decision drafted 5/16 and signed by Board
United States Army Corps of Engineers	Clean Water Act Section 404	Work within waters of the U.S. Pending submittal
MnDNR	Public Waters Work Permit	Pending submittal
	Dam Safety Permit	Pending submittal
Becker County	Wetland Conservation Act (WCA)	Pending submittal
	Conditional Use Permit	Pending submittal
Minnesota Pollution Control Agency (MPCA)	Section 401 Water Quality Certification	Permit unlikely needed
	Storm Water Pollution Prevention Plan (SWPPP)	Moore will prepare a SWPPP with the plans

EXHIBIT C

RESOLUTION SETTING PROJECT HEARING

STATE OF MINNESOTA
BEFORE THE
PELICAN RIVER WATERSHED DISTRICT

In the Matter of: **Buck's Mill Dam Modification Project**	**RESOLUTION SETTING MINN. STAT. § 103D.605 PROJECT HEARING**

At a public meeting conducted by the Board of Managers (the "Board") of the Pelican River Watershed District (the "District"), on July 16, 2025, Manager Charlie Jasken moved, seconded by Manager Olson for adoption of the following:

WHEREAS, the District, in cooperation with the Minnesota Department of Natural Resources (MnDNR), proposes to modify the Buck's Mill Dam to improve fish passage and ecological health (the "Project"), supporting the MnDNR "Reconnect the Red" initiative; and

WHEREAS, the general nature of the Project is to construct modifications to the dam including replacing the box culvert under Bucksmill Drive, raising the road elevation, removing the walkway and Kingsbury Lock for safety, and enhancing the spillway with rock riffles; and

WHEREAS, the Project will have three main construction elements: (1) removal of the remaining sections of the Kingsbury Lock and excavation of existing ground to be graded and prepared for construction of the rock riffles; (2) construction of the rock riffle structures within the channel of the Pelican River from the existing Buck's Mill Dam to downstream of the Bucksmill Drive crossing; and (3) culvert modification and road raise of Bucksmill Drive; and

WHEREAS, construction activities are anticipated to begin in the fall of 2025, following the necessary permitting and preparatory phases and the work will span an estimated 3-6 months, including site preparation, demolition, structural modifications, and site restoration; and

WHEREAS, the estimated cost of the Project is $3,600,000 with funds for the Project to be derived from state and federal dollars including Lessard Sams Outdoor Heritage Fund and the Get Out More program; and

WHEREAS, the Project is being established and constructed pursuant to authority granted to the District under Minn. Stat. § 103D.605[1], as the Managers are undertaking all or a portion of the Project as identified in its watershed management plan; and

WHEREAS, in accordance with Minn. Stat. § 103D.605, subd. 2, the District Engineer submitted the Project plan to the Director of Division of Ecological and Water Resources of the Department of Natural Resources (the "Director") and the Board of Water and Soil Resources ("BWSR") on August 1, 2025; and

[1] The Project was initiated prior to Minn. Stat. § 103D.605 being repealed by the Minnesota Legislature. The District adopted a motion to utilize the process under Minn. Stat. § 103D.605 to establish the Project prior to it being repealed.

WHEREAS, the District will receive the Director's advisory report on or before August 20, 2025; and

WHEREAS, the District will receive BWSR's advisory report on or before August 20, 2025; and

WHEREAS, pursuant to Minn. Stat. § 103D.605, subd. 3, the Managers set a public hearing and the District will provide notice of the public hearing by publication and mail contingent upon receipt of the advisory reports.

NOW THEREFORE, BE IT RESOLVED by the Board of Managers of the Pelican River Watershed District as follows:

1. In accordance with Minn. Stat. § 103D.605, subd. 3, the District will hold a public hearing on the Project on Wednesday, August 20, 2025, at 9:00 AM, at the District's office located at 211 Holmes Street West, Suite 201, Detroit Lakes, MN 56501.

2. At the public hearing, the District's Board of Managers will hear from any interested parties in the Project.

3. After the Project hearing, if the Managers find that the Project will be conducive to public health, promote the general welfare, and is in compliance with the watershed management plan and the provisions of Minn. Stat. § 103D.605, BWSR must, by order, establish the Project. The establishment order will include the findings of the District.

The motion carried unanimously and this resolution was duly adopted.

PELICAN RIVER
WATERSHED DISTRICT

Rick Michaelson
President

ATTEST:

Tera Guetter
Administrator

EXHIBIT D

MnDNR Advisory Report

DEPARTMENT OF NATURAL RESOURCES

Ecological and Water Resources
2115 Birchmont Beach Rd NE
Bemidji, MN 56601

August 28, 2025

Garrett Monson
Pelican River Watershed District Engineer
925 10th Avenue East,
West Fargo, ND 58078
Garrett.Monson@mooreengineeringinc.com

Re: Buck's Mill Dam Improvement Project Advisory Report

Dear Garrett Monson,

On behalf of the Director of Ecological and Water Resources of the Department of Natural Resources (MN DNR), I offer the following Advisory Report on the Engineer's Report for the Buck's Mill Dam Improvement Project.

MN DNR has reviewed the report based on the MN Statute 103D.711 Subp. 5 criteria:

1) MN DNR finds the Engineer's Report is complete and in accordance with Chapter 103D.
2) MN DNR finds the project to be a practical plan.
3) A soil survey is not required.

Please consider the following technical comments as project plans are finalized:

- Check for footings where the sheetpile will abut the existing spillway. The sheetpile may not be able to be driven flush against the concrete.
- Consider adding grout to the concrete cap on the top of the pier to protect the exposed rebar.
- Consider if loading the WPA slab foundation may cause settlement or rotation.
- Care should be taken when constructing near the existing structures. Consider having geotechnical personnel on site during excavation.

- Please explain the need for the sheet pile extension to the south and how the extension distance was chosen? Page 6 of the report indicates sheet pile to "extend the Dam's influence"; please clarify the intent of this.
- The lake runout elevation must be surveyed. Do not use only the reported runout elevation or conversion from Lake Melissa elevation. Please survey the benchmark on the right upstream abutment and each stoplog bay. Note that some bays have steel channel for stoplogs. Also note that over time, three different elevation datums have been used.
- Please clarify if the top of the rock matches the runout elevation or if it will be higher than the runout.
- Please add south berm soil type to the plan set legend.
- Please consult with MN DNR regarding the berm subgrade fabric wrapped around 1 to 3 inch rock.
- Plans indicate berm fill 95% with +/- 3% recommended. For dams, we recommend -1 to +3.

We appreciate the opportunity to review the Engineer's Report. Please continue to consult with Area Hydrologist Rodger Hemphill (rodger.hemphill@state.mn.us) regarding Public Water permitting and with Paul LeClaire (paul.leclaire@state.mn.us) and Nicholas Kludt (nicholas.kludt@state.mn.us) about design as project plans are further developed. We look forward to continuing to finalize the project plans collaboratively.

Sincerely,



Nathan Kestner
NW Regional Manager – Ecological and Water Resources

CC: Tera Guetter, PRWD
Zach Cormican, Moore Engineering
Owen Baird, Environmental Assessment Ecologist
Rodger Hemphill, Area Hydrologist
Erik Anthonisen, South District Manager
Jason Boyle, State Dam Safety Engineer
Nicholas Kludt, Red River Fisheries Specialist
LeClaire Paul, Stream Restoration Engineer

Equal Opportunity Employer

EXHIBIT E
BWSR ADVISORY REPORT

BOARD OF WATER AND SOIL RESOURCES

October 30, 2025

Board of Managers
Pelican River Watershed District
211 Holmes St. W, Suite 201
Detroit Lakes, MN 56501

Re: BWSR Advisory Report – Bucks Mill Dam Modification

Dear Managers,

On behalf of the Minnesota Board of Soil and Water Resources, I offer this advisory report in accordance with Minnesota Statute 103D.711, Subdivision 5. Please note that Minnesota Statute 103D.605 was repealed in 2024, so my review will be based on the 103D.711, Subdivision 2 requirements. The *Engineer's Report Buck's Mill Dam Modification* (dated August 1, 2025), was reviewed to prepare this advisory report.

The focus of this advisory report includes:

- A statement about the completeness of the report in relation to statutory requirements;
- A statement as to whether or not the report presents a practical plan;
- Recommendations for changes, if considered advisable, and;
- A recommendation as to whether a soil survey appears advisable.

The engineer's report is complete in accordance with the Minnesota Statute 103D.711, Subdivision 2, and I do believe that this project will accomplish the objectives of enhanced fish passage, improving biodiversity, and improving public safety. I appreciate that floodplain culverts will be added underneath Bucksmill Drive to maintain flood flows as much as possible. There is no need for a soil survey for this project.

The only concern I have with this project is that there is not enough information presented on the erosion along the house on the north side of the Pelican River to determine if this project will correct that issue. If Riffles 13-16 are along the house, the report shows that the velocities at Riffle 13 are higher than those under existing conditions. The water surface area in this area is also higher under proposed conditions. While the cross-section information on pages C-801 and C-802 do show some riprap placed up the side slope of the channel, there is no information provided to show the current extent of the erosion to determine if the rip rap placement is adequate. I suggest that the watershed

district staff discuss this area with their engineers to ensure that the project addresses the existing erosion or at a minimum, ensures the erosion will not continue to worsen during high flow events.

Please feel free to contact me at 651-539-2591 (email rita.weaver@state.mn.us) if you have questions regarding this advisory report.

Sincerely,

Rita Weaver, PE, CFM
Chief Engineer

CC: John Jaschke, Director
Ryan Hughes, Northern Region Supervisor
Pete Waller, Board Conservationists
Henry Van Offelen, Clean Water Specialist
Rodger Hemphill, DNR Area Hydrologist
Tera Guetter, Pelican River Watershed District

District Administrator Report
December 12, 2025

1) **Surface Waters Protection and Enhancement**
Capital Improvement Projects/Structural and Non-Structural Practices

- **Rice Lake Wetland Restoration Capital Improvement Project (CIP). Phase 2- Lower Structure.** The MN DNR Waters/Dam Safety permit was issued on December 2nd. The BWSR grant expiration date has been amended to December 31, 2026. Construction will commence upon DNR Wildlife completing the land easement. End of year grant reports will be submitted in E-LINK by December 15th.
- **Campbell Creek Project (MPCA 319 Funding/Otter Tail 1W1P).** Stantec is putting together the bid package with 2 construction phases – culvert installation in 2026 and bank restoration in 2027. We anticipate putting the project out to bid in early 2026 timeframe. Next steps are to schedule a public hearing for the establishment of the Campbell Creek Project. Guetter will be working on the MPCA CWP loan application later this month. We will be submitting a request for Otter Tail 1W1P WBIF FY27 funding allocations by December 19th. FY27 allocation for the OT1W1P is $1,518.104.00.
- **Little Floyd Lake Rock Arch Rapids (MN DNR funding).** The project will be closed out this month with Guetter and Bach submitting final grant reports and reimbursement request.
- **Bucks Mill Dam Modification (MN DNR Lessard-Sams, Get Out More Funding).** We anticipate receiving the MN DNR Waters/Dam Safety permit in the near future. The bid opening was moved from December 8th to December 16th. The award of bid will be on the December 17th meeting agenda. Moore reported there is great interest in the project – let's keep our fingers crossed for a "good" construction bid.
- **Willow Street Pond Feasibility Study.** Towards finalizing the water reuse concept option, Stantec has been working with City staff and meeting with them has been scheduled for December 17th to present the ballpark water re-use irrigation preliminary design.

2) **Becker County Drainage Systems 11, 12, 13 and 14**
   a) **DITCH 11 (Whiskey Creek)-** No activity to report.
   b) **DITCH 12 (Campbell Creek)**– No activity to report.
   c) **DITCH 13 (Little Floyd Lake to Big Detroit)** –
      i) d13-25-04 – 8/28/2025 – Work order for Feldt Plumbing to remove beaver dam at Jackson Ave under the old railroad bridge. Feldt has cleared the blockage. The invoice will be paid at the December board meeting. Open.
      ii) d13-25-07 – 10/27/2025 – Trap beaver at culvert at Dillon Field Crossing. Open.
      iii) Maintenance work – Feldt Excavating will be performing sediment removal (approved at November Board meeting). Open.
   d) **DITCH 14 and BRANCH 1 (HWY 10 to St. Clair Lake to Pelican River) –** No activity to report.

3) **WATER MANAGEMENT RULES** – see enclosed monthly report.

4)

5) **HABITAT PROTECTION AND MANAGEMENT**

River/Stream Connectivity – Barriers to Fish Movement. Buck's Mill and Little Floyd Lake –see reports under Capital Projects.

Aquatic Invasive Species Prevention and Management.

a) **CLP Research (Mankato State)** – The Final Report was delivered to PRWD and has been included in the December Board Packet. The invoice is to be paid with December claims.
b) The City of Detroit Lakes approved and paid the District for Flowering Rush Treatments on November 26.
c) Maps are being annotated with new reports to prepare for the 2026 treatment season.
d) MN DNR Roundtable Speaker Invitation. Guetter is invited to participate in early January on a panel on "Balancing Management of Aquatic Vegetation" to discuss how balancing management of native and invasive aquatic vegetation is key for ecological health, water quality, fish habitat, and recreational use. By exploring these various viewpoints, the session will illuminate the complexities, trade-offs, and opportunities involved in promoting healthy lake ecosystems and vibrant outdoor recreation.

6) **EDUCATION AND OUTREACH (Website, Social Media, and Workshops)**

a) **Butterfly Odyssey** – The exhibit is opening at the museum on 10/4/2025. Planning for the community event continues with the Museum staff. Our goal for the event is in the April timeframe.
b) **Local Media/Mailings.**
i) Bach was on the November 20th KDLM Hodge Podge. She discussed PRWD's Capital Projects and the incoming ice season.
c) Social Media Posts
i) (Facebook & Instagram) – Facebook Followers – 262 (last month 263), Instagram Followers – 26 (last month 26)

Date	Description	Engagement
11/10/2025	Veterans Day Post	1 like, 0 comments, 0 shares
11/12/2025	BWSR Native Plant of the Month – Large Beardtounge	2 likes, 0 comments, 0 shares
11/14/2025	New Email Address Post	1 like, 0 comments, 0 shares
11/25/2025	Lawns to Legumes Deadline Post	0 likes, 0 comments, 0 shares
11/26/2025	Happy Thanksgiving from PRWD	2 likes, 0 comments, 0 shares

d) **DLCCC/Becker County Museum Native Plantings** – Bach gathered some great information that may help with this project at the MN Watersheds Annual Conference ('sod' like native planting rolls and salt tolerant- parking lot friendly plant lists).
e) **Ottertail 1W1P Education and Outreach Group** – See 1W1P Section.
f) **MN Lakes and Rivers** – Video series is posted and available on the PRWD Facebook page and our website at: https://prwd.org/resources/shoreline-stewardship-video-campaign/

7) **DISTRICT OPERATIONS/ADMINISTRATION**.

a) **Grant Oversight** -
i) *Campbell Creek Watershed Restoration (MPCA Section 319 Small Watersheds Focus Group C Grant Funding).* We will work with Scott Schroeder, MPCA, to make any work plan updates due to changes with the bidding/phasing of the project. Next report date is Feb 1, 2026.
ii) *BWSR Clean Water Rice Lake Project – Phase 1 & Phase 2. MN DNR*. Phase 1 grant will be closed in December. The Phase 2 grant was amended to December 31, 2026, and elink report will be completed by 12/31/2025.

iii) *MN DNR – Conservation Partners Legacy Grant (Little Floyd Outlet)* – Final report is in process and will be completed by 12/31/2025.

iv) *Buck's Mill Dam Modification MN DNR* – Next progress report is due on 12/19/2025.

b) Otter Tail River 1W1P Partnership – WEBSITE: https://www.eotswcd.org/ot1w1p/

c) *Otter Tail 1W1P Implementation Grant* –Progress report was submitted to Nicole Lundeen for eLink Report.

i) **1W1P Grant – Feasibility Study West Area ("Willow Pond") Stormwater Treatment**. Ball Park Water Reuse Option will be finalized, and project will be closed out by year-end.

d) **Financial Audit 2025** – Lakes Area CPAs will conduct the 2025 Financial Audit the week of January 26, 2026.

e) **Policy Updates** – Personnel Policy updates were approved at the November Board Meeting, and the manual was updated and distributed to staff.

f) **Wells Fargo Office** – The lease for the PRWD Office expires in February 2026 and we have been in communication with Wells Fargo's leasing and property management who will be sending an amended lease agreement in the near future for consideration.

g) **Final 2026 Budget and Levies, Assessments, Fees** – In preparation of year-end and audit, Guetter and Bach reviewed 2025 Quickbooks payroll, revenue, and expenses for each fund account and updated the 2026 budget notes which will be presented at the December board meeting.

h) **Information Technology Upgrades** –Staff emails have been converted to prwd.org. Over the next few months we will be reorganizing district files. The technology upgrades will improve file sharing capabilities.

i) **Minnesota Watersheds.** Staff (Bach and Beranek) and Managers (Charles Jasken, Chris Jasken, Okeson, Olson, & Kral) attended the 2025 MN Watersheds Annual Conference. Annual Business meeting updates will be given at the December Board Meeting. The legislative event has been scheduled for March 3, 2026 in St. Paul.

