A

APPENDIX A

Public Participation Materials































| J | | | | | | | | | | | | | | | | | |
|------------------------------|---|---|---|---|---|------|---|---|---|---|---|---|---|----|----|---|---|
| | | | | | | 2004 | 1 | | | | | | | 20 | 05 | | |
| Task | F | M | A | M | J | J | A | S | 0 | Ν | D | J | F | Μ | A | Μ | J |
| Planning Grants Submittal | | | | | | | | | | | | | | | | | |
| Planning Grants Notification | | | | | | | | | | | | | | | | | |
| Curly-leaf Pondweed Survey | | | | | | | | | | | | | | | | | |
| Kick-off Meeting | | | | | | | | | | | | | | | | | |
| Water Sample | | | | | | | | | | | | | | | | | |
| Comprehensive Plant Survey | | | | | | | | | | | | | | | | | |
| Progress Report | | | | | | | | | | | | | | | | | |
| Sensitive Area Survey | | | | | | | | | | | | | | | | | |
| Data Analysis/First Draft | | | | | | | | _ | | | | | | | | | |
| Planning Meeting | | | | | | | | | | | | | | | | | |
| Report Revisions | | | | | | | | | | | | | | | | | |
| Report Delivery | | | | | | | | | | | | | | | | | |
| Wrap-up Meeting | | | | | | | | | | | | | | | | | |





Mount Morris Lakes Management Plan Contact Form

As mentioned during the Kick-off Meeting conducted on June 5, 2004, it is important for each member of the District to have an opportunity to express their questions, comments, and concerns about Mount Morris Lake's condition, its use, and its management. This document has been created to more easily facilitate the transfer of your thoughts to NES Ecological Services. Please take some time to express your thoughts using the form below. Please remember that we are looking for specific information on plants, fishing, lake use, and impacts from the watershed. Examples of useful information would be: "When we purchased our property in 1995, there was a large patch of yellow water-lilies near our dock. They have disappeared since then". Or "I know there is a culvert that enters the lake on the northeast side that has very turbid water flowing out of it when we get heavy rain". Information that would not be useful would be: "I remember there being more plants in the lake before". Or "the golf course uses chemicals that might be entering the lake". So, please be as specific as possible.

Please note that the completion of the personal information is not required.

Your comments can be mailed, emailed, or faxed via the information contained at the bottom of this form.

| Name: | Phone: |
|-------------------------------|---|
| Address: | Email: |
| | Years on lake: |
| | Please contact me (check): |
| Dl | |
| Please enter you thoughts and | l'or questions below (use the back of this sheet if necessary): |
| | |
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| | |

Thank you for your cooperation,

Tim Hoyman NES Ecological Services 4664 Golden Pond Park Ct. Oneida, WI 54155 Voice: (920) 499-5789 FAX: (920) 662-9141 thoyman@releeinc.com

Mt. Morris Lakes Management Plan Development Project – Update Printed in District Newsletter

The management plan project is moving along as scheduled with the first draft of the plan and report document being anticipated for sometime this spring. During May of last year, the curly-leaf pondweed survey was completed. All occurrences of this non-native and invasive plant were mapped. The comprehensive vegetation survey was completed during mid July and included the collection of aquatic plant, water depth, and substrate data at evenly spaced points throughout the five basins. This task also included mapping of the emergent and floating-leaf plant communities in the lake. Five water samples have also been collected and analyzed by the Wisconsin State Lab of Hygiene. The final water sample will be collected through the ice this winter.

The Board of Directors has created a Planning Committee comprised of eight district members that will assist Tim Hoyman, the aquatic ecologist hired to assist us with our planning effort, in creating the implementation plan that will direct our lake management efforts in the future. The implementation plan will be created during one or two meetings early this spring and will be comprised of a list of management alternatives with associated actions and an individual or group that will be responsible for the task's completion. The committee will also help Tim compile rough septic system data for use in the nutrient load modeling he will be doing as a part of the lake's watershed assessment.

Once all of the data is compiled and analyzed, Tim will form a list of management recommendations that will be presented to the Planning Committee. The recommendations will then be modified as appropriate based upon the discussions of the committee. When consensus is reached, those recommendations will then comprise the management alternatives for our lake. Tim and the Planning Committee will then work to create a realistic implementation plan to carry through those alternatives. The results of the study and the implementation plan will be presented to the district this summer.













| Life | Scientific | Common | Coefficient of |
|------|--|------------------------|------------------|
| Form | Name | Name | Conservatism (c) |
| | Calla palustris* | Water arum | 9 |
| | Carex comosa | Bristly sedge | 5 |
| | Carex stricta* | Common tussock sedge | 7 |
| | Eleocharis palustris | Creeping spikerush | 6 |
| | Impatiens capensis* | Orange Jewelweed | 2 |
| ŝ | Iris versicolor* | Northern blue flag | 5 |
| 52 | Lythrum salicaria* | Purple loosestrife | Exotic |
| Ē | Phalaris arundinacea* | Reed canary grass | Exotic |
| ш | Pontederia cordata* | Pickerelweed | 9 |
| | Sagittaria latifolia* | Common arrowhead | 3 |
| | Schoenoplectus acutus 1 | Hardstern bulrush | 5 |
| | Schoenoplectus tabernaemontani 2 | Softstern bulrush | 4 |
| | Typha latifolia | Broad-leaved cattail | 1 |
| | Lemna minor | Small duckweed | 5 |
| E. | Lemna trisulca | Forked duckweed | 6 |
| _ | Spirodela polyrhiza | Great duckweed | 5 |
| L | Nuphar variegata | Spatterdock | 6 |
| Ľ. | Nymphaea odorata | White water Ily | 6 |
| | Callitriche palustris* | Common water starwort | 8 |
| | Ceratophyllum demersum | Coontail | 3 |
| | Chara sp. | Muskgrasses | 7 |
| | Elodea canadensis | Common waterweed | 3 |
| | Myriophyllum spicatum* | Eurasian water milfoil | Exotic |
| | Myriophyllum sibiricum | Northern water milfoil | 7 |
| Ĕ | Najas flexilis | Slender naiad | 6 |
| rg, | Potamogeton crispus | Curry-teat pondweed | Exotic |
| Ĕ | Potamogeton illinoensis | Illinois pondweed | 6 |
| ģ | Potamogeton natans | Hoating-leaf pondweed | 5 |
| 0 | Potamogeton praelongus | write-stem pondweed | 8 |
| | Potamogeton nchardsonii Retemogeton zostarifermia | Elet etem pendwood | 5 |
| | Potamogeton Zostenformis | mat-stem pondweed | 6 |
| | Ranunculus aquatilis | Stiff water crowfoot | 8 |
| | Stuckenia pectinata" | sago pondweed | 3 |
| | Utricutaria vulgaris | Common bladderwort | 7 |
| | vamsnena americana | wild celery | 6 |





| Mount M | lorris Lake | | |
|----------|---|------------------------|------------------|
| Life | Scientific | Common | Coefficient of |
| Form | Name | Name | Conservatism (c) |
| | Calla palustris* | Water arum | |
| | Carex comosa | Bristly sedge | 5 |
| | Carex stricta* | Common tussock sedge | 7 |
| | Eleocharis palustris | Creeping spikerush | 6 |
| | Impatiens capensis* | Orange Jewelweed | 2 |
| eu | Iris versicolor* | Northern blue flag | 5 |
| 6.e | Lythrum salicaria* | Purple loosestrife | Exotic |
| .ŝ | Phalaris arundinacea* | Reed canary grass | Exotic |
| | Pontederia cordata* | Pickerelweed | 9 |
| | Sagittaria latifolia* | Common arrowhead | 3 |
| | Schoenoplectus acutus ¹ | Hardstern bulrush | 5 |
| | Schoenoplectus tabernaemontani ² | Softstern bulrush | 4 |
| | Typha latifolia | Broad-leaved cattail | 1 |
| | Lemna minor | Small duckweed | 5 |
| <u>H</u> | Lemna trisulca | Forked duckweed | 6 |
| - | Spirodela polyrhiza | Great duckweed | 5 |
| | Nuphar variegata | Spatterdock | 6 |
| Œ | Nymphaea odorata | White water lily | 6 |
| | Callitriche palustris* | Common water starwort | 8 |
| | Ceratophyllum demersum | Coontail | 3 |
| | Chara sp. | Muskgrasses | 7 |
| | Elodea canadensis | Common waterweed | 3 |
| | Myriophyllum spicatum* | Eurasian water milfoil | Exotic |
| | Myriophyllum sibiricum | Northern water milfoil | 7 |
| r. | Najas flexilis | Slender naiad | 6 |
| ě | Potamogeton crispus | Curly-leaf pondweed | Exotic |
| £. | Potamogeton Minoensis | Illinois pondweed | 6 |
| 9 | Potamogeton natans | Floating-leaf pondweed | ь |
| 0 | Potamogeton praelongus | Write-stem pondweed | 8 |
| | Potemogeton Techardsonii | Elot stom pondwood | 5 |
| | Poranogeion 20steritormis | Fill water areaded | 0 |
| | nanuncuus aqualiis | Sun water crowtoot | |
| | Stuckenia pectinata | Sago pondweed | 3 |
| | Vallanasia amariaana | Wild colory | 6 |
| | vanisriena americana | www.celery | 0 |





Aquatic Invasive Species Project

Project Goals

- Reduce the occurrence of curly-leaf pondweed within the lake and as a result, minimize its spread through harvesting.
- Control or possibly eradicate the small amount of Eurasian water milfoil that is currently known to exist within the lake.
- Minimize the opportunities for additional introductions of these species through the lake's public access.
- Prepare the MMLMD to continue the management and control efforts past the initial five-year project.

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B

APPENDIX B

Water Quality Data

Mount Morris Lake A Water Quality

| Mt. | Morris | Lake A | Data |
|-----|--------|--------|------|
|-----|--------|--------|------|

| Date: | 04-12-04 | | | Max Depth (ft): | 19.3 |
|----------|-------------------|-------|---------|--------------------|------|
| Time: | 14:34 | | | MTAS.S Depth (ft): | 3.0 |
| Weather: | 38F, Clear, Breez | zy | | MTAB B Depth (ft): | 16.0 |
| Ent: | TSN | Verf: | EJH/TAH | Secchi Depth (ft): | 9.7 |





| Parameter | MTAS | MTAB | |
|-----------------------|--------|--------|--------------------|
| Total P (µg/L) | 17.000 | 61.000 | Total P (µg/L) |
| Dissolved P (µg/L) | | | Dissolved P (µg/L) |
| Chl a (µg/L) | 5.30 | | Chl a (µg/L) |
| TKN (µg/L | | | TKN (µg/L |
| NO4+NO3-N (µg/L) | | | NO4+NO3-N (µg/L |
| NH3-N (µg/L) | | | NH3-N (µg/L) |
| Total N (µg/L) | | | Total N (µg/L) |
| Lab Cond. (µS/cm) | | | Lab Cond. (µS/cm |
| Lab pH | | | Lab pH |
| Alkal (mg/l CaCO3) | | | Alkal (mg/l CaCO3 |
| Total Susp Sol (mg/l) | | | Total Susp Sol (mg |
| Calcium (mg/l) | | | Calcium (mg/l) |
| | | | |
| Notes: | | | |
| | | | |
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| | | Mt. M | orris Lake | A Data | | | |
|------------------------------------|---|----------------------|----------------|--------|----------------------------|-------------|----------|
| Date: Time: Weather: Ent: | 06-16-04 8:57 ~70F, Calm, TSN | Partly Clou Verf: | ıdy | | Ma MTAS MTAB Secc | 23.9 6.8 | |
| | Depth (ft) | Temp (°C) | D.O. (mg/l) | pН | Sp. Cond (µS/cm) | | 0 |
| | 1.0 | 21.4 | 9.3 | na | 269 | | 0 + |
| | 3.0 | 17.2 | 10.3 | na | 294 | | 2 |
| | 5.0 | 14.8 | 5.0 | na | 279 | | 4 |
| | 7.0 | 13.9 | 3.4 | na | 285 | | £ 8 1 |
| | 9.0 | 13.1 | 0.6 | na | 332 | | €12 |
| | 11.0 | 12.0 | 0.3 | na | 346 | | a 14 |
| | 13.0 | 11.0 | 0.3 | na | 368 | | 18 |
| | 15.0 | 10.1 | 0.3 | na | 396 | | 20 22 |
| | 17.0 | 9.1 | 0.2 | na | 424 | | 24 |
| | 19.0 | 8.4 | 0.2 | na | 444 | | |
| | 21.0 | 8.1 | 0.2 | na | 454 | | |
| | 23.0 | 8.0 | 0.2 | na | 458 | | |



| Parameter | MTAS | MTAB |
|-----------------------|------|------|
| Total P (µg/L) | | |
| Dissolved P (µg/L) | | |
| Chl a (µg/L) | | |
| TKN (µg/L | | |
| NO4+NO3-N (µg/L) | | |
| NH3-N (µg/L) | | |
| Total P (µg/L) | | |
| Lab Cond. (µS/cm) | | |
| Lab pH | | |
| Alkal (mg/l CaCO3) | | |
| Total Susp Sol (mg/l) | | |
| Calcium (mg/l) | | |

Notes: SD taken at 9:20.

| Mt. Morris Lake A Data | | | | | |
|------------------------|------------|---------|---------|--------------------|------|
| Date: | 07-14-04 | | | Max Depth (ft): | 23.2 |
| Time: | 17:36 | | | MTAS S Depth (ft): | 3.0 |
| Weather: | Mostly Sun | ny, 75F | | MTAB B Depth (ft): | 20.0 |
| Ent: | TSN | Verf: | EJH/TAH | Secchi Depth (ft): | 13.7 |
| | | | | , | |

| Depth (ft) | Temp (°C) | D.O. (mg/l) | рН | Sp. Cond (µS/cm) |
|---------------|--------------|----------------|----|---------------------|
| 1.0 | 23.8 | 8.7 | na | 316 |
| 3.0 | 21.4 | 8.7 | na | 323 |
| 6.0 | 17.0 | 7.5 | na | 330 |
| 9.0 | 15.0 | 5.5 | na | 330 |
| 12.0 | 13.5 | 1.5 | na | 354 |
| 15.0 | 11.5 | 1.0 | na | 392 |
| 18.0 | 9.6 | 0.4 | na | 440 |
| 21.0 | 8.7 | 0.3 | na | 463 |
| 22.0 | 8.6 | 0.2 | na | 465 |
| | | | | |
| | | | | |
| | | | | |



| Parameter | MTAS | MTAB |
|-----------------------|--------|---------|
| Total P (μg/L) | 26.000 | 271.000 |
| Dissolved P (µg/L) | | |
| Chl a (µg/L) | 4.98 | |
| TKN (μg/L | | |
| NO4+NO3-N (µg/L) | | |
| NH3-N (µg/L) | | |
| Total N (µg/L) | | |
| Lab Cond. (µS/cm) | | |
| Lab pH | | |
| Alkal (mg/l CaCO3) | | |
| Total Susp Sol (mg/l) | | |
| Calcium (mg/l) | | |

| Notes: | | | |
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| Mt. Morris Lake A Data | | | | | | | |
|------------------------------------|---|--------------|----------------|----|----------------------------|--|--------------|
| Date: Time: Weather: Ent: | 08-16-04 9:35 Clear TSN | Verf: | EJH/TAH | | Ma MTAS MTAB Secc | ax Depth (ft): .S Depth (ft): .B Depth (ft): hi Depth (ft): | 23.4 10.2 |
| | Depth (ft) | Temp (°C) | D.O. (mg/l) | pН | Sp. Cond (µS/cm) | | |
| | 1.0 | 18.3 | 9.9 | na | 336 | | 0 |
| | 3.0 | 18.1 | 9.6 | na | 336 | | 0+ |
| | 6.0 | 16.4 | 9.0 | na | 347 | | 2 |
| [| 9.0 | 15.4 | 7.1 | na | 345 | | <u> </u> |
| [| 12.0 | 15.0 | 6.0 | na | 348 | | |
| [| 15.0 | 14.1 | 1.5 | na | 379 | | |
| | 18.0 | 11.0 | 0.5 | na | 461 | | 16 |
| [| 21.0 | 9.5 | 0.4 | na | 495 | | 20 |
| | 22.0 | 93 | 0.3 | na | 497 | | 54 |



| Parameter | MTAS | MTAB |
|-----------------------|------|------|
| Total P (μg/L) | | |
| Dissolved P (µg/L) | | |
| Chl a (µg/L) | | |
| TKN (μg/L | | |
| NO4+NO3-N (µg/L) | | |
| NH3-N (µg/L) | | |
| Total N (μg/L) | | |
| Lab Cond. (µS/cm) | | |
| Lab pH | | |
| Alkal (mg/l CaCO3) | | |
| Total Susp Sol (mg/l) | | |
| Calcium (mg/l) | | |

| Notes: | | | |
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| | | Mt. Mo | orris Lake A Data | | |
|----------|------------|---------|-------------------|--------------------|------|
| Date: | 11-23-04 | | | Max Depth (ft): | 22.9 |
| Time: | 13:25 | | | MTAS S Depth (ft): | 3.0 |
| Weather: | 45F, Windy | , Clear | | MTAB B Depth (ft): | 20.0 |
| Ent: | TSN | Verf: | EJH/TAH | Secchi Depth (ft): | 17.0 |

| Depth (ft) | Temp (°C) | D.O. (mg/l) | pН | Sp. Cond (µS/cm) |
|---------------|--------------|----------------|----|---------------------|
| 1.0 | 5.6 | 10.3 | na | 342 |
| 3.0 | 5.7 | 10.3 | na | 342 |
| 6.0 | 5.7 | 10.3 | na | 342 |
| 9.0 | 5.6 | 10.0 | na | 341 |
| 12.0 | 5.6 | 9.9 | na | 341 |
| 15.0 | 5.6 | 9.8 | na | 341 |
| 18.0 | 5.5 | 9.8 | na | 341 |
| 21.0 | 5.5 | 9.7 | na | 341 |
| 22.0 | 5.5 | 8.9 | na | 342 |
| | | | | |
| | | | | |
| | | | | |



| Parameter | MTAS | MTAB |
|-----------------------|--------|--------|
| Total P (μg/L) | 11.000 | 11.000 |
| Dissolved P (µg/L) | | |
| Chl a (µg/L) | | |
| TKN (μg/L | | |
| NO4+NO3-N (µg/L) | | |
| NH3-N (μg/L) | | |
| Total N (μg/L) | | |
| Lab Cond. (µS/cm) | | |
| Lab pH | | |
| Alkal (mg/l CaCO3) | | |
| Total Susp Sol (mg/l) | | |
| Calcium (mg/l) | | |

| Notes: | | | |
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Appendix B

| | | Mt. Morris L | ake A Data | |
|----------|----------------|-------------------|-----------------------|------|
| Date: | 03-17-05 | | Max Depth (ft): | 22.3 |
| Time: | 14:05 | | MTAS.S Depth (ft): | 3.0 |
| Weather: | 27°F, 50% Clou | d, Ice - 0.9 feet | MTAB B Depth (ft): | 20.0 |
| Ent: | TSN | Verf: EJH/T | AH Secchi Depth (ft): | 7.2 |