8) **DATA COLLECTION AND MONITORING PROGRAM**

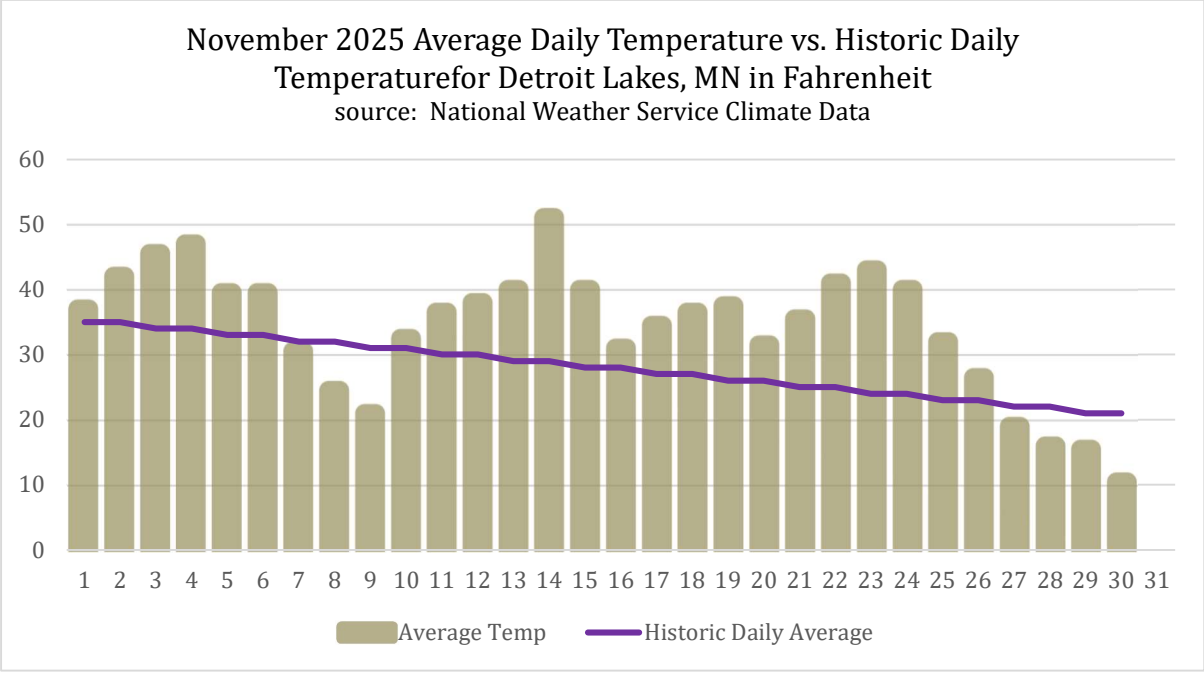
a) **Streams & Lakes** – Report assembly for the 2025 sampling season is underway.

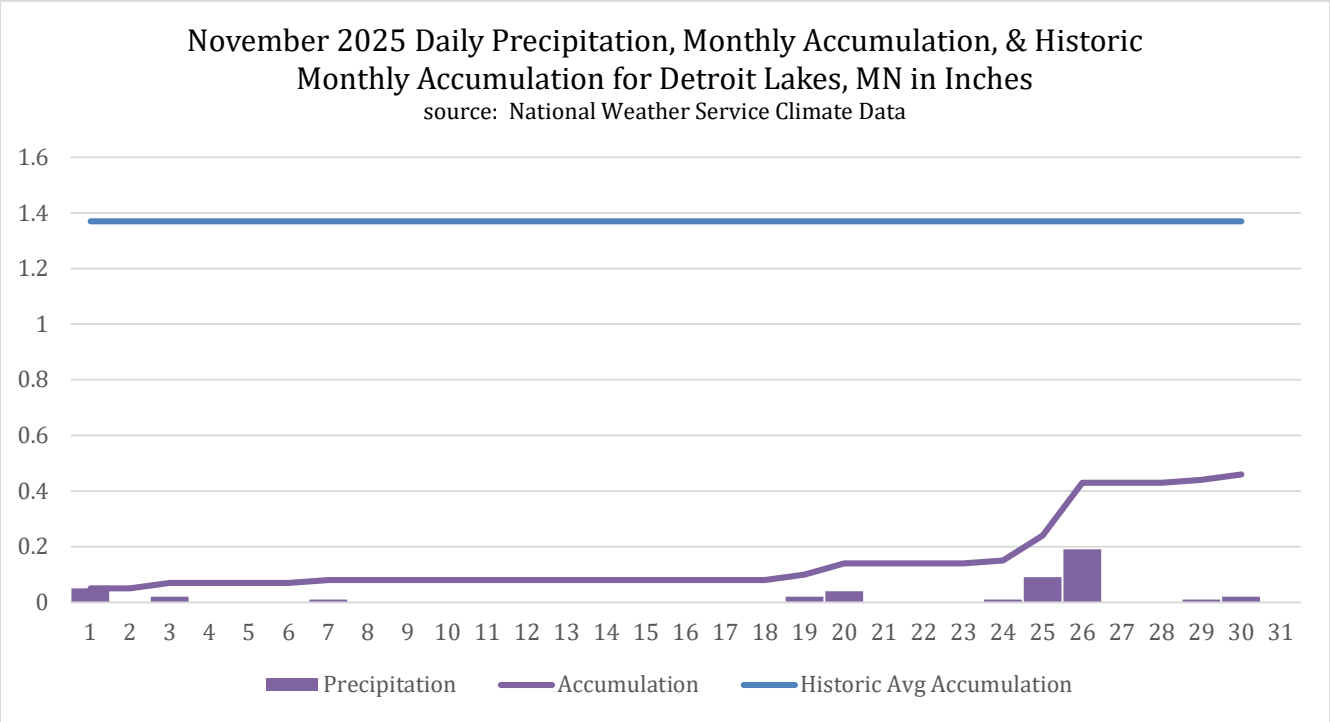
9) November Weather

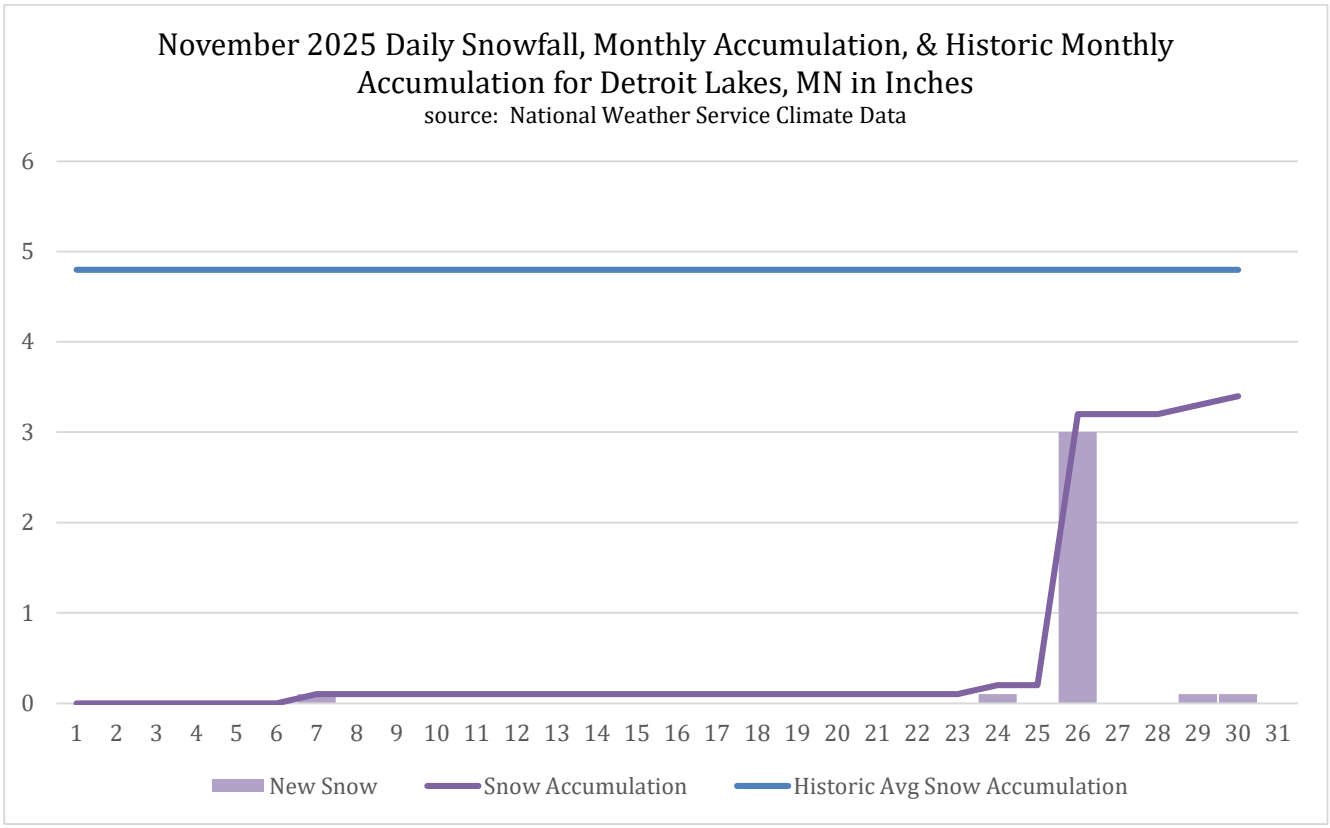
a. **Detroit Lakes, MN – National Weather Service Data**

November in Detroit Lakes was warmer and drier than average. The daily average temperature was below the historical average seven days this month. On November 14 the high temperature was 62 degrees F compared with an average high for this date of 37 degrees. The month saw no days of significant (>0.5") precipitation. We did receive our first snowfall of the season with a dusting on November 7. Three inches of snow fell over the Thanksgiving Holiday on November 26, but the overall precipitation for the month of November was only 0.46". This is 1.4" below the average precipitation of 0.91" for Detroit Lakes.

Monthly Temperature Data			
Warmest Day High Temp(s):	*62°F, 11/14/2025*	**Daily Average High Temp:**	*42°F*
Coldest Day Low Temp (s):	*6°F, 11/30/2025*	**Daily Average Low Temp:**	*25.7°F*
		Monthly Average Temp:	*33.8°F*
Monthly Precipitation Data			
Days with Significant Precipitation >0.5 inches:	0	**Total Precipitation for month:**	0.46 inches
Monthly Wind Data			
Days with Sustained winds over 13 mph (Moderate Breeze)	0	**Days with Gusts over 32 mph (Near Gale)**	0

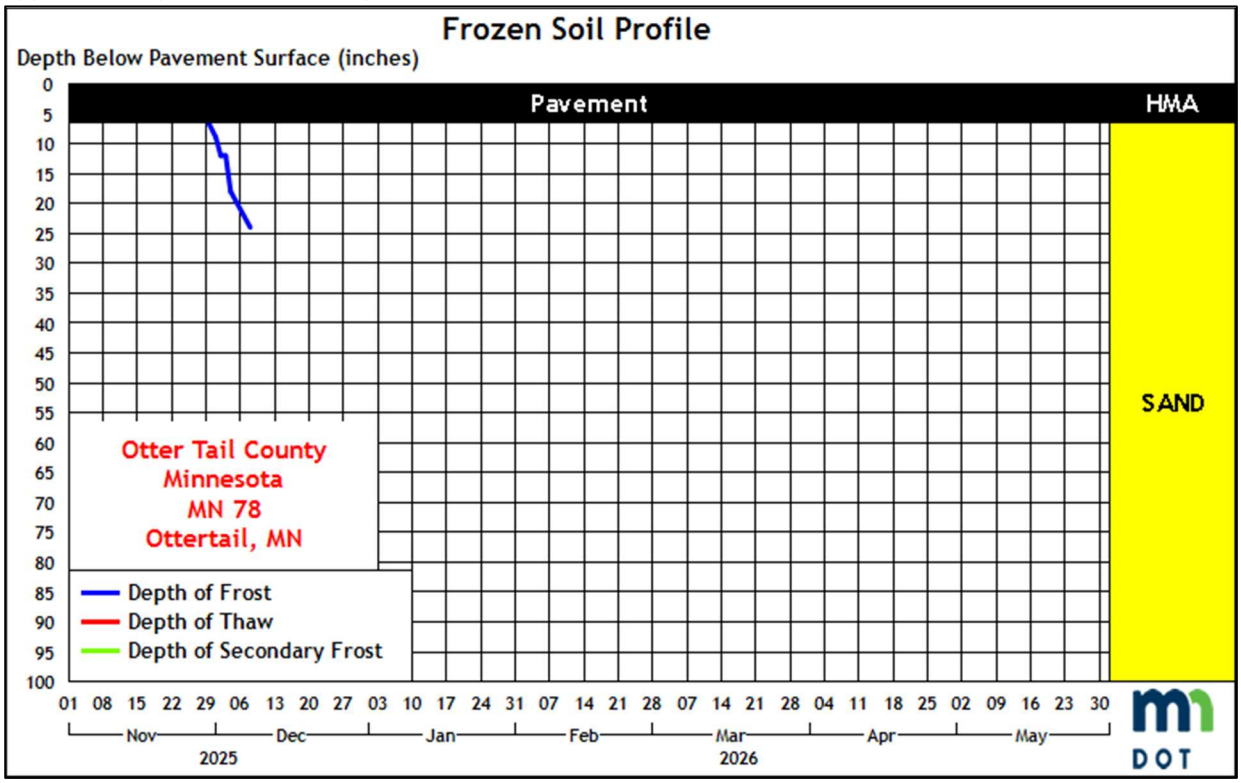



November 2025 Daily Precipitation, Monthly Accumulation, & Historic Monthly Accumulation for Detroit Lakes, MN in Inches
source: National Weather Service Climate Data
1.6
1.4
1.2
1
0.8
0.6
0.4
0.2
0
1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30 31
Precipitation
Accumulation
Historic Avg Accumulation


November 2025 Daily Snowfall, Monthly Accumulation, & Historic Monthly Accumulation for Detroit Lakes, MN in Inches
source: National Weather Service Climate Data
6
5
4
3
2
1
0
1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30 31
New Snow
Snow Accumulation
Historic Avg Snow Accumulation

b. **Frost Depth**

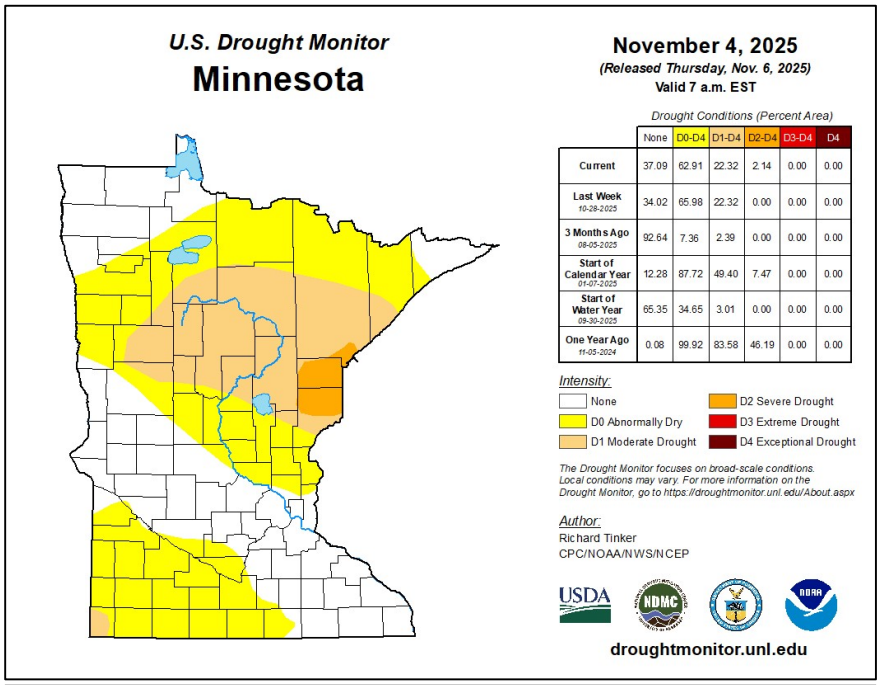
Soils are frozen in Otter Tail County. Frost accumulation began around Dec 1 and has progressed to approximately 25" of frozen depth as of Dec 8.

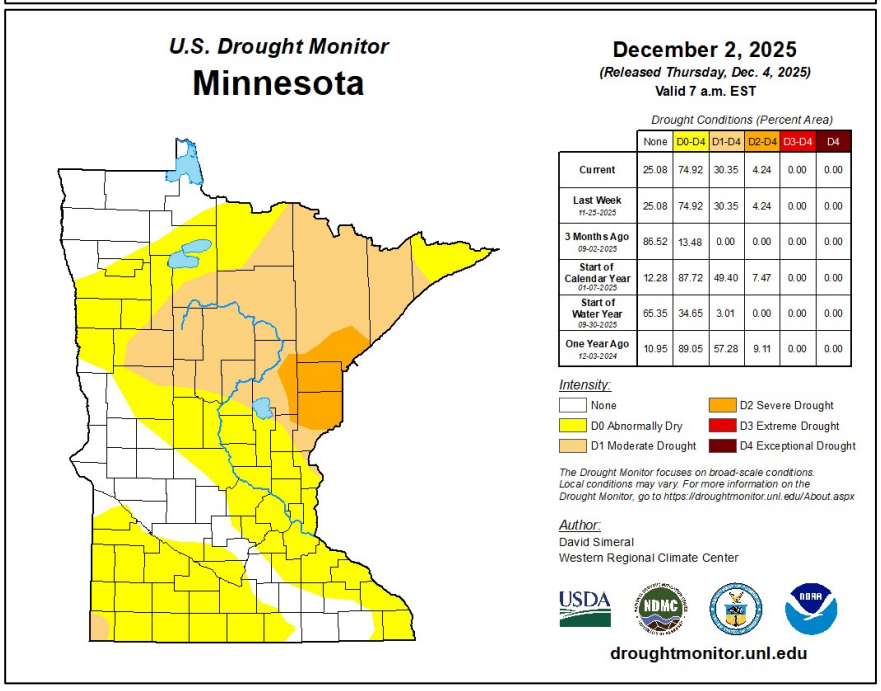


c. Minnesota Drought Report

The overall drought situation across Minnesota declined in November. Becker County saw no change with the majority of the county, including all of the Pelican River Watershed in Moderate Drought.

https://droughtmonitor.unl.edu/CurrentMap/StateDroughtMonitor.aspx?MN





Rules Report – December 2025

PELICAN RIVER watershed district

PERMITS COMPLETED

No.	Name/Address	Description
25-26	**Lynnview Estates** 865 Shorewood Dr PIN: 491682091 City of Detroit Lakes	Construction of a housing subdivision. PRWD Rule Chapter 6, Section 6.2(B) Residential subdivision or development of four (4) or more lots.
25-27	**Webber Family Motors** Spaeth Wenner Commercial Park Lots 6, 7, & 8 PIN: 492520156 492520157 492520158 City of Detroit Lake	Addition of quick lube station. PRWD Rule Chapter 6, Section 6.2(A)(3) Equal or greater than one (1) acre of impervious surface coverage.
25-28	**MN Flyers Gymnastics** 1306 Rossman Ave PIN: 497008000 City of Detroit Lakes	Addition to current facility. PRWD Rule Chapter 6, Section 6.2(A)(3) Equal or greater than one (1) acre of impervious surface coverage.

PERMITS IN PROCESS

Applicant	Application Status	Update	PRWD Contact Date
Detroit Lakes Airport 24813 Hwy 10 W PIN: 497003071 City of Detroit Lakes	Complete	Updated plans sent 11/7/25 and forwarded to Moore. Plans are currently under Moore review.	11/7/25
Solomon, Marty 12044 Co Hwy 17 PIN: 190447000 Lake Melissa	Violation	To date the Permit Amendment has not been requested by Mr. Solmon. The plan given to Mr. Solmon on 10/15/2025 is attached	10/29/2025

EXPECTED PROJECTS

Applicant	Project
Becker County - Dunton Locks 24878 Dunton Locks Rd PIN: 197010000 Lake Sallie/Muskrat Lake	Stormwater plan for building and parking lot. PRWD Rule Chapter 6, Section 6.2(A)(1) More than twenty-five percent (25%) impervious surface on riparian lots. Becker County (Mitch Lundeen) has been in contact with the district and is planning on a spring construction project.
The Port on Little Detroit (Bowling Alley Property) 1377 West Lake Dr PIN: 490124000 Little Detroit Lake	Construction of townhomes. PRWD Rule Chapter 6, Section 6.2(B) Residential subdivision or development of four (4) or more lots. Project Manager has been in contact with the district and is assembling application materials.

EXPECTED PROJECTS (continued)

Applicant	Project
Lake Sallie Bluffs TBD Lake Ridge Ln PIN: 19320000 190338002 190338001 191433000 Lake Sallie	Request a Final Plat for Common Interest Community Number 108 consisting of sixteen (16) lots to be known as LAKE SALLIE BLUFFS. PRWD Rule Chapter 6, Section 6.2(B) Residential subdivision or development of four (4) or more lots. Project Manager has been in contact with the district and is assembling application materials.

AGENCY MEETING REVIEW

City of Detroit Lakes – Planning Commission	No meeting in December.
City of Detroit Lakes – City Council	December 9, 2025 – no comments • Webber Family Motors – Conditional use permit for a car wash in "B-3" District. • Local Road Improvement Program (LRIP) relative to funding assistance for Multi-Use Trail improvements for West Lake Drive phase 4 (Pelican River to Long Bridge Road).
City of Detroit Lakes – Development Authority	November 6, 2025 • The Port on Little Detroit – Redevelopment Project 45 and tax increment financing. December 4, 2025 • The Port on Little Detroit – Redevelopment Project 45 and tax increment financing.
Becker County Commissioner	November 18, 2025 – no comments December 2, 2025 – no comments December 11, 2025 – no comments
Becker County – Planning and Zoning	December 3, 2025 – no comments
Becker County – Board of Adjustment	December 11, 2025 • 24252 Co Hwy 22 – Nesemeier - Request a variance to be at twenty-eight and two tenths (28.2) percent impervious coverage deviating from the allowable twenty-five (25) percent within the shoreland district due to lot size. (PRWD permit completed)

A Two Year Assessment of the Aquatic Plant Community in Response to Flumioxazin Treatments in Minnesota



A Final Data Summary Submitted to the Pelican River Watershed District

Pearl Jensen and Ryan M. Wersal, Ph.D.
Department of Biological Sciences
Minnesota State University, Mankato
Aquatic Weed Science Lab

Report: MNSU 0027

Background

Curlyleaf pondweed is a submersed aquatic plant that was introduced to the US in the 1800s (Catling and Dobson 1985). Originally from Eurasia, Africa, and Australia, it has since spread to all 48 continental states. Curlyleaf pondweed is capable of outcompeting native species and forming large monospecific beds (Tobiessen et al. 1992). It is widely considered to be an ecosystem transformer, accelerating internal nutrient loading and eutrophication (James et al. 2003). Curlyleaf pondweed can impact ecological balance by altering habitat structure, lowering species diversity, nutrient cycling, lowering dissolved oxygen, and affecting pH and temperature gradients (Tobiessen et al. 1992, Cheruvelil et al. 2002, James et al. 2003).

Curlyleaf pondweed primarily reproduces vegetatively via turion production or rhizome elongation (Bolduan et al. 1994, Woolf and Madsen 2003, Wells and Sytsma 2006). Turions are vegetative structures capable of surviving extreme conditions (i.e. droughts, freezing temperatures, and herbicide treatments) and producing a viable plant capable of reproduction (Madsen 2000). These structures are typically produced in the weeks prior to plant senescence (Bolduan et al. 1994, Woolf and Madsen 2003, Wells and Sytsma 2006). In northern populations, curlyleaf pondweed has an atypical growth cycle. It senesces in early summer after turion formation. Turions then fall to the substrate and are dormant throughout the summer. Turions sprout in mid to late fall and plants begin to grow, remaining viable under the ice throughout winter. When the ice melts in the spring curlyleaf pondweed will grow rapidly to reach the surface of the water and begin forming new turions (Woolf and Madsen 2003).

Curlyleaf pondweed is typically managed with herbicides such as fluridone, endothall, and diquat (Johnson et al. 2012, Bugbee at al. 2015). Many years of repeated applications of an herbicide, or multiple herbicides with the same mode of action, can lead to resistant populations (Richardson 2008). By alternating the type of herbicide being used in an area, herbicide resistance can be avoided. Flumioxazin is an herbicide that was registered for aquatic use in 2011. It is a contact herbicide that inhibits proto-porphyrinogen oxidase (PPO), an enzyme essential to the production of chlorophyll (Ortiz et al, 2020). Flumioxazin will hydrolyze quickly in high pH waters, with a documented half-life of 39 hours at a pH of 6-6.2 and 0.3 hours at a pH of 9 in closed water systems (Mudge 2010, Katagi 2003). Small scale studies have applied flumioxazin to aquatic plants in growth chambers and found that curlyleaf pondweed was susceptible to treatments at a rate of 200 µg L^{-1}, with effects not significantly enhanced at a rate of 400 µg L^{-1} (Glomski and Netherland 2013). However, field studies to determine effective rates of flumioxazin have not been completed.

The lakes used in this study included Detroit Lake, Lake Melissa, Lake Sallie, and Floyd Lake in Becker County, Bass Lake in Faribault County, Lake Tetonka in Le Sueur County, Lake George in Blue Earth

County, and Lake Schilling in Sibley County. With the exception of Lake Schilling, all of the lakes are used extensively for fishing and recreation. Lake George and Lake Schilling have never been managed for curlyleaf pondweed and were used as non-treated reference sites. The Bass Lake site has been undergoing treatment for two years prior to this study, and Lake Tetonka has not previously been managed for curlyleaf pondweed. No previous attempts to control the curlyleaf pondweed populations on the Becker County lakes have been made.

The main objectives for this study were to (1) reduce the presence of curlyleaf pondweed vegetation, (2) reduce the curlyleaf pondweed turion bank, (3) develop rate recommendations for flumioxazin use to control curlyleaf pondweed under field conditions, and (4) quantify native species response to flumioxazin treatments.

Materials and Methods

Herbicide Applications

Flumioxazin treatments occurred on May 14, 2024 and May 8, 2025 in Bass Lake, May 9, 2024 and May 13, 2025 in Lake Tetonka, and May 20, 2024 and May 31, 2025 in the Becker County lakes. A rate of 75 µg L^{-1} was used on Floyd Lake, 100 µg L^{-1} on Detroit Lake plots 1 and 2, 125 µg L^{-1} on Bass Lake and Lake Tetonka, and 150 µg L^{-1} on Lakes Melissa and Sallie. Lakes George and Schilling were included in the study as non-treated reference lakes. The pH at these sites ranged from 7.97 to 8.78 (Table 1).

Field Surveys

To assess the aquatic plant community in response to treatments, plant presence data were collected pretreatment, 3 weeks after treatment (3WAT), and 6 weeks after treatment (6WAT) in 2024 and 2025. Surveys on the non-treated sites occurred during the same week as the nearest treated lakes. The point-intercept method was utilized to maintain location consistency, covering each treatment plot in a grid dependent on the size of the plot. Further information on site parameters can be seen in Table 1, and plot locations can be seen in Figures 1-9. A rake was tossed at each point and plant identification occurred in the field with the help of the book, “Aquatic plants of the Upper Midwest” by Paul M. Skawinski. Spatial data were recorded using the FarmWorks Site Mate Software on a Trimble Yuma tablet PC.

The turion bank at each site was assessed monthly between May and October of 2024 and 2025. An Eckman dredge (0.02 m^2) was deployed at random locations in each plot to collect 20 sediment samples. The contents of each dredge sample were placed in a littoral wash bucket to isolate and count the turions.

Statistical Analysis

To assess individual plant species effects, percent occurrence was calculated by dividing the number of points that a given species was present by the total number of points surveyed at the site and multiplied by 100. A Cochran's Q test was used to determine differences in species occurrence between surveys. A McNemar's test was used to assess differences in the correlated proportions within a given data set between variables that are not independent. Changes in curlyleaf pondweed presence during the pretreatment surveys in 2024 and 2025 were assessed using a Cochran-Mantel-Haenszel test to control for year effects.

Species richness was used to observe changes in the plant community and calculated as the overall mean number of species found at the surveyed points in each site. A Kruskal-Wallis test was used to determine significant differences in species richness between surveys. If a difference was determined, a Dunn's all-pairwise comparison was used to separate those differences.

Turion densities were estimated by multiplying the number of turions in each sample by the area of the Eckman dredge (0.02 m^2). A 3-Way ANOVA was used to assess the source of variation between three components: year, month, and rate. No significant effects occurred between years ($p=0.54$), year x rate interaction (0.43), year x month interaction ($p=0.36$), and year x rate x month interaction ($p=0.29$). There was a difference observed between treatment rates ($p<0.001$), months ($p<0.001$), and rate x month interaction ($p<0.001$). Due to no differences being observed between 2024 and 2025, data from both years was combined to evaluate differences between rates for each month. All analyses were conducted at an $\alpha \leq 0.05$.

Results and Discussion

Curlyleaf Pondweed Assessment

Lake Melissa and Sallie were treated with flumioxazin at a rate of 150 µg L^{-1}. The pretreatment survey on Lake Melissa in 2024 found an initial occurrence of curlyleaf pondweed of 52% (Table 2). The subsequent 3WAT and 6WAT surveys found no curlyleaf pondweed present at any of the points ($p < 0.001$). In 2025, the occurrence of curlyleaf prior to treatment was 17% and had a non-significant decrease to 9% and 4% in the 3WAT and 6WAT surveys respectively ($p = 0.368$; Table 2; Fig. 10). Lake Melissa was the only site with a significant decrease in curlyleaf pondweed presence between the pretreatment surveys in 2024 to 2025 ($p = 0.032$). On Lake Sallie, limited curlyleaf was found pretreatment in 2024, only 4%, which did not significantly change during the 3WAT and 6WAT surveys ($p = 0.368$; Table 3). The following year, no curlyleaf was found pretreatment or 6WAT, but was present in 11% of the points surveyed 3WAT ($p = 0.050$; Table 3; Fig. 11). The presence of curlyleaf pondweed on

Lake Sallie was low and remained low throughout the study. Flumioxazin treatments on Lake Melissa were successful in decreasing curlyleaf pondweed by 3WAT and reduced the presence of curlyleaf pondweed the following year. A flumioxazin rate of 150 µg L^{-1} effectively controlled curlyleaf pondweed.

Bass Lake and Lake Tetonka plots were treated with flumioxazin at a rate of 125 µg L^{-1}. Bass Lake curlyleaf pondweed occurrence had a significant decrease from pretreatment to 6WAT ($p = 0.002$; Table 4). In 2025, curlyleaf pondweed was present at 65% of the points pretreatment and decreased to 25% 3WAT before experiencing some recovery 6WAT ($p = 0.038$; Table 4; Fig. 12). Lake Tetonka did not have significant changes in curlyleaf pondweed occurrence in 2024 or 2025 ($p = 0.074$; $p = 0.687$; Table 5; Fig. 13). Treatments on Lake Tetonka were likely influenced by the higher pH of the water compared to other lakes in this study. Based on literature estimates, flumioxazin would have had a half-life of about 1 hour, while other sites would have had 2-7 hours. Additionally, the treatment site was located near a channel connecting Lake Tetonka and Sakatah Lake. Increased water exchange at this site could also have negatively influenced the efficacy of the treatment through off-target movement of the herbicide. While the presence of curlyleaf was not significantly reduced on Lake Tetonka, visual observations of the plot suggest that its density, particularly in the upper water column, was reduced following treatment. Treating at a rate of 125 µg L^{-1} can effectively manage curlyleaf pondweed, but the magnitude of success will be site specific.

Detroit Lake plots 1 and 2 were treated with flumioxazin at a rate of 100 µg L^{-1}. Plot 1 pretreatment in 2024 had a 32% occurrence of curlyleaf pondweed, which significantly declined to 4% during the 6WAT survey ($p < 0.001$; Table 6). Due to technological issues, there is no pretreatment data for plot 1 in 2025. The 3WAT and 6WAT surveys each had a 7% occurrence rate of curlyleaf pondweed (Table 6; Fig. 14). In plot 2, curlyleaf pondweed was present at 36% of the points pretreatment in 2024, which decreased to 4% during the 3WAT survey ($p = 0.014$; Table 7). In 2025 there was a non-significant decrease by 6WAT ($p = 0.087$; Table 7; Fig. 15). Using a rate of 100 µg L^{-1} provided limited suppression of curlyleaf pondweed.

Floyd Lake was treated with flumioxazin at a rate of 75 µg L^{-1}. In 2024, curlyleaf pondweed occurrence was 13% prior to treatment and increased insignificantly to 33% by the 6WAT survey ($p = 0.325$; Table 8). Its occurrence increased from pretreatment in 2024 to pretreatment in 2025, with curlyleaf pondweed present at 53% of the surveyed points in 2025 ($p = 0.057$; Table 8; Fig. 16). While a Cochran's Q test detected a potential difference between surveys in 2025 ($p = 0.050$), the McNemar's comparison test indicated no significant difference between surveys, with the pretreatment and 6WAT surveys approaching significance ($p = 0.063$). This site was the smallest treated plot in this study, and increased edge effects may have reduced treatment efficacy through herbicide dilution and off-target movement.