| Depth (ft) | Temp (°C) | D.O. (mg/l) | pН | Sp. Cond (µS/cm) |
|---------------|--------------|----------------|-----|---------------------|
| 2.0 | 3.8 | 10.2 | 8.4 | 328 |
| 5.0 | 5.0 | 3.7 | 7.9 | 381 |
| 8.0 | 5.2 | 1.1 | 7.9 | 399 |
| 11.0 | 5.2 | 0.5 | 7.9 | 407 |
| 14.0 | 5.3 | 0.4 | 7.8 | 419 |
| 17.0 | 5.4 | 0.3 | 7.7 | 439 |
| 20.0 | 5.4 | 0.2 | 7.6 | 470 |
| 21.5 | 5.5 | 0.2 | 7.5 | 420 |
| | | | | |
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| Parameter | MTAS | MTAB |
|-----------------------|--------|---------|
| Total P (µg/L) | 11.000 | 318.000 |
| Dissolved P (µg/L) | | |
| Chl a (µg/L) | | |
| TKN (μg/L | | |
| NO4+NO3-N (µg/L) | | |
| NH3-N (µg/L) | | |
| Total N (µg/L) | | |
| Lab Cond. (µS/cm) | | |
| Lab pH | | |
| Alkal (mg/l CaCO3) | | |
| Total Susp Sol (mg/l) | | |
| Calcium (mg/l) | | |

| Notes: | | | |
|--------|--|--|--|
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Water Quality Data

| 2005 | Surfa | ace | Bot | tom |
|-----------------------|-------|-------|-------|-------|
| Parameter | Count | Mean | Count | Mean |
| Secchi Depth (feet) | 6 | 10.77 | | |
| Total P (µg/L) | 4 | 13.50 | 4 | 85.75 |
| Dissolved P (µg/L) | 0 | | 0 | |
| Chl a (µg/L) | 2 | 5.14 | 0 | |
| TKN (µg/L | 0 | | 0 | |
| NO4+NO3-N (µg/L) | 0 | | 0 | |
| NH3-N (µg/L) | 0 | | 0 | |
| Total N (µg/L) | 0 | | 0 | |
| Lab Cond. (µS/cm) | 0 | | 0 | |
| Lab pH | 0 | | 0 | |
| Alkal (mg/l CaCO3) | 0 | | 0 | |
| Total Susp Sol (mg/l) | 0 | | 0 | |
| Calcium (mg/l) | 0 | | 0 | |

| Wisconsin Trophic State Index (WTSI) | | | | | | | |
|--------------------------------------|-------|-------|-------|--|--|--|--|
| Year | TP | Chla | SD | | | | |
| 1986 | | | 43.46 | | | | |
| 1987 | | | 39.25 | | | | |
| 1988 | | | 41.53 | | | | |
| 1989 | | | 43.61 | | | | |
| 1990 | | | | | | | |
| 1991 | | | 42.01 | | | | |
| 1992 | | | 39.57 | | | | |
| 1993 | | | 43.93 | | | | |
| 1994 | | | 40.05 | | | | |
| 1995 | | | 41.40 | | | | |
| 1996 | | | 41.22 | | | | |
| 1997 | | | 42.23 | | | | |
| 1998 | | | 41.14 | | | | |
| 1999 | | | 43.23 | | | | |
| 2000 | | | 41.20 | | | | |
| 2001 | | | 40.35 | | | | |
| 2002 | | | 42.72 | | | | |
| 2003 | | | | | | | |
| 2004 | 53.50 | 46.80 | 43.60 | | | | |
| All Years (weighted) | 53.50 | 46.80 | 41.00 | | | | |
| WI Impoundments | 60.51 | 58.05 | 56.10 | | | | |
| Central Region | 51.45 | 49.88 | 47.33 | | | | |

Morphological / Geographical Data

| Parameter | Value |
|---------------------------|-----------------|
| Acreage | |
| Volume (acre-feet) | |
| Perimeter (miles) | See Lake D |
| Shoreland Development | |
| Maximum Depth (feet) | |
| County | Waushara County |
| WBIC | See Lake D |
| Lillie Mason Region(1983) | Central Region |
| Nichols Ecoregion(1999) | NCSE |

Watershed Data

| WiLMS Class | Acreage | kg/yr | lbs/yr |
|------------------------|---------|------------|--------|
| Urban/Developed | | | |
| Urban - High Intensity | | | |
| Urban - Low Intensity | | | |
| Golf Course | | | |
| Herbaceous/Field Crops | | | |
| Row Crops | | | |
| Grasslands | | See Lake D |) |
| Cranberry Bog | | | |
| Grassland | | | |
| Forest | | | |
| Open Water | | | |
| Wetland | | | |
| Cloud Cover | | | |

| | | Secchi | (feet) | | | Chlorop | hyll a (µg/L) | | | Phosph | orus (µg/L) | | | Nitroge | n (µg/L) | |
|----------------------|---------|--------|--------|-------|---------|----------|---------------|------|-----------|--------|-------------|-------|---------|---------|----------|------|
| | Growing | Season | Sum | nmer | Growing | Season . | Sun | nmer | Growing S | Season | Su | mmer | Growing | Season | Sun | nmer |
| Year | Count | Mean | Count | Mean | Count | Mean | Count | Mean | Count | Mean | Count | Mean | Count | Mean | Count | Mean |
| 1986 | 10 | 10.9 | 6 | 10.3 | | | | | | | | | | | | |
| 1987 | 7 | 12.7 | 3 | 13.8 | | | | | | | | | | | | |
| 1988 | 10 | 10.2 | 13 | 11.8 | | | | | | | | | | | | |
| 1989 | 12 | 9.7 | 9 | 10.2 | | | | | | | | | | | | |
| 1990 | | | | | | | | | | | | | | | | |
| 1991 | 10 | 11.4 | 10 | 11.4 | | | | | | | | | | | | |
| 1992 | 10 | 13.3 | 8 | 13.5 | | | | | | | | | | | | |
| 1993 | 13 | 10.7 | 10 | 10.0 | | | | | | | | | | | | |
| 1994 | 14 | 13.2 | 11 | 13.1 | | | | | | | | | | | | |
| 1995 | 12 | 11.9 | 12 | 11.9 | | | | | | | | | | | | |
| 1996 | 8 | 11.8 | 7 | 12.1 | | | | | | | | | | | | |
| 1997 | 9 | 11.3 | 9 | 11.3 | | | | | | | | | | | | |
| 1998 | 11 | 12.1 | 11 | 12.1 | | | | | | | | | | | | |
| 1999 | 10 | 10.5 | 9 | 10.5 | | | | | | | | | | | | |
| 2000 | 11 | 12.4 | 9 | 12.1 | | | | | | | | | | | | |
| 2001 | 8 | 13.2 | 7 | 12.8 | | | | | | | | | | | | |
| 2002 | 7 | 10.9 | 4 | 10.9 | | | | | | | | | | | | |
| 2003 | | | | | | | | | | | | | | | | |
| 2004 | 4 | 10.10 | 3 | 10.23 | 2 | 5.14 | 1 | 4.98 | 2 | 21.50 | 1 | 26.00 | 0 | 0.00 | 0 | 0.00 |
| All Years (weighted) | | 11.7 | | 12.3 | | 5.1 | | 5.0 | | 21.5 | | 26.0 | | | | |
| WI Impoundments | | | | 4.3 | | | | 22.3 | | | | 64 | | | | |
| Central Region | | | | 7.9 | | | | 7.5 | | | | 20 | | | | |

Mount Morris Lake B Water Quality

| N | ۸t. | Morris | Lake | в | Data |
|---|-----|--------|------|---|------|
| | | | | | |

| Date: | 04-12-04 | | | Max Depth (ft): | 38.2 |
|----------|-----------------|-------|-----------|----------------------|------|
| Time: | 14:08 | | | MTBS S Depth (ft): | 3.0 |
| Weather: | 38F, Clear, Bre | ezy | | MTBB B Depth (ft): | 35.0 |
| Ent: | TSN | Verf: | EJH/TAH | Secchi Depth (ft): | 10.2 |
| Lint. | ION | ven. | LJII/TAIT | Seccili Deptil (it). | 10. |

| Depth (ft) | Temp (°C) | D.O. (mg/l) | pН | Sp. Cond (µS/cm) |
|---------------|--------------|----------------|----|---------------------|
| 1.0 | 10.3 | 7.5 | na | 331 |
| 3.0 | 10.3 | 7.5 | na | 330 |
| 6.0 | 8.9 | 10.4 | na | 331 |
| 9.0 | 8.5 | 10.4 | na | 330 |
| 12.0 | 8.2 | 10.2 | na | 328 |
| 15.0 | 7.4 | 9.9 | na | 337 |
| 18.0 | 6.6 | 8.3 | na | 356 |
| 21.0 | 5.9 | 4.0 | na | 374 |
| 24.0 | 5.2 | 1.3 | na | 380 |
| 27.0 | 4.9 | 0.6 | na | 381 |
| 30.0 | 4.9 | 0.3 | na | 387 |
| 33.0 | 4.9 | 0.3 | na | 393 |
| 35.0 | 4.9 | 0.2 | na | 396 |



| Parameter | MTBS | MTBB |
|-----------------------|--------|--------|
| Total P (µg/L) | 20.000 | 23.000 |
| Dissolved P (µg/L) | | |
| Chl a (µg/L) | 8.17 | |
| TKN (μg/L | | |
| NO4+NO3-N (µg/L) | | |
| NH3-N (µg/L) | | |
| Total N (µg/L) | | |
| Lab Cond. (µS/cm) | | |
| Lab pH | | |
| Alkal (mg/l CaCO3) | | |
| Total Susp Sol (mg/l) | | |
| Calcium (mg/l) | | |

| Notes: | | |
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| | | Mt. M | orris Lake | B Data | | | |
|------------------------------------|--|----------------------|-----------------------|--------|----------------------------|--|----|
| Date: Time: Weather: Ent: | 06-16-04 9:34 ~70F, Partly TSN | Cloudy, Sli Verf: | ght Breeze EJH/TAH | | Ma MTBS MTBB Secc | ax Depth (ft): .S Depth (ft): .B Depth (ft): hi Depth (ft): | |
| | Depth (ft) | Temp (°C) | D.O. (mg/l) | pН | Sp. Cond (µS/cm) | | |
| | 1.0 | 21.4 | 9.5 | na | 271 | | |
| | 3.0 | 20.7 | 9.0 | na | 275 | | |
| | 6.0 | 18.5 | 7.9 | na | 281 | | |
| | 9.0 | 16.7 | 7.0 | na | 307 | | |
| | 12.0 | 14.8 | 6.9 | na | 330 | | (H |
| | 15.0 | 12.2 | 5.5 | na | 343 | | t |
| | 18.0 | 9.8 | 2.1 | na | 366 | | e |
| | 21.0 | 8.2 | 0.7 | na | 380 | | |
| | 24.0 | 7.4 | 0.4 | na | 384 | | |
| | 27.0 | 6.8 | 0.4 | na | 384 | | |
| | 30.0 | 6.4 | 0.3 | na | 388 | | |
| | 33.0 | 6.1 | 0.2 | na | 404 | | |
| | 36.0 | 6.0 | 0.2 | na | 412 | | |



38.5

6.5

| Parameter | MTBS | MTBB |
|-----------------------|------|------|
| Total P (μg/L) | | |
| Dissolved P (µg/L) | | |
| Chl a (µg/L) | | |
| TKN (μg/L | | |
| NO4+NO3-N (µg/L) | | |
| NH3-N (µg/L) | | |
| Total N (µg/L) | | |
| Lab Cond. (µS/cm) | | |
| Lab pH | | |
| Alkal (mg/l CaCO3) | | |
| Total Susp Sol (mg/l) | | |
| Calcium (mg/l) | | |

| Notes: | | |
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| Mt. Morris Lake B Data | | | | | |
|------------------------|---|---|---|--|--|
| | | | | | |
| 07-14-04 | | | Max Depth (ft): | 37.8 | |
| 18:02 | | | MTBS .S Depth (ft): | 3.0 | |
| Mostly Sunny, 75 | F | | MTBB B Depth (ft): | 35.0 | |
| TSN | Verf: | EJH/TAH | Secchi Depth (ft): | 14.4 | |
| | 07-14-04 18:02 Mostly Sunny, 75 TSN | Mt. Mc 07-14-04 18:02 Mostly Sunny, 75F TSN Verf: | Mt. Morris Lake B Data 07-14-04 18:02 Mostly Sunny, 75F TSN Verf: EJH/TAH | Mt. Morris Lake B Data 07-14-04 Max Depth (ft): 18:02 MTBS.S Depth (ft): Mostly Sunny, 75F MTBB.B Depth (ft): TSN Verf: EJH/TAH Secchi Depth (ft): | |

| Depth (ft) | Temp (°C) | D.O. (mg/l) | pН | Sp. Cond (µS/cm) |
|---------------|--------------|----------------|----|---------------------|
| 1.0 | 24.1 | 9.7 | na | 298 |
| 3.0 | 24.1 | 9.7 | na | 298 |
| 6.0 | 20.6 | 7.8 | na | 313 |
| 9.0 | 19.0 | 6.5 | na | 334 |
| 12.0 | 16.5 | 6.7 | na | 337 |
| 15.0 | 13.7 | 5.2 | na | 348 |
| 18.0 | 11.1 | 2.2 | na | 370 |
| 21.0 | 9.2 | 1.3 | na | 380 |
| 24.0 | 8.0 | 1.0 | na | 384 |
| 27.0 | 7.3 | 1.1 | na | 385 |
| 30.0 | 6.6 | 0.5 | na | 399 |
| 33.0 | 6.3 | 0.3 | na | 412 |
| 36.0 | 6.2 | 0.2 | na | 424 |



| Parameter | MTBS | MTBB |
|-----------------------|------|------|
| Total P (μg/L) | 14 | 307 |
| Dissolved P (µg/L) | | |
| Chl a (µg/L) | 1.21 | |
| TKN (μg/L | | |
| NO4+NO3-N (µg/L) | | |
| NH3-N (µg/L) | | |
| Total N (μg/L) | | |
| Lab Cond. (µS/cm) | | |
| Lab pH | | |
| Alkal (mg/l CaCO3) | | |
| Total Susp Sol (mg/l) | | |
| Calcium (mg/l) | | |

| Notes: | | |
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| Mt. Morris Lake B Data | | | | | | | |
|------------------------------------|---|--------------|----------------|----|----------------------------|--|---|
| Date: Time: Weather: Ent: | 08-16-04 10:50 Overcast, 65 TSN | iF Verf: | EJH/TAH | | Ma MTBS MTBB Secc | ax Depth (ft): .S Depth (ft): .B Depth (ft): hi Depth (ft): | |
| | Depth (ft) | Temp (°C) | D.O. (mg/l) | рН | Sp. Cond (µS/cm) | | |
| | 1.0 | 19.9 | 9.3 | na | 328 | | |
| | 3.0 | 19.8 | 9.3 | na | 327 | | |
| | 6.0 | 19.4 | 8.8 | na | 330 | | |
| | 9.0 | 19.3 | 8.5 | na | 331 | | |
| | 12.0 | 18.7 | 7.5 | na | 337 | | 3 |
| | 15.0 | 16.7 | 7.1 | na | 357 | | ł |
| | 18.0 | 12.8 | 4.0 | na | 373 | | 2 |
| | 21.0 | 10.4 | 3.0 | na | 381 | | - |
| | 24.0 | 8.6 | 1.0 | na | 385 | | |
| | 27.0 | 7.5 | 0.5 | na | 388 | | |
| | 30.0 | 7.0 | 0.4 | na | 405 | | |
| | 33.0 | 6.6 | 0.3 | na | 420 | | |
| | 36.0 | 6.4 | 0.3 | na | 446 | | |
| | 37.0 | 6.4 | 0.3 | na | 448 | | |



37.8

| Parameter | MTBS | MTBB |
|-----------------------|------|------|
| Total P (µg/L) | | |
| Dissolved P (µg/L) | | |
| Chl a (µg/L) | | |
| TKN (μg/L | | |
| NO4+NO3-N (µg/L) | | |
| NH3-N (µg/L) | | |
| Total N (µg/L) | | |
| Lab Cond. (µS/cm) | | |
| Lab pH | | |
| Alkal (mg/l CaCO3) | | |
| Total Susp Sol (mg/l) | | |
| Calcium (mg/l) | | |

| Notes: | | | |
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| | | Mt. Mo | orris Lake B Data | | |
|----------|-----------------|--------|-------------------|---------------------|------|
| Deter | 44 22 04 | | | Max Danth (ft) | 27.6 |
| Date: | 11-23-04 | | | wax Depth (it): | 57.0 |
| Time: | 12:40 | | | MTBS .S Depth (ft): | 3.0 |
| Weather: | 40F, Windy, Cle | ar | | MTBB .B Depth (ft): | 34.0 |
| Ent: | TSN | Verf: | EJH/TAH | Secchi Depth (ft): | 18.3 |

| Depth (ft) | Temp (°C) | D.O. (mg/l) | pН | Sp. Cond (µS/cm) |
|---------------|--------------|----------------|----|---------------------|
| 1.0 | 6.3 | 7.5 | na | 356 |
| 3.0 | 6.3 | 7.4 | na | 356 |
| 6.0 | 6.3 | 7.3 | na | 356 |
| 9.0 | 6.3 | 7.3 | na | 356 |
| 12.0 | 6.3 | 7.1 | na | 356 |
| 15.0 | 6.3 | 7.1 | na | 356 |
| 18.0 | 6.3 | 7.1 | na | 356 |
| 21.0 | 6.3 | 7.1 | na | 356 |
| 24.0 | 6.3 | 7.1 | na | 356 |
| 27.0 | 6.3 | 7.1 | na | 356 |
| 30.0 | 6.3 | 7.1 | na | 356 |
| 33.0 | 6.3 | 7.1 | na | 356 |
| 36.0 | 6.3 | 7.0 | na | 356 |
| | | | | |



| Parameter | MTBS | MTBB |
|-----------------------|-------|-------|
| | 10.00 | |
| Total P (µg/L) | 16.00 | 26.00 |
| Dissolved P (µg/L) | | |
| Chl a (µg/L) | 1.95 | |
| TKN (µg/L | | |
| NO4+NO3-N (µg/L) | | |
| NH3-N (µg/L) | | |
| Total N (µg/L) | | |
| Lab Cond. (µS/cm) | | |
| Lab pH | | |
| Alkal (mg/l CaCO3) | | |
| Total Susp Sol (mg/l) | | |
| Calcium (mg/l) | | |

| Notes: | | |
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| Mt | Morrie | I ako I | вг | Jata |
|-------|--------|---------|----|------|
| IVIL. | WOTTIS | Lake | рι | Jala |

| Date: 03 | -17-05 | | Max Depth (ft): | 35.8 |
|---------------|------------------------|---------|---------------------|------|
| Time: 14 | :45 | | MTBS .S Depth (ft): | 3.0 |
| Weather: 27°F | , 50% Cloud, Ice - 1.1 | feet | MTBB B Depth (ft): | 32.0 |
| Ent: TS | N Verf: | EJH/TAH | Secchi Depth (ft): | 14.0 |

| Depth (ft) | Temp (°C) | D.O. (mg/l) | pН | Sp. Cond (µS/cm) |
|---------------|--------------|----------------|-----|---------------------|
| 3.0 | 4.5 | 3.6 | 8.0 | 376 |
| 6.0 | 4.7 | 3.2 | 8.0 | 379 |
| 9.0 | 4.7 | 3.8 | 8.0 | 381 |
| 12.0 | 4.6 | 2.4 | 8.0 | 383 |
| 15.0 | 4.4 | 2.2 | 8.0 | 383 |
| 18.0 | 4.3 | 2.2 | 8.0 | 383 |
| 21.0 | 4.3 | 1.8 | 8.0 | 384 |
| 24.0 | 4.2 | 0.9 | 8.0 | 386 |
| 27.0 | 4.3 | 0.3 | 8.0 | 387 |
| 30.0 | 4.3 | 0.3 | 8.0 | 389 |
| 33.0 | 4.5 | 0.2 | 8.0 | 398 |
| 34.5 | 4.6 | 0.1 | 7.9 | 408 |
| | | | | |
| | | | | |



| Parameter | MTBS | MTBB |
|-----------------------|-------|--------|
| Total P (µg/L) | 13.00 | 138.00 |
| Dissolved P (µg/L) | | |
| Chl a (µg/L) | | |
| TKN (µg/L | | |
| NO4+NO3-N (µg/L) | | |
| NH3-N (µg/L) | | |
| Total N (µg/L) | | |
| Lab Cond. (µS/cm) | | |
| Lab pH | | |
| Alkal (mg/l CaCO3) | | |
| Total Susp Sol (mg/l) | | |
| Calcium (mg/l) | | |

| Notes: | | |
|--------|--|--|
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| | | |