Using this rate of 75 µg L^{-1} will not provide long-term control of curlyleaf pondweed unless applications are made to larger areas or protected bays with limited water exchange.

Lake George and Lake Schilling did not undergo an herbicide treatment. In 2024 the curlyleaf pondweed in Lake Schilling occurred at 81% of the points pretreatment and senesced early, with most gone by 3WAT and completely absent 6WAT ($p < 0.001$; Table 9). In 2025, occurrence remained high during each survey ($p = 0.135$; Table 9; Fig. 17). Lake George had an 83% occurrence pretreatment in 2024, which had a nonsignificant decrease to 56% by the 6WAT survey ($p = 0.087$; Table 10). Pretreatment occurrence in 2025 was 100%, decreasing to 33% by 6WAT ($p < 0.001$; Table 10; Fig. 18).

Average turion densities at each site between May and October of 2024 and 2025 can be seen in table 12. No differences between years were determined by a 3-Way ANOVA ($p=0.549$; Table 13) so data for each year were combined to determine differences in turion densities between rates. Non-treated sites had significantly more turions during each surveyed month than sites treated with flumioxazin (Table 14). Initial May turion densities at the 125 µg L^{-1} and 150 µg L^{-1} treated sites were not significantly different than the reference sites, however, the months following treatment have significantly lower densities than the reference sites. This indicates that treatments are reducing the number of turions being produced and thereby limiting recruitment. Further treatments should continue to reduce the number of turions being produced in a growing season to decrease the number of viable turions in the sediment through time. The treatment plot in Bass Lake has treated with flumioxazin since 2022, with 150 µg L^{-1} being applied in 2022 and 2023, and 125 µg L^{-1} in 2024 and 2025. A four year regression on average yearly turion densities can be observed in figure 1. Based on data from Bass Lake, a minimum of two years of treatment were necessary to reduce and maintain turion densities at a low level at this site. Further research is needed to determine how long treatments should occur to completely deplete a turion bank.

Native Plant Assessment

Species richness was calculated for total species richness and native species richness to better differentiate whether reductions in species richness was a result of the loss of curlyleaf pondweed. No reductions in native species richness between the pretreatment and 6WAT surveys in 2024 or 2025 were observed though herbicide response was species specific in some locations (Table 11). Many sites exhibited an increase in native species richness between the pretreatment and 6WAT surveys which can be attributed to the natural life history patterns of aquatic plant species.

White water crowfoot (*Ranunculus aquatilus*) occurrence decreased at Lake Melissa in 2024 according to the Cochran's Q test, however, the McNemar's comparison test was not able to confirm a significance between surveys (Table 2). Its presence did not return to the original 2024 pretreatment occurrence of

22% in 2025. Nodding waternymph (*Najas flexilis*) was not found during the 3WAT survey at Lake Melissa, however, its strong return during the 6WAT survey suggests it was likely just missed during sampling (Table 2). No other significant decreases in native species occurrences were observed at Lake Melissa and Lake Sallie following treatments of 150 µg L^{-1} or at Bass Lake and Lake Tetonka following treatments of 125 µg L^{-1}.

Northern watermilfoil, coontail, white-stem pondweed, and elodea all displayed a negative response to 100 µg L^{-1} treatments. Northern watermilfoil (*Myriophyllum sibiricum*) and coontail (*Ceratophyllum demersum*) presence decreased significantly following treatment at plot 2 in Detroit Lake in 2025 ($p = 0.005$; $p = 0.008$; Table 6) with a nonsignificant decrease in 2024 (Table 7). Coontail also decreased in 2024 at plot 1 ($p < 0.001$; Table 6). White-stem pondweed (*Potamogeton praelongus*) had a significant reduction following treatment at Detroit Lake plot 2 in 2024 that was not observed in 2025 (Table 7). This could be due to misidentification as clasping pondweed (*Potamogeton richardsonii*), which was not found pretreatment in 2024 or in any survey in 2025. Elodea (*Elodea canadensis*) presence decreased in plot 1 in 2024 ($p = 0.012$; Table 6), but a decrease was not observed in plot 2 (Table 7).

Water moss (*Drepanocladus sp.*) occurrence was significantly reduced following the 2024 75 µg L^{-1} treatment on Floyd Lake ($p = 0.007$; Table 8). No other negative effects on native species were observed. Negative effects are expected when using herbicide management methods. By treating curlyleaf pondweed before the native species have fully emerged, fewer negative impacts occur. Even at a higher rate of 150 µg L^{-1} of flumioxazin, few native species effects were observed and native plant community richness generally increased following treatments.

Summary

- Applying flumioxazin at a rate of 100 to 150 µg L^{-1} effectively decreased curlyleaf pondweed presence but magnitude of control will be site specific especially when 100 ug L^{-1} is used.
- Applying flumioxazin at a rate of 75 µg L^{-1} did not reduce the presence of curlyleaf pondweed in small plots.
- Mean native species richness (species $point^{-1}$) did not decrease in the treatment plots after herbicide applications and few negative species specific effects were observed.
- Subsequent treatments will be necessary to maintain control and to decrease the number of turions in the sediment. Flumioxazin applications in Bass Lake suggests 2 years of treatment is required to reduce and maintain turion densities at low levels.

Acknowledgements

Funds were provided by the Pelican River Watershed District. Herbicide applications and in-kind support provided by PLM Lake and Management Corporation. Thank you to David Hillstrom and Patrick Selter for their expertise and guidance in herbicide rate selection. Thank you to Thomas Zellmer, Justin Kjorness, Dillon Nelson, Mallory Kaiser, April Moffett, Shylah VonBerge, and Brady Narjes for fieldwork assistance and to the Pelican River Watershed District for the use of their boat.

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Table 1. Site parameters for flumioxazin assessments.

Lake	Treatment (µg L^{-1})	Early Season pH	Lake Area (acres)	Plot Area (acres)	Grid Size (meters)	Number of Points
Schilling	0	–	877	13.4	45	27
George	0	8.32	88	9.0	40	18
Floyd	75	8.29	1,178	3.2	30	15
Detroit Plot 1	100	8.02	3,067	18.2	50	31
Detroit Plot 2	100	8.02	3,067	13.5	45	26
Bass	125	8.78	199	8.0	40	20
Tetonka	125	8.08	1,358	10.7	45	22
Sallie	150	8.29	1,280	16.7	50	27
Melissa	150	8.38	1,850	11.2	45	23

Table 2. The percent occurrence and mean species richness (± 1 SE) of aquatic plants found in Lake Melissa in Becker County, MN following a flumioxazin herbicide treatment applied at a rate of 150 µg L^{-1}. Surveys occurred on May 6, June 11, and July 9, 2024, and May 13, June 11, and July 1, 2025. Significant differences in species occurrences within years according to a Cochran's Q test with a McNemar's Comparison and in species richness within years according to a Kruskal-Wallis test with Dunn's All-Pairwise Comparison are differentiated by letters ($\alpha = 0.05$). A difference in curlyleaf pondweed presence between pretreatment surveys at a $p \leq 0.05$ significance level was determined with the Cochran-Mantel-Haenszel test ($p = 0.032$).

Lake Melissa Macrophyte % Occurrence									
		2024				2025			
Scientific Name	**Common Name**	**Pre**	**3WAT**	**6WAT**	**p**	**Pre**	**3WAT**	**6WAT**	**p**
Potamogeton crispus	Curlyleaf pondweed	52**a***	0**b**	0**b**	< 0.001	17*	9	4	0.368
Ceratophyllum demersum	Coontail	57	57	57	1.000	9	9	9	1.000
Chara Sp.	Chara	0**a**	26**b**	22**ab**	0.021	22	26	13	0.529
Drepanocladus sp.	Water moss	13	22	35	0.178	13**a**	52**b**	43**ab**	0.024
Elodea canadensis	Common elodea	9	4	4	0.779	9	4	9	0.779
Hippuris vulgaris	Marestail	0	0	4	0.368	0	4	0	0.368
Lemna trisulca	Star duckweed	43**a**	83**b**	83**b**	< 0.001	52	65	61	0.584
Myriophyllum sibiricum	Northern watermilfoil	52	39	48	0.678	44	35	13	0.074
Najas flexilis	Nodding waternymph	22**ab**	0**b**	43**a**	0.007	44	22	17	0.076
Potamogeton illinoensis	Illinois pondweed	0	0	4	0.368	0	0	9	0.135
Potamogeton praelongus	White-stem pondweed	0	0	4	0.368	30	52	57	0.109
Potamogeton richardsonii	Clasping leaf pondweed	0**a**	35**b**	22**ab**	0.012	0	13	22	0.093
Potamogeton zosteriformis	Flatstem pondweed	4**a**	39**b**	35**b**	0.012	13	35	39	0.109
Ranunculus aquaticus	White water-crowfoot	22	9	0	0.042	0	4	0	0.368
Stuckenia pectinata	Sago pondweed	0	0	0	-	0	4	4	0.607
Utricularia sp.	Bladderwort	0	0	9	0.135	4	9	4	0.779
Vallisneria americana	Wild celery	0	0	9	0.135	0	0	4	0.368
Mean Species Richness ±1 SE		2.74 ± 0.33	3.13 ± 0.32	3.78 ± 0.29	0.090	2.57 ± 0.35	3.44 ± 0.35	3.09 ± 0.49	0.329
Native Species Richness ±1 SE		2.23 ± 0.31**a**	3.13 ± 0.32**ab**	3.78 ± 0.29**b**	0.003	2.39 ± 0.37	3.35 ± 0.34	3.04 ± 0.47	0.224

Table 3. The percent occurrence and mean species richness (± 1 SE) of aquatic plants found on Sallie Lake in Becker County, MN following a flumioxazin herbicide treatment applied at a rate of 150 µg L^{-1}. Surveys occurred on May 1, June 10, and July 10, 2024, and May 13, June 11, and July 1, 2025. Significant differences in species occurrences within years according to a Cochran's Q test with a McNemar's Comparison and in species richness within years according to a Kruskal-Wallis test with Dunn's All-Pairwise Comparison are differentiated by letters ($\alpha = 0.05$). There was no difference in curlyleaf pondweed presence between pretreatment surveys at a $p \leq 0.05$ significance level according to the Cochran-Mantel-Haenszel test ($p = 1.000$).

Lake Sallie Macrophyte % Occurrence									
		2024				2025			
Scientific Name	**Common Name**	**Pre**	**3WAT**	**6WAT**	**p**	**Pre**	**3WAT**	**6WAT**	**p**
Potamogeton crispus	Curlyleaf pondweed	4	7	0	0.368	0	11	0	0.050
Bidens beckii	Water marigold	0	0	0	-	0	0	4	0.368
Ceratophyllum demersum	Coontail	37	30	22	0.301	0	15	4	0.039
Chara Sp.	Chara	33	26	41	0.264	26	33	33	0.827
Drepanocladus sp.	Water moss	44	67	56	0.105	41**a**	78**b**	85**b**	0.001
Lemna trisulca	Star duckweed	78	85	85	0.670	78	89	89	0.472
Myriophyllum sibiricum	Northern watermilfoil	63	48	48	0.292	19	15	7	0.497
Potamogeton illinoensis	Illinois pondweed	0	0	15	0.018	0	4	15	0.074
Potamogeton praelongus	White-stem pondweed	0	0	11	0.050	11	11	26	0.234
Potamogeton richardsonii	Clasping leaf pondweed	0	11	19	0.066	0	11	0	0.050
Potamogeton zosteriformis	Flatstem pondweed	37	19	26	0.232	15	22	19	0.794
Ranunculus aquaticus	White water-crowfoot	7	4	0	0.368	0	0	7	0.135
Stuckenia pectinata	Sago pondweed	0	0	7	0.135	0	7	7	0.368
Utricularia sp.	Bladderwort	0	0	11	0.050	7	0	0	0.135
Vallisneria americana	Wild celery	0**a**	4**ab**	22**b**	0.006	0**a**	15**ab**	30**b**	0.013
Mean Species Richness ±1 SE		3.04 ± 0.30**a**	3.00 ± 0.24**ab**	3.63 ± 0.26**a**	0.146	1.96 ± 0.22**a**	3.11 ± 0.30**b**	3.26 ± 0.32**b**	< 0.001
Native Species Richness ±1 SE		3.00 ± 0.30**b**	2.93 ± 0.23**ab**	3.63 ± 0.26**a**	0.0788	1.96 ± 0.22**a**	3.00 ± 0.31**b**	3.26 ± 0.32**b**	0.002

Table 4. The percent occurrence and mean species richness (± 1 SE) of aquatic plants found on Bass Lake in Faribault County, MN following a flumioxazin herbicide treatment applied at a rate of 125 µg L^{-1}. Surveys occurred on May 7, June 6, and June 26, 2024, and May 5, May 29, and June 19, 2025. Significant differences in species occurrences within years according to a Cochran's Q test with a McNemar's Comparison and in species richness within years according to a Kruskal-Wallis test with Dunn's All-Pairwise Comparison are differentiated by letters ($\alpha = 0.05$). There was no difference in curlyleaf pondweed presence between pretreatment surveys at a $p \leq 0.05$ significance level according to the Cochran-Mantel-Haenszel test ($p = 0.211$).

Bass Lake Macrophyte % Occurrence									
		2024				2025			
Scientific Name	**Common Name**	**Pre**	**3WAT**	**6WAT**	**p**	**Pre**	**3WAT**	**6WAT**	**p**
Potamogeton crispus	Curlyleaf pondweed	35**a**	57**a**	5**b**	0.002	65**a**	25**b**	50**ab**	0.038
Myriophyllum spicatum	Eurasian watermilfoil	5	10	24	0.115	65**a**	10**b**	30**ab**	0.002
Chara sp.	Chara	0	0	5	0.368	0	0	0	-
Elodea canadensis	Common elodea	0	0	0	-	0	0	5	0.368
Myriophyllum sibiricum	Northern watermilfoil	5	10	19	0.174	0	5	0	0.368
Stuckenia pectinata	Sago pondweed	0	5	14	0.097	5	0	10	0.135
Mean Species Richness ±1 SE		0.50 ± 0.14	0.81 ± 0.19	0.67 ± 0.17	0.465	1.35 ± 0.18**a**	0.4 ± 0.13**b**	0.95 ± 0.14**a**	< 0.001
Native Species Richness ±1 SE		0.05 ± 0.05**a**	0.15 ± 0.08**ab**	0.40 ± 0.13**b**	0.040	0.05 ± 0.05	0.05 ± 0.05	0.15 ± 0.08	0.431

Table 5. The percent occurrence and mean species richness (± 1 SE) of aquatic plants found on Lake Tetonka in Le Sueur County, MN following a flumioxazin herbicide treatment applied at a rate of 125 µg L^{-1}. Surveys occurred on May 8, May 30, and June 19, 2024, and May 8, June 3, and June 24, 2025. Significant differences in species occurrences within years according to a Cochran's Q test with a McNemar's Comparison and in species richness within years according to a Kruskal-Wallis test with Dunn's All-Pairwise Comparison are differentiated by letters ($\alpha = 0.05$). There was no difference in curlyleaf pondweed presence between pretreatment surveys at a $p \leq 0.05$ significance level according to the Cochran-Mantel-Haenszel test ($p = 0.474$).

Lake Tetonka Macrophyte % Occurrence									
		2024				2025			
Scientific Name	**Common Name**	**Pre**	**3WAT**	**6WAT**	**p**	**Pre**	**3WAT**	**6WAT**	**p**
Potamogeton crispus	Curlyleaf pondweed	100	95	82	0.074	91	82	86	0.687
Myriophyllum spicatum	Eurasian watermilfoil	86	82	95	0.368	41**a**	64**ab**	91**b**	0.003
Ceratophyllum demersum	Coontail	14	27	27	0.500	41**a**	55**a**	96**b**	< 0.001
Elodea canadensis	Common elodea	0	5	0	0.368	9**a**	41**b**	64**b**	0.002
Lemna trisulca	Star duckweed	0	0	0	-	0	5	5	0.607
Myriophyllum sibiricum	Northern watermilfoil	9**a**	59**b**	9**a**	< 0.001	46	77	55	0.101
Potamogeton zosteriformis	Flatstem pondweed	0**a**	91**b**	5**a**	< 0.001	0	0	0	-
Potomageton richardsonii	Clasping leaf pondweed	0	5	0	0.368	0	5	5	0.607
Mean Species Richness ±1 SE		2.09 ± 0.13**a**	3.64 ± 0.20**b**	2.23 ± 0.19**a**	< 0.001	2.27 ± 0.20**a**	3.27 ± 0.27**b**	4.09 ± 0.21**b**	< 0.001
Native Species Richness ±1 SE		0.23 ± 0.09**a**	1.86 ± 0.18**b**	0.45 ± 0.14**a**	< 0.001	0.95 ± 0.18**a**	1.82 ± 0.20**b**	2.32 ± 0.15**b**	< 0.001

Table 6. The percent occurrence and mean species richness (± 1 SE) of aquatic plants found in plot 1 of Detroit Lake in Becker County, MN following a flumioxazin herbicide treatment applied at a rate of 100 µg L^{-1}. Surveys occurred on May 1, June 10, and July 10, 2024, and May 12, June 10, and June 30, 2025. Technological errors occurred during the May 12, 2025 pretreatment survey, resulting in the loss of the data collected. Significant differences in species occurrences within years according to a Cochran's Q test with a McNemar's Comparison and in species richness within years according to a Kruskal-Wallis test with Dunn's All-Pairwise Comparison are differentiated by letters ($\alpha = 0.05$).

Detroit Lake Plot 1 Macrophyte % Occurrence									
		2024				2025			
Scientific Name	**Common Name**	**Pre**	**3WAT**	**6WAT**	**p**	**Pre**	**3WAT**	**6WAT**	**p**
Potamogeton crispus	Curlyleaf pondweed	32**a**	18**ab**	4**b**	< 0.001	-	7	7	-
Bidens beckii	Water marigold	0	0	0	-	-	0	4	-
Ceratophyllum demersum	Coontail	29**a**	0**b**	4**b**	< 0.001	-	0	4	-
Chara sp.	Chara	90	96	89	0.549	-	93	93	-
Drepanocladus sp.	Water moss	0**a**	50**b**	50**b**	< 0.001	-	32	39	-
Elodea canadensis	Common elodea	19**a**	0**b**	4**ab**	0.012	-	0	0	-
Lemna trisulca	Star duckweed	0	4	4	0.607	-	0	0	-
Myriophyllum sibiricum	Northern watermilfoil	26	18	29	0.584	-	14	21	-
Najas flexilis	Nodding waternymph	0	0	11	0.050	-	18	21	-
Potamogeton illinoensis	Illinois pondweed	0	0	11	0.050	-	7	4	-
Potamogeton praelongus	Whitestem pondweed	0	0	0	-	-	21	18	-
Potamogeton richardsonii	Clasping leaf pondweed	0**a**	43**b**	21**b**	0.001	-	7	11	-
Potamogeton zosteriformis	Flatstem pondweed	16	21	32	0.223	-	11	14	-
Utricularia sp.	Bladderwort	0	0	7	0.135	-	4	4	-
Vallisneria americana	Wild celery	0	0	14	0.018	-	11	21	-
Mean Species Richness ±1 SE		2.13 ± 0.19	2.50 ± 0.22	2.82 ± 0.29	0.128	-	2.19 ± 0.24	2.64 ± 0.32	0.500
Native Species Richness ±1 SE		1.81 ± 0.16**a**	2.32 ± 0.18**ab**	2.79 ± 0.29**b**	0.005	-	2.18 ± 0.25	2.57 ± 0.31	0.433

Table 7. The percent occurrence and mean species richness (± 1 SE) of aquatic plants found in plot 2 of Detroit Lake in Becker County, MN following a flumioxazin herbicide treatment applied at a rate of 100 µg L^{-1}. Surveys occurred on May 6, June 10, and July 9, 2024, and May 12, June 10, and June 30, 2025. Significant differences in species occurrences within years according to a Cochran's Q test with a McNemar's Comparison and in species richness within years according to a Kruskal-Wallis test with Dunn's All-Pairwise Comparison are differentiated by letters ($\alpha = 0.05$). There was no difference in curlyleaf pondweed presence between pretreatment surveys at a $p \leq 0.05$ significance level according to the Cochran-Mantel-Haenszel test ($p = 0.922$).

Detroit Lake Plot 2 Macrophyte % Occurrence									
		2024				2025			
Scientific Name	**Common Name**	**Pre**	**3WAT**	**6WAT**	**p**	**Pre**	**3WAT**	**6WAT**	**p**
Potamogeton crispus	Curlyleaf pondweed	36**a**	4**b**	12**ab**	0.014	31	38	12	0.087
Ceratophyllum demersum	Coontail	44	42	31	0.678	42**a**	8**b**	15**b**	0.008
Chara sp.	Chara	0	0	0	-	8	0	8	0.368
Drepanocladus sp.	Water moss	4**a**	62**b**	85**b**	< 0.001	54**a**	15**b**	62**a**	0.003
Elodea canadensis	Common elodea	16	12	12	0.895	12	12	8	0.867
Lemna trisulca	Star duckweed	56**a**	62**ab**	85**b**	0.042	77	62	69	0.494
Myriophyllum sibiricum	Northern watermilfoil	24	15	12	0.497	27**a**	4**ab**	0**b**	0.005
Najas flexilis	Nodding waternymph	0	0	15	0.018	12	4	19	0.135
Potamogeton illinoensis	Illinois pondweed	0	0	4	0.368	0	0	0	-
Potamogeton praelongus	Whitestem pondweed	24**a**	0**b**	0**b**	0.002	27	35	42	0.397
Potamogeton richardsonii	Clasping leaf pondweed	0**a**	50**b**	8**a**	< 0.001	0	0	0	-
Potamogeton zosteriformis	Flatstem pondweed	36	54	50	0.449	39	15	23	0.155
Ranunculus aquaticus	White water-crowfoot	0	4	8	0.368	35	27	31	0.741
Stuckenia pectinata	Sago pondweed	0	8	4	0.368	0	4	8	0.368
Utricularia sp.	Bladderwort	0	8	15	0.135	23	19	12	0.558
Vallisneria americana	Wild celery	0**a**	12**a**	46**b**	< 0.001	0**a**	42**b**	38**b**	< 0.001
Mean Species Richness ±1 SE		2.40 ± 0.35**a**	3.31 ± 0.26**ab**	3.65 ± 0.28**b**	0.012	3.85 ± 0.38	2.96 ± 0.30	3.46 ± 0.39	0.170
Native Species Richness ±1 SE		2.04 ± 0.32**a**	3.27 ± 0.26**b**	3.35 ± 0.38**b**	0.001	3.54 ± 0.38	2.46 ± 0.27	3.35 ± 0.38	0.080

Table 8. The percent occurrence and mean species richness (± 1 SE) of aquatic plants found in Floyd Lake in Becker County, MN following a flumioxazin herbicide treatment applied at a rate of 75 µg L^{-1}. Surveys occurred on May 1, June 11, and July 10, 2024, and May 13, June 10, and June 30, 2025. Significant differences in species occurrences within years according to a Cochran's Q test with a McNemar's Comparison and in species richness within years according to a Kruskal-Wallis test with Dunn's All-Pairwise Comparison are differentiated by letters ($\alpha = 0.05$). There was no difference in curlyleaf pondweed presence between pretreatment surveys at a $p \leq 0.05$ significance level according to the Cochran-Mantel-Haenszel test ($p = 0.057$).

Floyd Lake Macrophyte % Occurrence									
		2024				2025			
Scientific Name	**Common Name**	**Pre**	**3WAT**	**6WAT**	**p**	**Pre**	**3WAT**	**6WAT**	**p**
Potamogeton crispus	Curlyleaf pondweed	13	13	33	0.325	53	27	20	0.050
Ceratophyllum demersum	Coontail	20	13	33	0.368	53	13	20	0.076
Chara Sp.	Chara	7**ab**	0**b**	40**a**	0.006	0	13	20	0.247
Drepanocladus sp.	Water moss	33	0	0	0.007	0	0	0	-
Elodea canadensis	Common elodea	20	20	20	1.000	40	20	33	0.497
Lemna trisulca	Star duckweed	73	73	67	0.867	27**a**	47**ab**	67**b**	0.021
Myriophyllum sibiricum	Northern watermilfoil	53	60	40	0.417	7	27	27	0.325
Nuphar variegata	Yellow water lily	7**a**	20**ab**	47**b**	0.030	13	20	20	0.846
Nymphea odorata	White water lily	0	0	20	0.050	0	7	27	0.039
Potamogeton illinoensis	Illinois pondweed	7	0	0	0.368	0	0	0	-
Potamogeton praelongus	Whitestem pondweed	0	0	0	-	7	0	7	0.607
Potamogeton richardsonii	Clasping leaf pondweed	0**a**	13**ab**	40**b**	0.018	0**a**	60**b**	47**b**	0.002
Potamogeton zosteriformis	Flatstem pondweed	7**a**	20**a**	67**b**	< 0.001	13**a**	0**a**	53**b**	0.002
Potomageton natans	Floating pondweed	0	33	13	0.042	0**a**	33**ab**	47**b**	0.020
Ranunculus aquaticus	White water-crowfoot	0**a**	27**ab**	67**b**	< 0.001	67	67	87	0.276
Schoenoplectus acutus	Hardstem bulrush	0	7	7	0.607	0	7	0	0.368
Stuckenia pectinata	Sago pondweed	0	0	13	0.135	0**a**	47**b**	53**b**	0.003
Typha sp.	Cattail	0	7	7	0.607	7	7	7	1.000
Vallisneria americana	Wild celery	0	7	0	0.368	7	20	0	0.174
Mean Species Richness ±1 SE		2.40 ± 0.34**a**	3.13 ± 0.31**a**	5.13 ± 0.62**b**	< 0.001	2.93 ± 0.46**a**	4.13 ± 0.56**ab**	5.33 ± 0.87**b**	0.030
Native Species Richness ±1 SE		2.27 ± 0.32**a**	3.00 ± 0.32**ab**	4.80 ± 0.61**b**	0.001	2.4 ± 0.40**a**	3.87 ± 0.52**ab**	5.13 ± 0.82**b**	0.008

Table 9. The percent occurrence and mean species richness (± 1 SE) of aquatic plants found in Schilling Lake in Sibley County, MN with no herbicide treatments. Surveys occurred on May 9, June 3, and June 24, 2024 and May 9, June 4, and June 25, 2025. Significant differences in species occurrences within years according to a Cochran's Q test with a McNemar's Comparison and in species richness within years according to a Kruskal-Wallis test with Dunn's All-Pairwise Comparison are differentiated by letters ($\alpha = 0.05$). There was no difference in curlyleaf pondweed presence between pretreatment surveys at a $p \leq 0.05$ significance level according to the Cochran-Mantel-Haenszel test ($p = 0.422$).

Lake Schilling Macrophyte % Occurrence									
		2024				2025			
Scientific Name	**Common Name**	**Pre**	**3WAT**	**6WAT**	**p**	**Pre**	**3WAT**	**6WAT**	**p**
Potamogeton crispus	Curlyleaf pondweed	81**a**	4**b**	0**b**	< 0.001	93	100	100	0.135
Stuckenia pectinata	Sago pondweed	0	7	4	0.368	7**a**	56**b**	89**c**	< 0.001
Mean Species Richness ±1 SE		0.81 ± 0.08**a**	0.11 ± 0.06**b**	0.04 ± 0.04**b**	< 0.001	1.00 ± 0.08**a**	1.56 ± 0.10**b**	1.89 ± 0.06**b**	< 0.001
Native Species Richness ±1 SE		0.00 ± 0.00	0.07 ± 0.05	0.04 ± 0.04	0.363	0.07 ± 0.05**a**	0.56 ± 0.1**b**	0.89 ± 0.06**c**	< 0.001

Table 10. The percent occurrence and mean species richness (± 1 SE) of aquatic plants found in Lake George in Blue Earth County, MN with no herbicide treatments. Surveys occurred on May 8, May 30, and June 19, 2024, and May 8, June 3, and June 24, 2025. Significant differences in species occurrences within years according to a Cochran's Q test with a McNemar's Comparison and in species richness within years according to a Kruskal-Wallis test with Dunn's All-Pairwise Comparison are differentiated by letters ($\alpha = 0.05$). There was no difference in curlyleaf pondweed presence between pretreatment surveys at a $p \leq 0.05$ significance level according to the Cochran-Mantel-Haenszel test ($p = 0.473$).

Lake George Macrophyte % Occurrence									
		2024				2025			
Scientific Name	**Common Name**	**Pre**	**3WAT**	**6WAT**	**p**	**Pre**	**3WAT**	**6WAT**	**p**
Potamogeton crispus	Curlyleaf pondweed	89	72	56	0.086	100**a**	83**a**	33**b**	< 0.001
Ceratophyllum demersum	Coontail	22	11	39	0.178	11	6	17	0.549
Chara sp.	Chara	6	0	6	0.607	0	0	0	-
Elodea canadensis	Common elodea	6	0	11	0.223	6	11	11	0.819
Lemna minor	Common duckweed	0	28	0	0.007	0	0	0	-
Mean Species Richness ±1 SE		1.22 ± 0.21	1.11 ± 0.20	1.11 ± 0.25	0.953	1.17 ± 0.09**a**	1.00 ± 0.14**ab**	0.58 ± 0.22**b**	0.009
Native Species Richness ±1 SE		0.33 ± 0.18	0.39 ± 0.12	0.56 ± 0.17	0.386	0.17 ± 0.09	0.17 ± 0.09	0.28 ± 0.14	0.854

Table 11. Mean species richness (± 1 SE) of lakes during the pretreatment, 3WAT, and 6WAT surveys in 2024 and 2025 in response to flumioxazin treatments. Significant differences between surveys according to a Kruskal-Wallis test are differentiated by letters ($\alpha = 0.05$).

Mean Species Richness ± 1 SE							
		2024			2025		
Site		Pretreatment	3WAT	6WAT	Pretreatment	3WAT	6WAT
Schilling (0 µg L^{-1})	Total	0.81 ± 0.08**c**	0.11 ± 0.06**d**	0.04 ± 0.04**d**	1.00 ± 0.08**bc**	1.56 ± 0.10**ab**	1.89 ± 0.06**a**
	Native	0.00 ± 0.00**b**	0.07 ± 0.05**b**	0.04 ± 0.04**b**	0.07 ± 0.05**b**	0.56 ± 0.1**a**	0.89 ± 0.06**a**
George (0 µg L^{-1})	Total	1.22 ± 0.21	1.11 ± 0.20	1.11 ± 0.25	1.17 ± 0.09	1.00 ± 0.14	0.58 ± 0.22
	Native	0.33 ± 0.18	0.39 ± 0.12	0.56 ± 0.17	0.17 ± 0.09	0.17 ± 0.09	0.28 ± 0.14
Floyd (75 µg L^{-1})	Total	2.40 ± 0.34**b**	3.13 ± 0.31**ab**	5.13 ± 0.62**a**	2.93 ± 0.46**ab**	4.13 ± 0.56**ab**	5.33 ± 0.87**a**
	Native	2.27 ± 0.32**b**	3.00 ± 0.32**ab**	4.80 ± 0.61**a**	2.4 ± 0.40**b**	3.87 ± 0.52**ab**	5.13 ± 0.82**a**
Detroit Plot 1 (100 µg L^{-1})	Total	2.13 ± 0.19	2.50 ± 0.22	2.79 ± 0.29		2.19 ± 0.24	2.64 ± 0.32
	Native	1.81 ± 0.16**b**	2.32 ± 0.18**ab**	3.14 ± 0.46**a**		2.18 ± 0.25**ab**	2.57 ± 0.31**ab**
Detroit Plot 2 (100 µg L^{-1})	Total	2.40 ± 0.35	3.31 ± 0.26	3.65 ± 0.28	3.85 ± 0.38	2.96 ± 0.30	3.46 ± 0.39
	Native	2.04 ± 0.32	3.27 ± 0.26	3.35 ± 0.38	3.54 ± 0.38	2.46 ± 0.27	3.35 ± 0.38
Bass (125 µg L^{-1})	Total	0.50 ± 0.14**b**	0.81 ± 0.19**ab**	0.67 ± 0.17**ab**	1.35 ± 0.18**a**	0.4 ± 0.13**b**	0.95 ± 0.14**ab**
	Native	0.05 ± 0.05	0.15 ± 0.08	0.40 ± 0.13	0.05 ± 0.05	0.05 ± 0.05	0.15 ± 0.08
Tetonka (125 µg L^{-1})	Total	2.09 ± 0.13**c**	3.64 ± 0.20**bc**	2.23 ± 0.19**bc**	2.27 ± 0.20**bc**	3.27 ± 0.27**ab**	4.09 ± 0.21**a**
	Native	0.23 ± 0.09**c**	1.86 ± 0.18**ab**	0.45 ± 0.14**c**	0.95 ± 0.18**bc**	1.82 ± 0.20**ab**	2.32 ± 0.15**a**
Sallie (150 µg L^{-1})	Total	3.04 ± 0.30**a**	3.00 ± 0.24**ab**	3.63 ± 0.26**a**	1.96 ± 0.22**b**	3.11 ± 0.30**a**	3.26 ± 0.32**a**
	Native	3.00 ± 0.30**b**	2.93 ± 0.23**ab**	3.63 ± 0.26**a**	1.96 ± 0.22**b**	3.00 ± 0.31**ab**	3.26 ± 0.32**ab**
Melissa (150 µg L^{-1})	Total	2.74 ± 0.33	3.13 ± 0.32	3.78 ± 0.29	2.57 ± 0.35	3.44 ± 0.35	3.09 ± 0.49
	Native	2.23 ± 0.31**b**	3.13 ± 0.32**ab**	3.78 ± 0.29**a**	2.39 ± 0.37**b**	3.35 ± 0.34**ab**	3.04 ± 0.47**ab**

Table 12. The mean turion density at flumioxazin treated plots between May and October of 2024 and 2025 in response to flumioxazin treatments.