Water Quality Data

| 2005 | Sur | face | Bottom | | |
|-----------------------|-------|----------|--------|--------|--|
| Parameter | Count | Mean | Count | Mean | |
| Secchi Depth (feet) | 6 | 12.82 | | | |
| Total P (µg/L) | 4 | 12.50 | 4 | 123.50 | |
| Dissolved P (µg/L) | 0 | | 0 | | |
| Chl a (µg/L) | 3 | 3.776667 | 0 | | |
| TKN (µg/L | 0 | | 0 | | |
| NO4+NO3-N (µg/L) | 0 | | 0 | | |
| NH3-N (µg/L) | 0 | | 0 | | |
| Total N (µg/L) | 0 | | 0 | | |
| Lab Cond. (µS/cm) | 0 | | 0 | | |
| Lab pH | 0 | | 0 | | |
| Alkal (mg/l CaCO3) | 0 | | 0 | | |
| Total Susp Sol (mg/l) | 0 | | 0 | | |
| Calcium (mg/l) | 0 | | 0 | | |

| Wisconsin Trophic State Index (WTSI) | | | | | | | |
|--------------------------------------|-------|-------|-------|--|--|--|--|
| Year | TP | Chla | SD | | | | |
| 1986 | | | 40.96 | | | | |
| 1987 | | | 39.34 | | | | |
| 1988 | | | 40.15 | | | | |
| 1989 | | | 43.85 | | | | |
| 1990 | | | | | | | |
| 1991 | | | 42.89 | | | | |
| 1992 | | | 34.74 | | | | |
| 1993 | | | 39.68 | | | | |
| 1994 | | | 39.34 | | | | |
| 1995 | | | 35.03 | | | | |
| 1996 | | | 39.68 | | | | |
| 1997 | | | 38.06 | | | | |
| 1998 | | | 37.13 | | | | |
| 1999 | | | 41.81 | | | | |
| 2000 | | | 38.91 | | | | |
| 2001 | | | 38.68 | | | | |
| 2002 | | | 42.07 | | | | |
| 2003 | | | | | | | |
| 2004 | 48.68 | 36.20 | 41.96 | | | | |
| All Years (weighted) | 48.68 | 36.20 | 39.29 | | | | |
| WI Impoundments | 60.51 | 58.05 | 56.10 | | | | |
| Central Region | 51.45 | 49.88 | 47.33 | | | | |

Morphological / Geographical Data

| Parameter | Value |
|---------------------------|-----------------|
| Acreage | |
| Volume (acre-feet) | |
| Perimeter (miles) | See Lake D |
| Shoreland Development | |
| Maximum Depth (feet) | |
| County | Waushara County |
| WBIC | See Lake D |
| Lillie Mason Region(1983) | Central Region |
| Nichols Ecoregion(1999) | NCSE |

Watershed Data

| WiLMS Class | Acreage | kg/yr | lbs/yr |
|------------------------|---------|------------|--------|
| Urban/Developed | | | |
| Urban - High Intensity | | | |
| Urban - Low Intensity | | | |
| Golf Course | | | |
| Herbaceous/Field Crops | | | |
| Row Crops | | | |
| Grasslands | | See Lake D | |
| Cranberry Bog | | | |
| Grassland | | | |
| Forest | | | |
| Open Water | | | |
| Wetland | | | |
| Cloud Cover | | | |

| | | Secchi | (feet) | | | Chlorop | hyll a (µg/L) | | | Phosph | orus (µg/L) | | | Nitroge | n (µg/L) | |
|----------------------|---------|--------|--------|-------|---------|----------|---------------|------|---------|----------|-------------|-------|---------|---------|----------|------|
| | Growing | Season | Sum | nmer | Growing | g Season | Sur | nmer | Growing | g Season | Su | mmer | Growing | Season | Sum | nmer |
| Year | Count | Mean | Count | Mean | Count | Mean | Count | Mean | Count | Mean | Count | Mean | Count | Mean | Count | Mean |
| 1986 | 10 | 12.9 | 6 | 12.3 | | | | | | | | | | | | |
| 1987 | 7 | 15.0 | 3 | 13.8 | | | | | | | | | | | | |
| 1988 | 20 | 12.8 | 13 | 13.0 | | | | | | | | | | | | |
| 1989 | 12 | 11.5 | 9 | 10.1 | | | | | | | | | | | | |
| 1990 | | | | | | | | | | | | | | | | |
| 1991 | 12 | 11.0 | 11 | 10.8 | | | | | | | | | | | | |
| 1992 | 8 | 17.5 | 6 | 18.9 | | | | | | | | | | | | |
| 1993 | 13 | 13.9 | 10 | 13.4 | | | | | | | | | | | | |
| 1994 | 14 | 14.4 | 11 | 13.8 | | | | | | | | | | | | |
| 1995 | 12 | 18.5 | 12 | 18.5 | | | | | | | | | | | | |
| 1996 | 8 | 13.0 | 7 | 13.4 | | | | | | | | | | | | |
| 1997 | 9 | 15.0 | 9 | 15.0 | | | | | | | | | | | | |
| 1998 | 11 | 16.0 | 11 | 16.0 | | | | | | | | | | | | |
| 1999 | 10 | 11.5 | 9 | 11.6 | | | | | | | | | | | | |
| 2000 | 11 | 13.9 | 9 | 14.2 | | | | | | | | | | | | |
| 2001 | 8 | 14.5 | 7 | 14.4 | | | | | | | | | | | | |
| 2002 | 7 | 11.6 | 4 | 11.4 | | | | | | | | | | | | |
| 2003 | | | | | | | | | | | | | | | | |
| 2004 | 4 | 11.15 | 3 | 11.47 | 2 | 4.69 | 1 | 1.21 | 2 | 17.00 | 1 | 14.00 | 0 | 0.00 | 0 | 0.00 |
| All Years (weighted) | | 13.8 | | 13.8 | | 4.7 | | 1.2 | | 17.0 | | 14.0 | | | | |
| WI Impoundments | | | | 4.3 | | | | 22.3 | | | | 64 | | | | |
| Central Region | | | | 7.9 | | | | 7.5 | | | | 20 | | | | |

| Mt. | Morris | Lake C | Data |
|-----|--------|--------|------|
|-----|--------|--------|------|

| Date: | 04-12-04 | | | Max Depth (ft): | 19.2 |
|----------|-------------|--------|---------|--------------------|------|
| Time: | 13:30 | | | MTCS Depth (ft): | 3.0 |
| Weather: | 38F, Clear, | Breezy | | MTCB Depth (ft): | 16.0 |
| Ent: | TSN | Verf: | EJH/TAH | Secchi Depth (ft): | 7.6 |

| Depth (ft) | Temp (°C) | D.O. (mg/l) | pН | Sp. Cond (µS/cm) |
|---------------|--------------|----------------|----|---------------------|
| 1.0 | 7.7 | 10.4 | na | 343 |
| 2.0 | 7.7 | 10.4 | na | 343 |
| 4.0 | 7.7 | 10.4 | na | 343 |
| 6.0 | 7.3 | 8.8 | na | 345 |
| 8.0 | 6.9 | 8.5 | na | 347 |
| 10.0 | 6.7 | 8.8 | na | 346 |
| 12.0 | 6.5 | 8.4 | na | 347 |
| 14.0 | 6.3 | 7.4 | na | 349 |
| 16.0 | 6.0 | 1.9 | na | 363 |
| 18.0 | 5.9 | 1.8 | na | 367 |



| Parameter | MTCS | MTCB |
|-----------------------|--------|--------|
| Total P (µg/l) | 16.000 | 51.000 |
| Dissolved P (µg/I) | | |
| Chl <u>a</u> (µg/l) | 4.78 | |
| TKN (µg/l) | | |
| NO4+NO3-N (µg/l) | | |
| NH3-N (μg/l) | | |
| Total N (µg/l) | | |
| Lab Cond. (µS/cm) | | |
| Lab pH | | |
| Alkal (mg/l CaCO3) | | |
| Total Susp Sol (mg/l) | | |
| Calcium (mg/l) | | |

Notes: Curley Leaf Pondweed was abundant near the sample spot, and was very abundant near the inlet from Norwegian Lake. Due to the presence of a wetland fringe surrounding the lake, approximately 40% of the shoreline is in a natural state.

| | Mt. Morris Lake C Data | | | | | | | |
|------------------------------------|---|-----------------|----------------|----|----|---------------------------|---|------|
| Date: Time: Weather: Ent: | 06-16-04 10:14 ~70F, Partly TSN | Cloudy Verf: | EJH/TAH | | | M MTCS MTCB Secc | ax Depth (ft): Depth (ft): Depth (ft): chi Depth (ft): | |
| | Depth (ft) | Temp (°C) | D.O. (mg/l) | p | ын | Sp. Cond (µS/cm) | | |
| | 1.0 | 21.1 | 8.1 | na | | 287 | | |
| | 2.0 | 19.7 | 8.1 | na | | 278 | | |
| | 4.0 | 15.3 | 4.4 | na | | 222 | | |
| | 6.0 | 13.4 | 2.4 | na | | 264 | | ŝ |
| | 8.0 | 12.1 | 0.5 | na | | 328 | | E E |
| | 10.0 | 10.4 | 0.3 | na | | 347 | | eptl |
| | 12.0 | 9.4 | 0.2 | na | | 362 | | Á. |
| | 14.0 | 8.8 | 0.2 | na | | 368 | | , |
| | 16.0 | 8.3 | 0.2 | na | | 376 | | |
| | 18.0 | 7.9 | 0.2 | na | | 384 | | |
| [| 20.0 | 7.8 | 0.1 | na | | 386 | | |



21.7

3.5

| Parameter | MTCS | MTCB |
|-----------------------|------|------|
| Total P (µg/I) | | |
| Dissolved P (µg/I) | | |
| Chl <u>a</u> (µg/l) | | |
| TKN (μg/l) | | |
| NO4+NO3-N (µg/l) | | |
| NH3-N (µg/l) | | |
| Total N (µg/l) | | |
| Lab Cond. (µS/cm) | | |
| Lab pH | | |
| Alkal (mg/l CaCO3) | | |
| Total Susp Sol (mg/l) | | |
| Calcium (mg/l) | | |

| Notes: | | | |
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| N//+ | Morrie | Laka | c | Data |
|-------|--------|------|---|------|
| IVIT. | WORTIS | Lake | ີ | Data |

| Date: | 07-14-04 | | Max Depth (ft): | 22.1 |
|----------|-------------------|---------|--------------------|------|
| Time: | 18:30 | | MTCS Depth (ft): | 3.0 |
| Weather: | Mostly Sunny, 72F | | MTCB Depth (ft): | 19.0 |
| Ent: | TSN Verf: | EJH/TAH | Secchi Depth (ft): | 6.7 |

| Depth (ft) | Temp (°C) | D.O. (mg/l) | рН | Sp. Cond (µS/cm) |
|---------------|--------------|----------------|----|---------------------|
| 1.0 | 21.9 | 8.4 | na | 337 |
| 3.0 | 21.3 | 8.4 | na | 339 |
| 6.0 | 16.0 | 7.2 | na | 342 |
| 9.0 | 13.9 | 3.0 | na | 343 |
| 12.0 | 10.8 | 1.1 | na | 362 |
| 15.0 | 9.2 | 0.4 | na | 380 |
| 18.0 | 8.2 | 0.2 | na | 392 |
| 20.0 | 8.1 | 0.2 | na | 394 |
| | | | | |
| | | | | |
| | | | | |



| Parameter | MTCS | MTCB |
|-----------------------|--------|---------|
| Total P (µg/I) | 30.000 | 397.000 |
| Dissolved P (µg/I) | | |
| Chl <u>a</u> (µg/l) | 3.63 | |
| TKN (μg/l) | | |
| NO4+NO3-N (µg/l) | | |
| NH3-N (µg/l) | | |
| Total N (µg/l) | | |
| Lab Cond. (µS/cm) | | |
| Lab pH | | |
| Alkal (mg/I CaCO3) | | |
| Total Susp Sol (mg/l) | | |
| Calcium (mg/l) | | |

| Notes: | | | |
|--------|--|--|--|
| | | | |
| | | | |
| | | | |
| | | | |

| | Mt. Morris Lake C Data | | | | | |
|------------------------------------|--|--------------|----------------|----|---------------------------|---|
| Date: Time: Weather: Ent: | 08-16-04 10:30 Cloudy, 65F TSN | Verf: | EJH/TAH | | M MTCS MTCB Seco | ax Depth (ft): Depth (ft): Depth (ft): chi Depth (ft): |
| | Depth (ft) | Temp (°C) | D.O. (mg/l) | pН | Sp. Cond (µS/cm) | |
| | 1.0 | 17.7 | 9.1 | na | 351 | |
| | 3.0 | 17.2 | 9.0 | na | 349 | |
| | 6.0 | 16.0 | 8.1 | na | 360 | |
| | 9.0 | 14.8 | 5.3 | na | 371 | |
| | 12.0 | 13.4 | 3.3 | na | 373 | |
| | 15.0 | 10.8 | 1.1 | na | 381 | |
| | 18.0 | 9.0 | 0.6 | na | 407 | |
| | 20.0 | 8.9 | 0.4 | na | 409 | |
| | | | | | | |



21.0

10.6

| Parameter | MTCS | MTCB |
|-----------------------|------|------|
| Total P (µg/l) | | |
| Dissolved P (µg/I) | | |
| Chl <u>a</u> (µg/l) | | |
| TKN (µg/l) | | |
| NO4+NO3-N (µg/l) | | |
| NH3-N (µg/l) | | |
| Total N (µg/l) | | |
| Lab Cond. (µS/cm) | | |
| Lab pH | | |
| Alkal (mg/l CaCO3) | | |
| Total Susp Sol (mg/l) | | |
| Calcium (mg/l) | | |

| Notes: | | | |
|--------|--|--|--|
| | | | |
| | | | |
| | | | |
| | | | |

| 844 | Marria | Laka | ~ | Data | |
|-------|--------|------|----|------|--|
| IVIT. | WORTIS | Lake | L. | Data | |

| Date: | 11-23-04 | | | Ма | x Depth (ft): | 20.5 |
|----------|-----------------|-------|---------|-------|----------------|------|
| Time: | 11:55 | | | MTCS | Depth (ft): | 3.0 |
| Weather: | 40F, Windy, Cle | ear | | MTCB | Depth (ft): | 17.0 |
| Ent: | TSN | Verf: | EJH/TAH | Secci | ni Depth (ft): | 14.8 |

| Depth (ft) | Temp (°C) | D.O. (mg/l) | рН | Sp. Cond (µS/cm) |
|---------------|--------------|----------------|----|---------------------|
| 1.0 | 5.3 | 10.1 | na | 364 |
| 3.0 | 5.3 | 10.1 | na | 364 |
| 6.0 | 5.3 | 10.1 | na | 364 |
| 9.0 | 5.3 | 10.0 | na | 364 |
| 12.0 | 5.3 | 10.0 | na | 364 |
| 15.0 | 5.3 | 10.1 | na | 364 |
| 18.0 | 5.3 | 10.0 | na | 364 |
| 19.0 | 5.3 | 9.9 | na | 364 |
| | | | | |
| | | | | |
| | | | | |

Т



| Parameter | MTCS | MTCB |
|-----------------------|------|------|
| Total P (µg/l) | | |
| Dissolved P (µg/I) | | |
| Chl <u>a</u> (µg/l) | 2.73 | |
| TKN (µg/l) | | |
| NO4+NO3-N (µg/l) | | |
| NH3-N (µg/l) | | |
| Total N (μg/l) | | |
| Lab Cond. (µS/cm) | | |
| Lab pH | | |
| Alkal (mg/l CaCO3) | | |
| Total Susp Sol (mg/l) | | |
| Calcium (mg/l) | | |

| Notes: | | | |
|--------|--|--|--|
| | | | |
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| | | | |
| | | | |

| | | Mt. Mc | orris Lake C Data | | | |
|------------|------------------|-----------|-------------------|-------|---------------|------|
| Date: | 03-17-05 | | | Ма | x Depth (ft): | 21.7 |
| Time: | 15:30 | | | MTCS | Depth (ft): | 3.0 |
| Weather: 2 | 27°F, 50% Cloud, | lce - 1.4 | feet | MTCB | Depth (ft): | 18.0 |
| Ent: | TSN | Verf: | EJH/TAH | Secch | i Depth (ft): | 10.2 |

| Depth (ft) | Temp (°C) | D.O. (mg/l) | pН | Sp. Cond (µS/cm) |
|---------------|--------------|----------------|-----|---------------------|
| 2.0 | 3.2 | 8.2 | 8.2 | 371 |
| 5.0 | 4.1 | 7.6 | 8.1 | 382 |
| 8.0 | 4.7 | 3.0 | 7.9 | 412 |
| 11.0 | 4.8 | 0.8 | 7.9 | 424 |
| 14.0 | 4.8 | 0.6 | 7.9 | 435 |
| 17.0 | 4.7 | 0.3 | 7.9 | 456 |
| 20.0 | 4.8 | 0.2 | 7.8 | 472 |
| | | | | |
| | | | | |
| | | | | |
| | | | | |



| Parameter | MTCS | MTCB |
|-----------------------|--------|---------|
| Total P (µg/I) | 12.000 | 121.000 |
| Dissolved P (µg/I) | | |
| Chl <u>a</u> (µg/l) | | |
| TKN (µg/l) | | |
| NO4+NO3-N (µg/l) | | |
| NH3-N (µg/l) | | |
| Total N (μg/l) | | |
| Lab Cond. (µS/cm) | | |
| Lab pH | | |
| Alkal (mg/l CaCO3) | | |
| Total Susp Sol (mg/l) | | |
| Calcium (mg/l) | | |

| Notes: | | | |
|--------|--|--|--|
| | | | |
| | | | |
| | | | |
| | | | |

Water Quality Data

| 2005 | Sur | face | Bottom | |
|-----------------------|-------|----------|--------|--------|
| Parameter | Count | Mean | Count | Mean |
| Secchi Depth (feet) | 6 | 8.64 | | |
| Total P (µg/L) | 3 | 19.33 | 3 | 189.67 |
| Dissolved P (µg/L) | 0 | | 0 | |
| Chl a (µg/L) | 3 | 3.713333 | 0 | |
| TKN (µg/L | 0 | | 0 | |
| NO4+NO3-N (µg/L) | 0 | | 0 | |
| NH3-N (µg/L) | 0 | | 0 | |
| Total N (µg/L) | 0 | | 0 | |
| Lab Cond. (µS/cm) | 0 | | 0 | |
| Lab pH | 0 | | 0 | |
| Alkal (mg/l CaCO3) | 0 | | 0 | |
| Total Susp Sol (mg/l) | 0 | | 0 | |
| Calcium (mg/l) | 0 | | 0 | |

| Wisconsin Trophic State Index (WTSI) | | | | | | |
|--------------------------------------|-------|-------|-------|--|--|--|
| Year | TP | Chla | SD | | | |
| 1986 | | | 44.61 | | | |
| 1987 | | | 41.40 | | | |
| 1988 | | | 44.08 | | | |
| 1989 | | | 45.01 | | | |
| 1990 | | | | | | |
| 1991 | | | 43.23 | | | |
| 1992 | | | 42.84 | | | |
| 1993 | | | 53.15 | | | |
| 1994 | | | 41.89 | | | |
| 1995 | | | 45.09 | | | |
| 1996 | | | 45.28 | | | |
| 1997 | | | 46.70 | | | |
| 1998 | | | 41.97 | | | |
| 1999 | | | 48.85 | | | |
| 2000 | | | 44.63 | | | |
| 2001 | | | 45.45 | | | |
| 2002 | | | 45.35 | | | |
| 2003 | | | | | | |
| 2004 | 54.61 | 44.43 | 49.21 | | | |
| All Years (weighted) | 54.61 | 44.43 | 44.12 | | | |
| WI Impoundments | 60.51 | 58.05 | 56.10 | | | |
| Central Region | 51.45 | 49.88 | 47.33 | | | |