	Average Turion Density (turions/m^2)											
	2024						2025					
	May	**Jun**	**Jul**	**Aug**	**Sep**	**Oct**	**May**	**Jun**	**Jul**	**Aug**	**Sep**	**Oct**
George (0 µg L^{-1})	150.0	495.0	667.5	647.5	317.5	447.5	117.5	725.0	797.5	600.0	415.0	237.5
Schilling (0 µg L^{-1})	212.5	142.5	192.5	170.0	172.5	190.0	130.0	220.0	200.0	152.5	165.0	187.5
Floyd (75 µg L^{-1})	7.5	0.0	0.0	10.0	10.0	0.0	7.5	0.0	5.0	5.0	0.0	0.0
Detroit 1 (100 µg L^{-1})	0.0	2.5	102.5	10.0	5.0	5.0	7.5	5.0	7.5	2.5	22.5	2.5
Detroit 2 (100 µg L^{-1})	5.0	22.5	37.5	7.5	27.5	22.5	10.0	5.0	25.0	25.0	5.0	5.0
Bass (100 µg L^{-1})	45.0	42.5	45.0	20.0	40.0	27.5	30.0	52.5	25.0	27.5	5.0	17.5
Tetonka (100 µg L^{-1})	67.5	120.0	245.0	235.0	200.0	87.5	142.5	217.5	175.0	132.5	147.5	90.0
Sallie (100 µg L^{-1})	62.5	25.0	55.0	62.5	27.5	20.5	0.0	40.0	105.0	57.5	67.5	47.5
Melissa (100 µg L^{-1})	95.0	57.5	202.5	137.5	100.0	108.0	92.5	100.0	192.5	335.0	185	142.5

Table 13. Descriptive statistics following a 3-way ANOVA, with the components year, rate, and month being tested against turion densities in response to flumioxazin treatments.

Source of Variation	DF	SS	MS	F	P
Year	1	10500.65	10500.65	0.36	0.549
Rate	3	12681507.16	4227169.05	144.94	<0.001
Month	5	1484284.51	296856.90	10.18	<0.001
Year x Rate	3	80642.58	26880.86	0.92	0.43
Year x Month	5	157987.63	31597.53	1.08	0.368
Rate x Month	15	1603192.06	106879.47	3.67	<0.001
Year x Rate x Month	15	506728.52	33781.90	1.16	0.299

Table 14. Mean turion density (± 1 SE) for sites in response to flumioxazin treatments of 0 µg L^{-1}, 100 µg L^{-1}, 125 µg L^{-1}, and 150 µg L^{-1}. Months represent combined data from 2024 and 2025 because no differences were detected between years (p=0.368). Significant differences between treatment rates for each month according to a Holm-Sidak Comparison test are differentiated by letters ($\alpha = 0.05$).

	Average Turion Density (turions/m^2)					
Treatment Rate	**May**	**June**	**July**	**August**	**September**	**October**
0 µg L^{-1}	152.5 ± 15.03**a**	395.63 ± 45.98**a**	464.38 ± 62.34**a**	392.50 ± 51.75**a**	267.5 ± 31.83**a**	265.63 ± 36.47**a**
100 µg L^{-1}	5.63 ± 2.28**b**	8.75 ± 3.41**b**	43.13 ± 16.41**b**	11.25 ± 3.09**b**	15.00 ± 6.06**b**	8.75 ± 3.30**b**
125 µg L^{-1}	71.25 ± 14.56**ab**	108.13 ± 22.28**c**	122.50 ± 30.90**bc**	103.75 ± 16.97**c**	98.13 ± 24.52**b**	55.63 ± 9.70**b**
150 µg L^{-1}	62.50 ± 16.14**ab**	55.63 ± 16.64**bc**	138.75 ± 37.39**c**	148.13 ± 26.13**c**	95.00 ± 18.65**b**	79.38 ± 18.21**b**



Figure 1. The location of the Lake Melissa treatment plot in Becker County, Minnesota, treated with flumioxazin at a rate of 150 ug L^{-1}.



Figure 2. The location of the Lake Sallie treatment plot in Becker County, Minnesota, treated with flumioxazin at a rate of 150 ug L^{-1}.

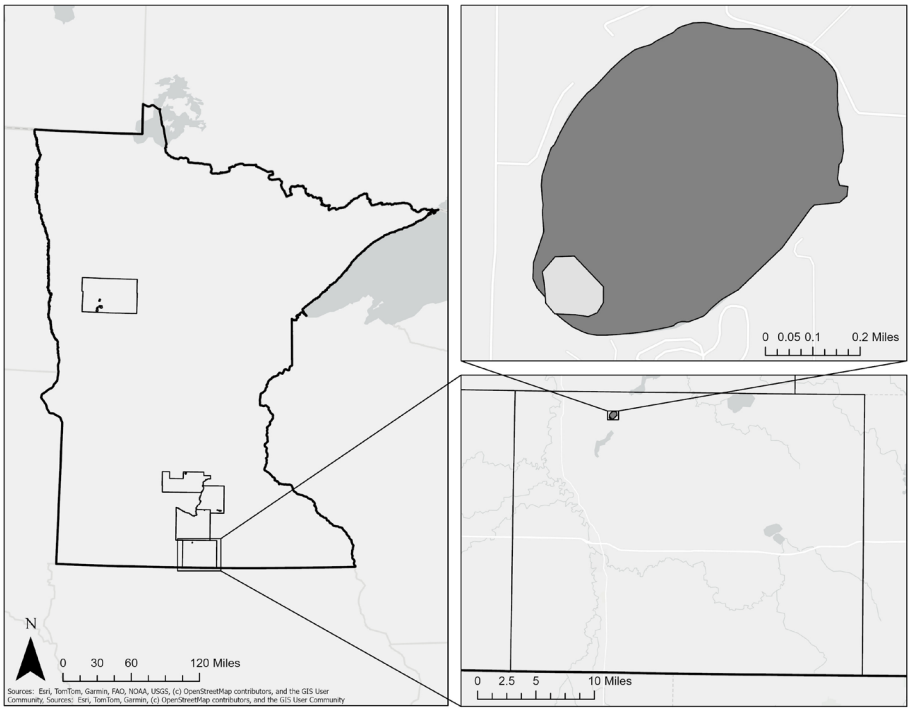


Figure 3. The location of the Bass Lake treatment plot in Faribault County, Minnesota, treated with flumioxazin at a rate of 125 ug L^{-1}.

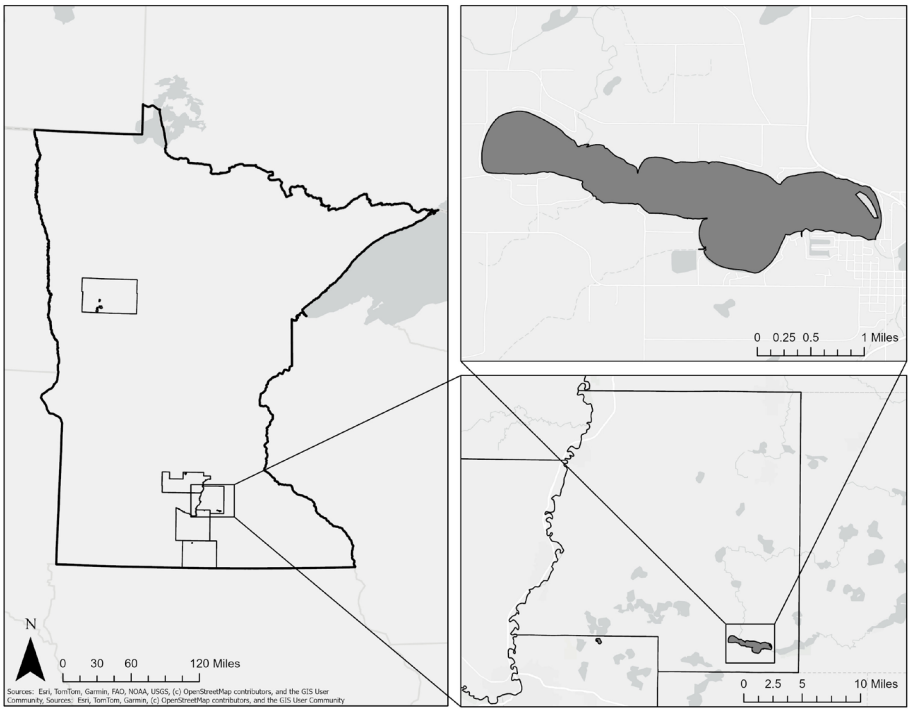


Figure 4. The location of the Lake Tetonka treatment plot in Le Sueur County, Minnesota, treated with flumioxazin at a rate of 125 ug L^{-1}.



Figure 5. The location of the Detroit Lake treatment plot 1 in Becker County, Minnesota, treated with flumioxazin at a rate of 100 ug L^{-1}.



Figure 6. The location of the Detroit Lake treatment plot 2 in Becker County, Minnesota, treated with flumioxazin at a rate of 100 ug L^{-1}.

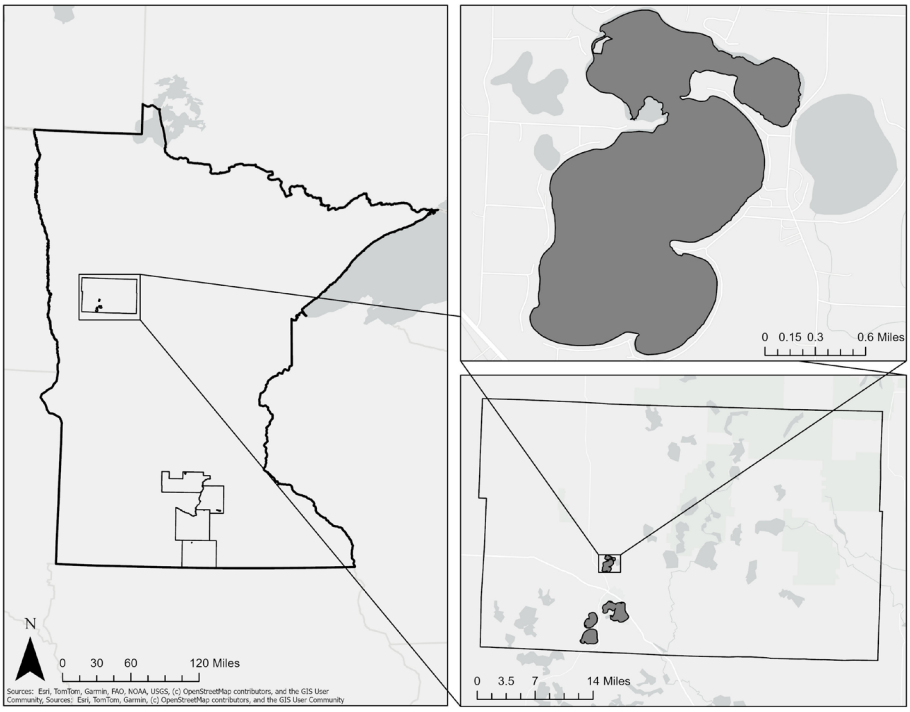


Figure 7. The location of the Floyd Lake treatment plot in Becker County, Minnesota, treated with flumioxazin at a rate of 75 ug L^{-1}.

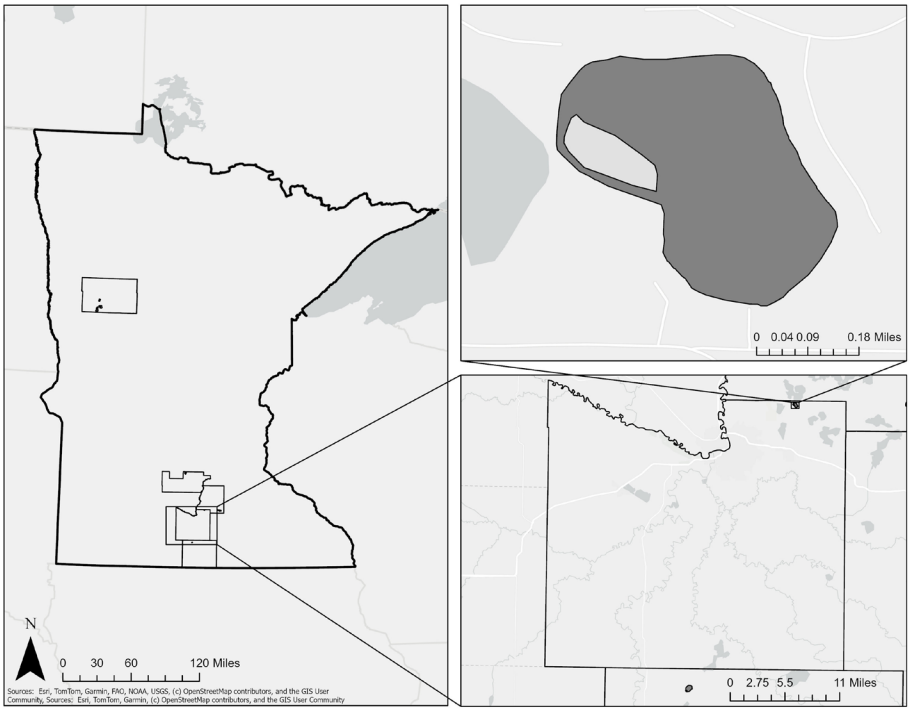


Figure 8. The location of the Lake George reference plot in Blue Earth County, Minnesota.

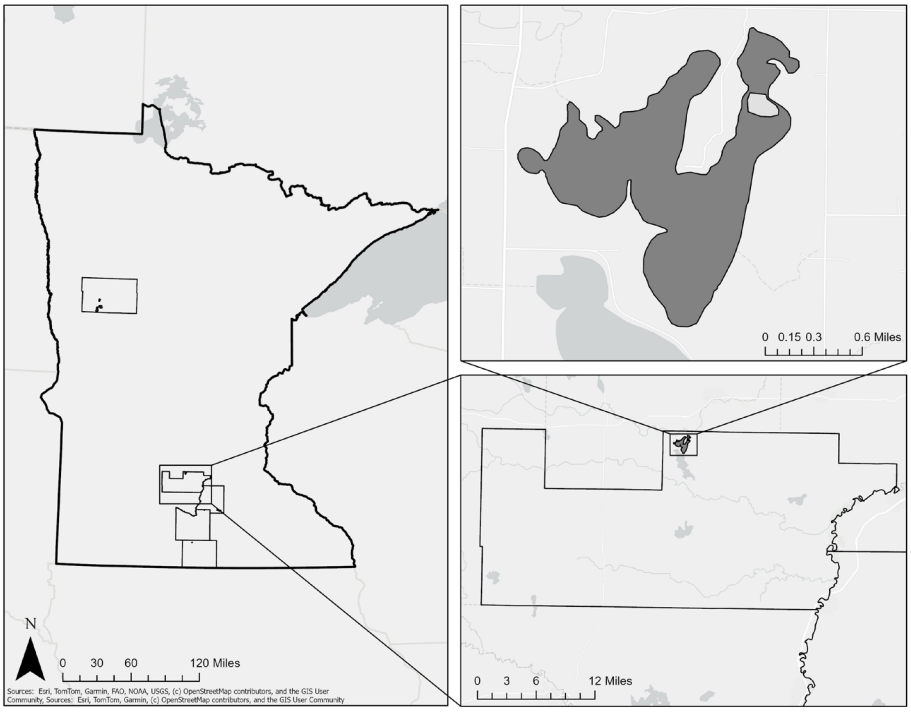


Figure 9. The location of the Lake Schilling reference plot in Sibley County, Minnesota.