Morphological / Geographical Data

| Parameter | Value |
|---------------------------|-----------------|
| Acreage | |
| Volume (acre-feet) | |
| Perimeter (miles) | See Lake D |
| Shoreland Development | |
| Maximum Depth (feet) | |
| County | Waushara County |
| WBIC | See Lake D |
| Lillie Mason Region(1983) | Central Region |
| Nichols Ecoregion(1999) | NCSE |

Watershed Data

| WiLMS Class | Acreage | kg/yr | lbs/yr |
|------------------------|---------|------------|--------|
| Urban/Developed | | | |
| Urban - High Intensity | | | |
| Urban - Low Intensity | | | |
| Golf Course | | | |
| Herbaceous/Field Crops | | | |
| Row Crops | | | |
| Grasslands | | See Lake D |) |
| Cranberry Bog | | | |
| Grassland | | | |
| Forest | | | |
| Open Water | | | |
| Wetland | | | |
| Cloud Cover | | | |

| | Secchi (feet) | | | | | Chlorop | hyll a (µg/L) | | | Phosph | orus (µg/L) | | | Nitroge | n (µg/L) | |
|----------------------|---------------|--------|-------|------|--------|----------|---------------|------|---------|----------|-------------|-------|--------|----------|----------|------|
| | Growing | Season | Sum | nmer | Growin | g Season | Sum | nmer | Growing | g Season | Sui | nmer | Growin | g Season | Sun | nmer |
| Year | Count | Mean | Count | Mean | Count | Mean | Count | Mean | Count | Mean | Count | Mean | Count | Mean | Count | Mean |
| 1986 | 10 | 8.9 | 6 | 9.5 | | | | | | | | | | | | |
| 1987 | 7 | 11.4 | 3 | 11.9 | | | | | | | | | | | | |
| 1988 | 18 | 10.2 | 12 | 9.9 | | | | | | | | | | | | |
| 1989 | 12 | 9.7 | 9 | 9.3 | | | | | | | | | | | | |
| 1990 | | | | | | | | | | | | | | | | |
| 1991 | 12 | 10.3 | 11 | 10.5 | | | | | | | | | | | | |
| 1992 | 9 | 11.2 | 7 | 10.8 | | | | | | | | | | | | |
| 1993 | 13 | 6.6 | 10 | 5.3 | | | | | | | | | | | | |
| 1994 | 14 | 11.7 | 11 | 11.5 | | | | | | | | | | | | |
| 1995 | 12 | 9.2 | 12 | 9.2 | | | | | | | | | | | | |
| 1996 | 8 | 9.2 | 7 | 9.1 | | | | | | | | | | | | |
| 1997 | 9 | 8.3 | 9 | 8.3 | | | | | | | | | | | | |
| 1998 | 11 | 11.5 | 11 | 11.5 | | | | | | | | | | | | |
| 1999 | 10 | 7.2 | 9 | 7.1 | | | | | | | | | | | | |
| 2000 | 11 | 10.4 | 9 | 9.5 | | | | | | | | | | | | |
| 2001 | 8 | 9.9 | 7 | 9.0 | | | | | | | | | | | | |
| 2002 | 7 | 9.4 | 4 | 9.1 | | | | | | | | | | | | |
| 2003 | | | | | | | | | | | | | | | | |
| 2004 | 4 | 7.10 | 3 | 6.93 | 2 | 4.205 | 1 | 3.63 | 2 | 23.00 | 1 | 30.00 | 0 | 0.00 | 0 | 0.00 |
| All Years (weighted) | | 9.8 | | 9.9 | | 4.2 | | 3.6 | | 23.0 | | 30.0 | | | | |
| WI Impoundments | | | | 4.3 | | | | 22.3 | | | | 64 | | | | |
| Central Region | | | | 7.9 | | | | 7.5 | | | | 20 | | | | |

| Date: | 04-12-04 | | |
|----------|-------------------|-------|---------|
| Time: | 12:50 | | |
| Weather: | 38F, Clear, Breez | у | |
| Ent: | TSN | Verf: | EJH/TAH |

Г

| Ма | x Depth (ft): | 41.0 |
|-------|----------------|------|
| MTDS | Depth (ft): | 3.0 |
| MTDB | Depth (ft): | 38.0 |
| Secch | ni Depth (ft): | 6.0 |

| Depth (ft) | Temp (°C) | D.O. (mg/l) | pН | Sp. Cond (µS/cm) |
|---------------|--------------|----------------|----|---------------------|
| 1.0 | 8.4 | 10.7 | na | 334 |
| 3.0 | 8.4 | 10.7 | na | 334 |
| 5.0 | 8.4 | 10.6 | na | 334 |
| 7.0 | 8.3 | 10.6 | na | 333 |
| 9.0 | 8.3 | 10.5 | na | 333 |
| 11.0 | 8.3 | 10.5 | na | 333 |
| 13.0 | 8.2 | 10.5 | na | 333 |
| 15.0 | 5.7 | 7.4 | na | 339 |
| 17.0 | 5.3 | 6.6 | na | 351 |
| 19.0 | 4.9 | 5.7 | na | 362 |
| 21.0 | 4.6 | 5.3 | na | 371 |
| 23.0 | 4.4 | 5.0 | na | 378 |
| 25.0 | 4.3 | 4.6 | na | 380 |
| 27.0 | 4.1 | 4.6 | na | 386 |
| 29.0 | 4.0 | 4.4 | na | 389 |
| 31.0 | 3.9 | 3.5 | na | 390 |
| 33.0 | 4.0 | 1.8 | na | 392 |
| 35.0 | 4.0 | 0.5 | na | 395 |
| 37.0 | 4.0 | 0.5 | na | 398 |
| 39.0 | 4.1 | 0.5 | na | 406 |



| Parameter | MTCDS | MTDB |
|-----------------------|---------|---------|
| Total P (µg/l) | 22.000 | 88.000 |
| Dissolved P (µg/I) | ND | 51.000 |
| Chl <u>a</u> (μg/l) | 10.10 | |
| TKN (μg/l) | 430.00 | 1060.00 |
| NO4+NO3-N (µg/l) | 653.000 | 523.000 |
| NH3-N (µg/l) | 58.000 | 600.000 |
| Total N (µg/I) | 1083.00 | 1583.00 |
| Lab Cond. (µS/cm) | 346 | 417 |
| Lab pH | 8.42 | 7.61 |
| Alkal (mg/l CaCO3) | 165 | 201 |
| Total Susp Sol (mg/l) | ND | 3 |
| Calcium (mg/l) | 40.8 | |

Notes:

| | | Mt. Mor | ris Lake D | Data | | | |
|----------|----------------------|---------|------------|------|-------|----------------|------|
| Date: | 06-16-04 | | | | Ма | x Depth (ft): | 41.0 |
| Time: | 11:32 | | | | MTDS | Depth (ft): | 3.0 |
| Weather: | ~70F, Overcast, Calm | | | | MTDB | Depth (ft): | 38.0 |
| Ent: | TSN | Verf: | EJH/TAH | | Seccl | hi Depth (ft): | 3.5 |
| | | | | | | | |
| | | | | | | | |

| Depth (ft) | Temp (°C) | D.O. (mg/l) | рН | Sp. Cond (µS/cm) |
|---------------|--------------|----------------|----|---------------------|
| 1.0 | 23.2 | 7.5 | na | 242 |
| 3.0 | 20.5 | 5.8 | na | 247 |
| 6.0 | 15.8 | 4.3 | na | 212 |
| 9.0 | 14.7 | 4.2 | na | 211 |
| 12.0 | 13.9 | 3.3 | na | 288 |
| 15.0 | 11.7 | 4.1 | na | 337 |
| 18.0 | 8.8 | 3.4 | na | 357 |
| 21.0 | 7.1 | 2.1 | na | 369 |
| 24.0 | 5.7 | 1.3 | na | 376 |
| 27.0 | 5.1 | 0.5 | na | 383 |
| 30.0 | 4.8 | 0.2 | na | 390 |
| 33.0 | 4.6 | 0.2 | na | 396 |
| 36.0 | 4.6 | 0.2 | na | 402 |
| 39.0 | 4.6 | 0.2 | na | 414 |



| Parameter | MTCDS | MTDB |
|-----------------------|--------|---------|
| Total P (µg/I) | 37.000 | 206.000 |
| Dissolved P (µg/I) | | |
| Chl <u>a</u> (µg/l) | 7.34 | |
| TKN (μg/l) | | |
| NO4+NO3-N (µg/l) | | |
| NH3-N (µg/l) | | |
| Total N (μg/l) | | |
| Lab Cond. (µS/cm) | | |
| Lab pH | | |
| Alkal (mg/l CaCO3) | | |
| Total Susp Sol (mg/l) | | |
| Calcium (mg/l) | | |

| Notes: | | |
|--------|--|--|
| | | |
| | | |
| | | |

| | | Mt. Moi | rris Lake D | Data | | | | |
|------------------------------------|---|--------------|----------------|------|---------------------------|---|----------------------------|---|
| Date: Time: Weather: Ent: | 07-14-04 18:56 68F, Sunny TSN | Verf: | EJH/TAH | | M MTDS MTDB Secc | ax Depth (ft): Depth (ft): Depth (ft): chi Depth (ft): | 41.6 3.0 39.0 9.7 | |
| | Depth (ft) | Temp (°C) | D.O. (mg/l) | рН | Sp. Cond (µS/cm) | | 0 | |
| | 1.0 | 24.3 | 8.2 | na | 323 | | 0 | э |
| | 3.0 | 24.1 | 8.2 | na | 322 | | 0 | |
| | 6.0 | 21.8 | 7.5 | na | 323 | | 5 | _ |
| | 9.0 | 17.9 | 4.5 | na | 308 | | 10 | |
| | 12.0 | 15.6 | 0.6 | na | 295 | | 🖲 15 🔤 | |
| | 15.0 | 12.4 | 0.8 | na | 330 | | 1 20 1 1 | |
| | 18.0 | 9.8 | 1.1 | na | 354 | | Å 25 | |
| | 21.0 | 7.2 | 1.3 | na | 370 | | 30 | 2 |
| | 24.0 | 5.8 | 0.4 | na | 380 | | 30 | Ŧ |
| | 27.0 | 5.3 | 0.3 | na | 387 | | 35 | t |
| | 30.0 | 4.8 | 0.2 | na | 395 | | 40 - | 1 |
| | 33.0 | 4.8 | 0.2 | na | 395 | | | |
| | 36.0 | 4.7 | 0.1 | na | 409 | l | | |
| | 39.0 | 4.7 | 0.1 | na | 422 | | | |



| Parameter | MTCDS | MTDB |
|-----------------------|---------|---------|
| Total P (µg/I) | 42.000 | 361.000 |
| Dissolved P (µg/I) | | |
| Chl <u>a</u> (µg/l) | 3.21 | |
| TKN (μg/l) | 1710.00 | 2230.00 |
| NO4+NO3-N (µg/l) | 397.000 | |
| NH3-N (µg/l) | 771.000 | 460.000 |
| Total N (µg/I) | 2107.00 | 2230.00 |
| Lab Cond. (µS/cm) | 317 | 430 |
| Lab pH | 8.38 | 7.85 |
| Alkal (mg/l CaCO3) | 153 | 213 |
| Total Susp Sol (mg/l) | | |
| Calcium (mg/l) | | |

Notes:

| Mt. Morris Lake D Data | | | | |
|------------------------|--|--|--|--|
| | | | | |

D.O.

(mg/l)

, 8.8 na

8.8 na

8.8 na

8.3 na

6.9 na

3.6 na

1.7 na

1.0 na 0.9 na

0.6 na

0.6 na 0.5 na 0.4 na

0.3 na

рΗ

Max Depth (ft):

MTDS Depth (ft):

Sp. Cond

. (µS/cm)

335

335

335

337

339

338

356

371

380

387

392

400

412

440

41.3

3.0

37.0

| Date: | 08-16-04 | | |
|----------|---------------|-------|---------|
| Time: | 10:50 | | |
| Weather: | 65F, Overcast | | |
| Ent: | TSN | Verf: | EJH/TAH |

Temp

(°C)

20.2

20.2

20.1

19.1

17.8

15.3

10.3

8.1

6.6

5.7 5.3 5.0

4.9

4.8

Depth

(ft)

1.0

3.0

6.0

9.0

12.0

15.0

18.0

21.0

24.0

27.0

30.0

33.0

36.0

39.0



| Parameter | MTCDS | MTDB |
|-----------------------|--------|---------|
| Total P (µg/l) | 19.000 | 352.000 |
| Dissolved P (µg/I) | | |
| Chl <u>a</u> (µg/l) | 5.93 | |
| TKN (µg/l) | | |
| NO4+NO3-N (µg/l) | | |
| NH3-N (µg/l) | | |
| Total N (µg/l) | | |
| Lab Cond. (µS/cm) | | |
| Lab pH | | |
| Alkal (mg/l CaCO3) | | |
| Total Susp Sol (mg/l) | | |
| Calcium (mg/l) | | |

Notes:

| | | Mt. Mo | rris Lake D | Data | | | |
|------------------------------------|---|--------------------------------|----------------|------|---------------------------|---|---------------|
| Date: Time: Weather: Ent: | 11-09-04 9:14 ~40F, Sunny TSN | /, Slight Bree Verf: | eze EJH/TAH | | M MTDS MTDB Seco | ax Depth (ft): Depth (ft): Depth (ft): thi Depth (ft): | 41.0 10.4 |
| | Depth (ft) | Temp (°C) | D.O. (mg/l) | рН | Sp. Cond (µS/cm) | | 0 5 |
| | 1.0 | 8.0 | 8.7 | na | 362 | | 0 5 |
| | 3.0 | 8.0 | 8.5 | na | 363 | | 0 |
| | 6.0 | 7.9 | 8.5 | na | 362 | | 5 |
| | 9.0 | 7.9 | 8.4 | na | 362 | | 10 |
| | 12.0 | 7.9 | 8.5 | na | 362 | | € 15 |
| | 15.0 | 7.9 | 8.4 | na | 362 | | 뜀 20 |
| | 18.0 | 7.9 | 8.4 | na | 362 | | Å 25 |
| | 21.0 | 7.9 | 8.4 | na | 363 | | 20 |
| | 24.0 | 7.8 | 8.1 | na | 364 | | 30 |
| | 27.0 | 7.6 | 7.2 | na | 368 | | ³⁵ |
| | 30.0 | 7.4 | 5.5 | na | 374 | | 40 🐱 🧳 |
| | 33.0 | 6.6 | 1.0 | na | 395 | | |
| | 36.0 | 5.4 | 0.2 | na | 417 | l | |
| | 39.0 | 5.2 | 0.2 | na | 429 | | |
| | 40.0 | 5.1 | 0.2 | na | 433 | | |

November 9, 2004

15

20

← Temp (°C) ← D.O. (mg/l) 25

10

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| Parameter | MTCDS | MTDB |
|-----------------------|-------|------|
| Total P (µg/I) | | |
| Dissolved P (µg/I) | | |
| Chl <u>a</u> (µg/l) | | |
| TKN (μg/l) | | |
| NO4+NO3-N (µg/l) | | |
| NH3-N (µg/l) | | |
| Total N (μg/l) | | |
| Lab Cond. (µS/cm) | | |
| Lab pH | | |
| Alkal (mg/I CaCO3) | | |
| Total Susp Sol (mg/l) | | |
| Calcium (mg/l) | | |