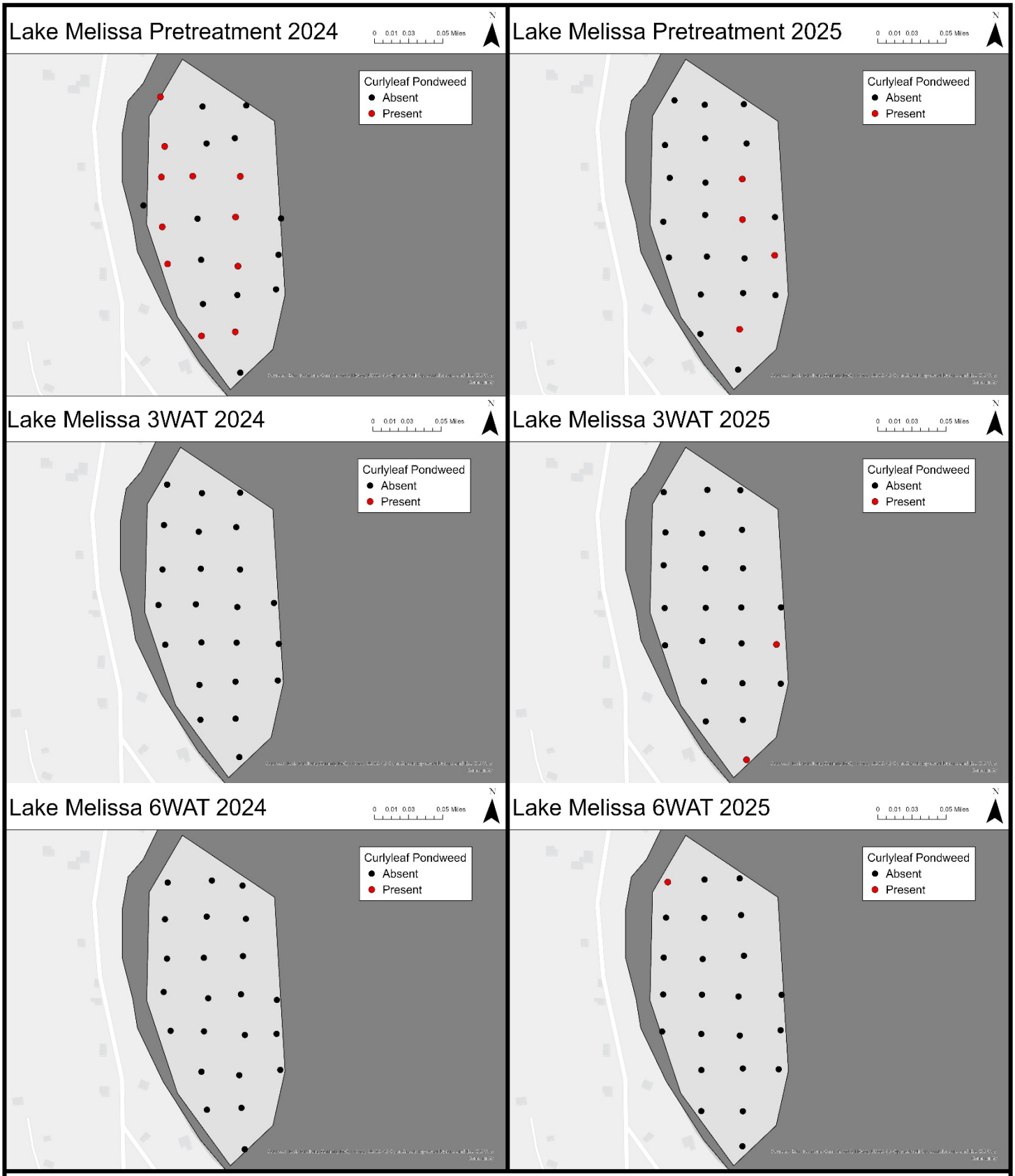


Figure 10. Presence of curlyleaf pondweed in response to flumioxazin treatments of 150 ug L^{-1} in 2024 and 2025 in Lake Melissa in Becker County, MN.

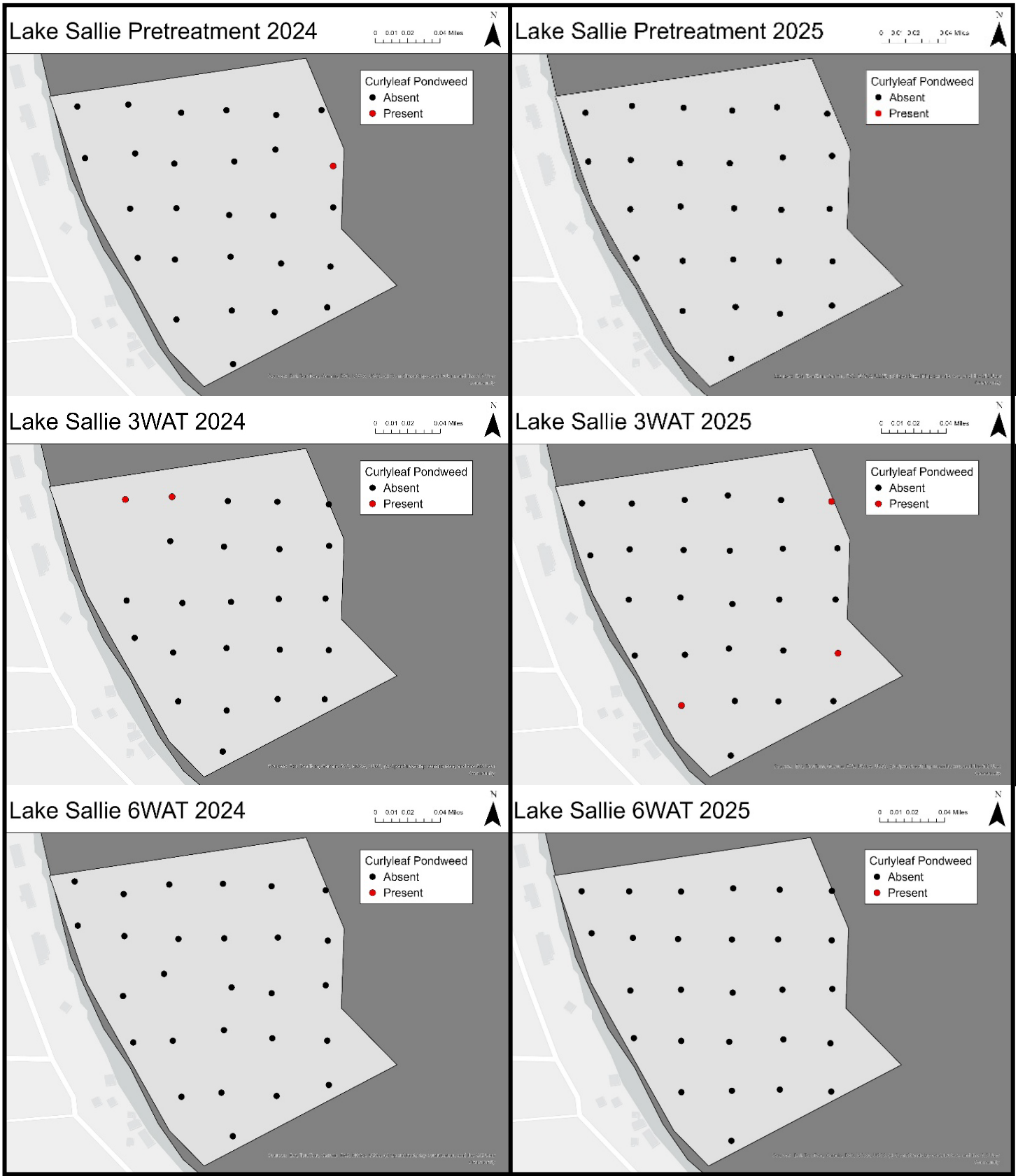


Figure 11. Presence of curlyleaf pondweed in response to flumioxazin treatments of 150 ug L^{-1} in 2024 and 2025 at Lake Sallie in Becker County, MN.

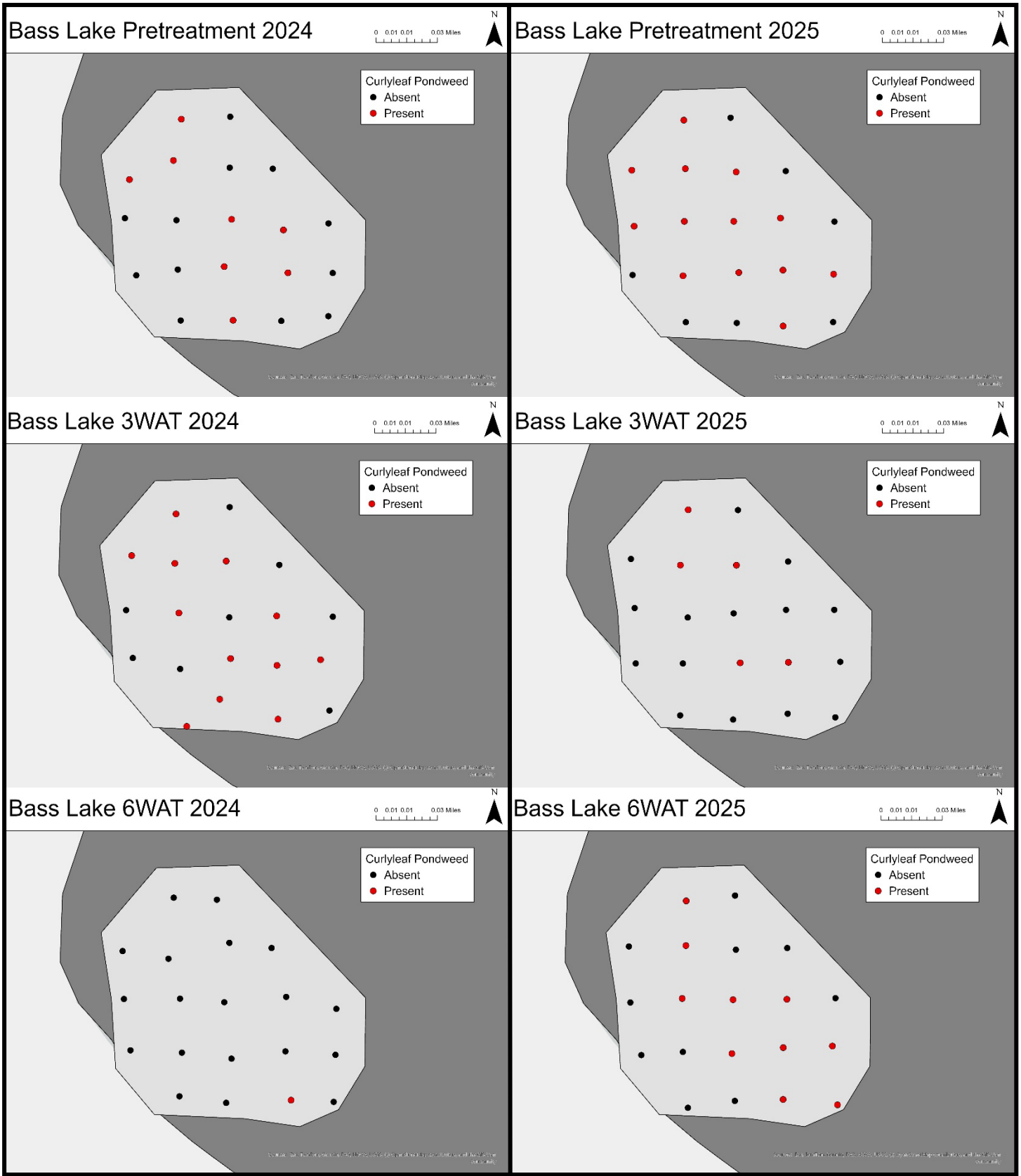


Figure 12. Presence of curlyleaf pondweed in response to flumioxazin treatments of 125 ug L^{-1} in 2024 and 2025 at Bass Lake in Faribault County, MN.

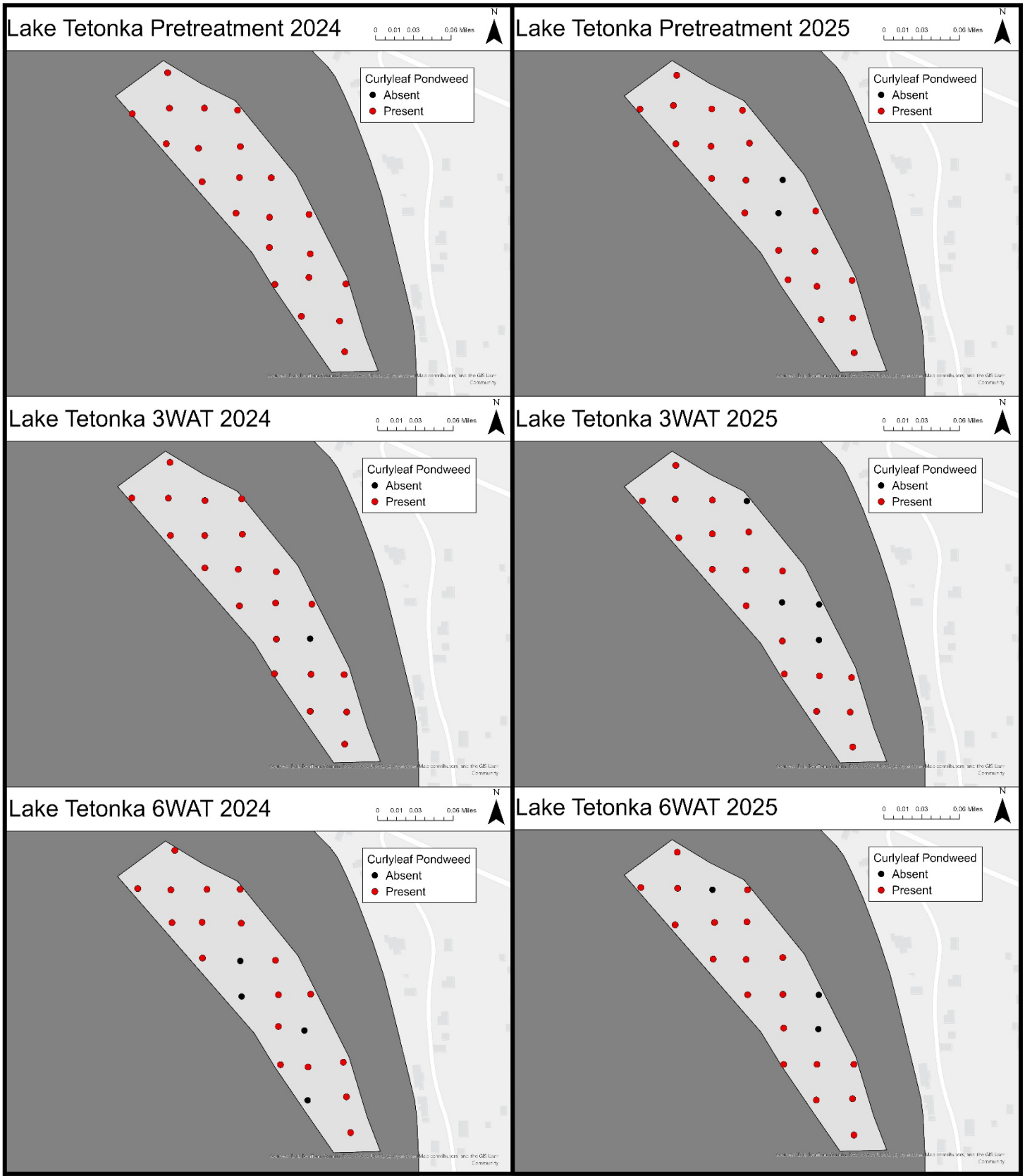


Figure 13. Presence of curlyleaf pondweed in response to flumioxazin treatments of 125 ug L^{-1}in 2024 and 2025 at Lake Tetonka in Le Sueur County, MN.

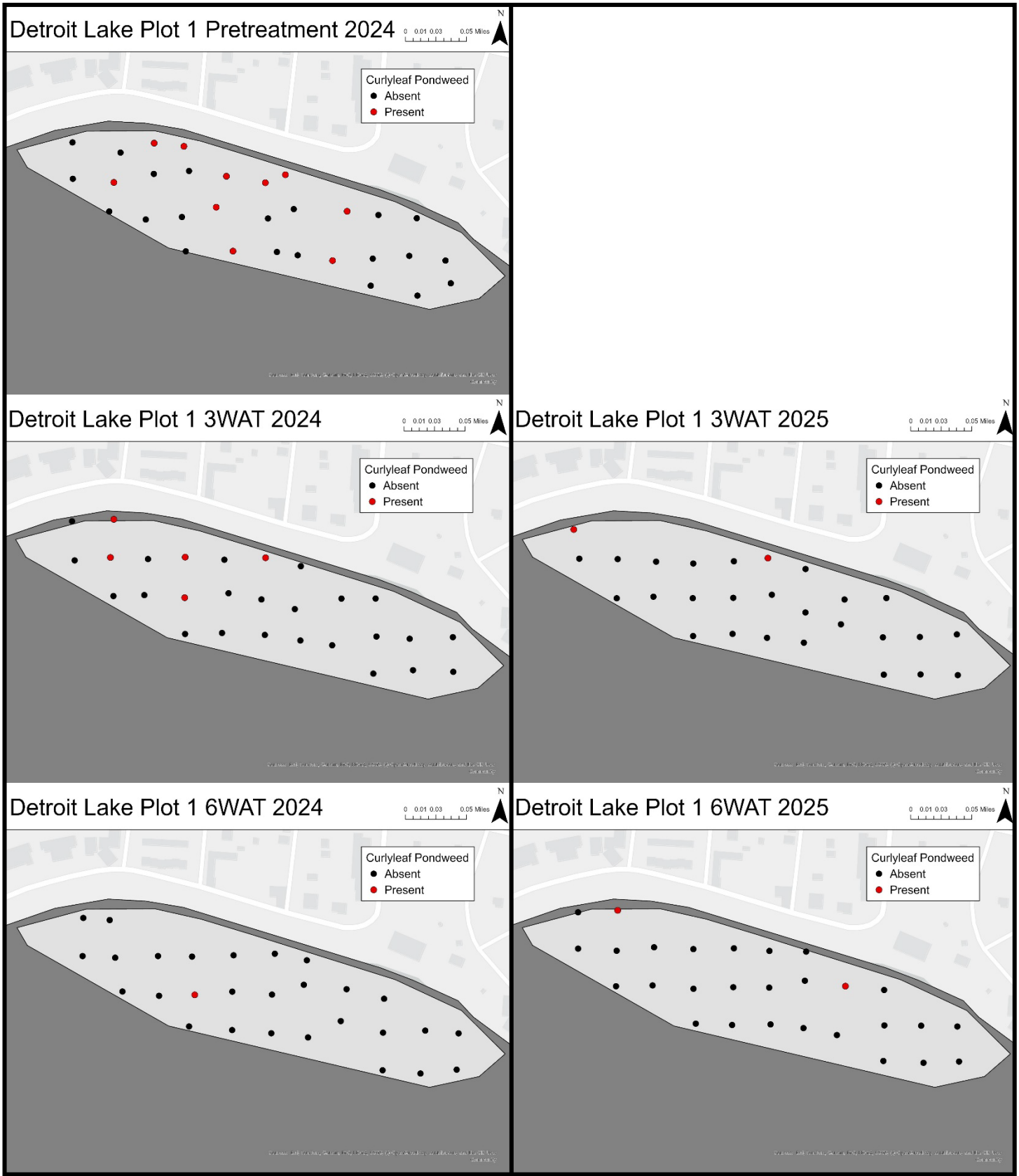


Figure 14. Presence of curlyleaf pondweed in response to flumioxazin treatments of 100 ug L^{-1}in 2024 and 2025 at Detroit Lake plot 1 in Becker County, MN. Due to technology errors, pretreatment data for 2025 was lost.