Notes: Lake was not mixed. Per phone conversation with TAH, samples were not collected, and surveys on the rest of the lakes were not conducted. Will return to collect profiles and samples week of 11-15-04. -TSN

| | | Mt. Mor | ris Lake D | Data | | | |
|----------|-------------|------------|------------|------|------|----------------|------|
| Date: | 11-23-04 | | | | Ма | ax Depth (ft): | 40.3 |
| Time: | 10:40 | | | | MTDS | Depth (ft): | 3.0 |
| Weather: | ~40F, Windy | , Overcast | | | MTDB | Depth (ft): | 37.0 |
| Ent: | TSN | Verf: | EJH/TAH | | Secc | hi Depth (ft): | 11.1 |
| _ | | | | | | _ | |
| | | | | | | | |

| Depth (ft) | Temp (°C) | D.O. (mg/l) | рH | Sp. Cond (µS/cm) |
|---------------|--------------|----------------|----|---------------------|
| 1.0 | 6.2 | 9.0 | na | 363 |
| 3.0 | 6.2 | 8.8 | na | 363 |
| 6.0 | 6.2 | 8.8 | na | 363 |
| 9.0 | 6.2 | 8.8 | na | 363 |
| 12.0 | 6.2 | 8.8 | na | 363 |
| 15.0 | 6.2 | 8.7 | na | 363 |
| 18.0 | 6.2 | 8.7 | na | 364 |
| 21.0 | 6.2 | 8.7 | na | 363 |
| 24.0 | 6.2 | 8.7 | na | 365 |
| 27.0 | 6.2 | 8.7 | na | 363 |
| 30.0 | 6.2 | 8.7 | na | 363 |
| 33.0 | 6.2 | 8.6 | na | 364 |
| 36.0 | 5.9 | 2.1 | na | 388 |
| 39.0 | 5.6 | 0.3 | na | 410 |
| | | | | |



| Parameter | MTCDS | MTDB |
|-----------------------|--------|---------|
| Total P (µg/I) | 23.000 | 143.000 |
| Dissolved P (µg/I) | | |
| Chl <u>a</u> (µg/l) | 6.90 | |
| TKN (µg/l) | | |
| NO4+NO3-N (µg/l) | | |
| NH3-N (µg/l) | | |
| Total N (µg/l) | | |
| Lab Cond. (µS/cm) | | |
| Lab pH | | |
| Alkal (mg/l CaCO3) | | |
| Total Susp Sol (mg/l) | | |
| Calcium (mg/l) | | |

| Notes: | | | |
|--------|--|--|--|
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| Date: | 03-17-05 | 5 | | Ма | x Depth (ft): | 41.7 |
|----------|--------------|----------|---------|------|----------------|------|
| Time: | 16:00 | | | MTDS | Depth (ft): | 3.0 |
| Weather: | 27°F, 50% CI | oud, Ice | | MTDB | Depth (ft): | 38.0 |
| Ent: | TSN | Verf: | EJH/TAH | Secc | hi Depth (ft): | 14.7 |

| Depth (ft) | Temp (°C) | D.O. (mg/l) | pН | Sp. Cond (µS/cm) |
|---------------|--------------|----------------|-----|---------------------|
| 3.0 | 3.6 | 9.5 | 8.3 | 374 |
| 6.0 | 3.7 | 8.6 | 8.3 | 386 |
| 9.0 | 3.7 | 8.1 | 8.2 | 390 |
| 12.0 | 3.7 | 8.0 | 8.2 | 390 |
| 15.0 | 3.7 | 7.8 | 8.2 | 389 |
| 18.0 | 3.7 | 7.8 | 8.2 | 390 |
| 21.0 | 3.7 | 7.6 | 8.2 | 390 |
| 24.0 | 3.6 | 7.1 | 8.2 | 391 |
| 27.0 | 3.5 | 6.6 | 8.2 | 392 |
| 30.0 | 3.5 | 6.2 | 8.2 | 394 |
| 33.0 | 3.4 | 5.3 | 8.1 | 396 |
| 36.0 | 3.4 | 2.8 | 8.1 | 399 |
| 39.0 | 3.6 | 0.9 | 8.0 | 405 |
| | | | | |
| | | | | |



| Parameter | MTCDS | MTDB |
|-----------------------|----------|---------|
| Total P (µg/l) | 10.000 | 73.000 |
| Dissolved P (µg/l) | | |
| Chl <u>a</u> (µg/l) | | |
| TKN (μg/l) | 260.00 | 1000.00 |
| NO4+NO3-N (µg/l) | 1160.000 | 587.000 |
| NH3-N (µg/l) | 43.000 | 276.000 |
| Total N (µg/l) | 1420.00 | 1587.00 |
| Lab Cond. (µS/cm) | | |
| Lab pH | | |
| Alkal (mg/l CaCO3) | | |
| Total Susp Sol (mg/l) | | |
| Calcium (mg/l) | | |

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| lotes: | | | |
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Water Quality Data

| 2005 | Surf | Surface | | ttom |
|-----------------------|-------|---------|-------|----------|
| Parameter | Count | Mean | Count | Mean |
| Secchi Depth (feet) | 7 | 9.39 | | |
| Total P (µg/L) | 6 | 25.5 | 6 | 203.8333 |
| Dissolved P (µg/L) | 0 | | 1 | 51 |
| Chl a (µg/L) | 5 | 6.696 | 0 | |
| TKN (µg/L | 3 | 800 | 3 | 1430 |
| NO4+NO3-N (µg/L) | 3 | 736.67 | 2 | 555 |
| NH3-N (µg/L) | 3 | 290.67 | 3 | 445.33 |
| Total N (µg/L) | 3 | 1536.67 | 3 | 1800 |
| Lab Cond. (µS/cm) | 2 | 331.5 | 2 | 423.5 |
| Lab pH | 2 | 8.4 | 2 | 7.73 |
| Alkal (mg/l CaCO3) | 2 | 159 | 2 | 207 |
| Total Susp Sol (mg/l) | 0 | | 1 | 3 |
| Calcium (mg/l) | 1 | 40.8 | 0 | |

| Wisconsin Trophic State Index (WTSI) | | | | | | | |
|--------------------------------------|-------|-------|-------|--|--|--|--|
| Year | TP | Chla | SD | | | | |
| 1986 | | | 40.76 | | | | |
| 1987 | | | 42.34 | | | | |
| 1988 | 45.24 | | 42.39 | | | | |
| 1989 | | | 44.67 | | | | |
| 1990 | | | | | | | |
| 1991 | | | 39.96 | | | | |
| 1992 | | | 39.87 | | | | |
| 1993 | | | 50.25 | | | | |
| 1994 | 49.88 | 45.14 | 41.41 | | | | |
| 1995 | 48.10 | 45.60 | 41.67 | | | | |
| 1996 | 51.96 | 46.37 | 44.21 | | | | |
| 1997 | 56.17 | 46.84 | 40.36 | | | | |
| 1998 | 49.21 | 42.12 | 39.15 | | | | |
| 1999 | 51.05 | 47.32 | 43.57 | | | | |
| 2000 | 50.63 | 39.96 | 40.00 | | | | |
| 2001 | 51.71 | 47.77 | 43.61 | | | | |
| 2002 | | | 45.76 | | | | |
| 2003 | | | | | | | |
| 2004 | 55.27 | 47.54 | 47.45 | | | | |
| All Years (weighted) | 51.66 | 45.78 | 41.32 | | | | |
| WI Impoundments | 60.51 | 58.05 | 56.10 | | | | |
| Central Region | 51.45 | 49.88 | 47.33 | | | | |

Morphological / Geographical Data

| Parameter | Value |
|---------------------------|-----------------|
| Acreage | 134.5 |
| Volume (acre-feet) | 1507.7 |
| Perimeter (miles) | 5.3 |
| Shoreland Development | 3.3 |
| Maximum Depth (feet) | 40 |
| County | Waushara County |
| WBIC | 246500 |
| Lillie Mason Region(1983) | Central Region |
| Nichols Ecoregion(1999) | NCSE |

Baseline Watershed Data Including Norwegian & Porters Subwatersheds

| WiLMS Class | Acreage | kg/yr | lbs/yr |
|---------------------------|---------|-------|----------|
| Urban - Rural Residential | 275.5 | 12 | 26.4552 |
| Urban - High Intensity | | | |
| Urban - Low Intensity | | | |
| Golf Course | | | |
| Herbaceous/Field Crops | | | |
| Row Crops | 793.5 | 322 | 709.8812 |
| Grasslands | 1193.1 | 145 | 319.667 |
| Cranberry Bog | | | |
| Forest | 2163.3 | 78 | 171.9588 |
| Open Water | 265.2 | 32 | 70.5472 |
| Wetland | 1146.2 | 47 | 103.6162 |
| Cloud Cover | | | |

| | Secchi (feet) Chlorophyll (| | hyll a (µg/L) | | Phosphorus (µg/L) | | | | Nitrogen (µg/L) | | | | | | | |
|----------------------|-----------------------------|--------|---------------|------|-------------------|----------|-------|------|-----------------|--------|-------|-------|---------|----------|-------|------|
| | Growing | Season | Sum | mer | Growin | g Season | Sum | mer | Growing | Season | Sum | ner | Growing | J Season | Sum | mer |
| Year | Count | Mean | Count | Mean | Count | Mean | Count | Mean | Count | Mean | Count | Mean | Count | Mean | Count | Mean |
| 1986 | 10 | 11.3 | 6 | 12.5 | | | | | | | | | | | | |
| 1987 | 7 | 12.2 | 3 | 11.2 | | | | | | | | | | | | |
| 1988 | 22 | 12.7 | 15 | 11.1 | 1 | 5.0 | | | 2 | 9.0 | 2 | 9.0 | | | | |
| 1989 | 5 | 9.5 | 5 | 9.5 | | | | | | | | | | | | |
| 1990 | | | | | | | | | | | | | | | | |
| 1991 | 10 | 12.8 | 9 | 13.2 | | | | | | | | | | | | |
| 1992 | 9 | 13.7 | 7 | 13.3 | | | | | | | | | | | | |
| 1993 | 13 | 7.7 | 10 | 6.5 | | | | | | | | | | | | |
| 1994 | 19 | 12.1 | 14 | 11.9 | 5 | 4.2 | 3 | 4.0 | 5 | 16.2 | 3 | 16.3 | | | | |
| 1995 | 16 | 11.6 | 15 | 11.7 | 4 | 3.7 | 3 | 4.2 | 4 | 15.0 | 3 | 13.0 | | | | |
| 1996 | 12 | 9.8 | 9 | 9.8 | 5 | 8.4 | 3 | 4.7 | 5 | 21.6 | 3 | 21.3 | | | | |
| 1997 | 14 | 12.6 | 12 | 12.8 | 4 | 5.8 | 3 | 5.0 | 5 | 36.8 | 3 | 36.7 | | | | |
| 1998 | 13 | 13.8 | 11 | 13.9 | 4 | 4.3 | 3 | 2.7 | 5 | 19.0 | 3 | 15.0 | | | | |
| 1999 | 13 | 10.5 | 10 | 10.3 | 4 | 5.5 | 3 | 5.3 | 4 | 19.8 | 3 | 19.0 | | | | |
| 2000 | 14 | 13.3 | 11 | 13.1 | 4 | 4.3 | 3 | 2.0 | 5 | 18.4 | 3 | 18.0 | | | | |
| 2001 | 12 | 10.8 | 9 | 10.2 | 4 | 5.8 | 3 | 5.7 | 5 | 19.4 | 3 | 20.7 | | | | |
| 2002 | 8 | 8.4 | 4 | 8.8 | | | | | 1 | 25.0 | | | | | | |
| 2003 | | | | | | | | | | | | | | | | |
| 2004 | 4 | 7.38 | 3 | 7.83 | 5 | 6.696 | 3 | 5.49 | 4 | 30.00 | 3 | 32.67 | 2 | 1595.00 | 2 | 8.50 |
| All Years (weighted) | | 11.9 | | 12.0 | | 5.4 | | 4.3 | | 21.3 | | 20.6 | | 1595.0 | | 8.5 |
| WI Impoundments | | | | 4.3 | | | | 22.3 | | | | 64 | | | | |
| Central Region | | | | 7.9 | | | | 7.5 | | | | 20 | | | | |

Mount Morris Lake E Water Quality

Mt. Morris Lake E Data

| Date: | 04-12-04 | | | |
|----------|--------------------|-------|---------|----|
| Time: | 12:28 | | | МТ |
| Weather: | 38F, Clear, Breezy | | | MT |
| Ent: | TSN | Verf: | EJH/TAH | S |

 Max Depth (ft):
 16.0

 TES
 Depth (ft):
 3.0

 TEB
 Depth (ft):
 13.0

 Secchi Depth (ft):
 7.5

| Depth (ft) | Temp (°C) | D.O. (mg/l) | pН | Sp. Cond (µS/cm) |
|---------------|--------------|----------------|----|---------------------|
| 1.0 | 8.5 | 11.7 | na | 303 |
| 3.0 | 8.4 | 11.7 | na | 303 |
| 5.0 | 8.4 | 11.6 | na | 303 |
| 7.0 | 8.3 | 11.6 | na | 303 |
| 9.0 | 8.2 | 11.5 | na | 302 |
| 11.0 | 8.1 | 11.6 | na | 304 |
| 13.0 | 8.0 | 12.5 | na | 306 |
| 15.0 | 8.0 | 11.2 | na | 312 |



| Parameter | MTES | MTEB |
|-----------------------|--------|--------|
| Total P (μg/l) | 13.000 | 11.000 |
| Dissolved P (µg/I) | | |
| Chl <u>a</u> (µg/l) | 4.63 | |
| TKN (μg/l) | | |
| NO4+NO3-N (µg/l) | | |
| NH3-N (µg/l) | | |
| Total N (μg/l) | | |
| Lab Cond. (µS/cm) | | |
| Lab pH | | |
| Alkal (mg/l CaCO3) | | |
| Total Susp Sol (mg/l) | | |
| Calcium (mg/l) | | |

Notes: Due to the steep slope of the shorelines banks, about 60% of Lake E's shoreline is in a semi-natural state.

| Mt. Morris Lake E Data | | | | | | | |
|------------------------|---------------------|------|---------|--------|-------------|--|--|
| | | | | | | | |
| Date: | 06-16-04 | | | Max | Depth (ft): | | |
| Time: | 11:00 | | | MTES | Depth (ft): | | |
| Weather: | ~70F, Mostly Cloudy | | | MTEB | Depth (ft): | | |
| Ent: | TSN Ve | erf: | EJH/TAH | Secchi | Depth (ft): | | |

D.O.

(mg/l)

9.1 na

8.9 na

8.9 na 9.2 na 7.9 na 7.0 na 5.6 na 1.3 na

1.2 na

pН

Sp. Cond

. (µS/cm)

270

270

270

270

276

284

299

315

319



15.6

8.0

| Parameter | MTES | MTEB |
|-----------------------|------|------|
| Total P (µg/I) | | |
| Dissolved P (µg/I) | | |
| Chl <u>a</u> (μg/l) | | |
| TKN (µg/l) | | |
| NO4+NO3-N (µg/l) | | |
| NH3-N (µg/l) | | |
| Total N (µg/I) | | |
| Lab Cond. (µS/cm) | | |
| Lab pH | | |
| Alkal (mg/l CaCO3) | | |
| Total Susp Sol (mg/l) | | |
| Calcium (mg/l) | | |

Depth

(ft)

1.0

2.0

4.0

6.0

8.0

10.0

12.0

14.0

14.5

Temp

(°C)

22.8

22.5

22.2

20.7

19.8

19.1

18.3

17.3

17.4

| Notes: | | | |
|--------|--|--|--|
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| | | Mt. Morri | s Lake E Da | ita | | |
|----------|------------|-----------|-------------|-------|---------------|------|
| | | | | | | |
| Date: | 07-14-04 | | | Max | k Depth (ft): | 16.8 |
| Time: | 19:25 | | | MTES | Depth (ft): | 3.0 |
| Weather: | 65F, Sunny | | | MTEB | Depth (ft): | 14.0 |
| Ent: | TSN | Verf: | EJH/TAH | Secch | i Depth (ft): | 9.3 |

| Depth (ft) | Temp (°C) | D.O. (mg/l) | pН | Sp. Cond (µS/cm) |
|---------------|--------------|----------------|----|---------------------|
| 1.0 | 25.6 | 8.4 | na | 271 |
| 3.0 | 24.4 | 8.7 | na | 269 |
| 6.0 | 23.6 | 8.8 | na | 266 |
| 9.0 | 21.2 | 7.7 | na | 271 |
| 12.0 | 19.8 | 2.4 | na | 313 |
| 15.0 | 18.3 | 0.4 | na | 419 |
| | | | | |
| | | | | |



| Parameter | MTES | MTEB |
|-----------------------|--------|--------|
| Total P (µg/l) | 31.000 | 54.000 |
| Dissolved P (µg/I) | | |
| Chl <u>a</u> (µg/l) | 6.59 | |
| TKN (μg/l) | | |
| NO4+NO3-N (µg/l) | | |
| NH3-N (µg/l) | | |
| Total N (μg/l) | | |
| Lab Cond. (µS/cm) | | |
| Lab pH | | |
| Alkal (mg/l CaCO3) | | |
| Total Susp Sol (mg/l) | | |
| Calcium (mg/l) | | |

| Notes: | | |
|--------|--|--|
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| Date: | 08-16-04 | | |
|----------|----------|-------|---------|
| Time: | 11:30 | | |
| Weather: | 65F | | |
| Ent: | TSN | Verf: | EJH/TAH |

Max Depth (ft):16.7MTESDepth (ft):MTEBDepth (ft):Secchi Depth (ft):10.9

| Depth (ft) | Temp (°C) | D.O. (mg/l) | pН | Sp. Cond (µS/cm) |
|---------------|--------------|----------------|----|---------------------|
| 1.0 | 21.3 | 8.3 | na | 281 |
| 3.0 | 21.1 | 8.3 | na | 281 |
| 6.0 | 20.9 | 8.4 | na | 281 |
| 9.0 | 20.6 | 8.2 | na | 280 |
| 12.0 | 20.4 | 8.1 | na | 281 |
| 15.0 | 20.2 | 7.6 | na | 289 |
| | | | | |
| | | | | |



| Parameter | MTES | MTEB |
|-----------------------|------|------|
| Total P (µg/l) | | |
| Dissolved P (µg/I) | | |
| Chl <u>a</u> (µg/l) | | |
| TKN (μg/l) | | |
| NO4+NO3-N (µg/l) | | |
| NH3-N (µg/l) | | |
| Total N (µg/l) | | |
| Lab Cond. (µS/cm) | | |
| Lab pH | | |
| Alkal (mg/l CaCO3) | | |
| Total Susp Sol (mg/l) | | |
| Calcium (mg/l) | | |

| lotes: | |
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| Date: | 11-09-04 | | | Max | c Depth (ft): |
|----------|--------------------|----------|---------|-------|---------------|
| Time: | 8:35 | | | MTES | Depth (ft): |
| Weather: | ~40F, Sunny, Sligh | t Breeze | e | MTEB | Depth (ft): |
| Ent: | TSN | Verf: | EJH/TAH | Secch | i Depth (ft): |

| Depth (ft) | Temp (°C) | D.O. (mg/l) | pН | Sp. Cond (µS/cm) |
|---------------|--------------|----------------|----|---------------------|
| 1.0 | 7.7 | 10.5 | na | 308 |
| 3.0 | 7.7 | 10.1 | na | 308 |
| 5.0 | 7.7 | 10.0 | na | 308 |
| 7.0 | 7.7 | 9.9 | na | 307 |
| 9.0 | 7.7 | 9.9 | na | 308 |
| 11.0 | 7.7 | 9.9 | na | 308 |
| 13.0 | 7.7 | 9.9 | na | 309 |
| | | | | |



14.4

| Parameter | MTES | MTEB |
|-----------------------|------|------|
| Total P (µg/l) | | |
| Dissolved P (µg/I) | | |
| Chl <u>a</u> (µg/l) | | |
| TKN (μg/l) | | |
| NO4+NO3-N (µg/l) | | |
| NH3-N (µg/l) | | |
| Total N (μg/l) | | |
| Lab Cond. (µS/cm) | | |
| Lab pH | | |
| Alkal (mg/l CaCO3) | | |
| Total Susp Sol (mg/l) | | |
| Calcium (mg/l) | | |

Notes: See note for Mt. Morris Lake D 11-09-04P.

| Date: | 11-23-004 | | | | Мах | Depth (ft): | 15.0 |
|----------|--------------------|-----|---------|---|--------|-------------|------|
| Time: | 14:21 | | | м | ITES | Depth (ft): | 3.0 |
| Weather: | 45F, Clear, Breezy | | | м | TEB | Depth (ft): | 15.0 |
| Ent: | TSN Ver | rf: | EJH/TAH | 5 | Secchi | Depth (ft): | 11.0 |

| Depth (ft) | Temp (°C) | D.O. (mg/l) | pН | Sp. Cond (µS/cm) |
|---------------|--------------|----------------|----|---------------------|
| 1.0 | 5.9 | 11.4 | na | 310 |
| 3.0 | 5.9 | 11.2 | na | 309 |
| 5.0 | 5.9 | 11.2 | na | 310 |
| 7.0 | 5.8 | 11.2 | na | 309 |
| 9.0 | 5.8 | 11.2 | na | 310 |
| 11.0 | 5.8 | 11.2 | na | 310 |
| 13.0 | 5.8 | 11.2 | na | 310 |
| 14.0 | 5.8 | 11.2 | na | 310 |



| Parameter | MTES | MTEB |
|-----------------------|--------|--------|
| Total P (µg/l) | 10.000 | 12.000 |
| Dissolved P (µg/I) | | |
| Chl <u>a</u> (µg/l) | 7.43 | |
| TKN (μg/l) | | |
| NO4+NO3-N (µg/l) | | |
| NH3-N (µg/l) | | |
| Total N (μg/l) | | |
| Lab Cond. (µS/cm) | | |
| Lab pH | | |
| Alkal (mg/l CaCO3) | | |
| Total Susp Sol (mg/l) | | |
| Calcium (mg/l) | | |