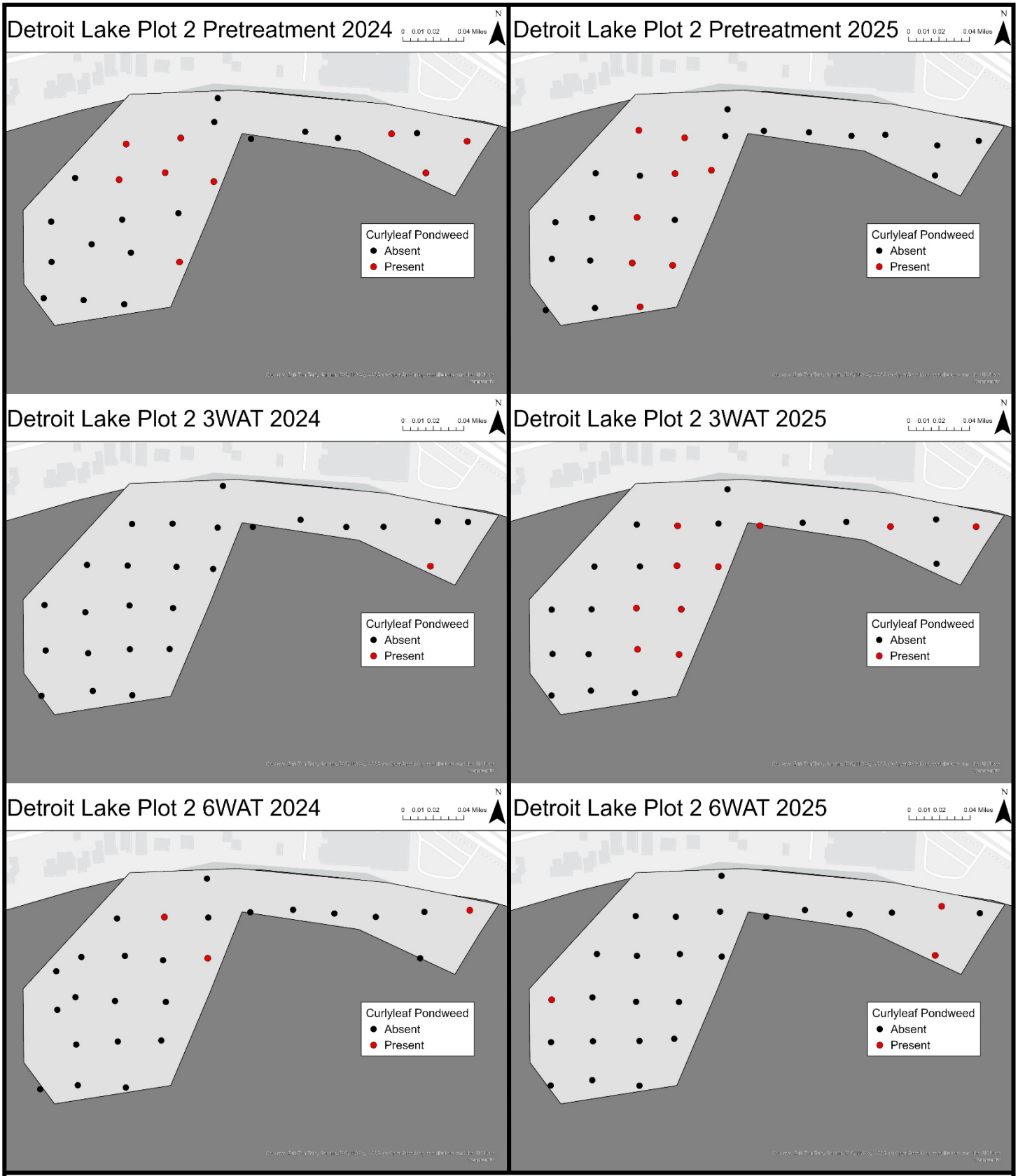


Figure 15. Presence of curlyleaf pondweed in response to flumioxazin treatments of 100 ug L^{-1}in 2024 and 2025 at Detroit Lake plot 2 in Becker County, MN.

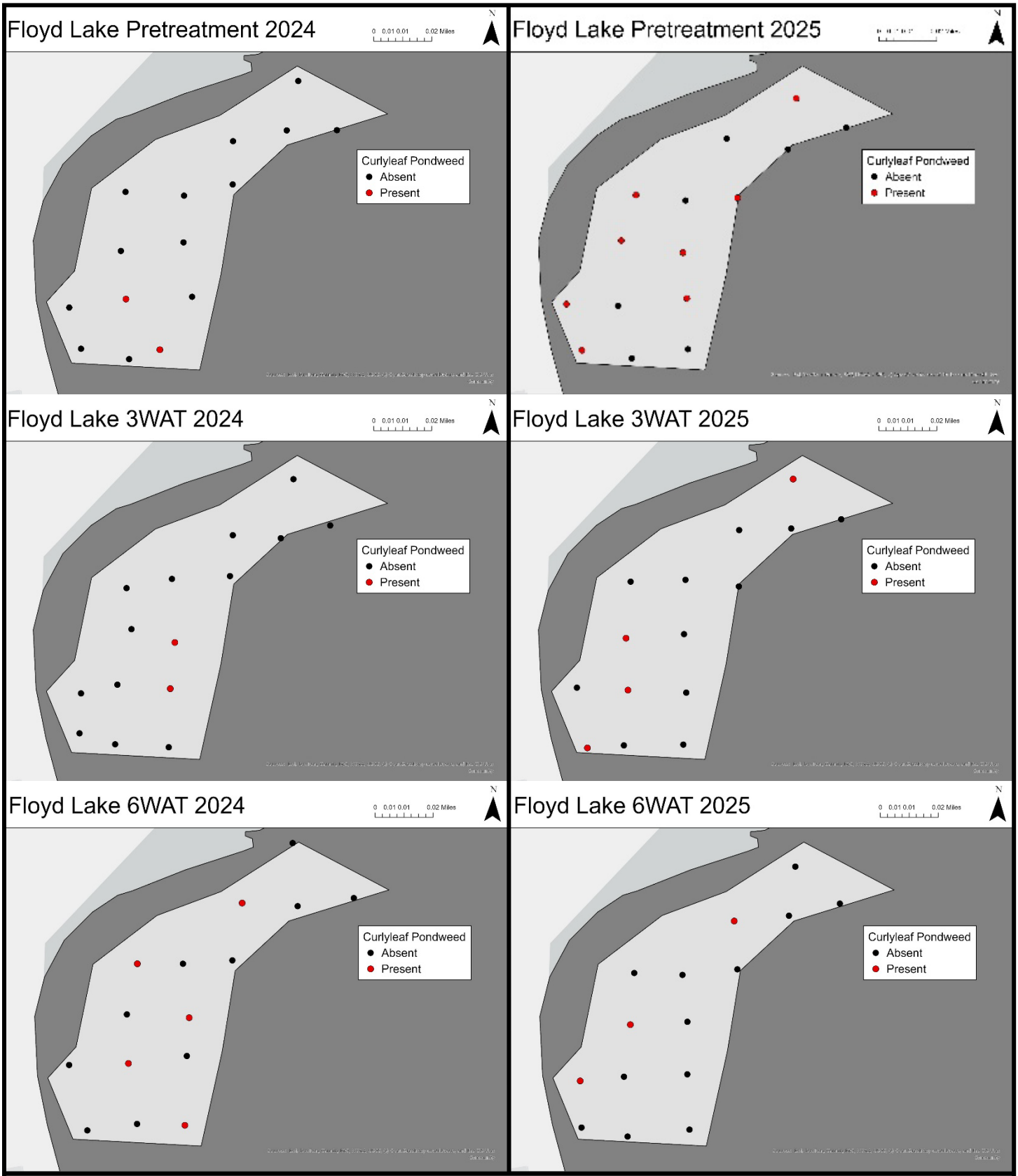


Figure 16. Presence of curlyleaf pondweed in response to flumioxazin treatments of 75 ug L^{-1}in 2024 and 2025 at Floyd Lake in Becker County, MN.

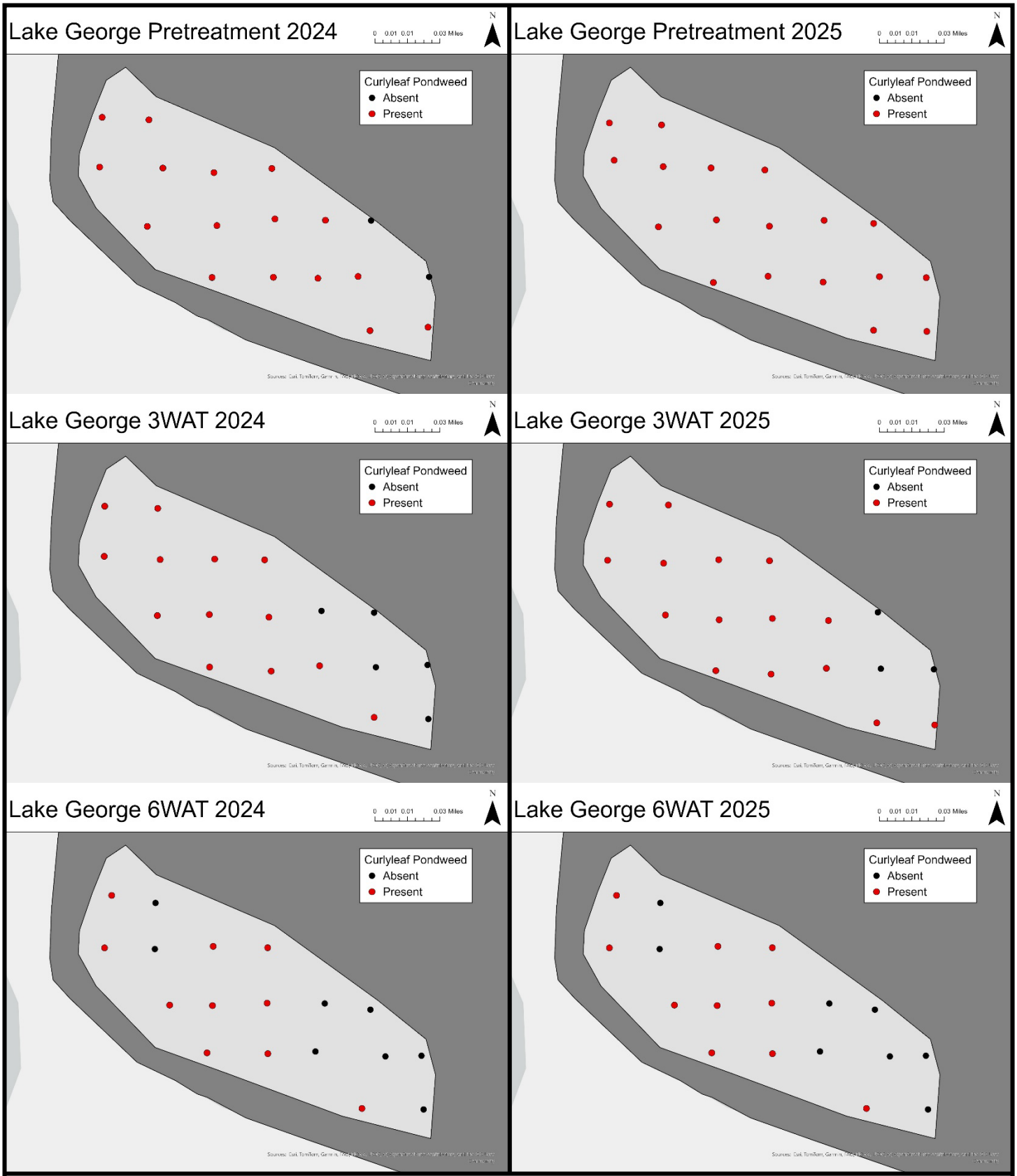


Figure 17. Presence of curlyleaf pondweed with no treatments in 2024 and 2025 at Lake George in Blue Earth County, MN.



Figure 18. Presence of curlyleaf pondweed with no treatments in 2024 and 2025 at Schilling Lake in Sibley County, MN.

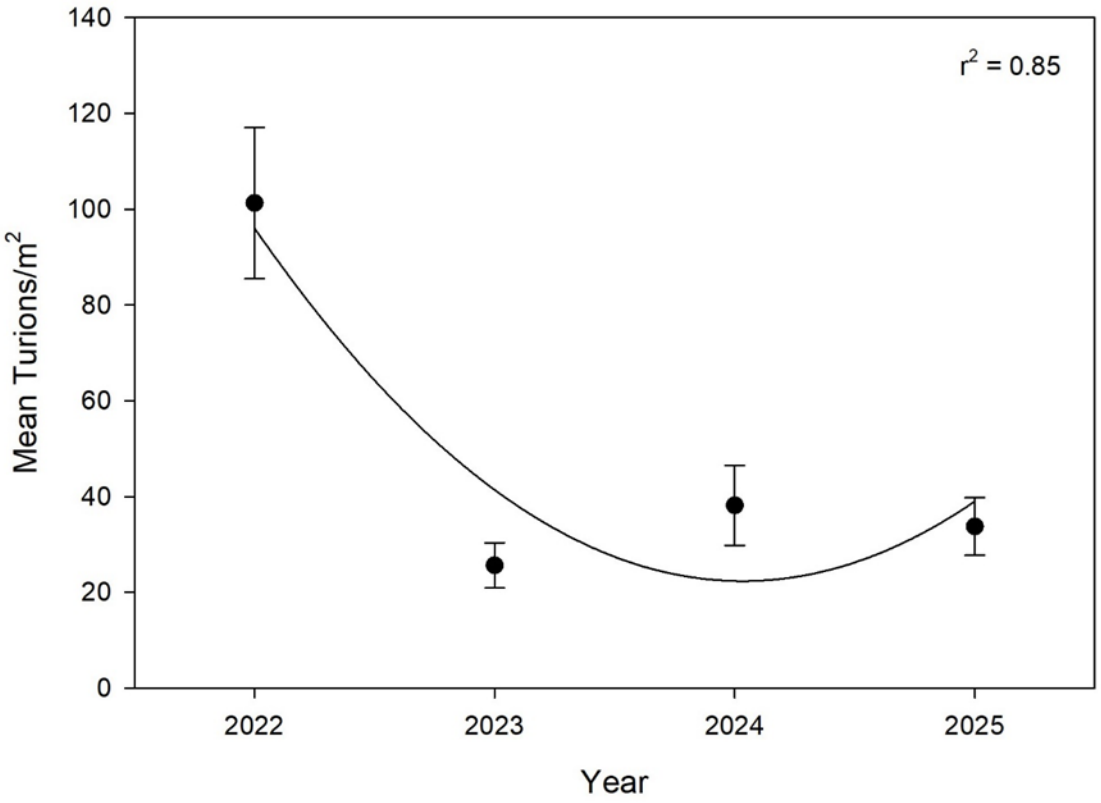


Figure 19. Mean turion densities between May and August of 2022 to 2025 in Bass Lake in Faribault County, MN, following flumioxazin treatments. Treatments in 2022 and 2023 were applied at a rate of 150 ug L^{-1} and was reduced to 125 ug L^{-1} in 2024 and 2025.