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| Notes: | |
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| Date: 03 | -17-05 | | Ма | k Depth (ft): | 16.0 |
|---------------|------------------|---------|-------|---------------|------|
| Time: 16 | :45 | | MTES | Depth (ft): | 3.0 |
| Weather: 27°F | , 50% Cloud, Ice | | MTEB | Depth (ft): | 13.0 |
| Ent: TS | SN Verf: | EJH/TAH | Secch | i Depth (ft): | 13.0 |

| Depth (ft) | Temp (°C) | D.O. (mg/l) | pН | Sp. Cond (µS/cm) |
|---------------|--------------|----------------|-----|---------------------|
| 2.0 | 2.7 | 8.4 | 8.4 | 377 |
| 4.0 | 3.6 | 7.7 | 8.3 | 375 |
| 6.0 | 4.0 | 6.7 | 8.3 | 377 |
| 8.0 | 4.1 | 6.5 | 8.3 | 377 |
| 10.0 | 4.2 | 6.4 | 8.3 | 377 |
| 12.0 | 4.3 | 5.6 | 8.3 | 379 |
| 14.0 | 4.4 | 5.3 | 8.3 | 379 |
| 15.0 | 4.4 | 5.3 | 8.3 | 380 |



| Parameter | MTES | MTEB |
|-----------------------|-------|--------|
| Total P (µg/l) | 9.000 | 10.000 |
| Dissolved P (µg/I) | | |
| Chl <u>a</u> (μg/l) | | |
| TKN (μg/l) | | |
| NO4+NO3-N (µg/l) | | |
| NH3-N (µg/l) | | |
| Total N (μg/l) | | |
| Lab Cond. (µS/cm) | | |
| Lab pH | | |
| Alkal (mg/l CaCO3) | | |
| Total Susp Sol (mg/l) | | |
| Calcium (mg/l) | | |

| Notes: | | | |
|--------|--|--|--|
| | | | |
| | | | |
| | | | |
| | | | |

Water Quality Data

| 2005 | Surf | ace | Bot | tom |
|-----------------------|-------|--------|-------|-------|
| Parameter | Count | Mean | Count | Mean |
| Secchi Depth (feet) | 7 | 10.36 | | |
| Total P (µg/L) | 4 | 15.750 | 4 | 21.75 |
| Dissolved P (µg/L) | 1 | 13.33 | 1 | 9 |
| Chl a (µg/L) | 1 | 13.59 | 1 | 11 |
| TKN (µg/L | 1 | 9.35 | 1 | 9 |
| NO4+NO3-N (µg/L) | 1 | 14.14 | 1 | 9 |
| NH3-N (µg/L) | 1 | 14.04 | 1 | 6 |
| Total N (µg/L) | 1 | 12.39 | 1 | 4 |
| Lab Cond. (µS/cm) | 0 | | 0 | |
| Lab pH | 1 | 9.70 | 1 | 3 |
| Alkal (mg/l CaCO3) | 1 | 13.05 | 0 | |
| Total Susp Sol (mg/l) | 0 | | 0 | |
| Calcium (mg/l) | 0 | | 0 | |

| Wisconsin Tro | phic State Index (W | /TSI) | |
|----------------------|---------------------|-------|-------|
| Year | TP | Chla | SD |
| 1986 | | | 38.82 |
| 1987 | | | 44.80 |
| 1988 | | | 39.78 |
| 1989 | | | 42.82 |
| 1990 | | | |
| 1991 | | | 39.79 |
| 1992 | | | 39.76 |
| 1993 | | | 42.43 |
| 1994 | | | 38.73 |
| 1995 | | | 39.78 |
| 1996 | | | 39.12 |
| 1997 | | | 39.78 |
| 1998 | | | 39.51 |
| 1999 | | | 44.75 |
| 2000 | | | 38.91 |
| 2001 | | | 39.12 |
| 2002 | | | 41.53 |
| 2003 | | | |
| 2004 | 54.87 | 48.91 | 44.82 |
| All Years (weighted) | 54.87 | 48.91 | 39.94 |
| WI Impoundments | 60.51 | 58.05 | 56.10 |
| Central Region | 51.45 | 49.88 | 47.33 |

Morphological / Geographical Data

| Value |
|--------------------|
| |
| |
| Included in Lake D |
| |
| |
| Waushara County |
| 246700 |
| Central Region |
| NCSE |
| |

Watershed Data

| WiLMS Class | Acreage | kg/yr | lbs/yr |
|------------------------|---------|--------------|--------|
| Urban/Developed | | | |
| Urban - High Intensity | | | |
| Urban - Low Intensity | | | |
| Golf Course | | | |
| Herbaceous/Field Crops | | | |
| Row Crops | | | |
| Grasslands | Inclu | ided in Lake | эD |
| Cranberry Bog | | | |
| Grassland | | | |
| Forest | | | |
| Open Water | | | |
| Wetland | | | |
| Cloud Cover | | | |

| | | Secchi | (feet) | | | Chlorop | hyll a (µg/L) | | 1 | Phospho | rus (µg/L) | | | Nitroge | n (µg/L) | |
|----------------------|---------|--------|--------|------|---------|----------|---------------|------|---------|---------|------------|-------|---------|---------|----------|------|
| | Growing | Season | Sum | mer | Growing | g Season | Sum | mer | Growing | Season | Sun | nmer | Growing | Season | Sum | mer |
| Year | Count | Mean | Count | Mean | Count | Mean | Count | Mean | Count | Mean | Count | Mean | Count | Mean | Count | Mean |
| 1986 | 10 | 14.4 | 6 | 14.3 | | | | | | | | | | | | |
| 1987 | 7 | 11.8 | 3 | 9.4 | | | | | | | | | | | | |
| 1988 | 18 | 13.6 | 12 | 13.3 | | | | | | | | | | | | |
| 1989 | 13 | 11.5 | 10 | 10.8 | | | | | | | | | | | | |
| 1990 | | | | | | | | | | | | | | | | |
| 1991 | 11 | 13.1 | 10 | 13.3 | | | | | | | | | | | | |
| 1992 | 9 | 13.5 | 7 | 13.4 | | | | | | | | | | | | |
| 1993 | 13 | 11.5 | 10 | 11.1 | | | | | | | | | | | | |
| 1994 | 14 | 14.4 | 11 | 14.3 | | | | | | | | | | | | |
| 1995 | 12 | 13.3 | 12 | 13.3 | | | | | | | | | | | | |
| 1996 | 8 | 14.0 | 7 | 14.0 | | | | | | | | | | | | |
| 1997 | 9 | 13.3 | 9 | 13.3 | | | | | | | | | | | | |
| 1998 | 11 | 13.6 | 11 | 13.6 | | | | | | | | | | | | |
| 1999 | 10 | 9.4 | 9 | 9.4 | | | | | | | | | | | | |
| 2000 | 11 | 14.1 | 9 | 14.2 | | | | | | | | | | | | |
| 2001 | 7 | 14.0 | 6 | 14.0 | | | | | | | | | | | | |
| 2002 | 7 | 12.4 | 4 | 11.8 | | | | | | | | | | | | |
| 2003 | | | | | | | | | | | | | | | | |
| 2004 | 5 | 9.70 | 3 | 9.40 | 2 | 5.61 | 1 | 6.59 | 2 | 22.00 | 1 | 31.00 | 0 | 0.00 | 0 | 0.00 |
| All Years (weighted) | | 13.1 | | 13.2 | | 5.6 | | 6.6 | | 22.0 | | 31.0 | | | | |
| WI Impoundments | | | | 4.3 | | | | 22.3 | | | | 64 | | | | |
| Central Region | | | | 7.9 | | | | 7.5 | | | | 20 | | | | |

C

APPENDIX C

2004 Aquatic Plant Survey Data

| | | | | | Daubenmire | | |
|----------|--------|-----------|---------------------------|-------------------------|------------|-----------|------------|
| Point | Z (ft) | Substrate | Species | Common Name | Cover | Latitude | Longitude |
| 1 | 4 | muck | Potamogeton crispus | Curly-leaf pondweed | 6 | 44.125030 | -89.219270 |
| | | muck | Nuphar variegata | Spatterdock | 3 | | |
| | | muck | Elodea canadensis | Common waterweed | 2 | | |
| | | muck | Myriophyllum sibiricum | Northern water milfoil | 2 | | |
| | | muck | Lemna minor | Lesser duckweed | 3 | | |
| | | muck | Spirodela polyrhiza | Greater duckweed | 3 | | |
| | | muck | Ceratophyllum demersum | Coontail | 2 | | |
| | | muck | Stuckenia pectinata | Sago pondweed | 2 | | |
| 2 | 7 | muck | Potamogeton crispus | Curly-leaf pondweed | 5 | 44.124355 | -89.219279 |
| | | muck | Potamogeton praelongus | White-stem pondweed | 3 | | |
| | | muck | Elodea canadensis | Common waterweed | 2 | | |
| | | muck | Ceratophyllum demersum | Coontail | 2 | | |
| | | muck | Myriophyllum sibiricum | Northern water milfoil | 2 | | |
| 3 | 3 | muck | Myriophyllum sibiricum | Northern water milfoil | 2 | 44.123680 | -89.219288 |
| | | muck | Elodea canadensis | Common waterweed | 2 | | |
| | | muck | Stuckenia pectinata | Sago pondweed | 5 | | |
| | | muck | Chara sp. | Muskgrasses | 3 | | |
| | | muck | Nymphaea odorata | White water lily | 4 | | |
| | | muck | Ceratophyllum demersum | Coontail | 2 | | |
| | | muck | Lemna minor | Lesser duckweed | 2 | | |
| | | muck | Spirodela polyrhiza | Greater duckweed | 2 | | |
| | | muck | Potamogeton praelongus | White-stem pondweed | 2 | | |
| | | muck | Nuphar variegata | Spatterdock | 1 | | |
| | | muck | Potamogeton zosteriformis | Flat-stem pondweed | 1 | | |
| 4 | 3 | muck | Chara sp. | Muskarasses | 6 | 44.123674 | -89.218350 |
| 5 | 18 | muck | NOVEG | NO VEG | 0 | 44.124349 | -89.218341 |
| 6 | 6 | muck | Potamogeton crispus | Curly-leaf pondweed | 0 | 44,125024 | -89,218333 |
| | | muck | Chara sp. | Muskarasses | 6 | | 00.2.0000 |
| | - | muck | Potamogeton illinoensis | Illinois pondweed | 1 | | |
| | | muck | Stuckenia pectinata | Sago pondweed | 1 | | |
| 7 | 12 | muck | Potamogeton praelongus | White-stem pondweed | 2 | 44 125018 | -89 217395 |
| | | muck | Chara sp | Muskarasses | 1 | 11120010 | 00.217000 |
| 8 | 16 | muck | NO VEG | NO VEG | 0 | 44 125011 | -89 216458 |
| 9 | 3 | muck | Chara sp | Muskarasses | 6 | 44 125005 | -89 215520 |
| _ | | muck | Potamogeton illinoensis | | 1 | 44.120000 | 00.210020 |
| 10 | 14 | muck | Potamogeton crispus | Curly-leaf pondweed | 4 | 44 124323 | -89 214592 |
| 10 | 1 1 7 | muck | | Coontail | 2 | 77.127020 | 00.214002 |
| | | muck | Elodea canadensis | | 2 | | |
| 11 | 20 | muck | | NO VEC | 0 | 11 123648 | -80 21/601 |
| 12 | 10 | muck | Rotamogoton zostariformis | Elat-stom pondwood | 3 | 44.123040 | -80 21/610 |
| 12 | 10 | muck | Myriophyllum sibiricum | Northern water milfoil | 3 | 44.122373 | -03.214010 |
| | | muck | Chara an | Muckgrosson | 5 | | |
| | | muck | Eleden considencia | Common waterwood | 0 | | |
| | | muck | | Controll | 2 | | |
| | | muck | | Coordinati | 2 | | |
| 10 | 2 | muck | | | 4 | 44 100001 | 00 010600 |
| 13 | 3 | muck | Chara sp. | Muskgrasses | 4 | 44.122291 | -89.213682 |
| | | тиск | | Northern water militoli | 1 | | |
| 4.4 | | тиск | Potamogeton praelongus | White-stem pondweed | 1 | 44.400000 | 00.040070 |
| 14 | 32 | INUCK | | | 0 | 44.122966 | -89.213673 |
| 15 | 34 | MUCK | Detemoretar richards and | NU VEG | 0 | 44.123641 | -89.213664 |
| 16 | 10 | muck | Potamogeton richardsonii | Clasping-leat pondweed | 2 | 44.124317 | -89.213655 |
| | | muck | Potamogeton zosteriformis | Flat-stem pondweed | 2 | | |
| | | muck | Chara sp. | Muskgrasses | 6 | | |
| | ļ | muck | Myriophyllum sibiricum | Northern water milfoil | 2 | | |
| | | muck | Stuckenia pectinata | Sago pondweed | 3 | | |
| | | muck | Elodea canadensis | Common waterweed | 2 | | |
| | | muck | Potamogeton crispus | Curly-leaf pondweed | 3 | | |
| 17 | 3 | muck | Chara sp. | Muskarasses | 4 | 44,124310 | -89.212717 |

| | | | | | Daubenmire | | |
|-------|----------|-----------|--------------------------------|------------------------|---------------|-----------|------------|
| Point | Z (ft) | Substrate | Species | Common Name | Cover | Latitude | Longitude |
| | | muck | Potamogeton crispus | Curly-leaf pondweed | 1 | | |
| | | muck | Elodea canadensis | Common waterweed | 1 | | |
| 18 | 21 | muck | NO VEG | NO VEG | 0 | 44.123635 | -89.212726 |
| 19 | 19 | muck | NO VEG | NO VEG | 0 | 44.122960 | -89.212735 |
| 20 | 3 | muck | Nuphar variegata | Spatterdock | 5 | 44.122285 | -89.212744 |
| | | muck | Stuckenia pectinata | Sago pondweed | 3 | | |
| | | muck | Chara sp. | Muskgrasses | 5 | | |
| | | muck | Potamogeton richardsonii | Clasping-leaf pondweed | 3 | | |
| | | muck | Elodea canadensis | Common waterweed | 2 | | |
| | | muck | Potamogeton zosteriformis | Flat-stem pondweed | 3 | | |
| | | muck | Myriophyllum sibiricum | Northern water milfoil | 2 | | |
| | | muck | Lemna minor | Lesser duckweed | 1 | | |
| | | muck | Spirodela polyrhiza | Greater duckweed | 1 | | |
| | | muck | Potamogeton crispus | Curly-leaf pondweed | 2 | | |
| | | muck | Ceratophyllum demersum | Coontail | 2 | | |
| 21 | 1 | muck | Nymphaea odorata | White water lily | 2 | 44.122272 | -89.210870 |
| | | muck | Spirodela polyrhiza | Greater duckweed | 5 | | |
| | | muck | Lemna minor | Lesser duckweed | 5 | | |
| | 1 | muck | Chara sp. | Muskgrasses | 5 | | |
| | | muck | Schoenoplectus acutus | Hardstem bulrush | 4 | | |
| | | muck | Potamogeton zosteriformis | Flat-stem pondweed | 2 | | |
| | | muck | Ceratophyllum demersum | Coontail | 2 | | |
| | | muck | Typha latifolia | Broad-leaved cattail | 5 | | |
| | | muck | Flodea canadensis | Common waterweed | 2 | | |
| 22 | 0 | muck | Nuphar variegata | Spatterdock | 5 | 44,121590 | -89,209941 |
| | <u> </u> | muck | Myriophyllum sibiricum | Northern water milfoil | 2 | 11121000 | 00.2000 11 |
| | | muck | Potamogeton natans | Floating-leaf pondweed | 2 | | |
| | | muck | Potamogeton illinoensis | Illinois pondweed | 2 | | |
| | | muck | Chara sp | Muskarasses | 5 | | |
| | | muck | Utricularia vulgaris | Common bladderwort | 2 | | |
| | | muck | l emna minor | Lesser duckweed | 2 | | |
| | | muck | Lemna trisulca | Forked duckweed | 2 | | |
| 23 | 0 | muck | Nuphar variegata | Spatterdock | 4 | 44 120915 | -89 209950 |
| | | muck | Chara sp | Muskarasses | 4 | 11120010 | 00.200000 |
| | | muck | Myriophyllum sibiricum | Northern water milfoil | 2 | | |
| | | muck | Nymphaea odorata | White water lilv | 2 | | |
| | | muck | Carex comosa | Bristly sedge | 2 | | |
| | | muck | Lemna minor | Lesser duckweed | 2 | | |
| | | muck | Spirodela polyrbiza | Greater duckweed | 2 | | |
| | | muck | Schoenonlectus tabernaemontani | Softstem bulrush | 2 | | |
| | | muck | Ceratophyllum demersum | Coontail | 2 | | |
| | | muck | Eleocharis palustris | Creening spike-rush | 2 | | |
| 24 | 15 | muck | Nymphaea odorata | White water lilv | 2 | 11 120008 | -80 200013 |
| 27 | 1.5 | muck | Chara sp | Muskarassos | 5 | 44.120300 | -03.203013 |
| | | muck | Muriophyllum sibiricum | Northorn water milfoil | 2 | | |
| | | muck | | | 2 | | |
| | | muck | Spirodela polyrbiza | Greater duckweed | 2 | | |
| | | muck | Spirodela polymiza | Sago pondwood | 2 | | |
| | | muck | Botamagatan illingansis | Ullinois pondwood | 2 | | |
| 25 | 15 | muck | Nymphaca adarata | White water like | 2 | 44 120240 | 80 200050 |
| 23 | 1.5 | muck | Nunbar variegata | Spatterdock | 2 | 44.120240 | -09.209959 |
| | | muck | Chara en | Muskarasses | <u>ک</u> ۶ | | |
| | | muck | Spirodola polyrbiza | Greater duckwood | 5 | | |
| | | muck | | | ວ F | | |
| | | muck | | | 5 | | |
| | | muck | | Northorn water milfeil | 2 | | |
| | | muck | | | 2 | | |
| | | muck | | | 2 | | |
| | 1 | TUTICK | ILeratoonviium demersum | CONTAIL | | | |

| | | | | | Daubenmire | | |
|-------|------------|----------------|--------------------------------|------------------------|------------|-----------|------------|
| Point | Z (ft) | Substrate | Species | Common Name | Cover | Latitude | Longitude |
| 20 | | muck | l omna minor | | 5 | 44.119504 | -09.209900 |
| | | muck | Spirodela polyrhiza | Greater duckweed | 5 | | |
| | | muck | Ceratophyllum demersum | Coontail | <u> </u> | | |
| 27 | 1 | muck | Nunhar variegata | Spatterdock | 5 | 44 118883 | -89 209040 |
| 21 | <u> '</u> | muck | Ranunculus aquatilis | White water-crowfoot | 4 | | 00.200010 |
| | | muck | Potamogeton crispus | Curly-leaf pondweed | 2 | | |
| | - | muck | Myriophyllum sibiricum | Northern water milfoil | 4 | | |
| | | muck | Lemna minor | Lesser duckweed | 5 | | |
| | | muck | Spirodela polyrhiza | Greater duckweed | 5 | | |
| | | muck | Chara sp. | Muskgrasses | 4 | | |
| | - | muck | Stuckenia pectinata | Sago pondweed | 3 | | |
| | | muck | Elodea canadensis | Common waterweed | 2 | | |
| 28 | 9 | muck | Potamogeton praelongus | White-stem pondweed | 2 | 44.119558 | -89.209031 |
| | | | Potamogeton richardsonii | Clasping-leaf pondweed | 2 | | |
| | | | Elodea canadensis | Common waterweed | 2 | | |
| 29 | 10 | muck | NO VEG | NO VEG | 0 | 44.120233 | -89.209022 |
| 30 | 2 | muck | Potamogeton crispus | Curly-leaf pondweed | 2 | 44.120902 | -89.208076 |
| | | | Potamogeton zosteriformis | Flat-stem pondweed | 2 | | |
| | | | Myriophyllum sibiricum | Northern water milfoil | 3 | | |
| | | | Stuckenia pectinata | Sago pondweed | 2 | | |
| | | | Elodea canadensis | Common waterweed | 2 | | |
| | | | Ceratophyllum demersum | Coontail | 2 | | |
| | | | Nuphar variegata | Spatterdock | 4 | | |
| | | | Ranunculus aquatilis | White water-crowfoot | 2 | | |
| | - | | Nymphaea odorata | White water lilv | 2 | | |
| | | | l emna minor | Lesser duckweed | 2 | | |
| | 1 | | Spirodela polyrhiza | Greater duckweed | 2 | | |
| | | | l empa trisulca | Forked duckweed | 1 | | |
| 31 | 4 | muck | Nymphaea odorata | White water lilv | 2 | 44,120227 | -89,208085 |
| | | | Potamogeton natans | Floating-leaf pondweed | 2 | | |
| | | | Potamogeton crispus | Curly-leaf pondweed | 2 | | |
| | | | Chara sp. | Muskgrasses | 5 | | |
| | | | Elodea canadensis | Common waterweed | 5 | | |
| | | | l emna minor | Lesser duckweed | 2 | | |
| | | | Spirodela polyrhiza | Greater duckweed | 2 | | |
| 32 | 18 | muck | NO VEG | NO VEG | 0 | 44,119551 | -89.208094 |
| 33 | 5 | muck | Elodea canadensis | Common waterweed | 3 | 44.118876 | -89.208103 |
| | | | Chara sp. | Muskarasses | 3 | | |
| 34 | 1 | | Typha latifolia | Broad-leaved cattail | 5 | 44.118201 | -89.208112 |
| | | | Lemna minor | Lesser duckweed | 5 | | |
| | | | Spirodela polvrhiza | Greater duckweed | 5 | | |
| | | | Ceratophyllum demersum | Coontail | 3 | | |
| | | | Chara sp. | Muskarasses | 3 | | |
| | | | Elodea canadensis | Common waterweed | 2 | | |
| | | | Stuckenia pectinata | Sago pondweed | 3 | | |
| | 1 | | Ranunculus aquatilis | White water-crowfoot | 2 | | |
| 35 | 9 | muck | Elodea canadensis | Common waterweed | 2 | 44.118870 | -89.207166 |
| 36 | 16 | muck | NO VEG | NO VEG | 0 | 44.119545 | -89.207157 |
| 37 | 3 | muck | Elodea canadensis | Common waterweed | 4 | 44.120220 | -89.207148 |
| 38 | 0.5 | muck | Nuphar variegata | Spatterdock | 2 | 44.121571 | -89.207130 |
| | - | | Lemna minor | Lesser duckweed | 5 | | |
| | 1 | | Spirodela polyrhiza | Greater duckweed | 5 | | |
| | 1 | | Nymphaea odorata | White water lilv | 1 | | |
| | 1 | | Potamogeton natans | Floating-leaf pondweed | 2 | | |
| | - | | Schoenoplectus tabernaemontani | Softstem bulrush | 5 | | |
| 39 | 2 | sand/detritous | Vallisneria americana | Wild celery | 2 | 44.120214 | -89.206210 |
| | 1 | | Eleocharis palustris | Creeping spike-rush | 2 | | |

| | | | | | Daubenmire | | |
|-------|--------|------------|--------------------------------|------------------------|------------|------------|------------|
| Point | Z (ft) | Substrate | Species | Common Name | Cover | Latitude | Longitude |
| | | | Elodea canadensis | Common waterweed | 2 | | |
| | | | Lemna minor | Lesser duckweed | 2 | | |
| | | | Spirodela polyrhiza | Greater duckweed | 2 | | |
| | | | Chara sp. | Muskgrasses | 3 | | |
| 40 | 6 | muck | Elodea canadensis | Common waterweed | 5 | 44.119538 | -89.206219 |
| | | | Myriophyllum sibiricum | Northern water milfoil | 4 | | |
| | | | Potamogeton richardsonii | Clasping-leaf pondweed | 2 | | |
| 41 | 6 | muck | Elodea canadensis | Common waterweed | 4 | 44.118863 | -89.206228 |
| 42 | 4 | muck | Elodea canadensis | Common waterweed | 4 | 44.118188 | -89.206237 |
| | | | Vallisneria americana | Wild celery | 2 | | |
| | | | Potamogeton crispus | Curly-leaf pondweed | 2 | | |
| | | | Chara sp. | Muskgrasses | 2 | | |
| 43 | 1 | sandy muck | Vallisneria americana | Wild celery | 3 | 44.118857 | -89.205291 |
| | | | Stuckenia pectinata | Sago pondweed | 3 | | |
| | | | Elodea canadensis | Common waterweed | 2 | | |
| | | | Chara sp. | Muskgrasses | 3 | | |
| | | | Ranunculus aquatilis | White water-crowfoot | 3 | | |
| | | | Myriophyllum sibiricum | Northern water milfoil | 2 | | |
| | | | Ceratophyllum demersum | Coontail | 2 | | |
| | | | Nymphaea odorata | White water lilv | 2 | | |
| | | | Lemna minor | Lesser duckweed | 2 | | |
| | | | Spirodela polyrhiza | Greater duckweed | 2 | | |
| | | | Potamogeton zosteriformis | Flat-stem pondweed | 2 | | |
| | | | Potamogeton crispus | Curly-leaf pondweed | 2 | | |
| 44 | 2 | muck | Nuphar variegata | Spatterdock | 5 | 44.118182 | -89.205300 |
| | | | Chara sp. | Muskarasses | 3 | | 001200000 |
| | | | Flodea canadensis | Common waterweed | 3 | | |
| | | | Myriophyllum sibiricum | Northern water milfoil | 2 | | |
| | | | Lemna minor | Lesser duckweed | 4 | | |
| | 1 | | Spirodela polyrhiza | Greater duckweed | 4 | | |
| | | | Potamogeton crispus | Curly-leaf pondweed | 2 | | |
| | | | Schoenoplectus tabernaemontani | Softstem bulrush | 2 | | |
| | 1 | | Ceratophyllum demersum | Coontail | 2 | | |
| 45 | 5 | muck | Myriophyllum sibiricum | Northern water milfoil | 3 | 44.117506 | -89.205309 |
| | | | Vallisneria americana | Wild celery | 2 | | 001200000 |
| | | | Chara sp. | Muskarasses | 2 | | |
| | | | Elodea canadensis | Common waterweed | 3 | | |
| 46 | 6 | muck | Potamogeton richardsonii | Clasping-leaf pondweed | 2 | 44,116825 | -89,204381 |
| | | | Flodea canadensis | Common waterweed | 4 | | 001201001 |
| | 1 | | Chara sp | Muskarasses | 3 | | |
| 47 | 4 | muck | Chara sp. | Muskgrasses | 4 | 44,116150 | -89,204390 |
| | · · · | | Potamogeton richardsonii | Clasping-leaf pondweed | 2 | | 001201000 |
| | 1 | | Flodea canadensis | Common waterweed | 4 | | |
| | | | Vallisneria americana | Wild celery | 3 | | |
| | | | Myriophyllum sibiricum | Northern water milfoil | 2 | | |
| 48 | 3 | muck | Nunhar variegata | Spatterdock | 5 | 44 116818 | -89 203444 |
| -10 | | muok | Nymphaea odorata | White water lilv | 2 | | 00.200111 |
| | | | Flodea canadensis | Common waterweed | 2 | | |
| | | | Chara sp | Muskarasses | 5 | | |
| | | | Ultricularia vulgaris | Common bladderwort | 2 | | |
| | | | Myriophyllum sibiricum | Northern water milfoil | 2 | | |
| | | | Potamogeton zosteriformis | Flat-stem pondweed | 2 | | |
| 10 | 1 | muck | Chara sp | Muskarassos | 6 | 11 1161/13 | -80 203453 |
| 43 | + 4 | | Myrionhyllum sibirioum | Northern water milfeil | 0 2 | 44.110143 | -03.203433 |
| | | | Flodea canadensis | | 2 | | |
| 50 | 5 | muck | Chara sp | Muskarasses | 2 | 11 115/60 | -80 203462 |
| 50 | 5 | IIIUUN | Myriophyllum sibirioum | Northern water milfeil | 3 2 | 44.110400 | -03.203402 |
| | | | Flodea canadonsis | Common waterwood | ა ი | | |

| | | | | | Daubenmire | | |
|-------|------------|-----------|---------------------------|------------------------|------------|-----------|------------|
| Point | Z (ft) | Substrate | Species | Common Name | Cover | Latitude | Longitude |
| | | | Potamogeton zosteriformis | Flat-stem pondweed | 2 | | |
| | | | Vallisneria americana | Wild celery | 4 | | |
| | | | Potamogeton richardsonii | Clasping-leaf pondweed | 2 | | |
| 51 | 5 | muck | Stuckenia pectinata | Sago pondweed | 2 | 44.114793 | -89.203471 |
| | | | Myriophyllum sibiricum | Northern water milfoil | 3 | | |
| | | | Nuphar variegata | Spatterdock | 2 | | |
| | | | Potamogeton crispus | Curly-leaf pondweed | 2 | | |
| | | | Potamogeton zosteriformis | Flat-stem pondweed | 1 | | |
| | | | Potamogeton richardsonii | Clasping-leaf pondweed | 0 | | |
| | | | Elodea canadensis | Common waterweed | 2 | | |
| 52 | 4 | muck | Myriophyllum sibiricum | Northern water milfoil | 3 | 44.114117 | -89.203480 |
| | | | Elodea canadensis | Common waterweed | 2 | | |
| | | | Vallisneria americana | Wild celery | 3 | | |
| | | | Stuckenia pectinata | Sago pondweed | 2 | | |
| | | | Potamogeton crispus | Curly-leaf pondweed | 2 | | |
| 53 | 33 | muck | NO VEG | NO VEG | 0 | 44.114111 | -89.202543 |
| 54 | 36 | muck | NO VEG | NO VEG | 0 | 44.114786 | -89.202534 |
| 55 | 31 | muck | NO VEG | NO VEG | 0 | 44.115461 | -89.202525 |
| 56 | 4 | muck | Chara sp. | Muskarasses | 5 | 44.116136 | -89.202516 |
| | | | Elodea canadensis | Common waterweed | 2 | | |
| | 1 | | Myriophyllum sibiricum | Northern water milfoil | 2 | | |
| | | | Potamogeton crispus | Curly-leaf pondweed | 1 | | |
| | | | Potamogeton zosteriformis | Flat-stem pondweed | 1 | | |
| 57 | 5 | muck | Vallisneria americana | Wild celery | 3 | 44.116805 | -89.201569 |
| | | | Potamogeton illinoensis | Illinois pondweed | 3 | | |
| | | | Chara sp. | Muskarasses | 4 | | |
| | | | Flodea canadensis | Common waterweed | 2 | | |
| | | | Potamogeton zosteriformis | Elat-stem pondweed | 2 | | |
| 58 | 39 | | NO VEG | NO VEG | 0 | 44 116130 | -89 201579 |
| 59 | 40 | | NOVEG | NO VEG | 0 | 44 115455 | -89 201588 |
| 60 | 40 | | NOVEG | NO VEG | 0 | 44,114780 | -89,201597 |
| 61 | 35 | | NOVEG | NO VEG | 0 | 44 114104 | -89 201606 |
| 62 | 4 | sand | Vallisneria americana | Wild celery | 2 | 44,113429 | -89,201615 |
| | · · | Carla | Flodea canadensis | Common waterweed | 1 | | 00.201010 |
| | | | Potamogeton zosteriformis | Elat-stem pondweed | 2 | | |
| 63 | 6 | muck | Chara sp | Muskarasses | 5 | 44 116799 | -89 200632 |
| 00 | | | Myriophyllum sibiricum | Northern water milfoil | 2 | | 00.200002 |
| | | | Flodea canadensis | Common waterweed | 2 | | |
| 64 | 49 | | NO VEG | NO VEG | 0 | 44 116123 | -89 200641 |
| 65 | 41 | | NO VEG | NO VEG | 0 | 44 115448 | -89 200650 |
| 66 | 35 | muck | NO VEG | NO VEG | 0 | 44 114773 | -89 200660 |
| 67 | 16 | muck | Flodea canadensis | Common waterweed | 1 | 44 114098 | -89 200669 |
| 68 | 3 | fine sand | Vallisperia americana | Wild celery | 3 | 44 113423 | -89 200678 |
| 69 | 5 | muck | Chara sp | Muskarasses | 6 | 44 114091 | -89 199731 |
| 00 | | muck | Ceratophyllum demersum | Coontail | 2 | | 00.100701 |
| | | | Myriophyllum sibiricum | Northern water milfoil | 2 | | |
| | | | Potamogeton zosteriformis | Flat-stem pondweed | 2 | | |
| 70 | 8 | muck | Flodea canadensis | Common waterweed | 1 | 11 111766 | -80 100722 |
| 10 | | muck | Myriophyllum sibiricum | Northern water milfoil | 2 | 44.114700 | -03.133722 |
| | | | Potamogeton zosteriformis | Flat-stem pondweed | 2 | | |
| | | | Ceratophyllum demersum | Coontail | 2 | | |
| 71 | 10 | muck | NO VEG | NOVEG | 0 | 11 115/12 | -80 100713 |
| 72 | 40 | muck | NO VEG | NOVEG | 0 | 44 116117 | -89 100704 |
| 72 | 7 | muck | Flodea canadensis | Common waterwood | 1 | 44 116702 | -80 100605 |
| 13 | <u> '</u> | | Myrionhyllum sibirioum | Northern water milfail | 2 | .110/92 | -03.139093 |
| | | | Chara sp | | 2 | | |
| | - | | Potamogeton illinoensis | Illinois pondwood | 2 | | |
| 71 | | muck | | | <u> </u> | 44 116110 | -80 108767 |

| | | | | | Daubenmire | | |
|-------|------------|-----------|---------------------------|------------------------|---------------|------------|------------|
| Point | Z (ft) | Substrate | Species | Common Name | Cover | Latitude | Longitude |
| 75 | 34 | muck | NO VEG | NO VEG | 0 | 44.115435 | -89.198776 |
| 76 | 6 | muck | Chara sp. | Muskgrasses | 5 | 44.114760 | -89.198785 |
| | | | Myriophyllum sibiricum | Northern water milfoil | 3 | | |
| | | | Elodea canadensis | Common waterweed | 2 | | |
| | | | Vallisneria americana | Wild celery | 2 | | |
| | | | Potamogeton crispus | Curly-leaf pondweed | 2 | | |
| | | | Potamogeton praelongus | White-stem pondweed | 6 | | |
| | | | Potamogeton zosteriformis | Flat-stem pondweed | 2 | | |
| | | | Stuckenia pectinata | Sago pondweed | 2 | | |
| 77 | 39 | muck | NO VEG | NO VEG | 0 | 44.115428 | -89.197839 |
| 78 | 19 | muck | NO VEG | NO VEG | 0 | 44.116104 | -89.197830 |
| 79 | 6 | muck | Chara sp. | Muskgrasses | 6 | 44.116097 | -89.196893 |
| | | | Myriophyllum sibiricum | Northern water milfoil | 3 | | |
| | | | Potamogeton zosteriformis | Flat-stem pondweed | 2 | | |
| | | | Elodea canadensis | Common waterweed | 2 | | |
| | | | Stuckenia pectinata | Sago pondweed | 2 | | |
| 80 | 28 | | NO VEG | NO VEG | 0 | 44.115422 | -89.196902 |
| 81 | 4 | muck | Chara sp. | Muskarasses | 5 | 44.114747 | -89.196911 |
| | 1 | | Elodea canadensis | Common waterweed | 2 | | |
| | | | Stuckenia pectinata | Sago pondweed | 2 | | |
| | | | Potamogeton zosteriformis | Flat-stem pondweed | 2 | | |
| | | | Vallisneria americana | Wild celerv | 3 | | |
| | | | Myriophyllum sibiricum | Northern water milfoil | 2 | | |
| 82 | 6 | muck | Utricularia vulgaris | Common bladderwort | 2 | 44,114740 | -89,195974 |
| | | | Chara sp. | Muskarasses | 5 | | |
| | | | Vallisneria americana | Wild celery | 3 | | |
| | | | Myriophyllum sibiricum | Northern water milfoil | 2 | | |
| | | | Potamogeton zosteriformis | Flat-stem pondweed | 2 | | |
| | | | Stuckenia pectinata | Sago pondweed | 2 | | |
| | | | Elodea canadensis | Common waterweed | 2 | | |
| 83 | 7 | muck | Chara sp | Muskarasses | 2 | 44 115415 | -89 195964 |
| 00 | <u> '</u> | maok | Elodea canadensis | Common waterweed | 4 | | 00.100001 |
| | | | Myriophyllum sibiricum | Northern water milfoil | 4 | | |
| 8/ | 2 | muck | Chara sp | Muskarasses | 5 | 11 11/73/ | -80 105036 |
| 04 | J | IIIUCK | Vallisperia americana | Wild colory | 3 | 44.1147.04 | -03.135050 |
| | | | | Northern water milfoil | 2 | | |
| | | | Potamogeton zosteriformis | Flat-stem pondweed | 2 | | |
| 85 | 2 | muck | | Common bladderwort | 2 | 11 11/727 | -80 10/000 |
| 00 | 2 | IIIUCK | Nymphaea odorata | White water lily | 2 | 44.114727 | -03.13+033 |
| | | | Vallisparia amoricana | Wild colony | 2 | | |
| | | | Flodoa canadonsis | Common waterwood | 2 | | |
| | | | Naiae flovilie | Slonder paiad | 2 | | |
| 86 | 1 | muck | Potamogeton illinoonsis | | 2 | 11 11/0/5 | -90 103171 |
| 00 | 4 | IIIUCK | Stuckonia poetinata | Saga pandwood | 2 | 44.114045 | -09.193171 |
| | | | Chara an | Muskgrasses | <u>ک</u> ۲ | | |
| | | | Eledea canadonsis | Common waterwood | 2 | | |
| | | | Vallianaria amariaana | Wild colory | 2 | | |
| | | | | Common bladdorwart | <u>ວ</u> | | |
| | | | | Northorn water milfeil | 2 | | |
| 97 | 0 | muck | | | 2 | 11 112270 | -80 102190 |
| 07 | 9 | MUCK | Chara an | Muskgrassas | 2 | 44.115570 | -09.193100 |
| | | | Detemogeton illineensie | Illinois ponduced | 2 | | |
| 00 | | muck | | | <u>∠</u> | 11 11 1070 | 90 100000 |
| ÖÖ | <u> </u> | MUCK | Detemogeton zectoriformia | Flot otom pandwood | 0 | 44.114072 | -09.190920 |
| | | | | Mild colory | 2 | | |
| | | | | Northorn water milfeil | 2 | | |
| | | | | | Δ | | |
| | | | | Clasping-leat pondweed | 4 | | |
| | 1 | 1 | | GORDELOOCK | 4 | | |

Mount Morris Lake Vegetation Survey

| | | | | | Daubenmire | | |
|-------|--------|-----------|---------------------------|------------------------|------------|-----------|------------|
| Point | Z (ft) | Substrate | Species | Common Name | Cover | Latitude | Longitude |
| | | | Elodea canadensis | Common waterweed | 2 | | |
| 89 | 6 | muck | Chara sp. | Muskgrasses | 6 | 44.113396 | -89.196929 |
| | | | Najas flexilis | Slender naiad | 2 | | |
| | | | Potamogeton zosteriformis | Flat-stem pondweed | 2 | | |
| 90 | 4 | | Chara sp. | Muskgrasses | 6 | 44.113403 | -89.197866 |
| | | | Nuphar variegata | Spatterdock | 4 | | |
| | | | Potamogeton richardsonii | Clasping-leaf pondweed | 3 | | |
| | | | Myriophyllum sibiricum | Northern water milfoil | 2 | | |
| | | | Vallisneria americana | Wild celery | 2 | | |
| | | | Potamogeton zosteriformis | Flat-stem pondweed | 2 | | |
| 91 | 2 | muck | Nuphar variegata | Spatterdock | 3 | 44.113409 | -89.198803 |
| | | | Chara sp. | Muskgrasses | 5 | | |
| | | | Potamogeton zosteriformis | Flat-stem pondweed | 2 | | |
| | | | Myriophyllum sibiricum | Northern water milfoil | 3 | | |
| | | | Potamogeton praelongus | White-stem pondweed | 2 | | |
| | | | Potamogeton illinoensis | Illinois pondweed | 2 | | |
| | | | Vallisneria americana | Wild celery | 2 | | |
| | | | Najas flexilis | Slender naiad | 2 | | |
| | | | Ceratophyllum demersum | Coontail | 2 | | |
| 92 | 8 | muck | Chara sp. | Muskgrasses | 6 | 44.112715 | -89.196001 |
| | | | Potamogeton praelongus | White-stem pondweed | 2 | | |
| | | | Potamogeton zosteriformis | Flat-stem pondweed | 2 | | |
| 93 | 14 | muck | Potamogeton crispus | Curly-leaf pondweed | 2 | 44.113390 | -89.195992 |
| | | | Myriophyllum sibiricum | Northern water milfoil | 3 | | |
| | | | Elodea canadensis | Common waterweed | 2 | | |
| 94 | 6 | muck | Chara sp. | Muskgrasses | 6 | 44.114065 | -89.195983 |
| 95 | 12 | muck | Chara sp. | Muskgrasses | 6 | 44.113383 | -89.195055 |
| | | | Ceratophyllum demersum | Coontail | 2 | | |
| 96 | 14 | muck | Myriophyllum sibiricum | Northern water milfoil | 2 | 44.112708 | -89.195064 |
| 97 | 4 | muck | Chara sp. | Muskgrasses | 4 | 44.112033 | -89.195073 |
| | | | Stuckenia pectinata | Sago pondweed | 3 | | |
| | | | Potamogeton zosteriformis | Flat-stem pondweed | 2 | | |
| | | | Myriophyllum sibiricum | Northern water milfoil | 2 | | |
| | | | Vallisneria americana | Wild celery | 2 | | |
| | | | Potamogeton richardsonii | Clasping-leaf pondweed | 3 | | |
| 98 | 5 | muck | Vallisneria americana | Wild celery | 3 | 44.112701 | -89.194127 |
| | | | Potamogeton richardsonii | Clasping-leaf pondweed | 3 | | |
| | | | Potamogeton zosteriformis | Flat-stem pondweed | 2 | | |
| | | | Stuckenia pectinata | Sago pondweed | 2 | | |
| | | | Myriophyllum sibiricum | Northern water milfoil | 2 | | |
| | | | Chara sp. | Muskgrasses | 3 | | |
| | | | Nymphaea odorata | White water lily | 2 | | |



APPENDIX D

February 2006 Aquatic Invasive Species Grant Application Project Scope

INTRODUCTION AND PROBLEM IDENTIFICATION

Mount Morris Lake is a 163-acre drainage lake with a maximum depth of 40 feet (Map 1). In 2004, the Mount Morris Lake Management District (MMLMD) received Wisconsin Department of Natural Resources (WDNR) Planning Grant funds to complete a comprehensive management plan. The project included multiple components and will be completed during the spring of 2006. The project focused water quality, watershed condition and impacts, aquatic plants, and educational issues. However, the foremost concern of the MMLMD is the impacts of curly-leaf pondweed (*Potamogeton crispus*) on their lake.

Surveys completed during June and July 2004 indicate that the aquatic plant community of Mount Morris Lake is exceptional. The lake was found to have 31 native species and a diversity of 0.92, which are both very high. The floristic quality of the lake is also very high at 30.9. Unfortunately, the plant community of Mount Morris Lake is being threatened by the presence of exotic species. The most widespread of these species is curly-leaf pondweed (Figure 1). It is not known when curly-leaf pondweed first became established in the lake; however, it is likely that it started in a small area and has been unintentionally spread to every basin in the lake (Map 2) largely through the district's harvesting activities



Figure 1. Mount Morris Lake occurrence analysis. Developed with 2004 aquatic plant data. Red indicates exotic species.

The impacts of invasive species such as curly-leaf pondweed on a quality plant community such as Mount Morris Lake's could be devastating; however, the negative effects do not only appear in the plant community. In lakes with dense occurrences, the water quality of the lake can also be affected following the die-off of the curly-leaf pondweed and are most often seen in raised total phosphorus levels. Mount Morris Lake is no exception to this phenomenon as evidenced by the increased phosphorus levels in Lake D that coincide with the late June dieback of curly-leaf pondweed (Figure 2). As the plant continues to infest other areas of the lake, this trend would continue to increase to the point that the lake would also experience mid summer algae blooms.



Figure 2. Total phosphorus concentrations in Mount Morris Lake D during portions of 2004 and 2005.

The curly-leaf pondweed infestation is negatively affecting Mount Morris Lake, and these effects are expected to increase as the infestation spreads. In 2004 a small colony of a second exotic plant, Eurasian water milfoil (*Myriophyllum spicatum*) was found near the north shore of Lake D (Map 2). The occurrence was verified in 2005. Eurasian water milfoil, like curly-leaf pondweed has the potential to severely affect the native plant population. Fortunately, no other occurrences are known, so this is likely a pioneer colony and the likeliness of control or possibly eradication is high.

PROJECT GOALS

As outlined above, the aquatic plant community of Mount Morris Lake is outstanding as evidenced by the system's high diversity, abundance of native floating-leaf and emergent plant communities, and its exceptional floristic quality. Unfortunately, the value of this unique system as an ecological and recreational resource is threatened by an established infestation of curly-leaf pondweed and a pioneer colony of Eurasian water milfoil. The draft aquatic plant management plan is a multi-year plan with basically two phases. The first phase will last five years and is an intense attack on existing exotics with the intent on significantly reducing their occurrence. The second phase is the continued control of the exotics, primarily through the efforts of the MMLMD. The project proposed here consists of the first phase of the plan. The MMLMD realizes that the completion of this project will not result in the eradication of curly-leaf pondweed and possibly even that of Eurasian water milfoil; therefore, the second phase of the management plan aims primarily at the continued control of exotic species. The second phase will be conducted by the MMLMD during and following this project and includes the continued monitoring and periodic treatment of curly-leaf pondweed and/or Eurasian water milfoil, as applicable. Further, the second phase includes major changes to the district's current harvesting plan so these activities are not counterproductive to the efforts outlined below. The updated harvesting plan can be found in Attachment A.

The goals of this project are to:

- Reduce the occurrence of curly-leaf pondweed within the lake and as a result, minimize its spread through harvesting.
- Control or possibly eradicate the small amount of Eurasian water milfoil that is currently known to exist within the lake.
- Minimize the opportunities for additional introductions of these species through the lake's public access.
- Prepare the MMLMD to continue the management and control efforts past the initial five-year project.

These goals will be met with a multi-faceted plan aimed at attacking the exotics problem through chemical, mechanical, and manual treatments, prevention of additional introductions from outside sources, and monitoring to guide efficient treatments, determine treatment effectiveness, and locate exotic infestations within the lake that are currently unknown or may occur in the future. Much of the work involved with this plan will be completed through volunteer efforts which raise stakeholder awareness and ownership in the project, while equipping the group to continue the efforts into the future.

PROJECT SCOPE

Control Treatments

Three types of treatments will be utilized to control curly-leaf pondweed and reduce its occurrence throughout the lake; chemical control using endothal (Aquathol- $K^{\text{(B)}}$), deep mechanical harvesting, and hand-removal by divers in select areas utilizing scuba. Hand-removal will also be utilized on the limited amount of Eurasian water milfoil found in Lake D. These efforts would be guided through pre-treatment monitoring performed by professionals (please see section on Pre-Treatment Monitoring below).

Chemical Applications

The plan includes multiple chemical treatments of curly-leaf pondweed within the lake. Chemicals will be applied by a licensed applicator at an initial rate of 1.5 ppm of Aquathol $K^{\text{(B)}}$ before turions are produced. If the proposed treatment rate does not appear to be providing acceptable effectiveness, the MMLMD would consult with the WDNR concerning the applicability of higher dose rate per acre.

As described above, the focus of this plan is the protection of important habitat; therefore, early spring treatments will be utilized to reduce impacts on native plants. The first treatment, proposed to occur in spring 2006, will include a total of approximately 24 acres in Lakes A, B, C, and D (Map 3). Locations targeted for chemical treatment include areas containing curly-leaf pondweed above what would be considered a scattered occurrence to areas clearly dominated by the plant and locations that cannot be reached by the district's harvesters. All target areas pose a definite threat to the ecosystem because they act as sources for potential spread to other areas of the lake through turion production.

As a part of this project, spring treatments will be completed annually for four years to reduce the turion base and as a result the occurrence of curly-leaf pondweed. As the project progresses, the original treatment areas may reduce in size; however, the budget for this portion of the project contains four treatments of the same size.

Hand-Removal

Hand-removal by divers is still an experimental procedure for curly-leaf pondweed and Eurasian water milfoil control; however, the method appears sound. Hand-removal of curly-leaf pondweed would be restricted to Lake E where only a few scattered plants were found (Map 3). Eurasian water milfoil would be hand-removed in its currently known area of Lake D. Removal would be performed by certified scuba divers following pre-treatment monitoring. During hand-removal, extra care will be taken not to disturb and spread existing turions to other locations in the lake. Furthermore, if turions are able to be seen while in the water, they will also be removed from lake.

To monitor effectiveness of hand-removal, select areas would be marked with single metal stakes so the precise locations could be visited each year. During each removal event, the area covered, number of plants removed, and other pertinent will be recorded. If conditions warrant, underwater photography will also be used to document treatment effectiveness.

Mechanical Harvesting

Mechanical harvesting of approximately 10 acres (Map 3) will be performed with the intent of minimizing turion production in those areas. Harvesting will begin in early May before turion production starts and continue until evidence of native growth appears. Harvesting will be completed to the maximum depth possible without disturbing bottom sediments. A sample of these areas will be monitored as a part of the pre- and post-treatment efforts described below in order to document turion reduction.

Monitoring

Monitoring is an important element of a complete management plan. For this project in particular, monitoring would be completed to assess long- and short-term effectiveness, to ensure efficiency in control techniques, and to determine if reductions in curly-leaf biomass within the lake suppresses the total phosphorus spike that was documented during the summer of 2004. Monitoring would be completed by professionals and volunteers as a part of this project. Volunteers would be trained to make certain that proper protocols would be followed and reliable data would be collected. As mentioned above, volunteer involvement is essential to raise awareness of the project and the value of responsible lake stewardship, while creating ownership in the project. The involvement would also raise the capacity of the MMLMD to continue the management efforts in the future.

Pre-treatment Monitoring

Pre-treatment monitoring will be completed annually to guide each year's control program. Doing this will ensure that chemicals are used sparing within the system and practical hand-removal areas will be selected. It will also allow professionals the opportunity to monitor and to quantify the success of the previous year's management effort.

Monitoring will be completed using surface surveys via boat, rake tows, scuba, and a limited amount of submerged video. Suspect areas located during the 2004 aquatic plant surveys and through the volunteer monitoring program will be the primary targets of the site visits and will naturally include all previously treated areas, as applicable. Monitoring will begin soon after ice-out when water temperatures reach approximately 48-52°F. Once the monitoring is complete, the findings will be analyzed and that year's treatment plan will be refined. The refined plan will be shared with the WDNR to obtain concurrence and ensure a smooth and rapid permitting process. Cooperation and preparedness will be essential for the success and ultimate usefulness of this component. Some of the permitting process will be completed based upon the previous year's treatments and monitoring; however, if all involved are not prepared to respond quickly, then the opportunity for an early season treatment may be lost.

Prior to the treatment, buoys would be placed to mark treatment areas for chemical application. Following the application, volunteers in charge of post-treatment monitoring (see below) would familiarize themselves with the treatment locations before retrieving the buoys.

Post-treatment Monitoring

The premise of completing early-season curly-leaf pondweed treatments, through harvesting and herbicide applications, is the reduction of turion production. If turion production is reduced, then a reduction in plant biomass can be assumed. Post-treatment monitoring will be completed by volunteers and professionals following each application. Specifically, volunteer monitoring will be completed during mid June, while professional monitoring will be performed the following spring previous to that year's treatment. Essentially, the volunteers will monitor if that year's treatment reduced turion production and then the professional monitoring will assess if the biomass is being reduced.

A key benefit of this component will be the ability to make alterations to the treatment plan as the project progresses. The ability to make these short-term assessments and changes will increase the likelihood of success in the long-term. These adjustments may include changes in treatment timing, dosage rate, and location, or possibly the complete discontinuation of treatments in particular areas.

Volunteer Monitoring

Volunteers will be trained by professionals following the first treatment to collect data aimed at determining if turion production is being stifled. On the second weekend following treatment, 2 teams of 2 volunteers will be used to gather post-treatment data. At roughly 80, pre-determined locations arranged in a grid pattern based on a 40-meter resolution within select treatment areas (Map 4), volunteers will observe the condition of curly-leaf pondweed from the surface and record if the plants appear to be dead or dying. At each location, the volunteers will also complete two rake tows. From each tow, biomass of curly-leaf pondweed (dead or living) on the rake head will be recorded on a scale of 1-3, as will the number of turions found either loose or attached to plants. Two sediment samples will also be retrieved at each location using a bottom dredge and each of those samples will be screened (washed) and the turions counted. It is estimated that each team will volunteer approximately 5 hours of time gathering data. These data will be summarized annually.

Professional Monitoring

Professional monitoring will be completed concurrently with each year's pre-treatment survey. Two rake tows will be completed at the same locations used by the volunteer monitors. Biomass of curly-leaf pondweed and native plants will be recorded for each tow on a scale of 1-3. These data will be summarized annually.

Water Quality Monitoring

As described in the Results and Discussion section, a definite phosphorus spike was detected in Lake D following the senescence of curly-leaf pondweed (Figure 2). It is expected that as the biomass of curly-pondweed is reduced through the efforts of this plan, that the associated phosphorus spike will also be reduced. It is the intent of this component to document this phenomenon through periodic water quality testing.

During first four years of this project, a volunteer will collect water quality samples from the deep holes of Lakes C and D. Near-surface and near-bottom samples will be collected twice a month May – August and will be analyzed for total and soluble reactive (ortho) phosphorus by the Wisconsin State Laboratory of Hygiene. The volunteer would be trained by professionals during the first season of monitoring. The results will be summarized annually.

Annual Monitoring for Aquatic Invasives

In lakes without curly-leaf pondweed and Eurasian water milfoil, early detection of pioneer colonies commonly leads to successful control and in some cases, eradication. Even in lakes where these plants occur, monitoring for new colonies is essential to successful control.

Volunteers from the MMLMD will be trained to monitor for curly-leaf pondweed and Eurasian water milfoil within the lake. The training would be based upon a protocol created for volunteer monitoring within the Town of Saint Germain (Attachment B) and would include identification of the target species and native look-alikes, methods to divide monitoring areas among participants, and a course of action to follow should suspect plants be found. The protocol would be modified slightly from that used in Saint Germain because of the existing populations of exotics within the lake. The primary modification will be the familiarization of the volunteers with known areas of curly-leaf pondweed and Eurasian water milfoil occurrences within their respective areas. This will be accomplished by visiting the sites after the first pre-treatment survey, but before the application is completed. An added benefit to this modification is the fact that volunteers would be exposed to these plants as they occur in situ.

Comprehensive Aquatic Plant Study

A survey of all aquatic plants, native and non-native, would be completed during the summer of 2010 utilizing the point-intercept method described in "Appendix C" of the Wisconsin Department of Natural Resource (WDNR) document, <u>Aquatic Plant Management in</u> <u>Wisconsin - Draft</u>, (April 25, 2005). The point-intercept method, following the guidelines of the WDNR would be used at a 40-meter resolution on Mount Morris Lake resulting in approximately 325 points. The results of this study would be the basis for determining if the 4-year control plan was successful at meeting the goals outlined above. It would also provide an additional baseline for determining the success of the MMLMD's continued management efforts.

Volunteer Watercraft Inspection

Despite the fact that Mount Morris Lake currently contains curly-leaf pondweed and a limited amount of Eurasian water milfoil, it is still important to help stop further infestation of these species. Furthermore, the educational value instilled to the volunteers during the training and then passed onto others as they do their work is invaluable to a project such as this.

Mr. Rob Adams of the MMLMD has attended a UW-Extension Clean Boats Clean Lakes training session and will lead this effort. Other members of the MMLMD will also attend training sessions to assist Mr. Adams in the facilitation of this component.

PROJECT DELIVERABLES

At the end of each year, an annual summary will be created outlining the activities and results of that year. The summary will also include proposed changes to the treatment regime and/or monitoring program that would be followed the next year. The summaries will be provided to the WDNR and MMLMD by March 1 of the year following the respective activities. The MMLMD will share each of the summaries with its members by publishing it in their newsletter.

The final product for this project would be a single report including the methodologies and results of the tasks described above, a summary of the final year's activities and results, and a compilation of the annual summaries as described above.

Four hardcopies of the final report will be provided to the MMLMD and two will be provided to the WDNR. Two CD-ROMs containing the final report and data in electronic format will also be supplied to each of these groups.